NASA Contractor Report 3442

A Computer Code for Swirling Turbulent Axisymmetric Recirculating Flows in Practical Isothermal Combustor Geometries

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CONTENTS

1. INTRODUCTION

1.1 The Problem

In combustion chamber development, designers are aided by experiments but, as a supplement to them, economical design and operation can be greatly facilitated by the availability of prior predictions of the flowfield. These may be obtained by use of a mathematical model incorporating a numerical finite difference prediction procedure. This work combines the rapidly developing fields of theoretical combustion aerodynamics and computational fluid dynamics, and its improvement and use will significantly increase understanding and reduce the time and cost of development.[1-6]

The present research work is concerned with complementary experimental and theoretical studies and is described in a recent paper.[7] The problem being investigated is restricted to steady turbulent flow in axisymmetric geometries, under low speed and nonreacting conditions - a study area highlighted recently[8-10] as a fundamental research requirement in combustion modeling. The particular problem is concerned with turbulent flow of a given turbulence distribution in a round pipe entering an expansion into another round pipe, as illustrated in Fig. 1. The in-coming flow may possess a swirl component of velocity via passage through swirl vanes at angle ϕ [equal approximately to $\tan^{-1}(w_{in}/u_{in})$], and the side-wall may slope at an angle α, to the main flow direction. The resulting flowfield domain may possess a central toroidal recirculation zone CTRZ in the middle of the region on the axis, in addition to the possibility of a corner recirculation zone CRZ near the upper corner provoked by the rather sudden enlargement of the cross-sectional area. Of vital concern is the characterization of flows of this type in terms of the effects of side-wall angle α, degree of swirl ϕ, turbulence intensity k_{in} of the inlet stream and expansion ratio D/d on the resulting flowfield in terms of its time-mean and turbulence quantities.

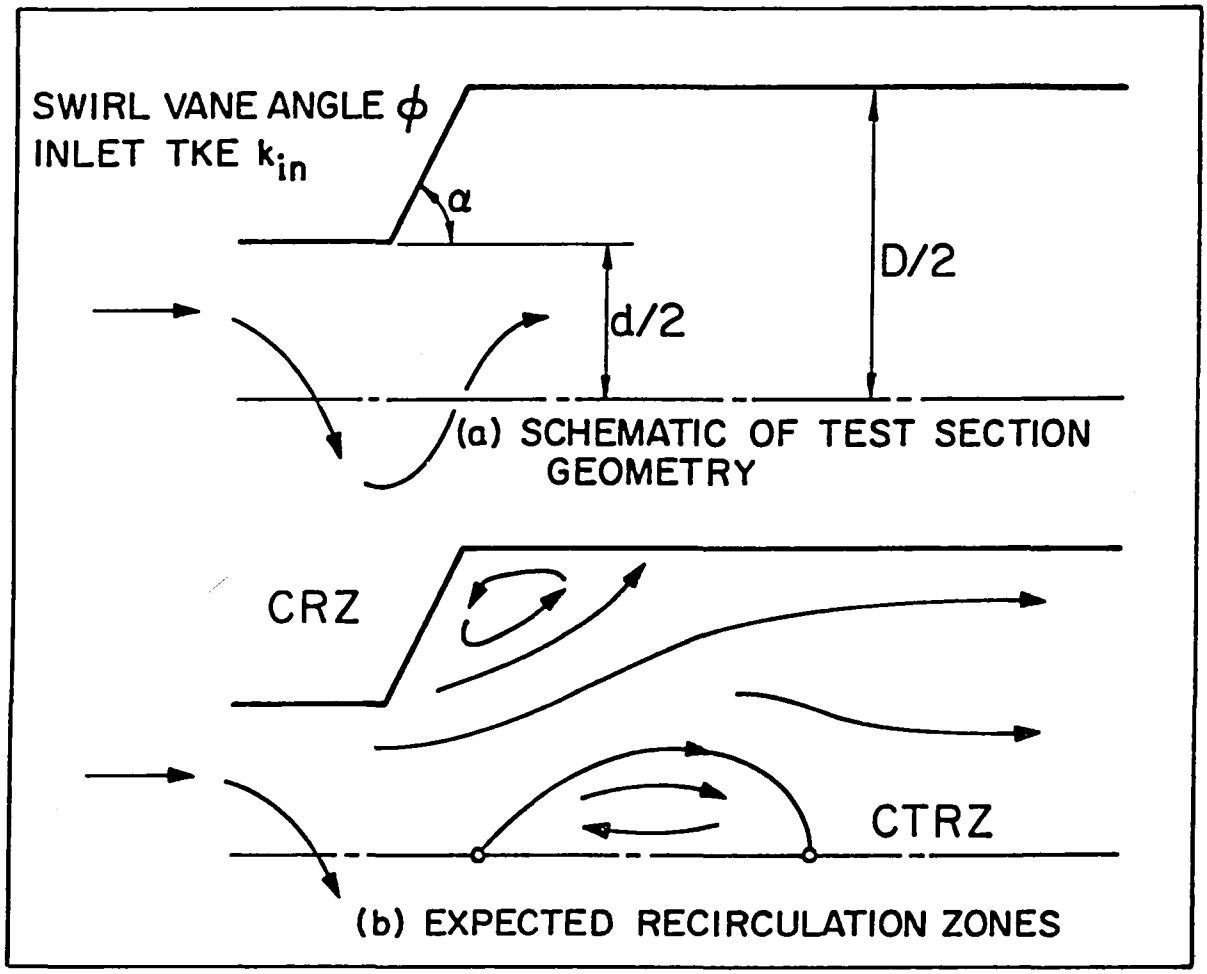


Fig. 1. The flowfield being investigated.

Such problems have received little attention, yet there is a definite need for work in this area even under nonreacting flow conditions.

The objective of the present document is to present details of the computational solution procedure which has been developed to perform the prediction function in the configuration just described. The finally developed computer program (written in Fortran 4) is code-named STARPIC (mnemonic for swirling turbulent axisymmetric recirculating flows in practical isothermal combustor geometries) and it is the purpose of this document to serve as a user's manual and describe it in sufficient detail for it to be used and amended by persons whose interest is confined more to the basis and results of the computations.

1.2 Previous Work

A mathematical solution of the flowfield of interest should provide results, if possible more cheaply, quickly, and correctly than possible by other means (for example, experiments on real-life systems or models). In order to achieve this, the model should simulate the flow in all its important respects (geometry, boundary conditions, physical properties of gases, turbulence, etc.) and provide a means whereby the governing equations may be solved. Mathematical models of steadily increasing realism and refinement are now being developed, both in the dimensionality of the model (together with the computational procedures) and in problems associated with the simulation of the physical processes occurring. Clearly there are two areas of difficulty: the simulation and solution.

Several previous publications discuss these problems at length, in terms of practical application,[5,6] turbulence modeling[11,12] and numerical solution of 2-D axisymmetric problems via the stream function ~ vorticity or primitive pressure ~ velocity approach.[13-15] Whereas the former approach, used in the 1968 computer program from Imperial College for example[16], reduces by one

the number of equations to be solved and eliminates the troublesome pressure (at the expense of trouble with the vorticity equation), the preferred approach now is SIMPLE (mnemonic for semi-implicit method for pressure linked equations) which focuses attention directly on the latter variables. Because it possesses many advantages, the present work has been developed immediately on this new technique, the basic ideas of which have been embodied into the 1974 Imperial College TEACH (teaching elliptic axisymmetric characteristics heuristically) computer program.[17] Advances to this code have been made elsewhere and applied to other 2-D[18-25] and 3-D[26-29] problems of interest to the combustor designer.

1.3 Outline of the Present Contribution

The present document serves as a user's manual for the STARPIC computer program, with three subsequent major sections dealing with the basic ideas, the computer program and the user's guide. Consideration is given to recent work in the finite difference solution, via a primitive variable code, of axisymmetric swirl flow in the combustor geometry of Fig. 1, where the inlet expansion sidewall may slope obliquely to the central axis. Section 2 describes the mathematical problem, by providing the basic equations and assumptions for the flow, and discussing the primitive variable solution technique to be used. Section 3 concerns itself with the organization and structure of the computer program. Sub-sections of the program are here described and linked with the equations previously noted in the text; and explanations are given of the special features of the program. Readers primarily interested in using the program, without concerning themselves greatly with the computational details, can give their main attention to Section 4. This is a user's guide to the program and the emphasis is on those parts of the program which will require alteration to suit particular flow configura-

tions, to obtain the desired output, to test for accuracy and to improve it when necessary. Appendices are provided dealing with the hydrid differencing scheme and reasons for its superiority, a Fortran symbol list, a listing of the STARPIC computer program, The program output is included in a microfiche supplement at the back of the report.

2. THE MATHEMATICAL PROBLEM

2.1 The Governing Equations

The turbulent Reynolds equations for conservation of mass, momentum (in x, y and θ directions), turbulence energy k and turbulence dissipation rate ε, which govern the 2-D axisymmetric, swirling, steady flow may be taken as previously.[19-15] The transport equations are all similar and contain terms for convection and diffusion (via turbulent flux terms) and source S_ϕ of a general variable (which contains terms describing the generation (creation) and consumption (dissipation) of ϕ). Introducing turbulent exchange coefficients and the usual turbulent diffusion-flux (stress ~ rate of strain type) laws, it can be shown that the similarity between the differential equations and their diffusion relations allows them all to be put in the common form:

$$\frac{1}{r}\left[\frac{\partial}{\partial x}(\rho u r\phi) + \frac{\partial}{\partial r}(\rho v r\phi) - \frac{\partial}{\partial x}\left(r\Gamma_\phi \frac{\partial \phi}{\partial x}\right) - \frac{\partial}{\partial r}\left(r\Gamma_\phi \frac{\partial \phi}{\partial r}\right)\right] = S_\phi \qquad (1)$$

for $\phi = 1$ (continuity equation), u, v, w (three velocity components), k and ε (two turbulence quantities). The forms for the source term S_ϕ are given in Table 1, where certain quantities are defined as follows:

$$S^u = \frac{\partial}{\partial x}\left(\mu \frac{\partial u}{\partial x}\right) + \frac{1}{r}\frac{\partial}{\partial r}\left(r\mu \frac{\partial v}{\partial x}\right) \qquad (2)$$

$$S^v = \frac{\partial}{\partial x}\left(\mu \frac{\partial u}{\partial r}\right) + \frac{1}{r}\frac{\partial}{\partial r}\left(r\mu \frac{\partial v}{\partial r}\right) \qquad (3)$$

$$\dot{G} = \mu\left[2\left\{\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial v}{\partial r}\right)^2 + \left(\frac{v}{r}\right)^2\right\} + \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x}\right)^2 + \left\{r\frac{\partial}{\partial r}(w/r)\right\}^2 + \left(\frac{\partial w}{\partial x}\right)^2\right] \qquad (4)$$

Implicit here is the use of the two-equations k-ε turbulence model[11,12]

Table 1. The Form of the Source Term in the General Equation for ϕ (Eq. (1))

ϕ	S_ϕ
u	$-\frac{\partial p}{\partial x} + S^u$
v	$-\frac{\partial p}{\partial r} + \frac{\rho w^2}{r} - \frac{2\mu v}{r^2} + S^v$
w	$-\frac{\rho v w}{r} - \frac{w}{r^2}\frac{\partial}{\partial r}(r\mu)$
k	$G - C_D \rho \varepsilon$
ε	$(C_1 \varepsilon G - C_2 \rho \varepsilon^2)/k$

$$\mu = C_\mu \rho k^2/\varepsilon + \mu_\ell \tag{5}$$

$$\Gamma_\phi = \mu/\sigma_\phi \tag{6}$$

which is commonly used in computer codes for turbulent flow prediction.

These equations have to be solved for the time-mean pressure p and velocity components u, v, and w. Then other useful designer information like streamline plots showing breakaway and reattachment points, recirculation zones and stagnation points are easily produced. Streamline plots are obtained from the dimensionless stream function which is given by

$$\psi^* = \int_0^r urdr \; / \; \int_0^{d/2} urdr \tag{7}$$

This quantity is calculated for all u-cells, and the coordinates of points constituting each of eleven streamlines ($\psi^* = 0.0$ through $\psi^* = 1.0$) is stored for plotting. Earlier publications[17-21] provide details of the present simulation and solution technique, and only highlights of the primitive-variable approach need be given here in the context of the specific problem being investigated.

All the linkages provide a high degree of non-linearity in the total problem, and given the numerical analysis of fluid flow its peculiar difficulty and flavor. The above equations do not alone specify the problem; additional information of two kinds is needed: initial and boundary conditions for all the dependent variables. Details of this are given in Section 2.3. The difficulties in solution spring mainly from the interlinkages between the ϕ's. Those between the axial and radial velocity components are of a peculiar kind, each containing an unknown pressure

gradient and the components are linked additionally by another equation, that of mass conservation, in which pressure does not appear. A successful solution procedure is one which takes account of these interactions and ensures that successive adjustments, which must be made to one variable after another, form an involuntary convergent sequence.

2.2 The Solution Technique and Finite Difference Formulation

Solution may be via the stream function-vorticity or primitive pressure-velocity approach, and, as discussed in Section 1.2, the present solution technique is based on the latter. The basic TEACH computer program using SIMPLE with TDMA provides the starting point upon which the present work is based.[17] The following features are incorporated into the program:

(i) a finite difference procedure is used in which the dependent variables are the velocity components and pressure;

(ii) the pressure is deduced from an equation which is obtained by the combination of the continuity equation and the momenta equations (yielding a new form of what is known in the literature as the Poisson equation for pressure);

(iii) the idea is present at each iteration of a first approximation of u, v, and p followed by a succeeding correction;

(iv) the procedure incorporates displaced grids for the axial and radial velocities u and v, which are placed between the nodes where pressure p and other variables are stored; and

(v) an implicity line-by-line relaxation technique is employed in the solution procedure (requiring a tridiagonal matrix to be inverted in order to update a variable at all points along a column), using the TDMA (tri-diagonal matrix algorithm).

The incorporation of these enhances the accuracy and rapidity of convergence

of the finally developed computer program.

The finite difference equations are solved on a complex mesh illustrated in Fig. 2. The intersections, the point P for example, of the solid lines mark the grid nodes where all variables except the u and v velocity components are stored. The latter are stored at points which are denoted by arrows (and labeled w and s respectively) located midway between the grid intersections, and the boomerang-shaped envelope encloses a triad of points with reference location P at (I,J). Details of the special merits of this staggered grid system have been reported previously[17,18] The different control volumes C, U and V which are appropriate for the P, w and s locations respectively are given in Fig. 3.

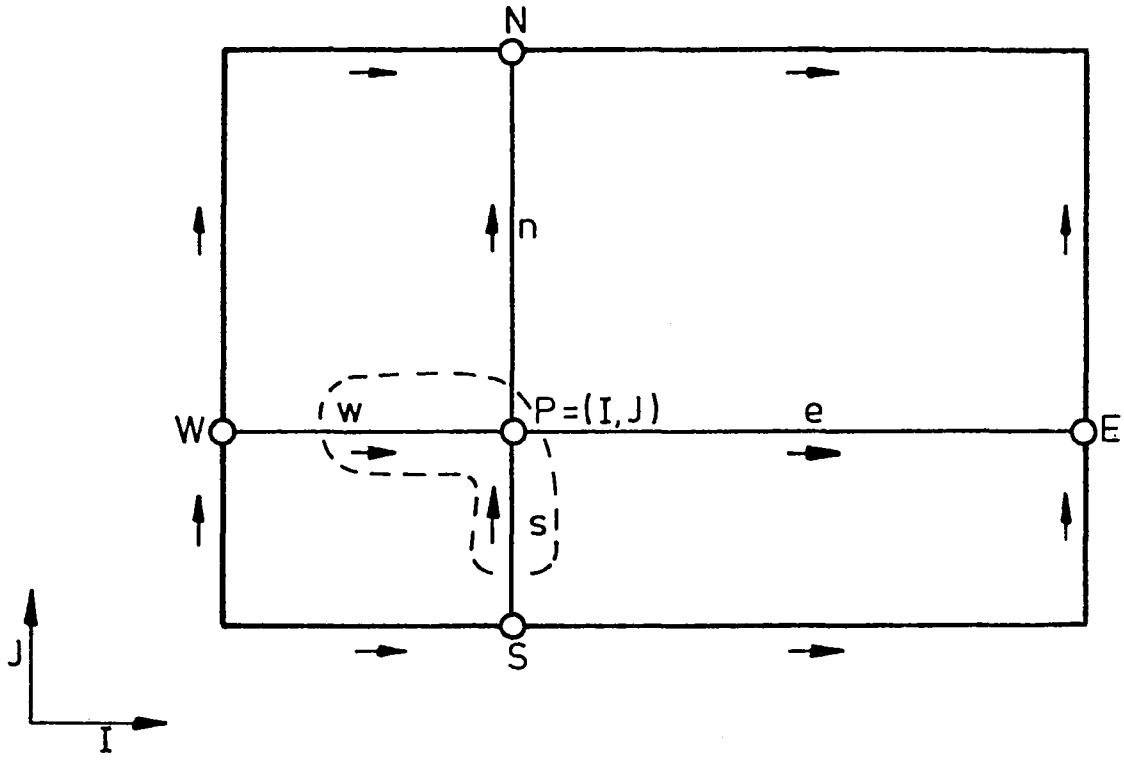
The finite difference equations for each ϕ are obtained by integrating Eq. (1) over the appropriate control volume (centered about the location of ϕ) and expressing the result in terms of neighboring grid point values. The convection and diffusion terms become surface integrals of the convection and diffusive fluxes while the source term is linearized, resulting in

$$[\rho u\phi - \Gamma_\phi \frac{\partial\phi}{\partial x}]_e A_e - [\rho u\phi - \Gamma_\phi \frac{\partial\phi}{\partial x}]_w A_w$$

$$+ [\rho v\phi - \Gamma_\phi \frac{\partial\phi}{\partial r}]_n A_n - [\rho v\phi - \Gamma_\phi \frac{\partial\phi}{\partial r}]_s A_s = [S_p\phi_p + S_U]\mathrm{Vol} \qquad (8)$$

where S_p^ϕ and S_U^ϕ are tabulated in Table 2 and subscripts n, s, e and w refer to north, south, east and west cell faces.

The additional source terms in the equations for swirling flows may induce instability if one is not careful. Only terms which are always negative are permitted in the SP(I,J) expression in order to aid the convergence of the iterative solution procedure by increasing the diagonal dominance of the equation set to be solved at each iteration. Inspection of the arrangement given in Table 2 reveals that the forms given enjoy this desirable stabilizing



THREE GRIDS : FOR p, w ETC. - AT POSITION MARKED (O)
FOR u VELOCITY - AT POSITION MARKED (→)
FOR v VELOCITY - AT POSITION MARKED (↑)

Fig. 2. Staggered grid and notation for the rectangular computational mesh.

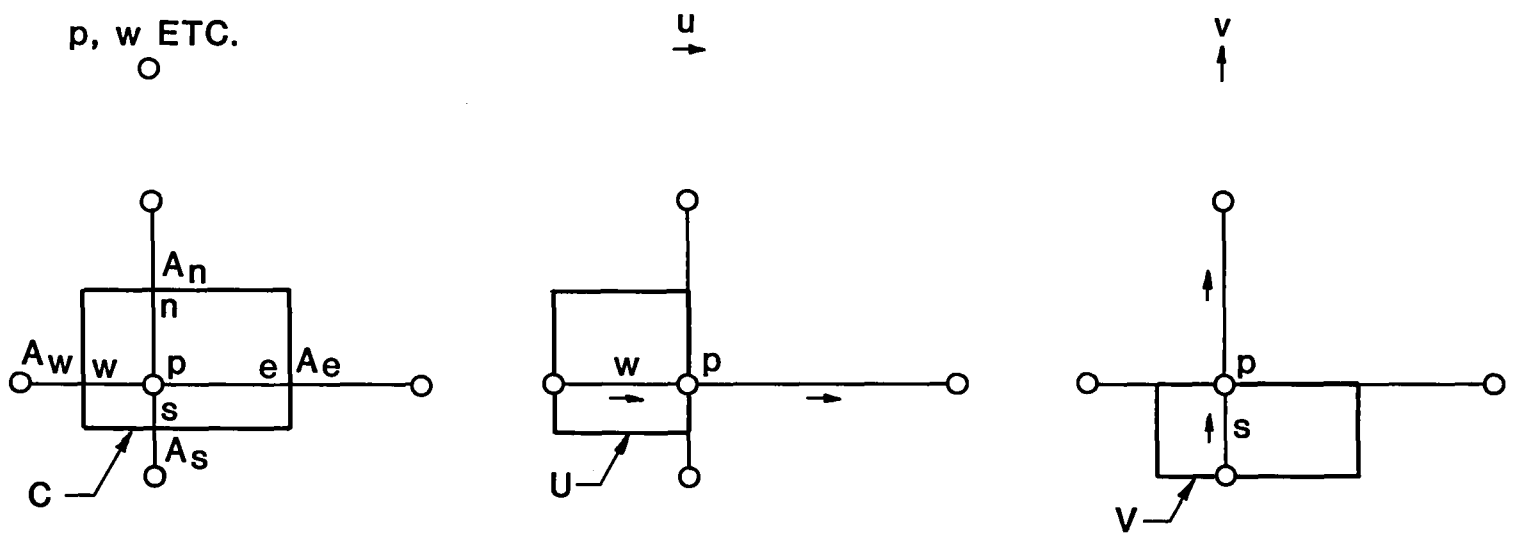


Fig. 3. The three control volumes associated with points of the three grids.

Table 2. The Form of the Components of the Linearized Source Term*, The Cell Volume Integral $\int_V S_\phi dV = S_P^\phi \phi_P + S_U^\phi$ of Eq. (1).

ϕ	Γ_ϕ	S_p^ϕ/V	S_U^ϕ/V
1	0	0	0
u	μ	0	$S^u - \frac{\partial P}{\partial x}$
v	μ	$-2\frac{\mu}{r^2}$	$S^v + \frac{\rho w^2}{r} - \frac{\partial P}{\partial r}$
w	μ	0	$-\frac{\rho vw}{r} - \frac{w}{r^2}\frac{\partial}{\partial r}(r\mu)$
k	μ/σ_k	$-C_\mu C_D \rho^2 k/\mu$	G
ε	μ/σ_ε	$-C_2\rho\varepsilon/k$	$C_1 C_\mu G\rho k/\mu$

In this table certain quantities are defined as follows:

$$S^u = \frac{\partial}{\partial x}\left(\mu \frac{\partial u}{\partial x}\right) + \frac{1}{r}\frac{\partial}{\partial r}\left(r\mu \frac{\partial v}{\partial x}\right)$$

$$S^v = \frac{\partial}{\partial x}\left(\mu \frac{\partial u}{\partial r}\right) + \frac{1}{r}\frac{\partial}{\partial r}\left(r\mu \frac{\partial v}{\partial r}\right)$$

$$G = \mu\left[2\left\{\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial v}{\partial r}\right)^2 + \left(\frac{v}{r}\right)^2\right\} + \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x}\right)^2 + \left\{r\frac{\partial}{\partial r}\left(\frac{w}{r}\right)\right\}^2 + \left(\frac{\partial w}{\partial x}\right)^2\right]$$

*In this table, V stands for the cell control volume and $\mu \equiv \mu_{eff}$.

characteristics. A false source stabilizing trick, which has no effect on the final solution, is used in the form of a false source of magnitude:

$$S_{false} = |\dot{m}_{net}| \ (\phi_P^{old} - \phi_P) \tag{9}$$

That is used in the program although not detailed in Table 2.

For the representation of the convective and diffusive terms over the cell control volume surfaces a hybrid scheme is used,[30] which is a combination of the so-called central and upwind differences. Consider the transport across one face of a control volume. Figure 4 shows the western face of area A_w normal to the x-direction, which lies midway between the grid-points W and P distant δx apart. The contribution c_w to the surface integral by the western face area A_w, for example, is given by

$$C = \begin{cases} (\rho u)_w A_w (\phi_W + \phi_P)/2 - (\Gamma_\phi)_w A_w (\phi_P - \phi_W)/\delta x \text{ for } |Pe| < 2 \\ (\rho u)_w A_w \phi_W \text{ for } Pe \geq 2 \\ (\rho u)_w A_w \phi_P \text{ for } Pe \leq -2 \end{cases} \tag{10}$$

where $Pe = (\rho u)_w \delta x/(\Gamma_\phi)_w$ is a cell Peclet number calculated at the western face of the cell. Similar expressions are used at the other three faces of the cell. Details regarding the derivation and superiority of this differencing technique may be found in Appendixes A, B and C.

When the various terms are handled in this manner the following general equation is obtained:

$$a_P^\phi \phi_P = \sum_j a_j^\phi \phi_j + S_U^\phi \tag{11}$$

where $a_P^\phi = \sum_j a_j^\phi - S_P^\phi$

Σ_j = sum over N, S, E and W neighbors

thus linking each ϕ-value at a point P with its four neighboring values.

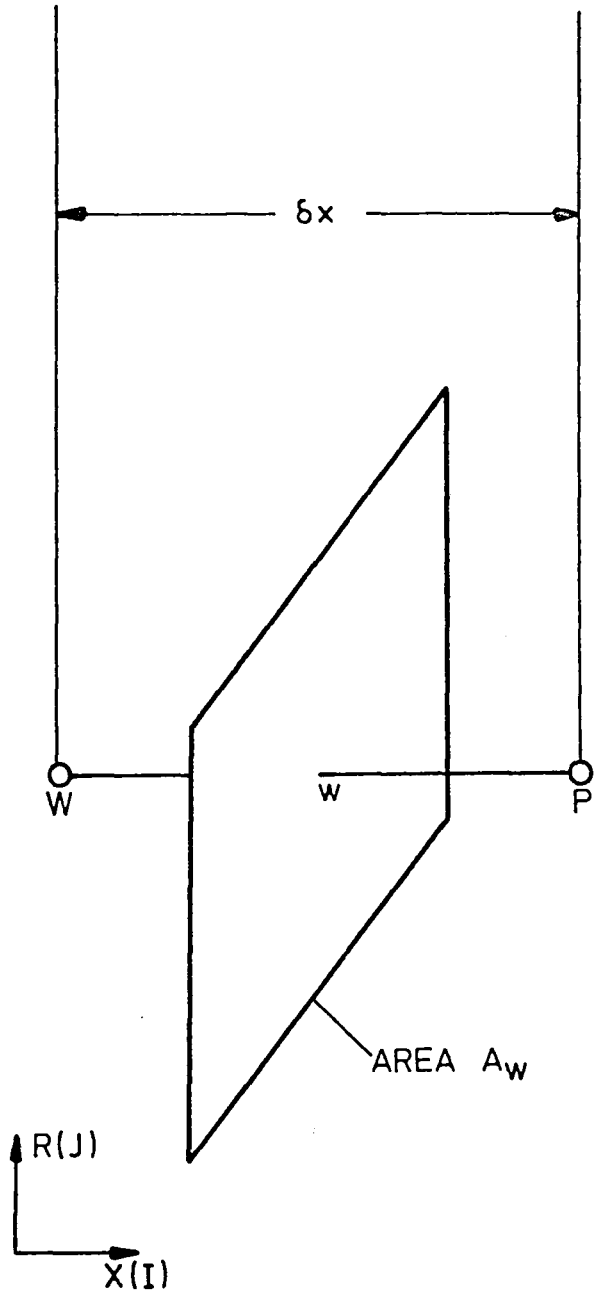


Fig. 4. One face of a control volume across which convective and diffusive fluxes are considered.

When ϕ = W, k and ε, equations of this type hold for values located at intersections of the grid system, but for ϕ = u and v there are two points of difference: (i) these variables are located to the west and south respectively of the point P and (ii) pressure gradient terms $\partial p/\partial x$ and $\partial p/\partial r$ respectively occur on the right hand side of their equations in addition to the usual source expression. Since the pressure field is not known when the u and v equations are required to be used at any stage of the iteration process, the best estimate so far of the pressure field p* is used. Solving the u and v equations with this p* field gives estimates u* and v* in the flowfield. These p*, u* and v* fields constitute any any iteration stage a first approximation to the solution and they are immediately followed by a succeeding correction at each point P:

$$p_P = p_P^* + p_P' \tag{12}$$

$$u_P = u_P^* + D^u(p_W' - p_P') \tag{13}$$

$$v_P = v_P^* + D^v(p_S' - p_P') \tag{14}$$

where $D^u = A_w/a_P^u$

$$D^v = \frac{1}{2}(A_n + A_s)/a_P^v$$

These corrections can be applied only after the pressure correction p' field has been found and this is obtained from a Poisson equation for pressure which may be deduced from a combination of the continuity and momentum equations, resulting in finite difference equations like

$$a_P^p\, p_P' = \sum_j a_j^p\, p_j' + S_U^p \tag{15}$$

where $a_P^p = \sum_j a_j^p$

$\sum_j$ = sum over N, S, E and W neighbors

S_U^p = term which results from mass sources of u* and v* fields.

Thus the application of Eqs. (13) and (14) at any iteration stage brings the first approximation obtained from solution of momentum equations into line with the requirement of continuity - it is here where the continuity equation is used, incorporated in fact in the derivation of the equation for p', Eq. (15).

2.3 Boundary Conditions

There are several methods of numerically positioning an irregular boundary, such as a sloping boundary segment, in finite difference computer programs. In order to retain conceptual simplicity, the stairstep simulation shown in Fig. 5 is utilized. The figure shows an example of grid specification for the geometry under consideration. The flowfield is covered with a nonuniform rectangular grid system. Typically the boundary of the solution domain falls halfway between its immediate nearby parallel gridlines. Clearly, specification of the x and r coordinates of the gridlines, together with information concerned with the position of the sloping sidewall boundary (via specification of JMAX(I) for each I) is sufficient to determine the flowfield of interest.

Up to this point the application of boundary conditions has not yet been considered, and the formulation has been concerned with regular internal mesh points. Insertion of correct boundary conditions requires amendment of the finite difference formulation for the near boundary points.[16] For cells

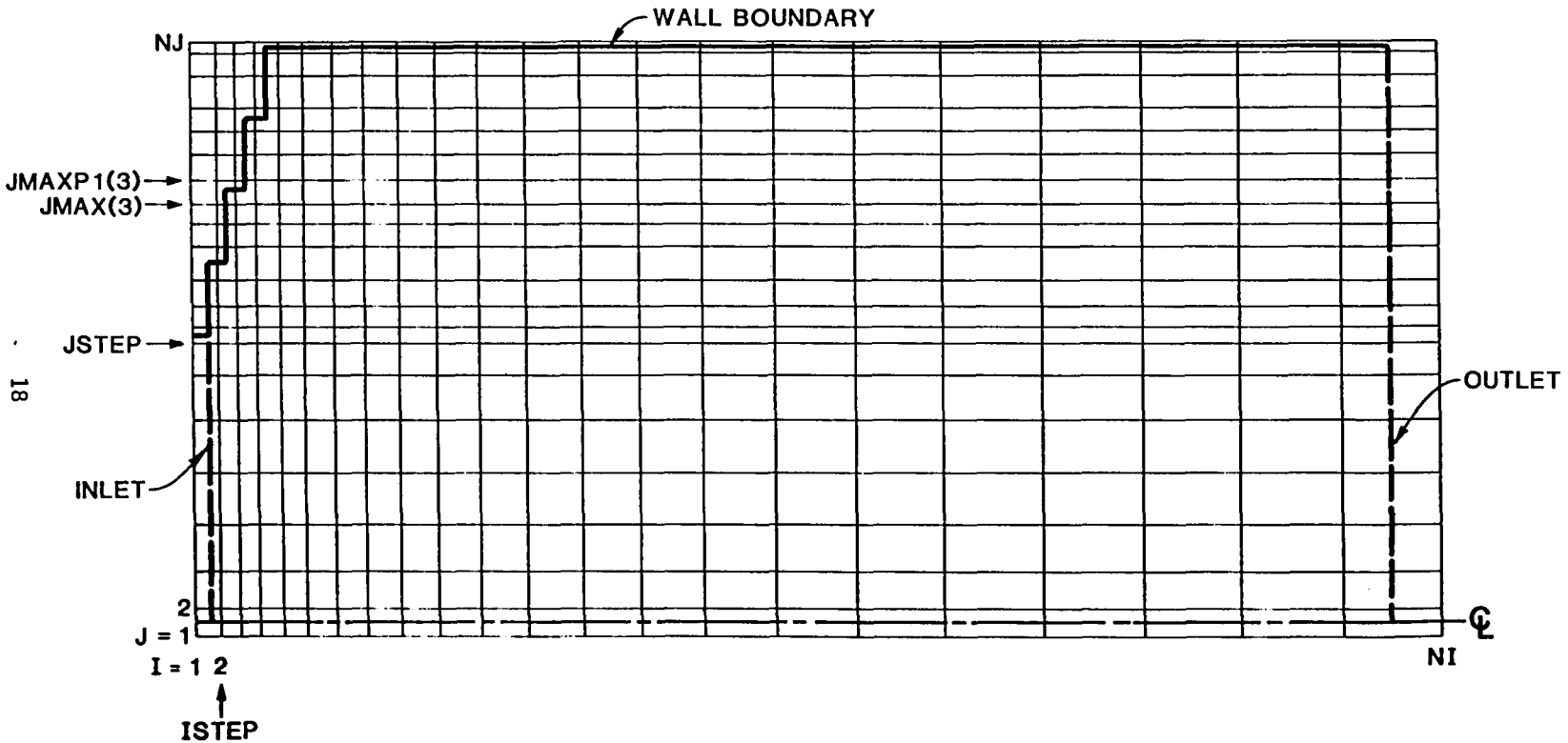


Fig. 5. An example of a grid system being employed to fit the flow domain.

adjacent to the west wall for example, as shown in Fig. 6, there is no convective flux through the cell west boundary which is coincident with an impervious wall. Hence the term for total ϕ-flux through this cell boundary in Eq. (8) is set to zero, and the diffusive flux term $\Gamma_\phi \, \partial\phi/\partial x$ is transferred to the right-hand side of the equation as a false source. In the case of a western wall boundary the normal P-W link is broken by setting:

$$a_W^\phi = 0 \tag{16}$$

and the correct expression is inserted by way of the S_U^ϕ and S_P^ϕ values:

(i) If a value M for the diffusion terms $\Gamma_\phi \, \partial\phi/\partial x$ is specified for the western face of a cell adjacent to a western wall, then as seen in Eq. (8):

$$S_U^\phi = -M/Vol \tag{17}$$

$$S_P^\phi = 0 \tag{18}$$

It is clear that this specification results in correct ϕ balance for the boundary cell, and that if zero normal gradient is the required condition (M = 0) then Eq. (16) is sufficient in itself.

(ii) If the value of ϕ on the boundary ϕ_B is specified, for a western boundary for example, then:

$$S_U^\phi = a_W' \, \phi_B \tag{19}$$

$$S_P^\phi = -a_W' \tag{20}$$

where

$$a_W' = (\Gamma_\phi)_w A_w / \delta x$$

It is clear that this specification gives the correct gradient-diffusion flux out of the western boundary of the cell.

(iii) If ϕ_P is required to be fixed at a value of ϕ_F then:

$$S_U^\phi = \phi_F . 10^{30} \tag{21}$$

$$S_P^\phi = - 10^{30} \tag{22}$$

to that these terms dominate in the equation for ϕ_P with solution $\phi_P = \phi_F$.

(iv) Velocities tangential to a wall boundary usually have boundary conditions of the type v_B given, τ_B(= tangential shear stress) given, or $\tau_B = \alpha v_p + \beta$ (from drag law for example). Any of these may be inserted by the usual treatment (break link and insert via linearized source).

(v) Velocities normal to a wall boundary are given zero values on the wall, but because this leads to incorrect gradient calculations for the first interior point away from the wall, zero normal gradient conditions are applied via breaking the appropriate coupling coefficient in the finite difference equation for this first interior point.

The above discussion about boundary condition types (i) - (v) has been concerned with a western wall boundary shown in Fig. 6. Analogous discussion is appropriate with a northern wall boundary shown in Fig. 7.

Conditions must be specified on the entire boundary around the solution domain, and special novelties concern the pressure correction p', velocity components and the two turbulence quantities k and ε. At the inlets all variables are given definite fixed values (Dirichlet conditions) and at the outlet all variables are given zero normal gradient $\partial\phi/\partial x = 0$ (Neumann conditions) via

$$a_E^\phi = 0 \tag{23}$$

except radial velocity v which is set to zero.

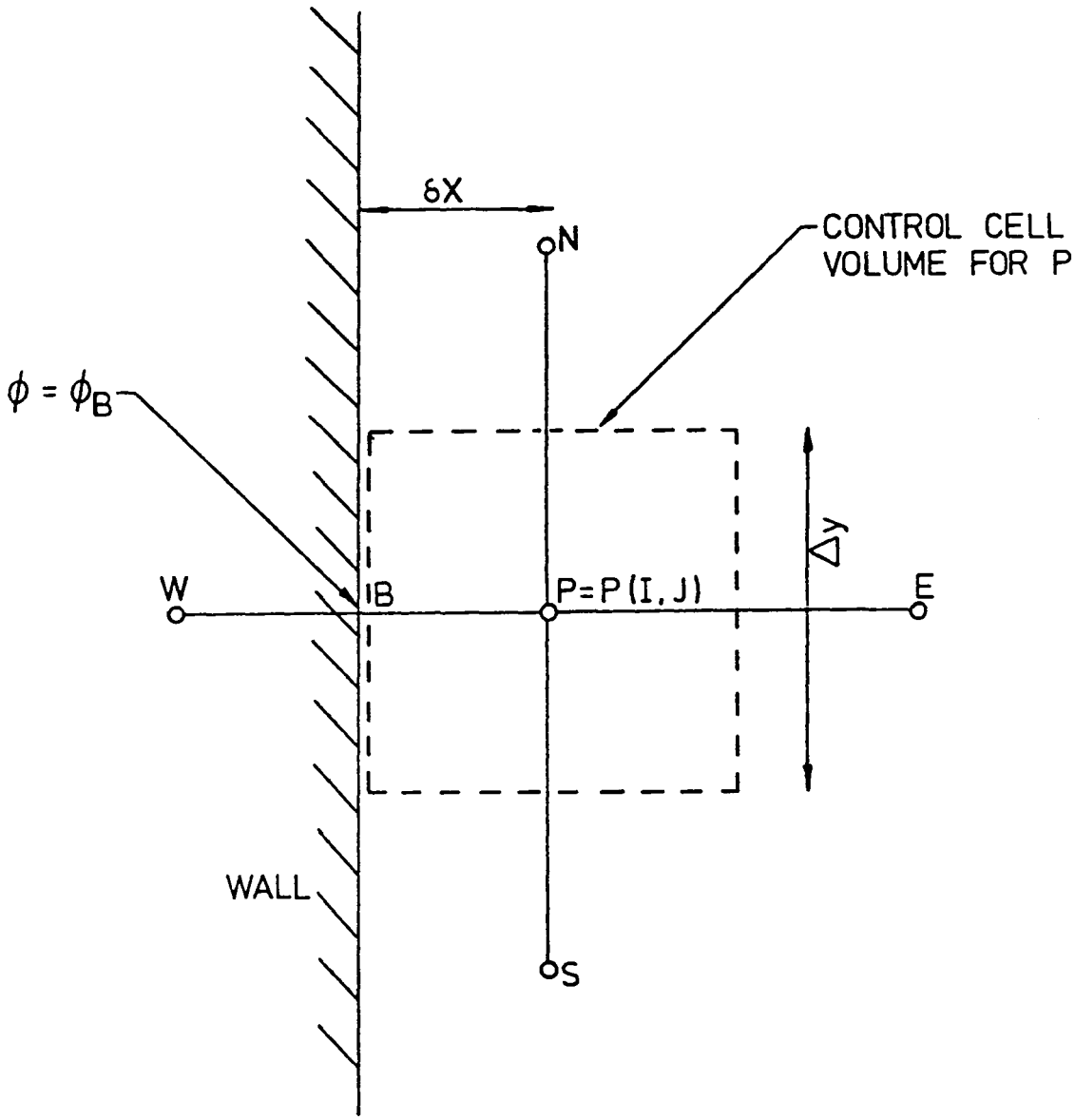


Fig. 6. Wall ϕ-value prescription for western wall.

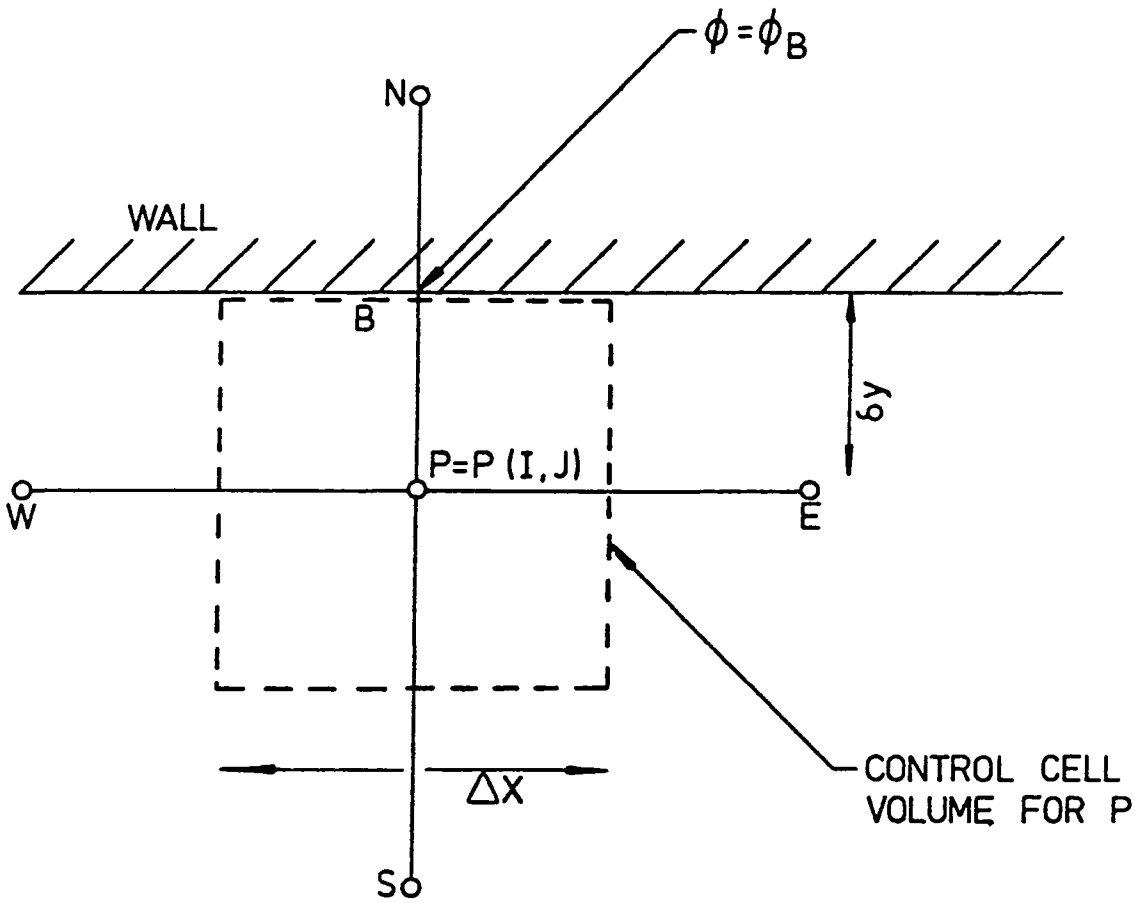


Fig. 7. Wall ϕ-value prescription for northern wall.

The u velocities are then readjusted slightly at each iteration so as to ensure overall mass conservation as compared with the inlet flow. At the symmetry axis $\partial\phi/\partial r = 0$ is assumed for all variables except v (which is given a definite zero value) and w (which is given an implied zero value as follows. Based on measurements[31] of swirl velocity, the BC for w along the centerline specifies solid body rotation through linear interpolation of w(I,2) between the latest value of w(I,3) and zero for w on the centerline. Also p' is given zero normal gradient specification everywhere except at the inlet, where it has zero value: as far as the aerodynamics is concerned it is immaterial what the absolute pressure is, only pressure gradients entering the equations.

2.4 Wall Functions and the Effect of Swirl

To avoid the need for detailed calculations in the nearwall regions, equations are introduced to link velocities, k and ε on the wall to those in the logarithmic region. This one-dimensional Couette flow characterization of the flow (diffusion perpendicular to the wall is dominant) is extremely useful. Also it provides a way around this region of steep nonlinear variation of the variables and the fact that laminar and turbulent effects become of the same order of magnitude. The new equations introduced, called 'wall functions', are introduced and used in the finite difference calculations at near-wall points. They occur in the momenta equations and k-generation terms, and their implementation is discussed elsewhere[11,12] together with appropriate near-wall ε specification.

The effect of swirl on wall function specification is handled as follows: The previous ideas are extended to find <u>total</u> tangential wall shear stress near boundaries [involving x and θ directions for an r = constant wall, and r and θ directions for an x = constant wall]. Then appropriate

components are deduced directly [for the u and w velocities which are tangential to an r = constant wall, and v and w velocities which are tangential to an x = constant wall]. The effects on u, v and w momentum equations are incorporated via the usual linearized source technique.

Northern Wall. The applicability of wall function formulations for swirl flows, especially for swirl momentum, appears uncertain a priori. However, from boundary layer velocity measuremetns in turbulent, swirling, pipe flows Backshall and Landis[31] showed that total tangential velocity near the northern top wall $V = (u^2 + w^2)^{1/2}$ is correlated by the universal velocity profile

$$V^+ = (1/\kappa)\ \ell n\ (E\ Y^+) \tag{24}$$

where κ and E are constants. The dimensionless total velocity V^+ and total distance Y^+ are obtained by nondimensionalizing with respect to the total shear velocity $(\tau_t/\rho)^{1/2}$. Hence the total tangential north wall shear stress $\tau_t = (\tau_{rx}^{\ 2} + \tau_{r\theta}^{\ 2})^{1/2}$ is obtained from

$$V(\tau_k\rho)^{\frac{1}{2}}/\tau_t = (1/\kappa)\ \ell n[Ey(\tau_k/\rho)^{\frac{1}{2}}/\nu] \tag{25}$$

where τ_k is an approximation for τ_t very near the wall. The quantity τ_k is formulated by observing that convection and diffusion of turbulence kinetic energy are nearly always negligible in this region.[11] Deleting these terms from the k-transport equation and invoking isotropic viscosity μ_{eff} leads to the result

$$\tau_k = (C_D\ C_\mu)^{\frac{1}{2}}\rho k \tag{26}$$

Thus one obtains

$$\tau_t = - V_p \kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ell n(E\ Y_P^+) \qquad (27)$$

where the negative sign is inserted since τ_t and V_p must have opposite directions. The quantities with subscript P are evaluated at the appropriate near-wall points as shown in Fig. 7 for this case of a northern wall.

The north wall diffusion flux for the x-momentum equation is $\mu_{eff}\ \partial u/\partial r$. The τ_{rx} component of τ_t is given by

$$\tau_{rx} = \mu_{eff} \left(\frac{\partial u}{\partial r} + \frac{\partial v}{\partial x}\right) \qquad (28)$$

however $\partial v/\partial x$ approaches zero near the north wall.[17] Hence τ_{rx} is the required diffusion flux term to be included as a false source for north wall u-cells; its wall function expression asserts the required boundary influence by indirectly incorporating the boundary condition $u_B = 0$. The above wall function formulation, Eq. (27), is multiplied by the factor $\cos\theta$ (= u/V) to obtain τ_{rx}. where θ is the angle between the total tangential velocity vector near the wall and the axial velocity vector (θ = arctan w/u). This is valid since θ is essentially constant near the wall.[32] Thus this wall function for u is

$$\mu_{eff} \frac{\partial u}{\partial r} = [-\kappa \rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}} / \ell n(E\ Y_P^+)] u_P \qquad (29)$$

which is precisely the same expression found for nonswirling flows in TEACH, although different values result due to swirl effects on k_p. Also, this result is consistent with an expression obtained by Date.[33]

For w-cells along the north wall, the diffusion is $\mu_{eff}\ \partial w/\partial r$. This quantity appears in the expression for $\tau_{r\theta}$ which is

$$\tau_{r\theta} = \mu_{eff}\ (\frac{\partial w}{\partial r} - \frac{w}{r}) \tag{30}$$

Applying the factor $\sin\theta(=w/V)$ to the τ_t wall function yields the following expression for $\tau_{r\theta}$:

$$\tau_{r\theta} = [-\kappa\rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}}/\ell n(E\ Y_P^+)]w_P \tag{31}$$

Hence the north wall function for w is given by

$$\mu_{eff}\ \frac{\partial w}{\partial r} = [-\kappa\rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}}/\ell n(E\ Y_P^+)] + \mu_{eff}/r]w_P \tag{32}$$

Western wall. Momentum wall functions along the west wall are similarly formulated. The total tangential velocity is now $V = (v^2 + w^2)^{1/2}$, and τ_{xr} reduces to $\mu_{eff}\ \partial v/\partial x$. Equation (27) for τ_t is again obtained and the τ_{xr} wall function is formulated by employing the factor $\cos\phi$; ϕ is the angle between the total tangential velocity vector and the radial velocity vector (ϕ = arctan w/v). Thus one obtains the v-momentum expression:

$$\mu_{eff}\ \frac{\partial v}{\partial x} = [-\kappa\rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}}/\ell n(E\ Y_P^+)]v_P \tag{33}$$

The w-equation wall function on the western wall approximates $\mu_{eff}\ \partial w/\partial x$, which is $\tau_{x\theta}$. Here the factor $\sin\phi$ is used to obtain the necessary wall function as

$$\mu_{eff}\ \frac{\partial w}{\partial x} = [-\kappa\rho C_\mu^{\frac{1}{4}} C_D^{\frac{1}{4}} k_P^{\frac{1}{2}}/\ell n(E\ Y_P^+)]w_P \tag{34}$$

Other details. In accordance with Gosman and Pun,[17] if Y^+ for a cell adjacent to any solid boundary is less than 11.63, it lies within the laminar sublayer where the laminar viscosity dominates. Hence, the wall function employed for north wall u-cells, for example, is

$$\mu_{eff} \frac{\partial u}{\partial r} = -\mu_\ell u_P/\delta_P \tag{35}$$

where $u_B = 0$ has been employed. Similar expressions are analagously obtained for other momentum diffusion terms of the problem.

For turbulence energy, from Eq. (30)

$$k\rho/|\tau_B| = (C_\mu C_D)^{-\frac{1}{2}} = \text{constant} \tag{36}$$

near a solid boundary which implies that the wall flux is zero. Accordingly, zero normal gradient prescription for k is appropriate for wall cells via Eq. (16). Also the shear stress wall functions are employed for the k-generation source G for k-cells along a wall. The general expression for G, given in Table 2, can alternately be expressed as

$$G = 2\mu_{eff}[(\frac{\partial u}{\partial x})^2 + (\frac{\partial v}{\partial r})^2 + (\frac{v}{r})^2] + [\tau_{rx}^2 + \tau_{r\theta}^2 + \tau_{x\theta}^2]/\mu_{eff} \tag{37}$$

For north wall cells $\tau_t^2 = \tau_{rx}^2 + \tau_{r\theta}^2$ which yields

$$G = 2\mu_{eff}[(\frac{\partial u}{\partial x})^2 + (\frac{\partial v}{\partial r})^2 + (\frac{v}{r})^2] + \tau_t^2/\mu_{eff} + \mu_{eff}(\frac{\partial w}{\partial x})^2 \tag{38}$$

where the previous wall function expression for τ_t is employed. Similarly, the result for west wall cells is

$$G = 2\mu_{eff}[(\frac{\partial u}{\partial x})^2 + (\frac{\partial v}{\partial r})^2 + (\frac{v}{r})^2] + \tau_t^2/\mu_{eff} + \mu_{eff}(\frac{\partial w}{\partial r} - \frac{w}{r})^2 \quad (39)$$

where $\tau_t^2 = \tau_{xr}^2 + \tau_{x\theta}^2$.

As for energy dissipation, near a wall the length scale is assumed to be proportional to the normal distance from the wall which leads to

$$\varepsilon = \frac{(C_\mu C_D)^{3/4}}{C_D \kappa} \frac{k_p^{3/2}}{\delta_p} \quad (40)$$

This is the effective wall boundary condition on ε and in the code this value is fixed for near wall points via the linearized source procedure, using Eqs. (21) and (22).

2.5 Boundary Conditions Summary

Table 3 summarizes the boundary values used in the present study, which are incorporated into the computer program. The symbol N in the table signifies that zero normal gradient prescription is appropriate. Footnotes (a) to (g) are dealt with as follows:

(a) Inlet values UIN etc. are directly specified and easily altered.

(b) The axial velocities at the outlet are deduced from their immediate upstream values by adding a fixed amount of each of U(NIM1,J) (J = 1 to NJM1); this amount is calculated to ensure overall mass conservation.

(c) Near wall tangential velocities are connected with their zero wall values by way of the tangential shear stress wall functions.

(d) Near-axis swirl velocity at J = 2 is fixed for solid body rotation in terms of the previous w at J = 3 and its zero value on the axis.

(e) Outlet values of k and ε are unimportant because of the limited upstream influence at high Reynolds numbers and zero gradient is

Table 3. Boundary Conditions (N stands for zero normal gradient specified)

(Footnotes are detailed in section 2.3 of the text)

Algebraic Variable	Inlets[a]	Outlet	Top Wall	Side wall	Symmetry Axis
u	UIN	adjusted[b]	(c)	N	N
v	0	0	N	(c)	0
w	WIN	N	(c)	(c)	0[d]
κ	TEIN	N[e]	N	N	N
ε	EDIN	N[e]	(f)	(f)	N
p'	0[g]	N	N	N	N

specified. If the local Peclet number is greater than +2, there is no upstream influence because of the implications of the hybrid formulation of convection and diffusion, and the downstream convection dominates.

(f) Near wall ε values are fixed using the length scale near the wall and the current value of k.

(g) The pressure correction p' possesses zero normal gradient specification everywhere except the inlet. Just one internal pressure p specification at (2,2) is then required to allow all the pressures to be calculated.

This concludes the discussion of boundary condition specification; its implementation is returned to in Section 4 of the present text.

2.6 Solution Procedure

The finite difference equations and boundary conditions constitute a system of strongly-coupled simultaneous algebraic equations. Though they appear linear they are not since the coefficients and source terms are themselves functions of some of the variables, and the velocity equations are strongly linked through the pressure. The solution proceeds by the cyclic repetition of the following steps:

(i) Guess the values of all variables including p*. Hence calculate auxiliary variables like turbulent viscosity etc.

(ii) Solve the axial and radial momentum equations to obtain u* and v* from equations like Eq. (11).

(iii) Solve the pressure correction equation, Eq. (15), to obtain p'.

(iv) Calculate the pressure p and the corrected velocities u and v from Eqs. (12) through (14).

(v) Solve the equations like Eq. (11) for the other ϕ's successively.

(vi) Treat the new values of the variables as improved guesses and return to step (i); repeat the process until convergence.

In the solution procedure algebraic equations like Eq. (11) are solved many times, coefficient and source updating being carried out prior to each occasion. The practice used here is to make use of the well-known tridiagonal matrix algorithm (TDMA), whereby a set of equations, each with exactly three unknowns in a particular order except the first and last which have exactly two unknowns, may be solved sequentially. One considers the values at grid-points along a vertical gridline to be unknown (values at P, N and S for each point P), but take as known, most recent values being used, the values at each E and W neighbor. The TDMA is then applied to this vertical gridline. In this manner one can traverse along all the lines in the vertical direction sequentially from left to right of the integration domain.

Two points clarify the solution technique regarding the stairstep sloping boundary. Firstly, interior points adjacent to the boundary must 'feel' the boundary in the usual way. Thus values in the external field must not be inadvertently picked up at these points. Usually the standard coupling coefficient of interest is set to zero and the wall effect given by way of a false source, according to the previous description. Secondly, if the TDMA is applied in columns over the entire 2-D array of points, the solution at external points can be automatically forced to zero by giving S_p^{ϕ} a very large negative value at these locations. This term then dominates in its finite difference equation at P with solution $\phi = 0$. Alternatively, the domain of TDMA execution can be restricted to the physically meaningful portion of the 2-D array of points. The latter technique is incorporated into the present computer code.

At each iteration it is necessary to employ some degree of under-relaxation when solving equations like Eq. (11). A weighted average of the

newly calculated value and the previous value is taken at each point. If $\tilde{\phi}_p^{n+1}$ represents the newly calculated value of ϕ at the n+1 iteration, it is obtained from

$$a_p^\phi \tilde{\phi}_p^{n+1} = \sum_j a_j^\phi \phi_j^n + S_U^\phi \tag{41}$$

The notation and similarity to Eq. (11) is obvious and

$$\phi_p^{n+1} = f \tilde{\phi}_p^{n+1} + (1-f) \phi_p^n \tag{42}$$

where ϕ_p^{n+1} represents the underrelaxed value of ϕ_p, employing the no-relaxation value $\tilde{\phi}_p^{n+1}$ and the underrelaxation parameter f ($0 < f \leq 1$). Rather than calculate and store the $\tilde{\phi}^{n+1}$ values and then apply Eq. (42), it is more convenient to modify and use Eq. (41) directly in the form

$$(a_p^\phi/f)\phi_p^{n+1} = \sum_j a_j^\phi \phi_j^n + [S_U^\phi + (1-f) \frac{a_p^\phi}{f} \phi_p^n] \tag{43}$$

so that the underrelaxed value is calculated immediately. This is the version used in the present code.

The effect of underrelaxation factor values on convergence rate is considerable. Unacceptably slow convergence or divergence of the solution is obtained if the factors are too low or too high, respectively. Large pressure corrections arise which produce large u- and v-velocity corrections. If these corrections are too large per iteration, the nonlinearity of the FDEs causes divergence.

Velocity and pressure corrections per iteration become smaller as the solution proceeds toward convergence. Thus the underrelaxation factors (especially for u-and v-velocities) have small initial values, to prevent

divergence, and increase for faster convergence as the corrections become smaller. Hence the underrelaxation factors for u, v and w are increased linearly during the first 40 iterations.

Increased accuracy of the initial estimate of field variables clearly reduces the amount of computational work required. Also it yields a slower rate-of-variable change and smaller corrections for continuity, which promotes convergence.

Since the user generally desires to utilize such a computer code to solve a series of problems, as in a parametric study for example, he almost always has converged (or partially-converged) solutions from previous computer runs of a similar problem. By storing field values of all variables on disk upon convergence for each swirl loop, a much better initial estimate conveniently becomes available for corresponding swirl cases of future problems, or for more stringent convergence of the same problem.

Final convergence is decided by way of a residual-source criterion, which measures the departure from exactness for the variable ϕ at the point P. The residual sources are defined for each variable at each point by equations like

$$R_P^{\phi} = a_P^{\phi}\phi_P - \sum_j a_j^{\phi}\phi_j - S_U^{\phi} \qquad (44)$$

When each of these quantities becomes smaller than a certain fraction of a reference value, the finite difference equations are declared to be solved. Typically, the solution is considered to be converged if the cumulative sum of the absolute residuals throughout the field for <u>all</u> variables is less than 0.5 per cent of the inlet flow rate of the corresponding variable.

3. THE STARPIC COMPUTER PROGRAM

3.1 Outstanding Features

The case described. The computer program code described and listed performs the function outlined in Section 2 for the particular 2-D axisymmetric geometry shown schematically in Fig. 5. The flowfield is covered with a gradually expanding rectangular grid system. The quantity EPSX specifies the degree of grid expansion in the axial direction, and in the radial direction it is determined through specification of the radial position of each individual horizontal grid line. The boundary of the solution domain falls halfway between its immediate nearby parallel gridlines; and clearly specification of JMAX(I) for each I (see Fig. 5) is sufficient to determine the flowfield of interest. This provides a stairstep approximation to any monotonically increasing top wall radius as required so as to simulate any sudden expansion, sloping straight or curved sidewall. The code is equipped to handle any of these with ease. The program is an advanced version of a framework of ideas embodied into the 1974 Imperial College TEACH computer program,[17] from which the present work has been developed. The following discussion is a commentary on the final developed program. A listing is supplied as Appendix E and should be read simultaneously with the discussion.

General arrangement. The STARPIC program (see the flow chart of Fig. 8) has been written (in Fortran 4) primarily with a view to maximizing simplicity and ease of amendment at the expense of computer time. This is achieved by limiting to the MAIN subprogram those features which characterize the particular flow conditions being investigated, while different boundary conditions may be inserted by way of the PROMOD (problem modifications) subroutine. The various functions of these and other subroutines are given briefly in Table 4 and in detail in sections 3.2 to 3.12. MAIN is the section of the

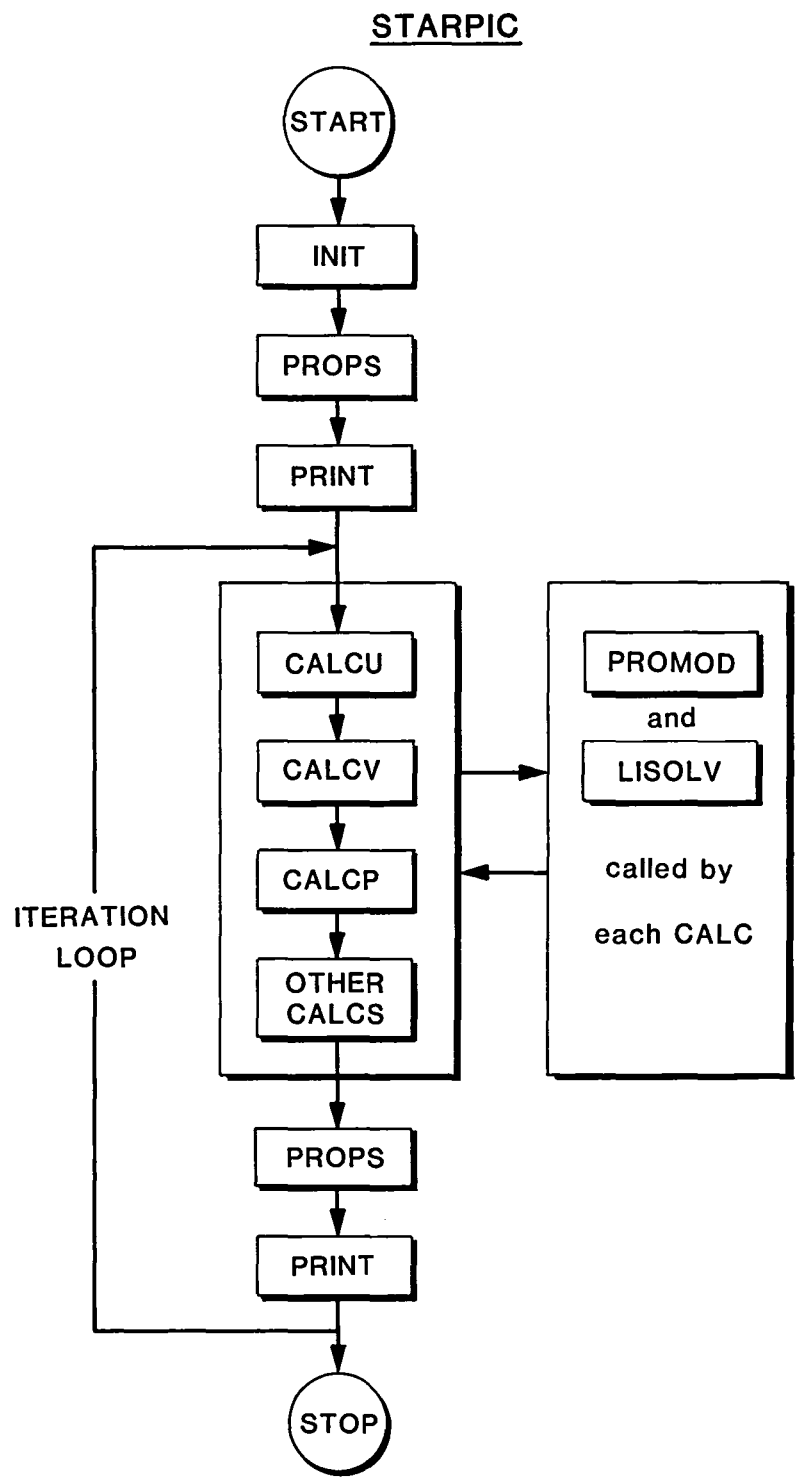


Fig. 8. Flow chart of computer program showing the subroutine arrangement.

Table 4. Subroutine Tasks

Subroutine	Task
MAIN	Controls and monitors the entire sequence of calculations: initialization, properties and initial output; the iteration loop with calls to update main variables, other mixture properties and intermediate output; and, after termination of the iteration loop, final output, an increment in inlet degree of swirl and a return to the beginning again.
INIT	Sets values to the numerous geometric quantities concerned with grid structure, see Figs. 9-11, and initializes most variables to zero or other reference value.
PROPS	Updates the fluid properties via calculation of turbulent viscosity, under-relaxed using its previous value. In nonisothermal flows, perhaps with chemical reaction, additional species' mass fractions, temperature and density are also calculated here, with an appeal to PROMOD (1) for any other modifications.
PRINT	Prints out an entire variable field according to a standard format.
CLACU and CALCV	Calculates coupling coefficients of finite difference equation for axial velocity u* and radial velocity v*, calls PROMOD (2) and PROMOD (3) for boundary modifications and LISOLV for entire field of variables to be updated to get u* and v* fields.

Table 4 (continued)

CALCP	Calculates coupling efficients of finite difference equation for pressure correction p'; calls PROMOD (4) for boundary modifications and LISOLV to obtain p' field. The subroutine closes with p*, u* and v* being 'corrected' with p', u' and v'.
Other CALC Subroutines	Calculates coupling coefficients of appropriate finite difference equation, calls appropriate part of PROMOD and then LISOLV for complete update of the variable in question.
PROMOD	Modifies the values of the finite difference equation coefficients, or the variables, near walls or other boundaries where particular conditions apply. The subroutine is divided into chapters, each handling a particular variable and being called from a CALC subroutine, and each chapter considers all the boundaries around the solution domain.
LISOLV	Updates entire field of a particular variable, by applying TDMA (tridiagonal matrix algorithm) to all the lines in the r-direction sequentially from left to right of the integration domain.

program to which a user will devote most of his attention, provided that he wishes to investigate configurations easily derivable from that shown in Fig. 5. He may also be concerned with PROMOD to adjust boundary condition types. Moreover all the subprograms are divided into chapters, each with a prescribed task to accomplish, thus decreasing the possibility of error on problem specification and modification.

MAIN controls the entire iterative solution procedure, with initial calls to INIT (initialization), PROPS (properties) and PRINT (for output of all variable fields). Repeated intermediate calls occur during the iteration loop to the CALC subroutines (CALCU for updating calculation of the U-velocity field, etc.), PROPS and PRINT (when required). Finally, after convergence or MAXIT (maximum iterations) number of iterations, PRINT is called again, together with the calculation and output of any special quantities required which are deducible from the flowfield values. Each of the CALC subroutines calls PROMOD (problem modifications) for modifications to the usual formulation because of boundary conditions. Subroutine LISOLV (line solve) is also called by each CALC subroutine to make several update sweeps of the relevant field of variables by applying the TDMA (tridiagonal matrix algorithm) to all the lines in the r-direction sequentially from left to right of the integration domain (NSWPU times for the u-field, etc. - number of sweeps for u).

Major variables. The discussion of Fortran variables is restricted to those symbols enjoying major significance in the accompanying listing of the program in Appendix E. Other symbols will readily yield their meanings on inspection of the context and their memonics; or they appear in parts of the program which the user is enjoined not to disarrange, the user restricting most of his attention to MAIN and PROMOD. A glossary of Fortran symbols is given in Appendix D. Table 5 lists principal dependent variables and controlling parameters.

Table 5. Principal Dependent Variables and Controlling Parameters

Algebraic Variable	Fortran Variable	Alphanumeric Heading	Logical Variable	Inlet Value	CALC Subroutine	Underrelax-ation factor	Number of sweeps of LISOLV per iteration	Prandtl/ Schmidt Number	Residual Source Term
u	U	HEDU	INCALU	UIN	CALCU	URFU	NSWPU	-	RESORU
v	V	HEDV	INCALV	VIN	CALCV	URFV	NSWPV	-	RESORV
w	W	HEDW	INCALW	WIN	CALCW	URFW	NSWPW	PRW	RESORW
k	TE	HEDK	INCALK	TEIN	CALCTE	URFK	NSWPK	PRTE	RESORK
ε	ED	HEDD	INCALD	EDIN	CALCED	URFE	NSWPD	PRED	RESORE
p'	PP	HEDP	INCALP	-	CALCP	URFP	NSWPP	-	(RESORM for mass calculated in CALCP)
μ	VIS	HEDVIS	INPRO	-	PROPS	URFVIS	-	-	-

3.2 The MAIN Subprogram

General arrangement. MAIN is that section of the program to which a user will devote most of his attention. The function of MAIN has been described in section 3.1. It is divided into chapters, each with a specific task, and a description of the individual chapters of MAIN now follows.

CO Preliminaries. Dimension, common and data blocks are followed by user input logical variables, which activate (when specified as true) certain special features of the program. As discussed in detail in Chapter 4, IFINE specifies a fine mesh in the x-direction with NI=35 as opposed to a coarser mesh with NI=23; IWRITE writes all dependent variables onto allocated disk storage; NONDIM calculates and prints the nondimensional solution in addition to the dimensional one; IREAD reads from allocated disk storage the initial solution guess, which is a previous solution of a similar problem; INITAL prints the initial guess of the solution; and INPLOT produces a line-printer plot of streamlines. Specification of NSWPU (number of sweeps for U), etc. and input read statements for alphanumeric headings HEDU (heading for U velocity), etc. are also located here. These alphanumeric headings are the only input data which appear after the program and are listed here in order:

U VELOCITY

V VELOCITY

W VELOCITY

PRESSURE

TEMPERATURE

TURBULENCE ENERGY

TURBULENCE DISSIPATION

VISCOSITY

DIMENSIONLESS LENGTH SCALE

DIMENSIONLESS STREAM FUNCTION

RADIAL COORDINATE OF STREAMLINES

DIMENSIONLESS U VELOCITY

DIMENSIONLESS V VELOCITY

DIMENSIONLESS W VELOCITY

DIMENSIONLESS PRESSURE

DIMENSIONLESS TURBULENCE ENERGY

DIMENSIONLESS STREAMLINE COORDS

DIMENSIONLESS EFF. VISCOSITY

C1 Parameters and control indices. This chapter really defines the problem to be solved. It is implicity that the problem is axisymmetric in cylindrical coordinates with the setting of INDCOS = 2. The problem domain is specified by dealing with the grid exemplified in Fig. 5, and giving values to the key parameters there-in. Other matters include dependent variable selection (setting .TRUE. or .FALSE. to INCALU etc.), fluid properties (see Prandtl/Schmidt numbers of Table 4), turbulence constants, boundary values (see inlet values of Table 4), pressure calculation reference point (IPREF, JPREF) and program control and monitor.

C2 Initial operations. Based on the problem specification already accomplished in C0 and C1, certain other initial operations are needed prior to the iteration procedure. In C2 the geometric quantities for the grids (see Figs. 9-11) are calculated and main 2-D array variables are set to zero or obvious initial values by way of the call to subroutine INIT. Returning to MAIN, the dependent variable fields are first specified at the inlet boundary including swirl velocity which uses VANB or SWNB for flat or solid-body rotation profile according to whether NSBR (number for solid body rotation) equals 0 or 1. Then estimates of dependent variables in the

field are calculated, as many of them depend on inlet values. Following the call to PROPS for fluid properties, an initial output is made of certain flow and geometric quantities. Finally, if IREAD = .TRUE. each dependent variable array is read sequentially from the disk storage allocated to unit 12 to re-specify the initial field estimates with improved values. Thus the user should specify IREAD = .TRUE. when a previous solution to a similar problem is available on disk, as this reduces the number of iterations required for convergence.

C3 Iteration loop. This is the section of MAIN that is repeated at each iteration where NITER counts the number of iterations. The task of C3 is several-fold: to adjust the underrelaxation factors for enhanced convergence based on numerical experience; to update dependent variables (via calls to subroutine CALCU if INCALU is true, etc.); to update fluid properties (if INPRO is true the call to PROPS updates secondary dependent variables); to give intermediate output of residual source sums and field values at monitored location (IMON, JMON) for all values of NITER; to include appropriate field prints when NITER=JPRINT; and finally to make appropriate iteration termination tests.

C4 Final operations and output. Having decided to terminate the iteration process, control transfers to C4 to obtain final variable field printouts and to calculate and print nondimensional variables if NONDIM = .TRUE. Also, a call to subroutine STRMFN calculates dimensionless stream function and determines the coordinates of points along NSTLN streamlines for plotting. Further, if IWRITE = .TRUE. each dependent variable array is stored sequentially on the disk space allocated to unit 11.

Control has now finished with the current problem. However, if LFS (loop for swirl) is less than LFSMAX (loop for swirl maximum) then LFS is incremented by 1, and the inlet swirl velocity profile is recalculated

for the next swirl problem based on SWNB (swirl number block) or VANB (vane angle block) according to whether NSBR (number for solid body rotation) equals 0 or 1. Before control begins C3 for the new swirl problem, the precious solution of a similar problem will be read from disk storage allocated to unit 12 if IREAD = .TRUE. This improved initial field estimate reduces the number of iterations required for convergence.

3.3 Subroutine INIT

INIT consists of two main chapters:

C1 Calculate geometric coefficients. Geometric quantities for the three grids for C, U and V cell control volumes (see Figs. 3 and 9-11) are here calculated once and for all for the particular geometric system previously specified in MAIN. Notice that setting INDCOS = 1 suppresses the variation of R with Y and thus obtains cartesian coordinates. In the current program, however, the problem is correctly coded only for cylindrical coordinates.

C2 Set variables to zero. In C2 most dependent and other 2-D array variables are set to zero throughout the flowfield although some are set to obvious nonzero initial values.

3.4 Subroutine PROPS

There is only one chapter:

C1 Viscosity. The turbulent viscosity μ is calculated from the two-equation k-ε turbulence model, Eqs. (5) and (6), making use of the URFVIS underrelaxation parameter.

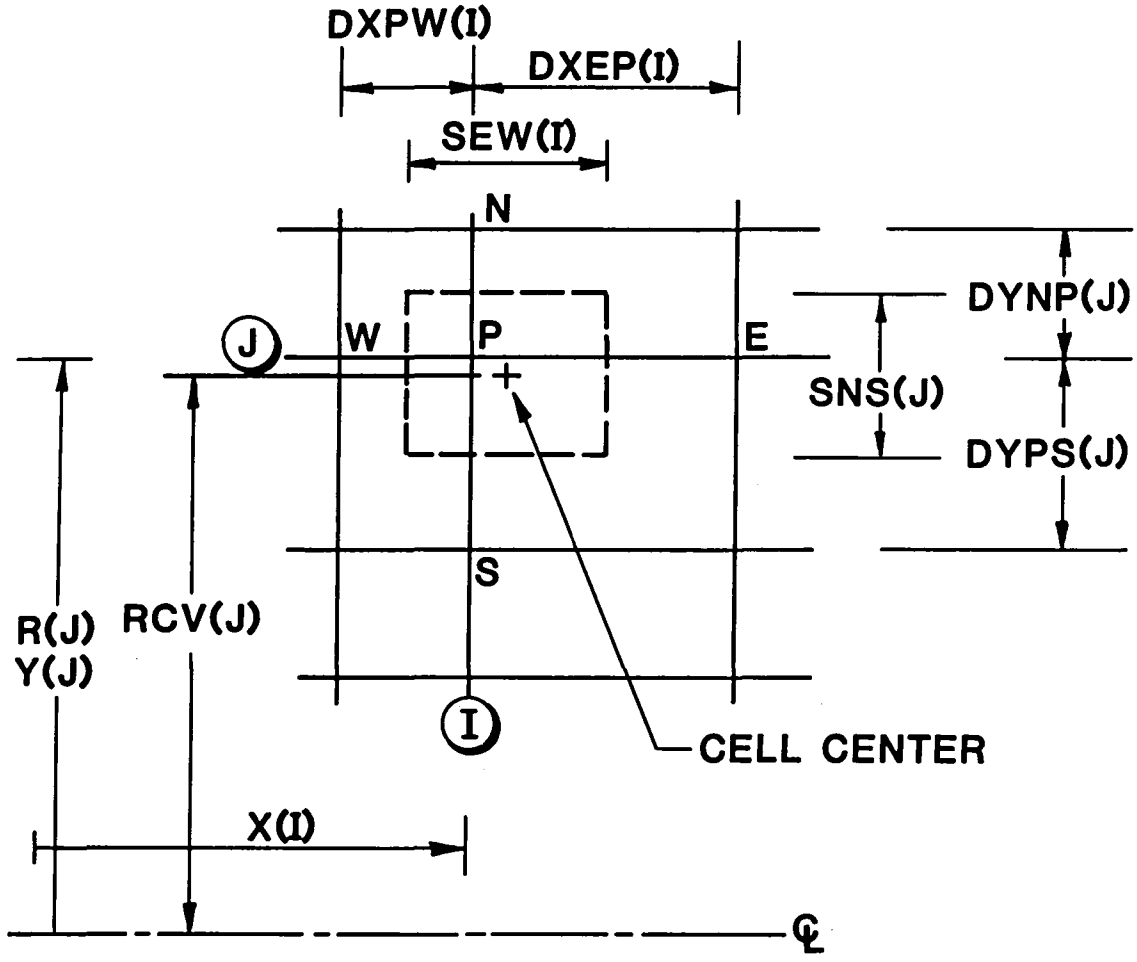


Fig. 9. Fortran variables related to the grid for C cells.

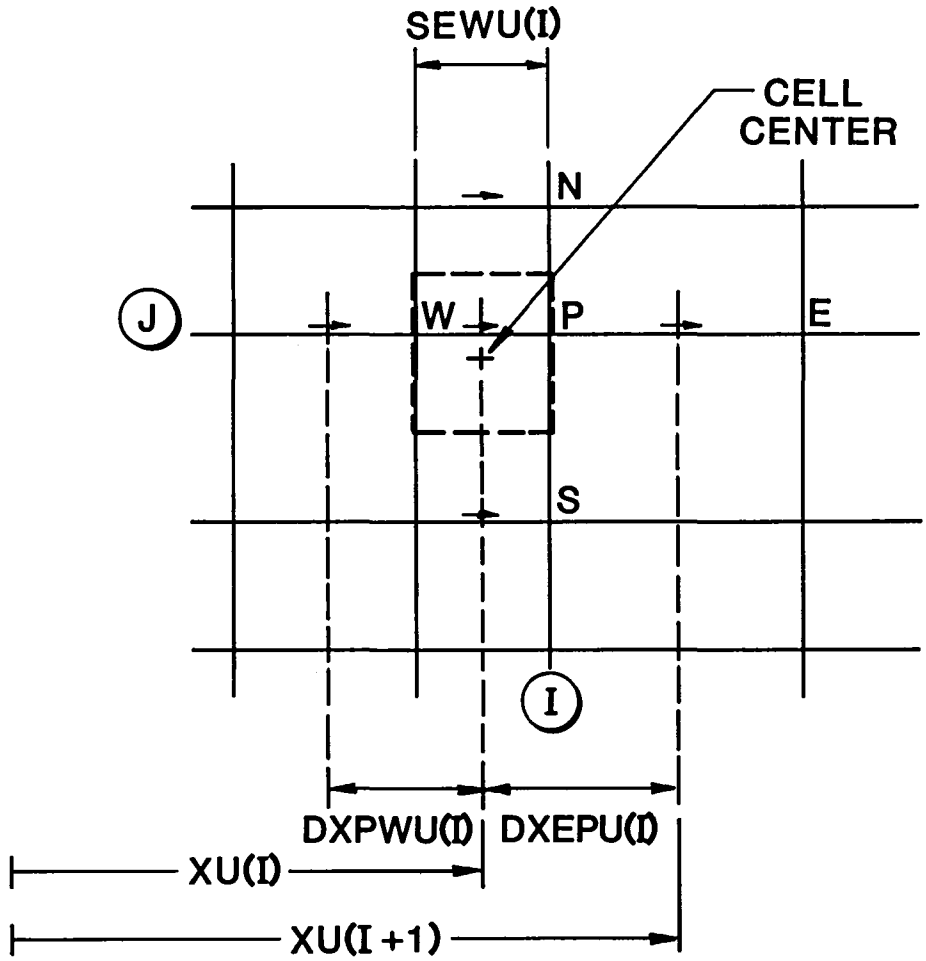


Fig. 10. Fortran variables related to the grid for U cells.

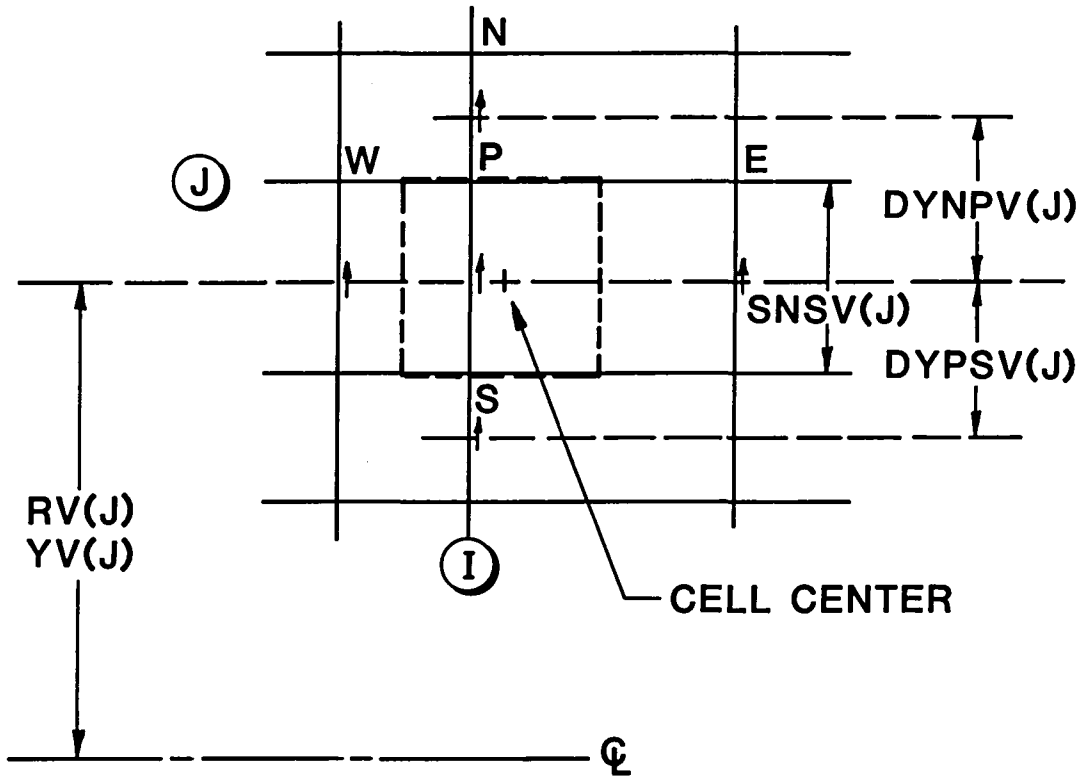


Fig. 11. Fortran variables related to the grid for V cells.

3.5 Subroutines CALCU and CALCV

CALCU has the task of calculating the appropriate coupling coefficients linking the value of U* at each 'w' point of the mesh system with its four neighbors via Eq. (11). The formulation is completely general and correct only for internal points but the call to PROMOD (2)(problem modifications, chapter 2) corrects for near boundary points by applying the correct formulation via a linearized source technique (see section 2.3). Underrelaxation via Eq. (43) precedes the updating of the U* field via a call to LISOLV, this being called NSWPU (number of sweeps for U) times for multiple inner updates of the U* field. The task of CALCV is similar as it renews the V* field and utilizes PROMOD (3). The chapters are:

C1 Assembly of coefficients. Two nested loops for I and J ensure that all internal points of the mesh are considered in C1. For each (I, J) - point the following sequence of calculations is performed:

(i) the cell face areas and volume (utilizing the geometric variables of Figs. 9-11.

(ii) the convection coefficients via the mass-velocities GN etc. and mass flow fluxes through the faces CN etc.

(iii) the diffusion coefficients utilizing viscosities, areas and distances to obtain DN etc.

(iv) the coefficients of source terms - here only the 'false' source stabilizing trick components of Eq. (9) are used; other parts of the source term are added in later.

(v) the main coefficients AN etc. are assembled, using the 'hybrid' formulation of central and upwind differences, Eq. (10). The SU and SP components of the source expression are now determined with the pressure term going into SU, see Tables 1 and 2.

C2 Problem modifications. The general forumlation of C1 is modified for near boundary points via the call to PROMOD. The call is to Chapter 2 of PROMOD in the case of CALCU and to Chapter 3 in the case of CALCV.

C3 Final coefficient assembly and residual source calculation. Two nested loops for I and J allow all points of the grid to be dealt with in turn. Firstly, AP (= a_p) is calculated and RESORU (residual source for U) is incremented, and secondly, the underrelaxation demands of Eq. (43) are applied.

C4 Solution of difference equation. LISOLV is called NSWPU times in order to update the U* field several times (NSWPV times in the case of V*). The LISOLV parameter list begins 3, 2, ... in the case of CALCU, but 2, 3, ... in the case of CALCV. Careful observation of the relationship between the physical and reference storage locations of the displaced grid systems for U and V confirm this requirement.

3.6 Subroutine CALCP

CALCP deals with the variable PP (= p' the pressure correction) in a similar fashion to the CALCU and CALCV subroutines just described. However, there are several points of difference:

(i) the subroutine is concerned with Eq. (15) and the calculation of p',

(ii) the assembly of coefficients is simpler than the previous two subroutines,

(iii) the subroutine closes with the application of the p' field to correct the latest estimates so far of the u, v and p fields, that is u*, v* and p*, by appropriate use of Eqs. (12) through (14).

C1 Assembly of coefficients. Two nested loops sweep through the entire grid system. At each point the following sequence of calculations is performed: areas and volume of cells, coupling coefficients, source terms and absolute mass sources.

C2 Problem modification. A call statement to PROMOD (4) is included.

C3 Final coefficient assembly. Coefficient AP is calculated for all points of the mesh.

C4 Solution of difference equations. LISOLV is called NSWPP times in order to obtain a good estimate of the p' field. The parameter list, beginning 2, 2, ..., is appropriate since pressures are stored at grid intersections.

C5 Correct velocities and pressure. When this stage is reached, first estimates of the u, v and p fields (U* from CALCU, V* from CALCV and p* from previous iteration) are known. Equations (12) through (14) are applied to obtain better estimates and ensure that the U* and V* momentum equation first-estimate solutions are brought into conformity with the continuity equation. Notice that the DO loop ranges are a little complicated so as to operate only on internal field points. There is no underrelaxation here on the velocity components (this was done prior to obtaining the U* and V* fields). Also, the required p' correction is added to the latest estimate of the pressure field p*.

3.7 The other CALC subroutines

The other main dependent variables which are to be solved from their governing partial differential equations are w, k, and ε as seen in Table 1. Each of these is dealt with in a separate subroutine denoted by the name CALC followed by W, TE and ED. They are each called sequentially in this order directly from the MAIN subprogram; and each of them is structured

similarly to the CALCU and CALCV subroutines described in section 3.5. Only highlights of the differences need be described.

C1 Assembly of coefficients. Since all these variables are physically located at the grid intersections, both the I and J loops begin with the value 2 and ensure a sweep over all internal mesh points. The third part of C1 is concerned with diffusion coefficients and it is here that the Prandtl/Schmidt numbers PRTE, etc. in Table 4 are brought into play: viscosities are divided by PRTE, etc. in order to obtain the appropriate exchange coefficients. The fourth part concerns source terms and rather longer expressions are formulated as required from Table 1.

C2, C3 and C4. These bear such a strong resemblance to their corresponding chapters already described in section 3.5 that no further elaboration need be given here, except to remark that the LISOLV call always begins with the parameters 2, 2.

3.8 Subroutine LISOLV

LISOLV (line solver) is called from each of the CALC subroutines. When called it provides one complete sweep of the relevant interior points at which the variable is located. Also it replaces the 2-D array PHI, the last parameter of the call list, with the solution of the equations previously built-up in the calling subroutine. This is effected by means of the well-known TDMA (tridiagonal matrix algorithm) being applied to each vertical gridline in turn, and traversing along all such lines in the vertical direction sequentially from left to right of the integration domain.

The subroutine begins with a DO loop for the W-E sweep. There is some complexity here involving ISTART and JSTART, the first two parameters of the call list (these are usually given the values 2, 2 but are 3, 2 and 2, 3 when the call is from CALCU and CALCV respectively). But careful perusal of

the steps involved will assure the reader that the calculations are correct. The subsequent parts of the subroutine concern implementation of the TDMA technique: with the S-N traverse, assembling the TDMA coefficients, the calculation of the coefficients of the recurrence formula and the back-substitution to obtain the solution values of the S-N gridline.

3.9 Subroutine PRINT

The task of PRINT is to print out the values of a 2-D array PHI, together with associated heading HEAD, the last parameter of the call list. The X and Y coordinates are written horizontally and vertically around the output matrix of values. Again, as discussed in Section 3.8, the first two parameters of the call list, ISTART and JSTART, are usually 1,1 so that all internal and external values are printed to help diagnostics. Also, for U the XU values are printed and for V the YV values so that correct physical position values accompany the output of these variables which are located on displaced grids.

3.10 Subroutine PROMOD

The finite difference equation coefficients are formulated in each of the CALC subroutines on the assumption that each point is a usual internal point. Of course some points lie near or on the rectangular boundary of the flow domain in which the solution is sought and the general formulation of a CALC routine is not correct at these points. So that all required corrections to the general formulation are simple to understand and apply, each CALC routine calls a particular chapter of PROMOD (problem modifications). This subroutine has the task of modifying the values of the finite difference equation coefficients, or the variables, near walls or other boundaries where particular conditions apply. Each chapter concerns itself solely with one

particular variable and each chapter considers in turn each of the boundaries around the solution domain. Boundary conditions are thus easy to formulate and simple to apply; and this novel feature makes PROMOD second only to MAIN as a subroutine to which a prospective user needs to apply his attention.

According to the value given to NCHAP (number of chapter required) of the call list, control proceeds to one and only one of the eight chapters of this subroutine. These chapters deal with:

C1 Properties

C2 U momentum

C3 V momentum

C4 Pressure correction

C5 Thermal Energy

C6 Turbulent kinetic energy

C7 Dissipation

C8 W momentum

where C5 is retained from the original TEACH arrangement, but is not used in the present version of the code.

Figure 5 reveals that amongst the boundaries of the solution domain only at the inlet is the usual formulation of the finite difference equations, as computed in the CALC subroutines, correct. At other boundaries of the solution domain appropriate sections of PROMOD have to supply the correct influence of the boundary conditions on the coupling coefficients a_j^{ϕ} (j = N, S, E, W and P) and components S_U^{ϕ} and S_p^{ϕ} of the linearized source term. In PROMOD each of the chapters is further divided into sections dealing with

(i) Northern top wall, I = 2 to NIM1

(ii) Southern symmetry axis, I = 2 to NIM1

(iii) Western side wall, J = 2 to NJM1

(iv) Eastern outlet, J = 2 to NJM1

In what follows all four cases of a N, S, E and W near-boundary point are dealt with simultaneously. One merely reads the appropriate line (designated by (N), (S), (E) and (W)) of the equations which follow, according to the particular case in which the reader is temporarily interested. Notation follows that of the boundary cells of Figs. 6 and 7.

Boundary conditions are inserted for each boundary cell. The first step generally involves breaking the link to any adjoining external cell by setting to zero the appropriate a_j of Eq. (11). Then, for each boundary

$$\begin{aligned} &AN\ (I, J) = 0 \quad (N) \\ &AS\ (I, J) = 0 \quad (S) \\ &AE\ (I, J) = 0 \quad (E) \\ &AW\ (I, J) = 0 \quad (W) \end{aligned} \tag{45}$$

This step is followed by insertion of the correct boundary flux (diffusion and/or convection) for the cell boundary in question into the linearized source terms SU and SP, as exemplified in the following sections.

Neumann conditions. If zero normal gradient condition is the one to be applied, breaking the appropriate link is all that is required. For then the terms

$$\begin{aligned} &a_N\ (\phi_P - \phi_N) = 0 \quad (N) \\ &a_S\ (\phi_P - \phi_S) = 0 \quad (S) \\ &a_E\ (\phi_P - \phi_E) = 0 \quad (E) \\ &a_W\ (\phi_P - \phi_W) = 0 \quad (W) \end{aligned} \tag{46}$$

are all zero in Eq. (11) so there is no flux through the boundary in question.

Dirichlet conditions. If the value of ϕ is prescribed as ϕ_B on the boundary then the usual boundary link is broken via Eq. (16). For a solid boundary the convective flux through the boundary face of the cell is zero,

but the diffusive flux is typically nonzero. Hence the diffusion term of Eq. (8) is transferred to the right-hand side RHS of the equation where it is incorporated into SU(I,J) and SP(I,J); on the RHS it is expressed in terms of ϕ_P and ϕ_B as

$$\begin{aligned} &\Gamma_B\ (\phi_B - \phi_P)\ r_B\ \Delta x/\delta y \quad (N)\\ &\Gamma_B\ (\phi_B - \phi_P)\ r_B\ \Delta x/\delta y \quad (S)\\ &\Gamma_B\ (\phi_B - \phi_P)\ r_B\ \Delta y/\delta x \quad (E)\\ &\Gamma_B\ (\phi_B - \phi_P)\ r_B\ \Delta y/\delta x \quad (W) \end{aligned} \tag{47}$$

where Γ_B is the appropriate exchange coefficient for ϕ evaluated at point B. Appropriate cell boundary face areas appear here. North and south face areas are given by $r_B\ \Delta\theta\ \Delta x$ whereas east and west areas are expressed as $r_B\ \Delta\theta\ \Delta r$; but $\Delta\theta$ cancels from the governing equations. These expressions may be split between SU(I,J) and SP(I,J) as

$$SU(I,J) = SU\ (I,J) + \begin{cases} \Gamma_B\ r_B\ \phi_B\ \Delta x/\delta y & (N)\\ \Gamma_B\ r_B\ \phi_B\ \Delta x/\delta y & (S)\\ \Gamma_B\ r_B\ \phi_B\ \Delta y/\delta x & (E)\\ \Gamma_B\ r_B\ \phi_B\ \Delta y/\delta x & (W) \end{cases} \tag{48}$$

and

$$SP(I,J) = SP\ (I,J) - \begin{cases} \Gamma_B\ r_B\ \Delta x/\delta y & (N)\\ \Gamma_B\ r_B\ \Delta x/\delta y & (S)\\ \Gamma_B\ r_B\ \Delta y/\delta x & (E)\\ \Gamma_B\ r_B\ \Delta y/\delta x & (W) \end{cases} \tag{49}$$

Flux specified. If the flux of ϕ through a boundary face of the cell is specified. When brought to the RHS of Eq. (8) it may be approximately expressed as $b\phi_p + c$ where b and c are known (if possible, retaining (-b) and (c) both positive to aid the convergence of the finite difference iteration procedure). This is implemented by breaking the boundary link and augmenting the source terms appropriately:

$$SU(I,J) = SU(I,J) + c \quad (N,S,E, \text{ and } W) \tag{50}$$

$$SP(I,J) = SP(I,J) + b \quad (N,S,E, \text{ and } W) \tag{51}$$

Fixing a value at an internal point. The value of ϕ at a near-boundary point P may be fixed at a value of ϕ_F via setting

$$SU(I,J) = \phi_F \, 10^{30} \quad (N,S,E, \text{ and } W) \tag{52}$$

$$SP(I,J) = -10^{30} \quad (N,S,E, \text{ and } W) \tag{53}$$

so that these terms dominate in the equation for ϕ at P, with the solution $\phi_P = \phi_F$.

Convective and diffusive influences. If both convection and diffusion through a cell boundary occurs, the hybrid formulation should be used. In this situation the contribution C for the flux passing the surface in question (N,S,E, or W) is calculated according to Eq. (10) and used along with the other surface contributions and source terms to formulate the usual finite difference equation. This is ensured automatically in the program for a normal inflow/outflow boundary.

3.11 Subroutine STRMFN

Subroutine STRMFN has been developed to calculate the dimensionless stream function

$$STFN = \int_0^r urdr \; / \; \int_0^{d/2} urdr \tag{54}$$

for all internal field points of the u-cell grid. The quadrature formulation for calculating STFN is essentially the Trapezoidal Rule. The integration proceeds radially one step SNSV(J) at a time so that a finite difference mesh which is either uniform or nonuniform in the radial direction is permissible.

The coordinates of points constituting each of NSTLN streamlines with dimensionless stream function values STVAL ranging from 0.0 to 1.0 are subsequently calculated for plotting. The present code calculates the coordinates of eleven streamlines with $\psi^* = 0.0, 0.1, \ldots, 1.0$. Each streamline is represented by NI-1 points whose dimensionless x- and r-coordinates are stored as XUND(I) and YSTLND(I,K) (K = 1,..,11) respectively, where the k-index indicates the particular streamline. These two arrays are employed in producing COMPLOT streamline plots via the usual CALCOMP subroutines. Immediate line printer plots of alternate streamlines are obtained through the use of corresponding arrays XUDPLT(I) and YSLPLT(N,I) (N = 1,...,6) for the six streamlines $\psi^* = 0.0, 0.2, \ldots, 1.0$.

3.12 Subroutine PLOT

The PLOT subroutine is a variant of the ϕ - profile line printer plot routine supplied with some versions of the GENMIX computer program. It is now described at length in a recent text.[34] In the present version supplied, it is called twice after each converged solution has been obtained. Firstly, with the parameter LARGE equal to 0 (giving a small-sized plot) and secondly with LARGE equal to 1 (giving a larger-sized plot). Prominent in the call list are XUDPLT(I) and YSLPLT(N,I) (N = 1,...,6) as described in Section 3.11 from which the required six streamlines are plotted. A 50 x 100 array is filled with alphanumeric characters as appropriate so as to give labels

0,2,4,6,8 and 1 corresponding to the nondimensional streamlines $\psi^* = 0.0$, 0.2,...,1.0.

4. USER'S GUIDE

4.1 Problem Specification

General. The listing of the program, which is supplied in Appendix E, is used for precisely those calculations which have been described in Sections 2 and 3 of this report. The user of the program will wish to make other calculations; for this he must modify the program. Although the description of the program which was given in Section 3 will allow the discerning reader already to distinguish the parts of the program which must be altered, the following notes will aid him to make the modifications to suit his case, without going through the whole program.

The general principles which the user should adopt are:

(i) Read through MAIN, paying special attention to the Chapter titles, and other subtitles, and considering whether any of the features of the problem which relate to those titles have suffered changes which should be incorporated.

(ii) Make the corresponding changes to MAIN.

(iii) If modifications are desired to the turbulence model, introduce these in C2 of MAIN and/or C2 of PROPS.

(iv) If different wall boundary conditions are required, read carefully Sections 2.3 and 3.10 and then change PROMOD accordingly.

(v) Check that the COMMON statements are still adequate.

(vi) Leave the general parts of the program alone, including the CALC subroutines, INIT, PROPS, LISOLV and PRINT (except those minor nonstructural parts just mentioned).

The following discussion is organized under the headings: Input data specification, system specification, boundary conditions, and turbulence specification.

Input data specification. Much of the data is internally specified. However, if IREAD = .TRUE. has been declared in C0 of MAIN, the unformatted reading of all input data from disk storage is activated. This input requires the proper job control "card" to allocate the logical unit number of the READ statement to the disk storage data file from which the data is to be read. The dependent variable fields are read from disk storage as an improved (near-solution) initial estimate to reduce the number of iterations required for convergence.

As seen in Section 4.2, the X(I) and Y(J) [=R(J)] arrays preceed the dependent variable arrays sequentially written on each data file stored. Hence in C0 of MAIN, these two independent variable arrays are read to enable the next unformatted READ in C2 of MAIN to read the U(I,J), etc. dependent variables. After the solution is printed in C4 of MAIN, the dependent variable arrays are re-initialized for the next swirl loop by another series of unformatted reads from disk storage. Also, as discussed in Section 3, alphanumeric headings are read in C0 of MAIN using an A format field.

System specification. Minor variants of the sample grid system of Fig. 4 can be derived simply by appropriate modifications being made to the grid section of C1 of MAIN. Appropriate choice of the integers NI, NJ, ISTEP, JSTEP and JMAX(I) together with RLARGE (=D/2) ALTOT (= total length), EPSX (the gradual expansion rate in the axial direction) and Y(J) defines completely the axisymmetric geometry with INDCOS = 2. Assigning true or false to INCALU etc. activates the calls to subroutine CALCU etc. during the subsequent iteration cycle to update the U-velocity field. They also determine whether printing is required. Clearly, true settings will generally be the ones to use for all the dependent variables. Specification is also required for

fluid properties, including Prandtl/Schmidt numbers and all material constants in SI units.

Boundary conditions. C1 of MAIN specifies boundary values of all the dependent variables. Hence specification of UIN etc. are required for the main inlet. Most inlet profiles of the turbulent flow are then taken to be uniform in C2 of MAIN and the user can easily amend this if desired. Employed here is the swirl number block SWNB or vane angle block VANB according to the value of NSBR (number for solid body rotation). The specification NSBR = 1 activates SWNB, which gives solid body rotation from a swirl generator, and NSBR = 0 activates VANB for a flat swirl velocity profile from swirl vanes. In either case, the desired inlet values of swirl velocity W are assigned appropriately.

Initial field values of all the dependent variables are specified in C2 of INIT and C2 of MAIN. The user will be content to leave these alone, for as soon as the iteration process is underway, these estimates are improved. Only occasionally in some cases will they be too inaccurate to permit a smooth iterative process to continue from their values - in such cases more realistic values closer to the true solution and/or underrelaxation must be specified.

Turbulence specification. Minor adjustments to the turbulence model already in the program can be simply achieved by altering the turbulence constants part of C1 of MAIN and C2 of PROPS for the viscosity calculation. If one desired to make a computation for laminar flow, VIS must be filled with appropriate values in the DO 100 loop of PROPS. Also, the logical variables INCALK and INCALD could be specified as false to suppress the calculation of k and ε and the complexity in PROMOD for velocities near wall boundaries would be removed. When a different turbulence model is required, of course, C2 of PROPS must reflect this. Should a nonisotropic

or direct turbulent stress specification model be required, more far-reaching changes would be required to the diffusion term calculations in all the CALC subroutines, possibly with other CALC routines for solving stress equations. It is here that current knowledge is uncertain and much current research activity is being directed toward more realistic turbulence models.

4.2 Iteration and Accuracy

Iteration control. The iteration process is monitored by comparing the sum of the absolute values of residual source of mass in the filed, RESORM, with a preset value, SORMAX, representing maximum source. Similarly for other variables U, V, W, etc. iteration is terminated for a particular problem when the largest residual source is less than SORMAX, or number of iterations NITER is greater than the maximum number of iterations MAXIT to be allowed. By analogy a divergence criterion can also be included if required, so as to prematurely terminate a computation giving results which appear not to be converging.

Fortran variables which are used to influence the iteration behavior are NSWPU etc. (representing number of update sweeps for U etc.) and URFU etc, (representing underrelaxation for U etc.). If divergence is found, the remedy often lies in increasing the former (especially NSWPP for pressure) and reducing the latter. However, the accompanying listing includes reasonable values which have been found convenient to use. They are automatically re-assigned in the iteration process according to the inlet swirl strength and number of iterations made toward convergence, as inspection of the listing reveals.

Output. At every iteration, RESORM etc. are printed out along with monitored values of variables at the location specified by IMON and JMON. Full field prints presently after 100 iterations and increments of 50 thereafter. Full field prints are obtained for each dependent variable with a true logical variable (like INCALU for U-veloctiy) by way of a call to subroutine PRINT. The user, of course, is entirely free to make any output he wishes at each iteration stage in C3 of MAIN and to make a field print of any 2-D array via a call to PRINT. This structure is a flexible one which can be utilized to advantage.

If IWRITE = .TRUE. has been specified in C0 of MAIN, the unformatted writing of all output data onto disk storage is activated. This output requires the proper job control "card" to allocate the logical unit number of the WRITE statement to the disk storage data file which is to receive the data. First, the X(I) and then the Y(J) [=R(J)] arrays are written to disk storage allocated to logical unit 11, as seen in the initial output portion of MAIN, C2. Also, located here is the writing of XUND(I), nondimensional XU(I), to disk storage allocated to logical unit 14.

Upon completion of the solution process for each swirl loop each field variable is nondimensionalized and printed (if NONDIM = .TRUE.) subsequent to the printing of dimensional variables. Then, the following dependent variable arrays are written onto disk (logical unit 11): U(I,J), V(I,J), W(I,J), P(I,J), TE(I,J), ED(I,J), VIS(I,J) and STFN(I,J). Immediately following is the WRITE of YSTLND(I,K) to disk (logical unit 14), where YSTLND(I,K) contains the dimensionless radial coordinate corresponding to each dimensionless axial coordinate XUND(I) along each K streamline. These arrays are subsequently used in obtaining CALCOMP streamline plots.

Independence of grid size. A computation may be considered to be accurate if alterations in the grid size produce no significant changes in the values of dependent variables, or the fluxes, at the points in the flow or its boundary which are interesting to the user of the program. Such alterations are obtained by changing the values of NI and NJ (number of grid intervals in I and J (i.e. X and Y) directions) along with EPSX and Y(J). Specification of these quantities is made in C1 of MAIN. Of course, large values of NI and NJ increase the computer time significantly, so smallest values should be used that are consistent with acceptable accuracy. There is no way but trial to establish what these values are, but a 23 x 21 or 35 x 21 grid is probably sufficient, as available by simple choice in the delivered code.

Comparison with exact or experimental values. Further tests of accuracy can be made by setting the geometry and boundary conditions of the program to correspond to a problem for which exact solutions or experimental results are available. For example, the inlet step could be dispensed with and standard pipe flow results. In either case the presence of swirl and turbulence is optional. Hence comparison of the predictions of the program for this degenerate case with exact or experimental results can provide valuable insight into the accuracy with which the differential equations are being solved.

'Trouble-shooting' - It is possible to mention only a few of the remedies which can be employed when the program, in the course of being adapted to a new problem, generates computations that are evidently faulty.

To prevent divergence, the source terms should be formulated so that -SP is always positive for each ϕ variable. This keeps the point P dominant in its finite difference form with its N, S, E and W neighbors and aids the

stability of the iteration process. The forms shown in Table 2 enjoy this characteristic.

Lack of conservation of properties which ought to be conserved is often the result of incompatible specification of boundary conditions and fluid properties, for example. One has to take extreme care. It is not possible to say much more in general than that inadvertently introduced incompatibilities are among the most common causes of error.

4.3 The Sample Computation

The sample computation code listing (Appendix E) and the results given in the microfiche supplement are concerned with the inert turbulent flow in an idealized combustion chamber. An air flow (constant density $\rho = 1.211$ kg/m^3 and molecular viscosity $\mu = 1.8 \times 10^{-5}$ kg/ms) enters a 45 deg. expansion ($\alpha =$ 45 deg.) from an inlet pipe (radius $d/2 = 0.03125$ m) to a large pipe (radius $D/2 = 0.0625$ m). The total length of the flow domain is 0.5 m so as to be sufficient to enclose any expected recirculation zones. Computer runs through a range of seven inlet swirl vane angles ϕ (= arctan w_{in}/u_{in}) equal to 0, 45,55, 60, 65, 68 and 70 deg. are given, although serious production runs with the larger swirl strengths are made with the total length further extended to about 0.8 m in order to cover a larger domain associated with a longer central recirculation zone. A maximum of 200 iterations for each swirl strength is allowed, with the solutions for each value of ϕ being used as the initial starting values for the next higher value of ϕ.

The flow domain is covered by a 23 x 21 mesh system (NI = 23 for the x-direction, NJ = 21 for the r-direction). The sidewall angle of $\alpha = 45$ deg. is accommodated by way of four steps each of three cells high in the radial direction. The specification is

ISTEP = 2

JSTEP = 8

JMAX(1) = 8

JMAX(2) = 11

JMAX(3) = 14

JMAX(4) = 17

JMAX(I) = 20 (I = 5,6,...,21)

In the x-direction a uniformly expanding grid up to x = 0.375 m at I = 20 is specified via EPSX = 1.11, then equidistant addition grid lines are specified up to x = 0.5 m at NI = 23. This grid is appropriate for sidewall angles α = 45 and 90 deg., though with α = 70 deg. a uniformly expanding grid up to x = 0.375 m at I = 30 is specified via EPSX = 1.102, then equidistant additional grid lines are specified up to x = 0.55 m at NI = 35. In the r-direction the 21 grid lines are clustered near the expansion corner, centerline and north wall since additional refinement is required in regions with expected large gradients. The choice of x-grid is determined by setting IFINE to be true or false, giving fine or coarse grid system, respectively. Both grids are arranged

(i) to give good resolution in strategic locations near the inlet, exit, projecting corners and front and back stagnation points,

(ii) to give corresponding axial locations at which to compare predictions with present and previous measurements.

Finally, the choice of logical variables in Chapter 0 of MAIN is self-explanatory giving rather detailed output but not reading from or writing to any disk storage locations.

When the user wishes to compute a problem with a sidewall angle α different from 45 deg. [as in the listing supplied in Appendix E] he has

to specify the x and r [≡ y] grid line locations and JMAX(I) for each I. Many variants of the flow domain of Fig. 5 discussed in Section 2.3 can thus be investigated. Auxiliary computations lead to the required specification. For example, other values of α are obtained by modifying the x-grid spacing near the inlet, which depends on NI, EPSX and ALTOT, and comparing it with the corresponding r-grid spacing near the expansion corner. That is, XU(3) - XU(2) is compared with YV(JSTEP+2) - YV(JSTEP+1) to get the aspect ratio by the expansion corner. When a multi-cell step is envisioned a greater range of YV values are considered. Corresponding values of α can be tabulated with various combinations of NI and EPSX, and the user can then judiciously choose an appropriate combination with JMAX(I) values for his needs.

Another parameter frequently requiring different values is swirl strength. The program is set up via LFS and LFSMAX to sequentially calculate through a range of seven swirl vane angles. These angles are specified in a DATA statement for the array VANB which is activated if NSBR = 0. If NSBR = 1 the swirl number for consecutive swirl numbers to be investigated is specified via a DATA statement for the array SWNB.

5. CLOSURE

The STARPIC computer program has been developed to predict swirling recirculating inert turbulent flows in axisymmetric combustion chambers. The technique involves a staggered grid system for axial and radial velocities, a line relaxation procedure for efficient solution of the equations, a two-equation $k - \varepsilon$ turbulence model, a stairstep boundary representation of the expansion flow, and realistic accommodation of swirl effects. Predictions of this type allow some results to be obtained more cheaply, quickly, and correctly than currently possible by the almost exclusive use of experimental means. Further development and application is providing a valuable supplementary technique for designers of practical combustion equipment.

This report has dealt with the computational problem and shown how the mathematical basis and computational scheme may be translated into a computer program. A flow chart, Fortran 4 listing, notes about various subroutines and a user's guide are supplied as an aid to prospective users of the code.

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7. NOMENCLATURE

A	Cell face area, Eq. (8)
a	Coupling coefficient, Eq. (11)
C	Contribution to cell surface integral, Eq. (10)
C,U,V	Control cell volumes for ϕ, u, v, Fig. 3
D	Chamber diameter, Fig. 1
d	Nozzle diameter, Fig. 1
E	Constant in law of wall, Eq. (24)
f	Underrelaxation parameter, Eq. (42)
G	k - generation term, Eq. (4)
I,J	Mesh point, Fig. 2
k	Kinetic energy of turbulence, Eq. (1)
$\dot{m}_{net}$	Net outflow of mass from cell, Eq. (9)
Pe	Cell Peclet number = $\rho u \delta / \Gamma$, Eq. (10)
p	Time-mean pressure, Eq. (1)
R	Residual source, Eq. (44)
S	Source term (with subscript), Eq. (1)
S_P, S_U	Components of linearized source term, Eq. (8)
V	Magnitude of total velocity vector, Eq. (24)
$\underline{v} = (u,v,w)$	Time-mean velocity (in x,r,θ directions), Eq. (1)
x,r,θ	Axial, radial, circumferential polar co-ordinates, Eq. (1)
y	Distance normal to a wall, Eq. (25)
Γ	Turbulent exchange coefficient, Eq. (1)
α	Side-wall angle, Fig. 1
Γ	Exchange coefficient, Eq. (7)

δx	Axial distance between two neighboring mesh points, Fig. 4
ε	Turbulence energy dissipation rate, Eq. (1)
κ	Constant in log law, Eq. (24)
μ	Effective viscosity, Eq. (5)
ρ	Time-mean density, Eq. (1)
σ	Prandtl-Schmidt number, Eq. (6)
τ	Wall shear stress, Eq. (25)
ϕ	Swirl vane angle, Fig. 1 dependent variable, Eq. (1)
ψ	Stream function, Eq. (7)

Superscripts

old	Last iterate value, Eq. (9)
*	Preliminary u, v and p field based on estimated pressure field p*, Eqs. (12)-(15)
'	Correction value to u*,v*,p* to get u,v,p, Eqs. (12)-(15)

Subscripts

in	Inlet, Fig. 1
ℓ	Laminar value, Eq. (5)
n,s,e,w	North, south, east, west faces of cell, Eq. (8)
P,N,S,E,W	Point, north, south, east, west neighbors, Fig. 2
t	Total, Eq. (25)

APPENDIX A DERIVATION OF THE HYBRID DIFFERENCING SCHEME

In the discussion of Section 2.2, it was remarked that a hybrid differencing scheme is used in representing the combined effects of convection and diffusion at cell boundaries. It possesses certain advantages over the well-known central and upstream differencing schemes, and it is convenient to provide here sufficient derivation, in the context of the present 2-D axisymmetric flow problem. The reasons and choices are aided by comparison of possible finite difference representations with the exact solution of a simplified 1-D convection and diffusion problem, whose solution values and flux calculations therefrom provides useful guidance.

Consider the transport across one face of a control volume, for example the western face of area A_w normal to the x-direction which lies midway between the gridpoints W and P distant δx apart, as shown earlier in Fig. 4. The contribution C_w of the convection and diffusion terms of Eq. (1) to the surface integral for the western face is

$$C_w = [\rho u\phi - \Gamma_\phi \frac{\partial \phi}{\partial x}]_w A_w \qquad (A1)$$

and the task is to derive a finite difference expression to represent the right hand side realistically in terms of ϕ and Γ_ϕ values at W and P using appropriate differencing. The choice will be aided by comparison with the exact solution of

$$\rho u\phi - \Gamma_\phi \frac{\partial \phi}{\partial x} = 0 \qquad (A2)$$

in the interval $W \leq x \leq P$, taken without loss of generality to be $0 \leq x \leq \delta x$, where $\Gamma_\phi = (\Gamma_\phi)_w$ = constant and ρ and u are presumed to be constant known values evaluated at $x = \delta x/2$. Solving this one-dimensional

Eq. (A2) subject to the two grid values

$$x = 0 \qquad \phi = \phi_W$$
$$x = \delta x \qquad \phi = \phi_P \tag{A3}$$

yields the solution

$$\phi = \phi_W + (\phi_P - \phi_W) \left[\frac{e^{Pe\ x/\delta x} - 1}{e^{Pe} - 1} \right] \tag{A4}$$

where the cell Peclet number has been defined by

$$Pe = \rho u\ \delta x\ /\ \Gamma_\phi \tag{A5}$$

which is evaluated at $x = \delta x/2$, i.e. at the western face of the cell around P. The exact solution, Eq. (A4), is portrayed in Fig. 12 where inspection shows that the value of ϕ always lies within the extreme values of ϕ_W and ϕ_P. When Pe becomes very large and positive, because of axial velocity u being very large and from left to right in Fig. 3, the ϕ-x curve is nearly horizontal and nearly equal to ϕ_W at all points, with a steep rise to the value Φ_P as x approaches δx (i.e. near P). Conversely when Pe is very large and negative, because of axial velocity u being very large and from right to left for example, the ϕ-x curve is nearly equal to ϕ_P at all points with the steep part near $x = 0$ (i.e. near W). When Pe is near to zero in value, the linear interpolation straight line is close to the exact solution.

The present task is to look at the net transfer of ϕ across the mid-plane at $x = \delta x/2$ and to deduce a satisfactory finite difference analogue of the differential equation Eq. (A2) in terms of ϕ_W and ϕ_P. The flux of ϕ across the mid-plane at $x = \delta x/2$ is

$$Q_{\delta x/2} = \left[\rho u \phi - \Gamma_\phi \frac{\partial \phi}{\partial x} \right] x = \delta x/2 \tag{A6}$$

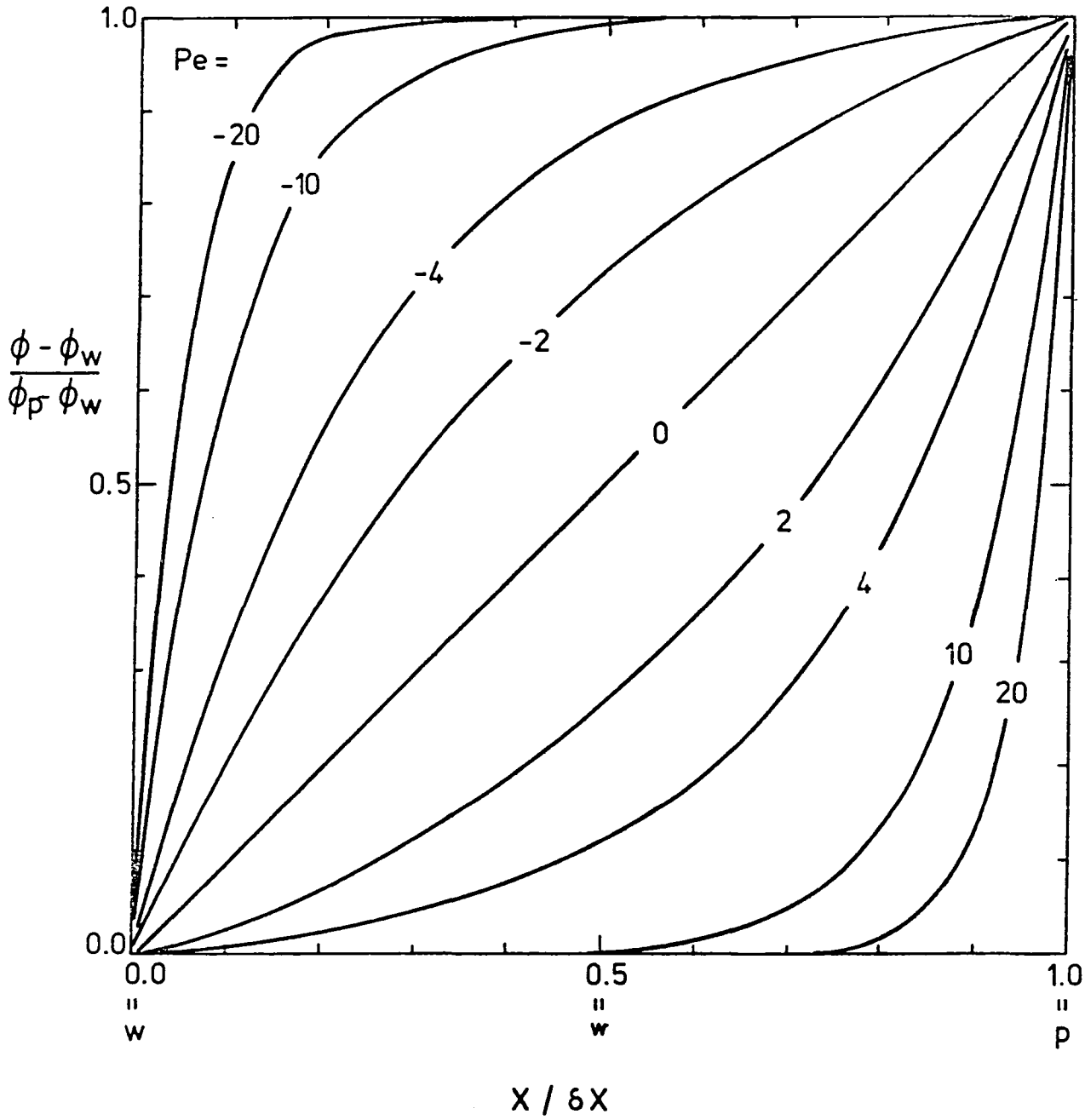

Fig. 12. ϕ versus x curves for different values of the cell Peclet number Pe (assuming $\phi_W < \phi_p$).

and upon substituting the exact solution for ϕ and $\frac{\partial \phi}{\partial x}$ at $x = \delta x/2$ using Eq. (A4) yields (see Appendix B)

$$Q_{\delta x/2} = (\rho u)_{\delta x/2} \left\{ \frac{\phi_W e^{Pe} - \phi_P}{e^{Pe} - 1} \right\}$$

$$= (\rho u)_{\delta x/2} \left\{ \frac{\phi_W e^{Pe}}{e^{Pe} - 1} - \frac{\phi_P e^{-Pe}}{1 - e^{-Pe}} \right\} \tag{A7}$$

Three limits of this expression can be examined:

$$Pe \to +\infty \qquad Q_{\delta x/2} \to (\rho u)_{\delta x/2} \cdot \phi_W \tag{A8}$$

$$Pe \to -\infty \qquad Q_{\delta x/2} \to (\rho u)_{\delta x/2} \cdot \phi_P \tag{A9}$$

$$|Pe| \to 0 \qquad Q_{\delta x/2} \to (\rho u)_{\delta x/2} \left\{ \phi_W \frac{1 + Pe + \cdots}{Pe\ (1 + Pe/2 + \cdots)} - \phi_P \frac{1 - Pe + \cdots}{Pe\ (1 - Pe/2 + \cdots)} \right\} \tag{A10}$$

$$= (\rho u)_{\delta x/2} (\phi_W + \phi_P)/2 - \Gamma_{\delta x/2} \frac{\phi_P - \phi_W}{\delta x} \tag{A11}$$

where terms of order Pe^2 and higher have been omitted from the last expression. Rearrangement and substitution of $\Gamma_{\phi,\delta x/2} / \delta x$ for $(\rho u)_{\delta x/2} / Pe$ has been made to obtain the final form of Eq. (A11). This last equation is equivalent to central differencing of the diffusion part (in square brackets) of Eq. (A1). The first two limits of Eqs. (A8) and (A9) are the upstream convection dominated limits where diffusion terms are negligible. In computing it is necessary to use a finite difference expression for the flux passing the surface for the western face contribution

$$C_W = Q_{\delta x/2} \cdot A_W \tag{A12}$$

which exhibits these three limiting cases. The hybrid scheme recommended and used in Refs. 17-23 exhibits these properties via the use of

$$C_w = \begin{cases} (\rho u)_w A_w (\phi_W + \phi_P)/2 - (\Gamma_\phi)_w A_w(\phi_P - \phi_W)/\delta x \text{ for } |Pe| < 2 \\ (\rho u)_w A_w \phi_W \text{ for } Pe \geq 2 \\ (\rho u)_w A_w \phi_P \text{ for } Pe \leq -2 \end{cases} \quad (A13)$$

where $Pe = (\rho u)_w \delta x/(\Gamma_\phi)_w$ is the cell Peclet number calculated at w. This hybrid scheme is denoted by HS.

Figure 13 shows the nondimensional flux passing the mid-plane at $x - \delta x/2$ versus Peclet number Pe. Four lines are shown representing the exact solution ES, the hybrid scheme HS, the central difference scheme CDS and the upwind difference scheme UDS. These lines show the overall superiority of the HS over the CDS and UDS approaches, for the particular case considered in Appendix C. However, the result is quite general.[30] These different schemes and the superiority of the hybrid scheme recommended and used in this work[7] are fully discussed in Appendix C.

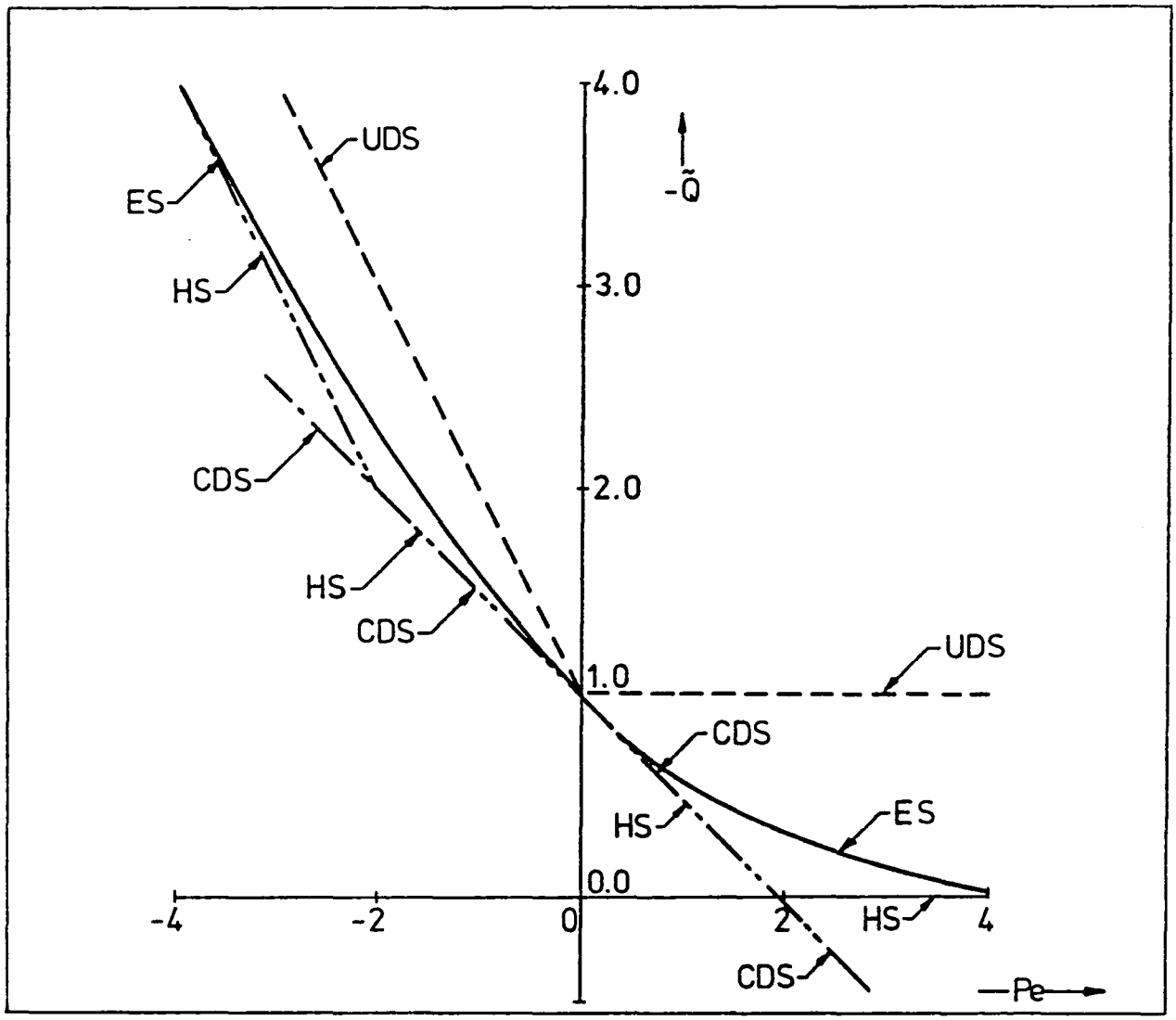

Fig. 13. Comparison of exact flux passing through western face with other approaches, as a function of Peclet number (ES, CDS, UDS, AND HS are described in Appendix C).

APPENDIX B DERIVATION OF EQ. (A7) FROM EQ. (A6)

Equation (A4) gives ϕ and $\frac{\partial \phi}{\partial x}$ evaluated at $x = \partial x/2$ as

$$\phi_{\delta x/2} = \phi_W + (\phi_P - \phi_W) \frac{e^{Pe/2} - 1}{e^{Pe} - 1} \tag{B1}$$

and

$$\left.\frac{\partial \phi}{\partial x}\right|_{\delta x/2} = (\phi_P - \phi_W) \cdot \frac{1}{e^{Pe} - 1} \cdot \frac{Pe}{\delta x} \cdot e^{Pe/2} \tag{B2}$$

Substitution into Eq. (A6) gives, where $\rho u = (\rho u)_{\delta x/2}$:

$$\begin{aligned} Q_{\delta x/2} &= \rho u \left\{ \phi_W + (\phi_P - \phi_W) \frac{e^{Pe/2} - 1}{e^{Pe} - 1} \right\} \\ &\quad - \Gamma_\phi \left\{ (\phi_P - \phi_W) \frac{1}{e^{Pe} - 1} \cdot \frac{Pe}{\delta x} \cdot e^{Pe/2} \right\} \\ &= \rho u \, \phi_W \left\{ 1 - \frac{e^{Pe/2} - 1}{e^{Pe} - 1} + \frac{e^{Pe/2}}{e^{Pe} - 1} \right\} \\ &\quad + \rho u \, \phi_P \left\{ \frac{e^{Pe/2} - 1}{e^{Pe} - 1} - \frac{e^{Pe/2}}{e^{Pe} - 1} \right\} \end{aligned} \tag{B3}$$

on substituting for Γ_ϕ in terms of the Peclet number $Pe = \rho u \delta x / \Gamma_\phi$.

continuing

$$\begin{aligned} Q_{\delta x/2} &= \rho u \, \phi_W \left\{ \frac{e^{Pe} - 1 + 1}{e^{Pe} - 1} \right\} + \rho u \, \phi_P \left\{ \frac{-1}{e^{Pe} - 1} \right\} \\ &= (\rho u)_{\delta x/2} \left\{ \phi_W \frac{e^{Pe}}{e^{Pe} - 1} - \phi_P \frac{1}{e^{Pe} - 1} \right\} \end{aligned} \tag{B4}$$

which is equivalent to Eq. (A7).

APPENDIX C THE SUPERIORITY OF THE HYBRID DIFFERENCING SCHEME

Here the concern is with exhibiting possible finite difference analogues of Eq. (A7) which expresses the exact solution for the flux $Q = Q_{\delta x/2}$ passing the mid-plane $x = \delta x/2$, as a function of local density and axial velocity evaluated at this point $\rho u = (\rho u)_{\delta x/2}$, the local Peclet number Pe and the ϕ-values at W and P. Three limiting cases for $Pe \to +\infty$, $Pe \to -\infty$ and $|Pe| \to 0$ were given in Eqs. (A8) - (A11), the first two being upstream convection dominated and the last one being equivalent to simple averaging for the convection term and central differencing for the diffusion term.

In computing it is advantageous to use a finite difference analogue of Eq. (A2) which gives the best fit for this flux Q over a range of ρ, u, Γ and δx likely to be encountered, as expressed via the Peclet number Pe. The suffix ϕ on Γ is omitted from here onward to avoid confusion. Nonsubscripted variables are evaluated at $x = \delta x/2$. The three popular practices, and the exact solution, are:

(i) CDS - the central difference scheme. For all Pe numbers, use

$$Q = \rho u\,(\phi_P + \phi_W)/2 - \Gamma(\phi_P - \phi_W)/\delta x \qquad (C1)$$

(ii) UDS - the upstream difference scheme. For all Pe numbers, use

$$Q = \begin{cases} \rho u \phi_W - \Gamma(\phi_P - \phi_W)/\delta x & (u > 0) \\ \rho u \phi_P - \Gamma(\phi_P - \phi_W)/\delta x & (u < 0) \end{cases} \qquad (C2)$$

(iii) HS - the hybrid scheme. According to Pe and u, use (see Eq. (A13)):

$$Q = \begin{cases} \rho u\,(\phi_P + \phi_W)/2 - \Gamma(\phi_P - \phi_W)/\delta x & (|Pe| < 2) \\ \rho u\,\phi_W & (Pe \geq 2,\ u > 0) \\ \rho u\,\phi_P & (Pe \leq -2,\ u < 0) \end{cases} \qquad (C3)$$

(iv) ES - the exact solution. According to Pe number, use (see Eq. (A7)):

$$Q = \rho u \left\{ \frac{\phi_W \, e^{Pe}}{e^{Pe}-1} - \phi_P \frac{e^{-Pe}}{1 - e^{-Pe}} \right\} \tag{C4}$$

We wish to determine which of the CDS, UDS or HS is generally the best to use as an approximation to ES, over a range of Pe numbers. Nondimensionalizing the fluxes via

$$\hat{Q} = Q \cdot \frac{\delta x}{\Gamma} \cdot \frac{1}{\phi_P - \phi_W} \tag{C5}$$

gives the following forms (using $Pe = \rho u \delta x / \Gamma$ when required):

(i) CDS
$$\hat{Q} = \tfrac{1}{2} \cdot Pe \cdot \frac{\phi_P + \phi_W}{\phi_P - \phi_W} - 1 \tag{C6}$$

(ii) UDS
$$\hat{Q} = \begin{cases} Pe \cdot \dfrac{\phi_W}{\phi_P - \phi_W} - 1 & (u > 0) \\ Pe \cdot \dfrac{\phi_P}{\phi_P - \phi_W} - 1 & (u < 0) \end{cases} \tag{C7}$$

(iii) HS
$$\hat{Q} = \begin{cases} \tfrac{1}{2} \cdot Pe \cdot \dfrac{\phi_P + \phi_W}{\phi_P - \phi_W} - 1 & (|Pe| < 2) \\ Pe \cdot \dfrac{\phi_W}{\phi_P - \phi_W} & (Pe \geq 2, \; u > 0) \\ Pe \cdot \dfrac{\phi_P}{\phi_P - \phi_W} & (Pe \leq 2, \; u < 0) \end{cases} \tag{C8}$$

(iv) ES
$$\hat{Q} = Pe \left\{ \frac{\phi_W \, e^{Pe}}{e^{Pe} - 1} - \frac{\phi_P \, e^{-Pe}}{1 - e^{-Pe}} \right\} \tag{C9}$$

It is useful to examine limiting cases of the ES, in a manner similar to that used in obtaining Eqs. (A8) - (A11). Now they are

$$\hat{Q} \to \begin{cases} -1 & (|PE| \to 0) \\ Pe \cdot \dfrac{\phi_W}{\phi_P - \phi_W} & (Pe \to +\infty) \\ Pe \cdot \dfrac{\phi_P}{\phi_P - \phi_W} & (Pe \to -\infty) \end{cases} \tag{C10}$$

In order to discriminate between the CDS, UDS and HS approaches to approximating the ES, we plot $\hat{Q}$ versus Pe. The plot depends, of course, on the values of ϕ_P and ϕ_W. To illustrate the point, and without loss of generality of the result, let us take $\phi_W = 0$ and $\phi_P = 1$. For this case the $\hat{Q}$ versus Pe relationships to plot are:

(i) CDS

$$\hat{Q} = \tfrac{1}{2} Pe - 1 \tag{C11}$$

(ii) UDS

$$\hat{Q} = \begin{cases} -1 & (u > 0) \\ Pe - 1 & (u < 0) \end{cases} \tag{C12}$$

(iii) HS

$$\hat{Q} = \begin{cases} \tfrac{1}{2} Pe - 1 & (|Pe| < 0) \\ 0 & (Pe \geq 2,\ u > 0) \\ Pe & (Pe \leq -2, u < 0) \end{cases} \tag{C13}$$

(iv) ES

$$\hat{Q} = -Pe \cdot \frac{e^{-Pe}}{1 - e^{-Pe}} \tag{C14}$$

The three limiting cases of the ES are also

$$\hat{Q} \rightarrow \begin{cases} -1 & (|Pe| \rightarrow 0) \\ 0 & (Pe \rightarrow +\infty) \\ -Pe & (Pe \rightarrow -\infty) \end{cases} \qquad (C15)$$

In Fig. 13 are plotted four lines labelled CDS, UDS, HS and ES, each of which represents $\hat{Q}$ as a function of Pe. That marked ES represents the exact solution and its three limiting cases are clearly seen. When $|Pe|$ is small, ES tends to -1; this is the value appropriate to $\hat{Q}$ because of diffusion alone. When Pe is very large and positive, $\hat{Q}$ tends to 0; when Pe is very large in magnitude, but negative, $\hat{Q}$ tends to be equal to -Pe. With the CDS approach, $\hat{Q}$ tends to $\frac{1}{2}Pe$ instead of zero when Pe is large and positive, and at the other extreme it tends to $\frac{1}{2}Pe$ instead of Pe. These disagreements are quite severe. And, of course, the finite difference equation coefficients obtained with the CDS approach when $|Pe| > 2$ are such as to encourage divergence during an iterative solution procedure. The UDS approach of the other hand, has errors which are larger than the CDS approach for moderate values of Pe, but when $|Pe|$ is large the UDS solution is more exact than the CDS one.

The HS approach combines the advantages of the CDS and UDS ideas and its corresponding straight lines are marked on the figure. Evidently this prescription is somewhat more accurate, overall, than either of its associated predecessors. It clearly tends to the asymptotes of 0 and -Pe, as Pe tends to $+\infty$ and $-\infty$ respectively (making it superior to the UDS for large values of $|Pe|$), and is equivalent to the CDS approach where the latter may be usefully employed when $|Pe| < 2$. The HS approach also happens to keep the finite difference coefficients within bounds which

ensure convergence of the iterative scheme for solving the resulting set of algebraic equations. Hence the recommendation and current use of the hybrid differencing scheme as given by Eq. (A13), and quoted earlier as Eq. (10).

APPENDIX D FORTRAN SYMBOL LIST

A(J)	=	Coefficient of recurrence relation
AE(I,J)	=	Coefficient of combined convective/diffusive flux through east-wall of control volume
AL1	=	X-coordinate of inlet boundary of flow domain
AL2	=	X-coordinate of outlet boundary of flow domain
ALAMDA	=	Length scale factor at inlet of flow domain
ALPHA	=	Inlet sloping wall expansion angle
ALTOT	=	Total length of pipe of larger diameter
AN(I,J)	=	Coefficient of combined convective/diffusive flux through north-wall of control volume
AP(I,J)	=	Sum of coefficients of combined convective/diffusive fluxes through all four walls of control volume
AREAEW	=	Area of east/west wall of control volume
AREAN	=	Area of north-wall of control volume
AREAS	=	Area of south-wall of control volume
ARDEN	=	Area of east/west cell-wall times density of fluid
ARDENT	=	Sum of all east/wall ARDEN at a cross-section
AS(I,J)	=	Coefficient of combined convective/diffusive flux through south-wall of control volume
AW(I,J)	=	Coefficient of combined convective/diffusive flux through west-wall of control volume
B(J)	=	Coefficient of recurrence formulae
C(J)	=	Coefficient of recurrence relation
C1	=	Constant of turbulence model (=1.44)
C2	=	Constant of turbulence model (=1.92)
CAPPA	=	Von Karman constant (=0.4187)

CD	=	Constant of turbulence model (=1.0)
CDTERM	=	CMU * * 0.25
CE	=	Coefficient of convective flux through east-wall of control volume
CMU	=	Constant of turbulence model (=0.09)
CN	=	Coefficient of convective flux through north-wall of control volume
CP	=	Maximum of zero and net outflow (SMP) from control volume
CPO	=	CP
CS	=	Coefficient of convective flux through south-wall of control volume
CW	=	Coefficient of convective flux through west-wall of control volume
D(J)	=	Coefficient of recurrence formulae
DE	=	Coefficient of diffusive flux through east-wall of control volume
DEN(I,J)	=	Density of fluid
DENSIT	=	Density of fluid at inlet of the calculation domain
DITERM	=	Coefficient of volume integral of energy dissipation rate in vicinity of walls
DN	=	Coefficient of diffusive flux through north-wall of control volume
DS	=	Coefficient of diffusive flux through south-wall of control volume
DU(I,K)	=	Coefficient of velocity-correction term for U velocity
DUDXE	=	$\partial u/\partial x$ at eastern face of U-cell
DUDXW	=	$\partial u/\partial x$ at western face of U-cell
DUDX	=	$\partial u/\partial x$ at main grid node (I,J)

DUDY = $\partial u/\partial y$ at main grid node (I,J)

DUDYE = $\partial u/\partial y$ at mid-point of east wall of V-cell

DUDYW = $\partial u/\partial y$ at mid-point of west wall of V-cell

DVDX = $\partial v/\partial x$ at main grid node (I,J)

DVDXN = $\partial v/\partial x$ at mid-point of north wall of U-cell

DVDXS = $\partial v/\partial x$ at mid-point of south wall of U-cell

DVDY = $\partial v/\partial y$ at main grid node (I,J)

DVDYN = $\partial v/\partial y$ at mid-point of north wall of V-cell

DVDYS = $\partial v/\partial y$ at mid-point of south wall of V-cell

DW = Coefficient of diffusive flux through west wall of control volume

DWDX = $\partial W/\partial x$ at main grid node (I,J)

DWDY = $\partial W/\partial y$ at main grid node (I,J)

DXEP(I) = X(I+1)-X(I)

DXEPU(I) = XU(I+1)-XU(I)

DXPW(I) = X(I)-X(I-1)

DYNP(J) = Y(J+1)-Y(J)

DYNPV(J) = YV(J+1)-YV(J)

DYPS(J) = Y(J)-Y(J-1)

DYPSV(J) = YV(J)-YV(J-1)

ED(I,J) = Energy dissipation rate, ε

EDIN = Energy dissipation rate at inlet of flow domain (ε_{in})

ELOG = Constant of P-function for heat transfer at walls (=9.793)

EPSX = Grid expansion factor in axial direction

FACTOR = Area ratio for setting initial u-velocity field

FLOW = Mass flow rate at a cross-section based on calculated velocity

FLOWIN = Total mass flow rate entering pipes

GE = Mass flux through east-wall of cell

GEN(I,J) = Generation of turbulence by shear from mean flow

GENCOU = Part of generation term modified in terms of wall shear stress

GENRES = Total unmodified generation of turbulence (GEN(I,J) less $\mu_t(\partial v/\partial x)^2$.

GN = Mass flux through north-wall of cell

GNW = Mass flux through north-wall of u-cell

GP = Mass flux at location of velocity

GREAT = A very large value (10^{30})

GS = Mass flux through south-wall of cell

GSW = Mass flux through south-wall of u-cell

HEDA = Heading 'KPLUS = TE * RHO/TAUN'

HEDB = Heading 'LENGTH SCALE/PIPE RADIUS'

HEDD = Heading 'ENERGY DISSIPATION'

HEDDK = Heading 'DIMENSIONLESS TURBULENCE ENERGY'

HEDDP = Heading 'DIMENSIONLESS PRESSURE'

HEDDSL = Heading 'DIMENSIONLESS STREAMLINE COORDS'

HEDDU = Heading 'DIMENSIONLESS U VELOCITY'

HEDDV = Heading 'DIMENSIONLESS V VELOCITY'

HEDDVS = Heading 'DIMENSIONLESS EFF. VISCOSITY'

HEDDW = Heading 'DIMENSIONLESS W VELOCITY'

HEDK = Heading 'TURBULENCE ENERGY'

HEDM = Heading 'VISCOSITY'

HEDP = Heading 'PRESSURE'

HEDSF = Heading 'DIMENSIONLESS STREAM FUNCTION'

HEDSL = Heading 'RADIAL COORDINATE OF STREAMLINES'

HEDT = Heading 'TEMPERATURE'

HEDU	=	Heading 'U VELOCITY'
HEDV	=	Heading 'V VELOCITY'
I	=	Index for dependent variables, and co-ordinates
IFINE	=	Logical parameter for fine x-direction grid spacing
IMON	=	I-index of monitoring location
INCALA	=	Additional (unused) logical parameter for selection of dependent variables
INCALB	=	Additional (unused) logical parameter for selection of dependent variables
INCALD	=	Logical parameter for solution of ε-equation
INCALK	=	Logical parameter for solution of k-equation
INCALM	=	Additional (unused) logical parameter for selection of dependent variables
INCALP	=	Logical parameter for solution of P'-equation
INCALS	=	Logical parameter for calculation of stream function
INCALU	=	Logical parameter for solution of U-equation
INCALV	=	Logical parameter for solution of V-equation
INCALW	=	Logical parameter for solution of W-equation
INDCOS	=	Control index for definition of co-ordinate system (= 1 for plane flows; = 2 for axisymmetric flows)
INITAL	=	Logical parameter to print initial field estimates
INPLOT	=	Logical parameter to produce line printer streamline plots
IREAD	=	Logical parameter to read initial field values from allocated disk storage
IWRITE	=	Logical parameter to write solution field values to allocated disk storage
INPRO	=	Logical parameter for updating of fluid properties
IPREF	=	I-index of location where pressure is fixed

IPRINT = If equal to NITER, activates printing of residual sums and monitor values of field variables

ISTEP = I-index of entrance plane, within calculation domain

ISTM1 = ISTEP-1

ISTP1 = ISTEP+1

IT = I-index of maximum dimension of dependent variables

J = Index for dependent variables, and co-ordinate

JMAX(I) = Maximum value of j-index within flow domain

JMON = J-index of monitoring location

JPREF = J-index of location where pressure is fixed

JPRINT = If equal to NITER, activates printing of field variable values

JSTEP = J-index of horizontal plane next to wall of, and within, smaller pipe

JSTM1 = JSTEP-1

JSTP1 = JSTEP+1

JT = J-index of maximum dimension of dependent variables

LFS = Index for counting loops for swirl

LFSMAX = Number of swirl loops to be run

MAXIT = Maximum number of iterations to be completed if iteration sequence is not stopped by test on value of SORCE

NI = Maximum value of I-index

NIM1 = NI-1

NITER = Number of iterations completed

NJ = Maximum value of J-index

NJM1 = NJ-1

NJM2 = NJ-2

NONDIM - Activates the calculation and printing of dimensionless solution when specified as true

NSBR = Zero value specifies flat W profile; the value one specifies solid body rotation

NSTLN = Number of streamlines calculated

NSWPD = Number of application of line iteration for ε-equation

NSWPK = Number of application of line iteration for k-equation

NSWPP = Number of application of line iteration for P'-equation

NSWPU = Number of application of line iteration for U-equation

NSWPW = Number of application of line iteration for W-equation

P(I,J) = Pressure, P

PHI(I,J) = General representation for all dependent variables, ϕ

PP(I,J) = Pressure-correction, P'

PRANDT = Turbulent Prandtl number

PRED = Constant of turbulence model in ε-equation, σ_ε

PRTE = Constant of turbulence model in k-equation, σ_ε

PSTAR(I,J)= Dimensionless pressure

R(J) = Radius of main grid node (I,J) from symmetry axis

RCV(J) = Radius of C- and U-cell center

RESOR = Residual source for individual control volume

RESORE = Sum of residual sources within calculation domain for ε-equation

RSORK = Sum of residual sources within calculation domain for k-equation

RESORM = Sum of mass sources within calculation domain

RESORU = Sum of residual sources within calculation domain for U-equation

RESORV = Sum of residual sources within calculation domain for V-equation

RESORW = Sum of residual sources within calculation domain

RLARGE = Radius of large pipe

RSDRL = RSMALL/RLARGE

RSMALL = Radius of small pipe

RV(J) = Radius of location of V(I,J) from symmetry axis

SEW(I) = 0.5*(DXEP(I) + DXPW(I))

SEWU(I) = 0.5*(DXEPU(I) + DXPWU(I))

SMP = Net outflow from control volume

SNS(J) = 0.5*(DYNP(J) + DYPS(J))

SNSV(J) = 0.5*(DYNPV(J) + DYPSV(J))

SORCE = Maximum of RESORM, RESORU, RESORV, RESORW, RESORK

SORMAX = Maximum acceptable value of SORCE for converged solution

SORVOL = GREAT * VOL

SP(I,J) = Coefficient of linearized source treatment

SPKD(I,J) = -CP, for k- and ε-equations

SSC = Shear-stress coefficient

STFN(I,J) = Dimensionless stream function

STVAL(K) = Stream function value of streamlines

SU(I,J) = Coefficient of linearized source treatment

SUKD(I,J) = CPO * TE(I,J), for k-equation

= CPO * ED(I,J), for ε-equation

SWNB(LFS) = Inlet swirl number speciacation of WINST

SWRLNO = Calculated inlet swirl number

TAUN(I) = Shear stress at north wall-boundary of flow domain

TAURX = North wall shear stress, x-component

TAURW = North wall shear stress, θ-component

TAUW(J) = Shear stress at west wall-boundary of flow domain

TAUXR = West wall shear stress, r-component

TAUXW = West wall shear stress, θ-component

TE(I,J) = Turbulence energy, k

TESTAR(I,J)	=	Dimensionless turbulence energy
TEIN	=	Turbulence energy at inlet of flow domain (k_{in})
TMULT	=	Coefficient of wall shear-stress expression
TURBIN	=	Turbulence intensity factor at inlet of flow domain
U(I,J)	=	Component of mean velocity in axial direction (u-velocity)
UEFF	=	SQRT[U(I,J)**2 + W(I,J)**2]
UIN	=	U-velocity at inlet of flow domain
UINC	=	Uniform increment of u-velocity at outlet of flow domain
ULARGE	=	UIN * (RSMALL/RLARGE)**2
UMEAN	=	Mean u-velocity at inlet
URFE	=	Under-relaxation factor for energy dissipation
URFK	=	Under-relaxation factor for turbulence energy
URFP	=	Under-relaxation factor for pressure-correction
URFU	=	Under-relaxation factor for u-velocity
URFV	=	Under-relaxation factor for v-velocity
URFVIS	=	Under-relaxation factor for viscosity
URFW	=	Under-relaxation factor for w-velocity
USTAR(I,J)	=	Dimensionless u-velocity
V(I,J)	=	Component of mean velocity in radial direction (v-velocity)
VANB(LFS)	=	Swirl vane angle
VAVG	=	Average v-velocity between nodes (I,J) and (I,J+1)
VDR	=	V(I,J)/RV(J)
VIS(I,J)	=	Effective viscosity
VISCOS	=	Laminar viscosity
VISE	=	Effective viscosity at mid-point of east-wall of cell

VISOLD = Value of effective viscosity before underrelaxation

VISN = Effective viscosity at mid-point of north-wall of cell

VISS = Effective viscosity at mid-point of south-wall of cell

VISTAR(I,J)= Dimensionless effective viscosity

VISW = Effective viscosity at mid-point of west-wall of cell

VOL = Volume of cell or control-volume

VSTAR(I,J)= Dimensionless v-velocity

W(I,J) = w-velocity

WIN = Inlet w-velocity from swirl vanes

WINST = Inlet w-velocity at JSTEP from solid body rotation swirl generator

WMONIN = Inlet swirl momentum

WSTAR(I,J)= Dimensionless w-velocity

X(I) = Distance from inlet plane in axial direction

XMONIN = Momentum of fluid at inlet of flow domain

XND(I) = Dimensionless X(I)

XPLUSW(I) = Local Reynolds number based on friction velocity and distance from west wall-boundary of flow domain

XU(I) = X-coordinate of storage location of U(I,J)

XUDPLT(I) = Dimensionless XU(I) required for line printer streamline plots

Y(J) = Distance from symmetry axis in radial direction

YND(J) = Dimensionless Y(J)

YPLUSN(J) = Local Reynolds number based on friction velocity and distance from north wall-boundary of flow domain

YSLOPE = Height of first stairstep along sloping wall

YSLPLT(N,I)= Dimensionless YSTLN(I,K) required for line printer streamline plots

YSTLN(I,K) = Radial coordinate of points representing streamlines

YSTLND(I,K) = Dimensionless YSTLN(I,K)

YV(J) = Y-coordinate of storage location of V(I,J)

YUND(J) = Dimensionless YV(J)

APPENDIX E COMPUTER PROGRAM LISTING

The computer program listing obtained for the sample computation described in Section 4.3 is now given.

```
C     SUBROUTINE CONTRO                                                          0000100
C                                                                                0000200
CA*****************************************************************************0000300
C                                                                                0000400
C                                                                                0000500
C     A COMPUTER PROGRAM FOR TURBULENT, SWIRLING, RECIRCULATING,                 0000600
C     FLOW IN COMBUSTOR GEOMETRIES                                               0000700
C                                                                                0000800
C     VERSION OF APRIL, 1981                                                     0000900
C                                                                                0001000
C     D L RHODE & D G LILLEY                                                     0001100
C     MECHANICAL AND AEROSPACE ENGINEERING                                       0001200
C     OKLAHOMA STATE UNIVERSITY                                                  0001300
C     STILLWATER, OK     74078                                                   0001400
C                                                                                0001500
C                                                                                0001600
CA*****************************************************************************0001700
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0          0001800
C                                                                                0001900
      DIMENSION HEDU(9), HEDV(9), HEDW(9), HEDP(9), HEDT(9), HEDK(9),            0002000
     *HEDD(9), HEDM(9), HEDL(9), VANB(7),SWNB(7),HEDSF(9),HEDSL(9),              0002100
     #HEDDU(9),HEDDV(9),HEDDW(9),                                                0002200
     #HEDDP(9),HEDDK(9),HEDDSL(9),HEDDVS(9)                                      0002300
      DIMENSION YAXES(10),SYMB L(10)                                             0002400
      COMMON                                                                     0002500
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)                       0002600
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                       0002700
     */WVEL/ RESORW, NSWPW, URFW                                                 0002800
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                    0002900
     1/TEN/RESORK,NSWPK,URFK                                                     0003000
     1/TDIS/RESORE,NSWPD,URFE                                                    0003100
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),         0003200
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),                 0003300
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)         0003400
     #,VISTAR(48,24)                                                             0003500
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                       0003600
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),              0003700
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                         0003800
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),                0003900
     #YND(24),YVND(24)                                                          0004000
      COMMON                                                                     0004100
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                   0004200
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                      0004300
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1           0004400
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                         0004500
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                             0004600
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),         0004700
     1       SP(48,24)                                                           0004800
     1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT                   0004900
      LOGICAL INCALU,INCALV,INCALW,INCALP,INPRO,INCALK,INCALD,INCALM,            0005000
     *INCALA,INCALB,INCALS,INPLOT,IWRITE,NONDIM,IREAD,INLET,                     0005100
     *INITAL,IFINE                                                               0005200
C---------ALL PRIMARY USER INPUTS ARE LOCATED HERE                               0005300
      DATA VANB /0.,45.,55.,60.,65.,68.,70./                                     0005400
     #,SWNB/0.,.5,1.0,1.25,1.50,1.75,2.0/                                        0005500
      DATA  XAXIS /3HXI /                                                        0005600
      DATA YAXES /3H 00,3H 02,3H 04,3H 06,3H 08,3H 10,                           0005700
     #3H 06,3H 07,3H 08,3H 09/                                                   0005800
      DATA SYMB L /1H0,1H2,1H4,1H6,1H8,1H1,1H6,1H7,1H8,1H9/                      0005900
C---------DELETE UNDERFLOW ERROR MESSAGES, CALL TRAPS WHEN USING WATFIV           0006000
```

```
C---------CALL TRAPS(1,1,4000)                                          0006100
      CALL ERRSET(208,256,-1,1,0,0)                                     0006200
C---------SET INPLOT=.TRUE. ONLY FOR STREAMLINE LINE-PRINTER PLOT        0006300
      INPLOT=.TRUE.                                                     0006400
C---------SET IWRITE=.TRUE. ONLY FOR WRITING SOLN. ON DATA FILES         0006500
      IWRITE=.FALSE.                                                    0006600
C---------SET NONDIM=.TRUE. ONLY FOR PRINTING DIMENSIONLESS SOLN.       0006700
      NONDIM=.TRUE.                                                     0006800
C---------SET IREAD=.TRUE. ONLY FOR READING INITIAL GUESS OF SOLN.      0006900
C---------     FROM DATA FILES                                          0007000
      IREAD=.FALSE.                                                     0007100
C---------SET INITAL=.TRUE. ONLY FOR PRINTING INITIAL GUESS OF SOLN.    0007200
      INITAL=.TRUE.                                                     0007300
C---------SET IFINE=.TRUE. ONLY FOR FINE GRID IN X-DIRECTION            0007400
      IFINE=.FALSE.                                                     0007500
      IF(.NOT. IREAD) GO TO 150                                         0007600
      READ(12) X                                                        0007700
      READ(12) Y                                                        0007800
  150 CONTINUE                                                          0007900
      NSTLN=11                                                          0008000
      NPLTLN=6                                                          0008100
      MAXLN=10                                                          0008200
      NITER=0                                                           0008300
      JPRINT=NITER+300                                                  0008400
      IPRINT=NITER+1                                                    0008500
      LFS=1                                                             0008600
      LFSMAX=7                                                          0008700
      NSBR=0                                                            0008800
      MAXIT=NITER+200                                                   0008900
C---------SEE STATEMENT 304 FOR MAXIT SPEC. FOR FURTHER SWIRL CASES     0009000
      DENSIT=1.211                                                      0009100
      IT=48                                                             0009200
      JT=24                                                             0009300
      GREAT=1.E30                                                       0009400
      NSWPU=4                                                           0009500
      NSWPV=3                                                           0009600
      NSWPW=3                                                           0009700
      NSWPP=5                                                           0009800
      NSWPK=3                                                           0009900
      NSWPD=3                                                           0010000
      READ(5,10) HEDU,HEDV,HEDW,HEDP,HEDT,HEDK,HEDD,HEDM,HEDL,          0010100
     $HEDSF,HEDSL,HEDDU,HEDDV,HEDDW,HEDDP,HEDDK,HEDDSL,HEDDVS           0010200
  010 FORMAT(9A4)                                                       0010300
C                                                                       0010400
CHAPTER  1  1  1  1  1  PARAMETERS AND CONTROL INDICES  1  1  1  1  1  1 0010500
C                                                                       0010600
C---------GRID                                                          0010700
      ISTEP=2                                                           0010800
      JSTEP=8                                                           0010900
      INDCOS=2                                                          0011000
      NJ=21                                                             0011100
      NJM1=NJ-1                                                         0011200
      ISTP1=ISTEP+1                                                     0011300
      ISTM1=ISTEP-1                                                     0011400
      JSTP1=JSTEP+1                                                     0011500
      JSTM1=JSTEP-1                                                     0011600
      RLARGE=.0625                                                      0011700
      ALTOT=.375                                                        0011800
      IF(IFINE) GO TO 120                                               0011900
C---------COARSE MESH GRID LINES IN X-DIRECTION                         0012000
```

```
      NI=20                                                              0012100
      NIM1=NI-1                                                          0012200
      EPSX=1.11                                                          0012300
      IF(EPSX-1.)  13,12,13                                              0012400
13    SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5              0012500
      GO TO 15                                                           0012600
12    CONTINUE                                                           0012700
      SUMX=NIM1-1                                                        0012800
15    DX=ALTOT/SUMX                                                      0012900
      X(1)=-.5*DX                                                        0013000
      X(2)=-X(1)                                                         0013100
      DO  100  I=3,NIM1                                                  0013200
      X(I)=X(I-1)+DX                                                     0013300
  100 DX=EPSX*DX                                                         0013400
      X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))                                    0013500
      X(21)=X(20)+(X(20)-X(19))                                          0013600
      X(22)=X(21)+(X(20)-X(19))                                          0013700
      X(23)=X(22)+(X(20)-X(19))                                          0013800
      NI=23                                                              0013900
      NIM1=NI-1                                                          0014000
      ALTOT=(X(22)+X(23))/2.                                             0014100
      AL1=0.5*(X(ISTEP)+X(ISTM1))                                        0014200
      AL2=ALTOT-AL1                                                      0014300
C---------FINE MESH GRID LINES IN X-DIRECTION                           0014400
      IF(.NOT. IFINE) GO TO 130                                          0014500
  120 NI=30                                                              0014600
      NIM1=NI-1                                                          0014700
      EPSX=1.102                                                         0014800
      IF(EPSX-1.)  17,16,17                                              0014900
17    SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5              0015000
      GO TO 18                                                           0015100
16    CONTINUE                                                           0015200
      SUMX=NIM1-1                                                        0015300
18    DX=ALTOT/SUMX                                                      0015400
      X(1)=-.5*DX                                                        0015500
      X(2)=-X(1)                                                         0015600
      DO  170  I=3,NIM1                                                  0015700
      X(I)=X(I-1)+DX                                                     0015800
  170 DX=EPSX*DX                                                         0015900
      X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))                                    0016000
      DO 180 L=31,35                                                     0016100
  180 X(L)=X(L-1)+(X(NI)-X(NIM1))                                        0016200
      NI=35                                                              0016300
      NIM1=NI-1                                                          0016400
      ALTOT=(X(NIM1)+X(NI))/2.                                           0016500
      AL1=0.5*(X(ISTEP)+X(ISTM1))                                        0016600
      AL2=ALTOT-AL1                                                      0016700
C---------SPECIFY RADIAL HEIGHT(NO. OF J-CELLS) OF COMBUSTOR             0016800
C---------     WALL FOR EACH I GRID LINE                                 0016900
  130 CONTINUE                                                           0017000
      JMAX(1)=JSTEP                                                      0017100
      JMAXP1(1)=JMAX(1)+1                                                0017200
      DO 160 I=2,NI                                                      0017300
      JMAX(I)=JMAX(I-1)+3                                                0017400
      IF(JMAX(I-1) .EQ. NJM1) JMAX(I)=JMAX(I-1)                          0017500
  160 JMAXP1(I)=JMAX(I)+1                                                0017600
C---------GRID LINES IN Y-DIRECTION                                     0017700
      Y(1)=-1.5625E-3                                                    0017800
      Y(2)=1.5625E-3                                                     0017900
      Y(3)=5.625E-3                                                      0018000
```

```
      Y(4)=1.0625E-2                                                    0018100
      Y(5)=1.625E-2                                                     0018200
      Y(6)=2.1875E-2                                                    0018300
      Y(7)=2.6875E-2                                                    0018400
      Y(8)=3.03125E-2                                                   0018500
      Y(9)=3.21875E-2                                                   0018600
      Y(10)=3.4375E-2                                                   0018700
      Y(11)=3.71875E-2                                                  0018800
      Y(12)=4.09375E-2                                                  0018900
      Y(13)=4.328125E-2                                                 0019000
      Y(14)=4.5625E-2                                                   0019100
      Y(15)=4.8125E-2                                                   0019200
      Y(16)=5.078125E-2                                                 0019300
      Y(17)=5.34375E-2                                                  0019400
      Y(18)=5.59375E-2                                                  0019500
      Y(19)=5.9375E-2                                                   0019600
      Y(20)=6.1875E-2                                                   0019700
      Y(21)=6.3125E-2                                                   0019800
      RSMALL=0.5*(Y(JSTEP)+Y(JSTP1))                                    0019900
C---------DEPENDENT VARIABLE SELECTION                                  0020000
      INCALU=.TRUE.                                                     0020100
      INCALV=.TRUE.                                                     0020200
      INCALW=.TRUE.                                                     0020300
      INCALP=.TRUE.                                                     0020400
      INCALK=.TRUE.                                                     0020500
      INCALD=.TRUE.                                                     0020600
      INPRO=.TRUE.                                                      0020700
      INCALS=.TRUE.                                                     0020800
C---------FLUID PROPERTIES                                              0020900
C---------TURBULENCE CONSTANTS                                          0021000
      CMU=0.09                                                          0021100
      CD=1.00                                                           0021200
      C1=1.44                                                           0021300
      C2=1.92                                                           0021400
      CAPPA=.4187                                                       0021500
      ELOG=9.793                                                        0021600
      PRED=CAPPA*CAPPA/(C2-C1)/(CMU**.5)                                0021700
      PRTE=1.0                                                          0021800
C---------BOUNDARY VALUES                                               0021900
      UIN=30.                                                           0022000
      ULARGE=UIN*(RSMALL/RLARGE)**2                                     0022100
      TURBIN=.03                                                        0022200
      TEIN=TURBIN*UIN**2                                                0022300
      ALAMDA=0.005                                                      0022400
      EDIN=TEIN**1.5/(ALAMDA*RLARGE)                                    0022500
      VISCOS=1.8E-5                                                     0022600
C---------PRESSURE CALCULATION                                          0022700
      IPREF=2                                                           0022800
      JPREF=2                                                           0022900
C---------PROGRAM CONTROL AND MONITOR                                   0023000
      IMON=NIM1                                                         0023100
      JMON=8                                                            0023200
      SORMAX=.004                                                       0023300
C                                                                       0023400
CHAPTER  2  2  2  2  2  2  INITIAL OPERATIONS  2  2  2  2  2  2  2  2  2 0023500
      CALL INIT                                                         0023600
C---------NONDIMENSIONALIZE X & Y VARIABLES FOR NONDIMENSIONAL OUTPUT    0023700
      DO 50 I=1,NI                                                      0023800
      XND(I)=X(I)/(2.*RLARGE)                                           0023900
   50 XUND(I)=XU(I)/(2.*RLARGE)                                         0024000
```

```
      DO 60 J=1,NJ                                                      0024100
      YND(J)=Y(J)/(2.*RLARGE)                                           0024200
   60 YVND(J)=YV(J)/(2.*RLARGE)                                         0024300
C---------INITIALISE VARIABLE FIELDS                                    0024400
      FLOWIN=0.0                                                        0024500
      ARDEN=0.0                                                         0024600
      ARDENT=0.                                                         0024700
      XMONIN=0.                                                         0024800
      WMONIN=0.0                                                        0024900
      ANGMOM=0.                                                         0025000
C                                                                       0025100
C---------INLET SWIRL VELOCITY PROFILE                                  0025200
C                                                                       0025300
C---------W,  USE SOLID BODY ROTATION MODEL                             0025400
      WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN                             0025500
      DO 206 J=2,JSTEP                                                  0025600
  206 W(1,J)=WINST*R(J)/R(JSTEP)                                        0025700
C---------NSBR=0  -  FLAT SWIRL VELOCITY PROFILE FROM SWIRL VANES       0025800
C---------NSBR=1  -  SOLID BODY ROTATION FROM SWIRL GENERATOR           0025900
      IF(NSBR .EQ. 1) GO TO 208                                         0026000
C---------W, FLAT PROFILE                                               0026100
      WIN=UIN*TAN(VANB(LFS)*3.14159/180.)                               0026200
      DO 207 J=2,JSTEP                                                  0026300
  207 W(1,J)=WIN                                                        0026400
  208 CONTINUE                                                          0026500
C---------INITIALIZE U-,TE-,ED-, & W-FIELDS                             0026600
      DO  200  J=2,JSTEP                                                0026700
      U(2,J)=UIN                                                        0026800
      TE(1,J)=TEIN                                                      0026900
      ED(1,J)=EDIN                                                      0027000
      ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)                       0027100
      XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)                                 0027200
      WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)                                 0027300
      ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)                            0027400
      ARDENT=ARDENT+ARDEN                                               0027500
  200 FLOWIN=FLOWIN+ARDEN*U(2,J)                                        0027600
      UMEAN=FLOWIN/ARDENT                                               0027700
      SWRLNO=ANGMOM/(XMONIN*RSMALL)                                     0027800
      IF(W(1,JSTEP) .EQ. 0.) WMONIN=1.                                  0027900
      DO  202  I=2,NI                                                   0028000
      IJ=JMAXP1(I-1)                                                    0028100
      FACTOR=(YV(JSTP1)*RV(JSTP1))/(YV(IJ)*RV(IJ))                      0028200
      JJ=JMAX(I-1)                                                      0028300
      DO  202  J=2,JJ                                                   0028400
      U(I,J)=UIN*FACTOR                                                 0028500
202   CONTINUE                                                          0028600
C                                                                       0028700
      IF(NSBR .EQ. 0) GO TO 219                                         0028800
      DO 209 I=2,NI                                                     0028900
      JJ=JMAX(I)                                                        0029000
      DO 209 J=2,JJ                                                     0029100
      WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*U(I,2)                          0029200
      W(I,J)=WINST*R(J)/R(JJ)                                           0029300
      TE(I,J)=TEIN                                                      0029400
      ED(I,J)=EDIN                                                      0029500
  209 CONTINUE                                                          0029600
      GO TO 221                                                         0029700
C                                                                       0029800
219   CONTINUE                                                          0029900
      DO 220 I=2,NI                                                     0030000
```

```
      JJ=JMAX(I)                                                        0030100
      DO 220 J=2,JJ                                                     0030200
      TE(I,J)=TEIN                                                      0030300
      ED(I,J)=EDIN                                                      0030400
  220 CONTINUE                                                          0030500
C                                                                       0030600
  221 CONTINUE                                                          0030700
      DO  203  I=2,NIM1                                                 0030800
  203 YPLUSN(I)=11.0                                                    0030900
      DO  204  J=JSTEP,NJ                                               0031000
      XPLUSW(J)=11.0                                                    0031100
  204 IF(J.EQ.JSTEP) XPLUSW(J)= 0.0                                     0031200
      URFVIS=.7                                                         0031300
      CALL PROPS                                                        0031400
C---------INITIAL OUTPUT                                               0031500
      WRITE(6,211)                                                      0031600
      IK=JMAXP1(ISTEP)                                                  0031700
      YSLOPE=YV(IK)-YV(JSTP1)                                           0031800
      IF(JMAX(ISTEP) .LT. NJM1) ALPHA=ATAN(YSLOPE/SEWU(2))*180./3.14159 0031900
      IF((JSTEP .LT. NJM1) .AND. (JMAX(ISTEP) .EQ. NJM1)) ALPHA=90.     0032000
      WRITE(6,225) ALPHA                                                0032100
      WRITE(6,235) RSMALL                                               0032200
      WRITE(6,240) RLARGE                                               0032300
      WRITE(6,245) ALTOT                                                0032400
      RE=UIN*RSMALL*2.0*DENSIT/VISCOS                                   0032500
      WRITE(6,250) RE                                                   0032600
      WRITE(6,255) VISCOS                                               0032700
      RSDRL=RSMALL/RLARGE                                               0032800
      WRITE(6,260) DENSIT                                               0032900
  295 CONTINUE                                                          0033000
      IF(.NOT. IWRITE) GO TO 297                                        0033100
      WRITE(11) X                                                       0033200
      WRITE(11) Y                                                       0033300
      WRITE(14) XUND                                                    0033400
  297 CONTINUE                                                          0033500
      IF(.NOT. IREAD) GO TO 298                                         0033600
      READ(12) U                                                        0033700
      READ(12) V                                                        0033800
      READ(12) W                                                        0033900
      READ(12) P                                                        0034000
      READ(12) TE                                                       0034100
      READ(12) ED                                                       0034200
      READ(12) VIS                                                      0034300
      READ(12) STFN                                                     0034400
  298 CONTINUE                                                          0034500
      IF(.NOT. INITAL) GO TO 299                                        0034600
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                0034700
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                0034800
      IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, X, Y, W, HEDW)        0034900
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)                0035000
      IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                0035100
  299 CONTINUE                                                          0035200
      RESORU=.005                                                       0035300
      URFP=1.                                                           0035400
      RESORV=.005                                                       0035500
      RESORW=.005                                                       0035600
C                                                                       0035700
CHAPTER  3  3  3  3  3  3  3  ITERATION LOOP  3  3  3  3  3  3  3  3  3 0035800
C                                                                       0035900
      WRITE(6,310) IMON,JMON                                            0036000
```

```
  300 NITER=NITER+1                                                      0036100
      DO 330 I=2,NIM1                                                    0036200
      DO 330 J=2,NJM1                                                    0036300
  330 PP(I,J)=0.                                                         0036400
      IF(LFS .GE. 3) GO TO 425                                           0036500
      URFU=.5                                                            0036600
      URFV=.5                                                            0036700
      URFW=.6                                                            0036800
      URFK=.7                                                            0036900
      URFE=.7                                                            0037000
      URFVIS=.7                                                          0037100
      IF(LFS .LT. 3) GO TO 430                                           0037200
  425 CONTINUE                                                           0037300
C---------INCREASE UNDERRELAXATION FACTORS AS CONVERGENCE NEARS          0037400
      URFU=.15+(FLOAT(NITER))*((.35-.15)/40.)                            0037500
      IF(URFU .GT. .35) URFU=.35                                         0037600
      URFV=.20+(FLOAT(NITER))*((.25-.20)/40.)                            0037700
      IF(URFV .GT. .25) URFV=.25                                         0037800
      URFW=.50+(FLOAT(NITER))*((.60-.50)/40.)                            0037900
      IF(URFW .GT. .60) URFW=.60                                         0038000
      URFK=.70                                                           0038100
      URFE=.70                                                           0038200
      URFVIS=.70                                                         0038300
      IF((RESORV .LT. .08) .AND. (RESORU .LT. .10)) URFU=.40             0038400
      IF((RESORV .LT. .06) .AND. (RESORU .LT. .08)) URFU=.45             0038500
      IF((RESORK .LT. .10E-1) .AND. (RESORE .LT. .10E+10)) URFE=.75      0038600
      IF((RESORK .LT. .4E-2) .AND. (RESORE .LT. .5E+9)) URFE=.80         0038700
      IF(RESORU .LT. SORMAX) URFU=.20                                    0038800
      IF(RESORV .LT. SORMAX) URFV=.20                                    0038900
      IF(RESORW .LT. SORMAX) URFW=.25                                    0039000
      IF(RESORK .LT. .10E-2) URFK=.60                                    0039100
      IF(RESORE .LT. .10E+8) URFE=.55                                    0039200
  430 CONTINUE                                                           0039300
C---------UPDATE MAIN DEPENDENT VARIABLES                                0039400
      IF(INCALU) CALL CALCU                                              0039500
      IF(INCALV) CALL CALCV                                              0039600
      IF(INCALP) CALL CALCP                                              0039700
      IF(INCALW) CALL CALCW                                              0039800
      IF(INCALK) CALL CALCTE                                             0039900
      IF(INCALD) CALL CALCED                                             0040000
C---------UPDATE FLUID PROPERITIES                                       0040100
      IF(INPRO) CALL PROPS                                               0040200
C---------INTERMEDIATE OUTPUT                                            0040300
      RESORM=RESORM/FLOWIN                                               0040400
      RESORU=RESORU/XMONIN                                               0040500
      RESORV=RESORV/XMONIN                                               0040600
      RESORW=RESORW/WMONIN                                               0040700
      RESORK=RESORK/(.5*FLOWIN*UMEAN*UMEAN)                              0040800
      IF(NITER .NE. IPRINT) GO TO 301                                    0040900
      IPRINT=IPRINT+1                                                    0041000
      WRITE(6,311) NITER,RESORU,RESORV,RESORW,RESORM,RESORK,             0041100
     *RESORE,U(IMON,JMON),V(IMON,JMON),W(IMON,JMON),P(IMON,NJM1),        0041200
     *ED(IMON,NJM1)                                                      0041300
      IF(NITER .NE. JPRINT) GO TO 301                                    0041400
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                 0041500
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                 0041600
      IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)                  0041700
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)                  0041800
      IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                 0041900
      JPRINT=JPRINT+25                                                   0042000
```

```
      WRITE(6,310) IMON,JMON                                                    0042100
  301 CONTINUE                                                                  0042200
C---------TERMINATION TESTS                                                    0042300
      SORCE=AMAX1(RESORM,RESORU,RESORV,RESORW,RESORK)                           0042400
      IF(NITER.GE.MAXIT) GO TO 302                                              0042500
  303 IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) GO TO 302                         0042600
      IF(SORCE.GT.SORMAX .OR. NITER .LT. 20) GO TO 300                          0042700
  302 CONTINUE                                                                  0042800
      IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) WRITE(6,960)                      0042900
C                                                                               0043000
CHAPTER  4  4  4  4  4  4  FINAL OPERATIONS AND OUTPUT  4  4  4  4  4  4       0043100
C                                                                               0043200
  440 CONTINUE                                                                  0043300
C---------NONDIMENSIONALIZE PROBLEM SOLN.                                       0043400
      IF(.NOT. NONDIM) GO TO 700                                                0043500
      DO 600 I=1,NI                                                             0043600
      DO 600 J=1,NJ                                                             0043700
      USTAR(I,J)=U(I,J)/UIN                                                     0043800
      VSTAR(I,J)=V(I,J)/UIN                                                     0043900
      WSTAR(I,J)=W(I,J)/UIN                                                     0044000
      PSTAR(I,J)=P(I,J)/(DENSIT*(UIN**2)/2.)                                    0044100
      TESTAR(I,J)=TE(I,J)/(UIN*UIN)                                             0044200
      SP(I,J)=0.0                                                               0044300
      IF(ED(I,J) .GT. 1.E-15) SP(I,J)=TE(I,J)**1.5/ED(I,J)/RLARGE               0044400
      VISTAR(I,J)=VIS(I,J)/VISCOS                                               0044500
  600 CONTINUE                                                                  0044600
  700 CONTINUE                                                                  0044700
      IF(INCALS) CALL STRMFN                                                    0044800
      WRITE(6,312)                                                              0044900
      WRITE(6,410) LFS,NSBR,SWNB(LFS),VANB(LFS),SWRLNO,UMEAN,FLOWIN             0045000
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                        0045100
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                        0045200
      IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, X, Y, W, HEDW)                0045300
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)                         0045400
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,PP,HEDP)                        0045500
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)                        0045600
      IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                        0045700
      IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,STFN,HEDSF)                    0045800
      IF(INCALS) CALL PRINT(1,1,NI,NSTLN,IT,JT,XU,STVAL,YSTLN,HEDSL)            0045900
      IF(.NOT. NONDIM) GO TO 750                                                0046000
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,YND,USTAR,HEDDU)               0046100
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YVND,VSTAR,HEDDV)               0046200
      IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, XND, YND,WSTAR,HEDDW)         0046300
      IF(INCALS) CALL PRINT(1,1,NI,NSTLN,IT,JT,XUND,STVAL,YSTLND,HEDDSL)        0046400
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,PSTAR,HEDDP)                0046500
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,TESTAR,HEDDK)               0046600
      IF(INCALK) CALL PRINT(2,2,NI,NJ,IT,JT,X,Y,SP,HEDL)                        0046700
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,VISTAR,HEDDVS)              0046800
  750 CONTINUE                                                                  0046900
      IF(.NOT. IWRITE) GO TO 702                                                0047000
      WRITE(11) U                                                               0047100
      WRITE(11) V                                                               0047200
      WRITE(11) W                                                               0047300
      WRITE(11) P                                                               0047400
      WRITE(11) TE                                                              0047500
      WRITE(11) ED                                                              0047600
      WRITE(11) VIS                                                             0047700
      WRITE(11) STFN                                                            0047800
      WRITE(14) YSTLND                                                          0047900
  702 CONTINUE                                                                  0048000
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C---------CALCULATION OF SHEAR-STRESS COEFFICIENT ALONG LARGE DUCT WALL  0048100
      WRITE(6,402)                                                       0048200
      DO  401  I=2,NIM1                                                  0048300
      SSC=ABS(TAUN(I))/(.5*DENSIT*UIN*UIN)                               0048400
      WRITE(6,403) I,XND(I),SSC                                          0048500
  401 CONTINUE                                                           0048600
      WRITE(6,312)                                                       0048700
C---------PLOT DIMENSIONLESS STREAMLINES                                 0048800
      LARGE=0                                                            0048900
      IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,    0049000
     #MAXLN,NPLTLN,YAXES,SYMB L,LARGE)                                   0049100
      LARGE=1                                                            0049200
      IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,    0049300
     #MAXLN,NPLTLN,YAXES,SYMB L,LARGE)                                   0049400
C---------RESET INITIAL CONDITIONS FOR ANOTHER SWIRL CASE                0049500
      IF(LFS .GE. LFSMAX) GO TO 409                                      0049600
      LFS=LFS+1                                                          0049700
      NITER=0                                                            0049800
      JPRINT=NITER+300                                                   0049900
      IPRINT=NITER+1                                                     0050000
  304 IF(LFS .GE. 3) MAXIT=NITER+200                                     0050100
      IF(NSBR .EQ. 0) GO TO 405                                          0050200
      WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN                              0050300
      DO 406 J=2,JSTEP                                                   0050400
  406 W(1,J)=WINST*R(J)/R(JSTEP)                                         0050500
      GO TO 408                                                          0050600
  405 WIN=UIN*TAN(VANB(LFS)*3.14159/180.)                                0050700
      DO 407 J=2,JSTEP                                                   0050800
  407 W(1,J)=WIN                                                         0050900
  408 FLOWIN=0.                                                          0051000
      ARDEN=0.                                                           0051100
      ARDENT=0.                                                          0051200
      XMOMIN=0.                                                          0051300
      ANGMOM=0.                                                          0051400
      WMOMIN=0.                                                          0051500
C---------READ INITIAL GUESS OF NEXT SWIRL PROBLEM FROM                 0051600
C---------PREVIOUS SOLN. OF SIMILAR PROBLEM                              0051700
      IF(.NOT. IREAD) GO TO 445                                          0051800
      READ(12) U                                                         0051900
      READ(12) V                                                         0052000
      READ(12) W                                                         0052100
      READ(12) P                                                         0052200
      READ(12) TE                                                        0052300
      READ(12) ED                                                        0052400
      READ(12) VIS                                                       0052500
      READ(12) STFN                                                      0052600
  445 CONTINUE                                                           0052700
      DO  490  J=2,JSTEP                                                 0052800
      ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)                        0052900
      XMOMIN=XMOMIN+ARDEN*U(2,J)*U(2,J)                                  0053000
      WMOMIN=WMOMIN+ARDEN*U(2,J)*W(1,J)                                  0053100
      ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)                             0053200
      ARDENT=ARDENT+ARDEN                                                0053300
  490 FLOWIN=FLOWIN+ARDEN*U(2,J)                                         0053400
      UMEAN=FLOWIN/ARDENT                                                0053500
      SWRLNO=ANGMOM/(XMOMIN*RSMALL)                                      0053600
      IF(W(1,JSTEP) .EQ. 0.) WMOMIN=1.                                   0053700
      WRITE(6,310) IMON,JMON                                             0053800
      GO TO 300                                                          0053900
  409 CONTINUE                                                           0054000
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```
      STOP                                                                  0054100
C---------FORMAT STATEMENTS                                                 0054200
  211 FORMAT(1H1,T37,'AXISYMMETRIC,ISOTHERMAL, GT COMBUSTOR FLOWFIELD SI    0054300
     #MULATION',//,T35,'USING THE STAIRSTEP APPROXIMATION FOR THE SLOPIN    0054400
     #G EXPANSION WALL',//,T53,'AND THE K-E TURBULENCE MODEL')               0054500
  225 FORMAT(////,T40,'EXPANSION ANGLE(DEG.) =',T77,1PE13.3)                0054600
  230 FORMAT(//,T40,'NUMBER OF STAIRSTEPS =',T81,I1)                        0054700
  235 FORMAT (//,T40,'INLET RADIUS(M) =',T77,1PE13.3)                       0054800
  240 FORMAT(//,T40,'COMBUSTOR RADIUS(M) =',T77,1PE13.3)                    0054900
  245 FORMAT(//,T40,'COMBUSTOR LENGTH(M) =',T77,1PE13.3)                    0055000
  250 FORMAT(//,T40,'INLET REYNOLDS NO.(USING DIAM.) =',T77,1PE13.3)        0055100
  255 FORMAT(//,T40,'LAMINAR VISCOSITY(KG/M/SEC) =',T77,1PE13.3)            0055200
  260 FORMAT(//,T40,'DENSITY(KG/CU. M) =',T77,1PE13.3,////)                 0055300
  310 FORMAT(13H0ITER    I---,  9X,29HABSOLUTE RESIDUAL SOURCE SUMS,9X,     0055400
     111H---I   I---,37H FIELD VALUES AT MONITORING LOCATION(,I2,1H,,I2,    0055500
     *6H) ---I/14H  NO      UMON,7X,'VMON',7X,'WMON',7X,'MASS',7X,          0055600
     *'TKIN'                                                                0055700
     3,7X,4HDISP,9X,1HU,9X,1HV,10X,1HW,10X,1HP,10X,1HD/)                    0055800
  311 FORMAT (2X,I4,11E11.4)                                                0055900
  312 FORMAT (1H0,59(2H- ))                                                 0056000
  402 FORMAT(///9X,1HI,5X,3HX/D,5X,10HS.S.COEFF.)                           0056100
  403 FORMAT(/5X,I5,2(1PE11.3))                                             0056200
  410 FORMAT(//23H SWIRL CASE WITH LFS  =,I3/                               0056300
     1          23H              AND NSBR =,I3//                           0056400
     163H CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =    0056500
     1,F10.3//37H OR IF NSBR = 0 TO SWIRL VANE ANGLE =,F10.3//,             0056600
     11X,' COMPUTED INLET SWIRL NUMBER =',F10.4//,                          0056700
     11X,' COMPUTED INLET MEAN AXIAL VELOCITY =',F10.4//,                   0056800
     11X,' COMPUTED INLET MASS FLOW RATE =',F10.5////)                      0056900
  950 FORMAT(10X,6F10.5,/,10X,6F10.5,/,10X,4F10.5)                          0057000
  960 FORMAT(15X,'  THE SOLN. IS NOT CONVERGING')                           0057100
      END                                                                   0057200
C                                                                           0057300
C-------------------------------------------------------------------        0057400
C                                                                           0057500
      SUBROUTINE INIT                                                       0057600
CA*************************************************************************0057700
C                                                                           0057800
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0      0057900
C                                                                           0058000
      COMMON                                                                0058100
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)                  0058200
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                  0058300
     */WVEL/ RESORW, NSWPW, URFW                                            0058400
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF               0058500
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),    0058600
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),            0058700
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)    0058800
     #,VISTAR(48,24)                                                        0058900
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                  0059000
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),         0059100
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                    0059200
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),           0059300
     #YND(24),YVND(24)                                                      0059400
      COMMON                                                                0059500
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)              0059600
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                 0059700
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1      0059800
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                    0059900
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                        0060000
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     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),  0060100
     1       SP(48,24)                                                    0060200
     1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT            0060300
C                                                                         0060400
CHAPTER  1  1  1  1  1  CALCULATE GEOMETRICAL QUANTITIES  1  1  1  1  1   0060500
C                                                                         0060600
      DO 100 J=1,NJ                                                       0060700
      R(J)=Y(J)                                                           0060800
  100 IF(INDCOS.EQ.1)R(J)=1.0                                             0060900
      DXPW(1)=0.0                                                         0061000
      DXEP(NI)=0.0                                                        0061100
      DO 101 I=1,NIM1                                                     0061200
      DXEP(I)=X(I+1)-X(I)                                                 0061300
  101 DXPW(I+1)=DXEP(I)                                                   0061400
      DYPS(1)=0.0                                                         0061500
      DYNP(NJ)=0.0                                                        0061600
      DO 102 J=1,NJM1                                                     0061700
      DYNP(J)=Y(J+1)-Y(J)                                                 0061800
  102 DYPS(J+1)=DYNP(J)                                                   0061900
      SEW(1)=0.0                                                          0062000
      SEW(NI)=0.0                                                         0062100
      DO 103 I=2,NIM1                                                     0062200
  103 SEW(I)=0.5*(DXEP(I)+DXPW(I))                                        0062300
      SNS(1)=0.0                                                          0062400
      SNS(NJ)=0.0                                                         0062500
      DO 104 J=2,NJM1                                                     0062600
  104 SNS(J)=0.5*(DYNP(J)+DYPS(J))                                        0062700
      XU(1)=0.0                                                           0062800
      DO 105 I=2,NI                                                       0062900
  105 XU(I)=0.5*(X(I)+X(I-1))                                             0063000
      DXPWU(1)=0.0                                                        0063100
      DXPWU(2)=0.0                                                        0063200
      DXEPU(1)=0.0                                                        0063300
      DXEPU(NI)=0.0                                                       0063400
      DO 106 I=2,NIM1                                                     0063500
      DXEPU(I)=XU(I+1)-XU(I)                                              0063600
  106 DXPWU(I+1)=DXEPU(I)                                                 0063700
      SEWU(1)=0.0                                                         0063800
      DO 107 I=2,NI                                                       0063900
  107 SEWU(I)=X(I)-X(I-1)                                                 0064000
C---------U-VELOCITIES WEIGHTING FACTORS                                  0064100
      DO 111  I=2,NIM1                                                    0064200
      WFE(I)=SEWU(I+1)/(SEWU(I+1)+SEWU(I))                                0064300
      IF(I .LE. 2) GO TO 111                                              0064400
      WFW(I)=SEWU(I-1)/(SEWU(I-1)+SEWU(I))                                0064500
  111 CONTINUE                                                            0064600
      YV(1)=0.0                                                           0064700
      RV(1)=0.0                                                           0064800
      DO 108 J=2,NJ                                                       0064900
      RV(J)=0.5*(R(J)+R(J-1))                                             0065000
  108 YV(J)=0.5*(Y(J)+Y(J-1))                                             0065100
      RCV(1)=R(1)                                                         0065200
      RCV(NJ)=R(NJ)                                                       0065300
      DO 113 J=2,NJM1                                                     0065400
  113 RCV(J)=0.5*(RV(J+1)+RV(J))                                          0065500
      DYPSV(1)=0.0                                                        0065600
      DYPSV(2)=0.0                                                        0065700
      DYNPV(NJ)=0.0                                                       0065800
      DO 109 J=2,NJM1                                                     0065900
      DYNPV(J)=YV(J+1)-YV(J)                                              0066000
```

```
  109 DYPSV(J+1)=DYNPV(J)                                                0066100
      SNSV(1)=0.0                                                        0066200
      DO 110 J=2,NJ                                                      0066300
  110 SNSV(J)=Y(J)-Y(J-1)                                                0066400
C---------V-VELOCITIES WEIGHTING FACTORS                                 0066500
      DO 112 J=3,NJM1                                                    0066600
      WFN(J)=SNSV(J+1)/(SNSV(J+1)+SNSV(J))                               0066700
      WFS(J)=SNSV(J-1)/(SNSV(J-1)+SNSV(J))                               0066800
  112 CONTINUE                                                           0066900
C                                                                        0067000
CHAPTER  2  2  2  2  2  2  SET VARIABLES TO ZERO  2  2  2  2  2  2       0067100
C                                                                        0067200
      DO 200 I=1,NI                                                      0067300
      TAUN(I)=1.0                                                        0067400
      DO 200 J=1,NJ                                                      0067500
      TAUW(J)=1.0                                                        0067600
      U(I,J)=0.0                                                         0067700
      V(I,J)=0.0                                                         0067800
      W(I,J)=0.                                                          0067900
      P(I,J)=0.0                                                         0068000
      PP(I,J)=0.0                                                        0068100
      TE(I,J)=0.0                                                        0068200
      ED(I,J)=0.0                                                        0068300
      DEN(I,J)=DENSIT                                                    0068400
      VIS(I,J)=VISCOS                                                    0068500
      DU(I,J)=0.0                                                        0068600
      DV(I,J)=0.0                                                        0068700
      SU(I,J)=0.0                                                        0068800
      SP(I,J)=0.0                                                        0068900
      STFN(I,J)=0.                                                       0069000
200   CONTINUE                                                           0069100
      DO 300 I=1,NI                                                      0069200
      DO 300 J=1,NSTLN                                                   0069300
      YSTLN(I,J)=0.                                                      0069400
      YSTLND(I,J)=0.                                                     0069500
      STVAL(J)=0.                                                        0069600
  300 CONTINUE                                                           0069700
      DO 400 N=1,NPLTLN                                                  0069800
      DO 400 I=1,NI                                                      0069900
      YSLPLT(N,I)=0.                                                     0070000
  400 CONTINUE                                                           0070100
      RETURN                                                             0070200
      END                                                                0070300
C                                                                        0070400
C------------------------------------------------------------------      0070500
C                                                                        0070600
      SUBROUTINE PROPS                                                   0070700
CA*************************************************************************0070800
C                                                                        0070900
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0   0071000
C                                                                        0071100
      COMMON                                                             0071200
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)           0071300
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0071400
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),         0071500
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0071600
     #,VISTAR(48,24)                                                     0071700
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)               0071800
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                 0071900
C                                                                        0072000
```

```
CHAPTER   1   1   1   VISCOSITY   1   1   1                                  0072100
C                                                                            0072200
      DO 100 I=2,NIM1                                                        0072300
      DO 100 J=2,NJM1                                                        0072400
      VISOLD=VIS(I,J)                                                        0072500
      IF(ED(I,J).EQ.0.) GO TO 102                                            0072600
      VIS(I,J)=DEN(I,J)*TE(I,J)**2*CMU/ED(I,J)+VISCOS                        0072700
      GO  TO  101                                                            0072800
  102 VIS(I,J)=VISCOS                                                        0072900
C---------UNDER-RELAX VISCOSITY                                              0073000
101   VIS(I,J)=URFVIS*VIS(I,J)+(1.-URFVIS)*VISOLD                            0073100
  100 CONTINUE                                                               0073200
      RETURN                                                                 0073300
      END                                                                    0073400
C                                                                            0073500
C-------------------------------------------------------------------         0073600
C                                                                            0073700
      SUBROUTINE CALCU                                                       0073800
CA*************************************************************************** 0073900
C                                                                            0074000
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0      0074100
C                                                                            0074200
      COMMON                                                                 0074300
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)                   0074400
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                   0074500
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                0074600
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),     0074700
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),             0074800
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)     0074900
     #,VISTAR(48,24)                                                         0075000
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                   0075100
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),          0075200
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                     0075300
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),            0075400
     #YND(24),YVND(24)                                                       0075500
      COMMON                                                                 0075600
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)               0075700
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),     0075800
     1       SP(48,24)                                                       0075900
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                  0076000
     2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1      0076100
C                                                                            0076200
CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1     0076300
C                                                                            0076400
      DO 100 I=3,NIM1                                                        0076500
      DO 101 J=2,NJM1                                                        0076600
C---------COMPUTE AREAS AND VOLUME                                           0076700
      AREAN=RV(J+1)*SEWU(I)                                                  0076800
      AREAS=RV(J)*SEWU(I)                                                    0076900
      AREAEW=RCV(J)*SNS(J)                                                   0077000
      VOL=RCV(J)*SEWU(I)*SNS(J)                                              0077100
C---------CALCULATE CONVECTION COEFFICIENTS                                  0077200
      GN=0.5*(DEN(I,J+1)+DEN(I,J))*V(I,J+1)                                  0077300
      GNW=0.5*(DEN(I-1,J)+DEN(I-1,J+1))*V(I-1,J+1)                           0077400
      GS=0.5*(DEN(I,J-1)+DEN(I,J))*V(I,J)                                    0077500
      GSW=0.5*(DEN(I-1,J)+DEN(I-1,J-1))*V(I-1,J)                             0077600
      GE=DEN(I,J)*(U(I+1,J)*(1.0-WFE(I))+U(I,J)*WFE(I))                      0077700
      GW=DEN(I-1,J)*(U(I-1,J)*(1.0-WFW(I))+U(I,J)*WFW(I))                    0077800
      CN=0.5*(GN+GNW)*AREAN                                                  0077900
      CS=0.5*(GS+GSW)*AREAS                                                  0078000
```

```
      CE=GE*AREAEW                                                          0078100
      CW=GW*AREAEW                                                          0078200
C---------CALCULATE DIFFUSION COEFFICIENTS                                 0078300
      VISN=0.25*(VIS(I,J)+VIS(I,J+1)+VIS(I-1,J)+VIS(I-1,J+1))               0078400
      VISS=0.25*(VIS(I,J)+VIS(I,J-1)+VIS(I-1,J)+VIS(I-1,J-1))               0078500
      DN=VISN*AREAN/DYNP(J)                                                 0078600
      DS=VISS*AREAS/DYPS(J)                                                 0078700
      DE=VIS(I,J)*AREAEW/DXEPU(I)                                           0078800
      DW=VIS(I-1,J)*AREAEW/DXPWU(I)                                         0078900
C---------CALCULATE COEFFICIENTS OF SOURCE TERMS                           0079000
      SMP=CN-CS+CE-CW                                                       0079100
      CP=AMAX1(0.0,SMP)                                                     0079200
      CPO=CP                                                                0079300
C---------ASSEMBLE MAIN COEFFICIENTS                                       0079400
      AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                  0079500
      AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                  0079600
      DE=AMAX1(DE,-WFE(I)*CE,(1.0-WFE(I))*CE)                               0079700
      DW=AMAX1(DW,WFW(I)*CW,-(1.0-WFW(I))*CW)                               0079800
      AE(I,J)=DE-(1.0-WFE(I))*CE                                            0079900
      AW(I,J)=DW+(1.-WFW(I))*CW                                             0080000
      DU(I,J)=AREAEW                                                        0080100
      DUDXE=(U(I+1,J)-U(I,J))/DXEPU(I)                                      0080200
      DUDXW=(U(I,J)-U(I-1,J))/DXPWU(I)                                      0080300
      SORCE1=(DUDXE*VIS(I,J)-DUDXW*VIS(I-1,J))/SEWU(I)                      0080400
      DVDXN=(V(I,J+1)-V(I-1,J+1))/SEWU(I)                                   0080500
      DVDXS=(V(I,J)-V(I-1,J))/SEWU(I)                                       0080600
      SORCE2=(RV(J+1)*VISN*DVDXN-RV(J)*VISS*DVDXS)/(RCV(J)*DYNPV(J))        0080700
      SU(I,J)=CPO*U(I,J)+DU(I,J)*(P(I-1,J)-P(I,J))                          0080800
      SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                                   0080900
      SP(I,J)=-CP                                                           0081000
  101 CONTINUE                                                              0081100
  100 CONTINUE                                                              0081200
C                                                                           0081300
CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2   0081400
C                                                                           0081500
      CALL PROMOD (2)                                                       0081600
C                                                                           0081700
CHAPTER  3  FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION  3  3     0081800
C                                                                           0081900
      RESORU=0.0                                                            0082000
      DO 300 I=3,NIM1                                                       0082100
      DO 301 J=2,NJM1                                                       0082200
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                       0082300
      DU(I,J)=DU(I,J)/AP(I,J)                                               0082400
      RESOR=AN(I,J)*U(I,J+1)+AS(I,J)*U(I,J-1)+AE(I,J)*U(I+1,J)              0082500
     1     +AW(I,J)*U(I-1,J)-AP(I,J)*U(I,J)+SU(I,J)                         0082600
      VOL=RCV(J)*SEWU(I)*SNS(J)                                             0082700
      SORVOL=GREAT*VOL                                                      0082800
      IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                        0082900
      RESORU=RESORU+ABS(RESOR)                                              0083000
C---------UNDER-RELAXATION                                                 0083100
      AP(I,J)=AP(I,J)/URFU                                                  0083200
      SU(I,J)=SU(I,J)+(1.-URFU)*AP(I,J)*U(I,J)                              0083300
      DU(I,J)=DU(I,J)*URFU                                                  0083400
  301 CONTINUE                                                              0083500
  300 CONTINUE                                                              0083600
C                                                                           0083700
CHAPTER  4  4  4  SOLUTION OF DIFFERENCE EQUATION  4  4  4  4  4  4  4      0083800
C                                                                           0083900
      DO 400 N=1,NSWPU                                                      0084000
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  400 CALL LISOLV(3,2,NI,JMAX,IT,JT,U,2)                                0084100
      RETURN                                                            0084200
      END                                                               0084300
C                                                                       0084400
C-----------------------------------------------------------------      0084500
C                                                                       0084600
      SUBROUTINE CALCV                                                  0084700
CA******************************************************************* 0084800
C                                                                       0084900
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0085000
C                                                                       0085100
      COMMON                                                            0085200
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)              0085300
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)              0085400
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF           0085500
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0085600
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),        0085700
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0085800
     #,VISTAR(48,24)                                                    0085900
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)              0086000
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),     0086100
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                0086200
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),       0086300
     #YND(24),YVND(24)                                                  0086400
      COMMON                                                            0086500
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)          0086600
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24), 0086700
     1       SP(48,24)                                                  0086800
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                             0086900
     2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1 0087000
C                                                                       0087100
CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1 0087200
C                                                                       0087300
      DO 100 I=2,NIM1                                                   0087400
      DO 101 J=3,NJM1                                                   0087500
C---------COMPUTE AREAS AND VOLUME                                      0087600
      AREAN=R(J)*SEW(I)                                                 0087700
      AREAS=R(J-1)*SEW(I)                                               0087800
      AREAEW=RV(J)*SNSV(J)                                              0087900
      VOL=RV(J)*SEW(I)*SNSV(J)                                          0088000
C---------CALCULATE CONVECTION COEFFICIENTS                             0088100
      GN=DEN(I,J)*(V(I,J+1)*(1.0-WFN(J))+V(I,J)*WFN(J))                 0088200
      GS=DEN(I,J-1)*(V(I,J-1)*(1.0-WFS(J))+V(I,J)*WFS(J))               0088300
      GE=0.5*(DEN(I+1,J)+DEN(I,J))*U(I+1,J)                             0088400
      GSE=0.5*(DEN(I,J-1)+DEN(I+1,J-1))*U(I+1,J-1)                      0088500
      GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                               0088600
      GSW=0.5*(DEN(I,J-1)+DEN(I-1,J-1))*U(I,J-1)                        0088700
      CN=GN*AREAN                                                       0088800
      CS=GS*AREAS                                                       0088900
      CE=0.5*(GE+GSE)*AREAEW                                            0089000
      CW=0.5*(GW+GSW)*AREAEW                                            0089100
C---------CALCULATE DIFFUSION COEFFICIENTS                              0089200
      VISE=0.25*(VIS(I,J)+VIS(I+1,J)+VIS(I,J-1)+VIS(I+1,J-1))           0089300
      VISW=0.25*(VIS(I,J)+VIS(I-1,J)+VIS(I,J-1)+VIS(I-1,J-1))           0089400
      DN=VIS(I,J)*AREAN/DYNPV(J)                                        0089500
      DS=VIS(I,J-1)*AREAS/DYPSV(J)                                      0089600
      DE=VISE*AREAEW/DXEP(I)                                            0089700
      DW=VISW*AREAEW/DXPW(I)                                            0089800
C---------CALCULATE COEFFICIENTS OF SOURCE TERMS                        0089900
      SMP=CN-CS+CE-CW                                                   0090000
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      CP=AMAX1(0.0,SMP)                                                 0090100
      CPO=CP                                                            0090200
C---------ASSEMBLE MAIN COEFFICIENTS                                   0090300
      DN=AMAX1(DN,-WFN(J)*CN,(1.0-WFN(J))*CN)                           0090400
      DS=AMAX1(DS,WFS(J)*CS,-(1.0-WFS(J))*CS)                           0090500
      AN(I,J)=DN-(1.0-WFN(J))*CN                                        0090600
      AS(I,J)=DS+(1.0-WFS(J))*CS                                        0090700
      AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                              0090800
      AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                              0090900
      DV(I,J)=0.5*(AREAN+AREAS)                                         0091000
      DUDYE=(U(I+1,J)-U(I+1,J-1))/SNSV(J)                               0091100
      DUDYW=(U(I,J)-U(I,J-1))/SNSV(J)                                   0091200
      SORCE1=(DUDYE*VISE-DUDYW*VISW)/DXEPU(I)                           0091300
      DVDYN=(V(I,J+1)-V(I,J))/DYNPV(J)                                  0091400
      DVDYS=(V(I,J)-V(I,J-1))/DYPSV(J)                                  0091500
      SORCE2=(VIS(I,J)*RCV(J)*DVDYN-VIS(I,J-1)*RCV(J-1)*DVDYS)          0091600
     #  /(RV(J)*SNSV(J))                                               0091700
      SU(I,J)=CPO*V(I,J)+DV(I,J)*(P(I,J-1)-P(I,J))                      0091800
      SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                               0091900
      SP(I,J)=-CP                                                       0092000
      IF(INDCOS .EQ. 1) GO TO 101                                       0092100
      SU(I,J)=SU(I,J)+VOL*((DEN(I,J)+DEN(I,J-1))*(W(I,J)+W(I,J-1)       0092200
     #)**2)/(8.*RV(J))                                                  0092300
      SP(I,J)=SP(I,J)-(VIS(I,J)+VIS(I,J-1))*VOL/RV(J)**2                0092400
  101 CONTINUE                                                          0092500
  100 CONTINUE                                                          0092600
C                                                                       0092700
CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2 0092800
C                                                                       0092900
      CALL PROMOD (3)                                                   0093000
C                                                                       0093100
CHAPTER  3  FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION  3  3  0093200
C                                                                       0093300
      RESORV=0.0                                                        0093400
      DO 300 I=2,NIM1                                                   0093500
      DO 301 J=3,NJM1                                                   0093600
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                   0093700
      DV(I,J)=DV(I,J)/AP(I,J)                                           0093800
      RESOR=AN(I,J)*V(I,J+1)+AS(I,J)*V(I,J-1)+AE(I,J)*V(I+1,J)          0093900
     1     +AW(I,J)*V(I-1,J)-AP(I,J)*V(I,J)+SU(I,J)                     0094000
      VOL=RV(J)*SEW(I)*SNSV(J)                                          0094100
      SORVOL=GREAT*VOL                                                  0094200
      IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                    0094300
      RESORV=RESORV+ABS(RESOR)                                          0094400
C---------UNDER-RELAXATION                                            0094500
      AP(I,J)=AP(I,J)/URFV                                              0094600
      SU(I,J)=SU(I,J)+(1.-URFV)*AP(I,J)*V(I,J)                          0094700
      DV(I,J)=DV(I,J)*URFV                                              0094800
  301 CONTINUE                                                          0094900
  300 CONTINUE                                                          0095000
C                                                                       0095100
CHAPTER  4  4  4  SOLUTION OF DIFFERENCE EQUATION  4  4  4  4  4  4  4  0095200
C                                                                       0095300
      DO 400 N=1,NSWPV                                                  0095400
  400 CALL LISOLV(2,3,NI,JMAX,IT,JT,V,3)                                0095500
      RETURN                                                            0095600
      END                                                               0095700
C                                                                       0095800
C-----------------------------------------------------------------      0095900
C                                                                       0096000
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      SUBROUTINE CALCW                                                          0096100
CA*****************************************************************************0096200
C                                                                               0096300
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0         0096400
C                                                                               0096500
      COMMON                                                                    0096600
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)                      0096700
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                      0096800
     */WVEL/ RESORW, NSWPW, URFW                                                0096900
     1/TEN/RESORK,NSWPK,URFK                                                    0097000
     1/TDIS/RESORE,NSWPD,URFE                                                   0097100
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),        0097200
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),                0097300
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)        0097400
     #,VISTAR(48,24)                                                            0097500
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                      0097600
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),             0097700
     1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                         0097800
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),               0097900
     #YND(24),YVND(24)                                                          0098000
      COMMON                                                                    0098100
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                  0098200
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                     0098300
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1          0098400
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                        0098500
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                            0098600
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),        0098700
     1      SP(48,24)                                                           0098800
C---------IF NO SWIRL, RETURN TO MAIN                                          0098900
      IF(W(1,3) .LE. 0.) GO TO 500                                              0099000
C                                                                               0099100
CHAPTER 1 1 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1 1                0099200
C                                                                               0099300
      DO 100  I=2, NIM1                                                         0099400
      DO 101  J=2, NJM1                                                         0099500
C                                                                               0099600
C       COMPUTE AREAS AND VOLUME                                                0099700
C                                                                               0099800
      AREAN=RV(J+1)*SEW(I)                                                      0099900
      AREAS=RV(J)*SEW(I)                                                        0100000
      AREAEW=RCV(J)*SNS(J)                                                      0100100
      VOL=RCV(J)*SNS(J)*SEW(I)                                                  0100200
C                                                                               0100300
C---------CALCULATE CONVECTION COEFFICIENTS                                     0100400
C                                                                               0100500
      GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)                                     0100600
      GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                       0100700
      GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                                     0100800
      GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                       0100900
      CN=GN*AREAN                                                               0101000
      CS=GS*AREAS                                                               0101100
      CE=GE*AREAEW                                                              0101200
      CW=GW*AREAEW                                                              0101300
C                                                                               0101400
C---------CALCULATE DIFFUSION COEFFICIENTS                                      0101500
C                                                                               0101600
      VISN=0.5*(VIS(I,J)+VIS(I,J+1))                                            0101700
      VISS=0.5*(VIS(I,J)+VIS(I,J-1))                                            0101800
      VISE=0.5*(VIS(I,J)+VIS(I+1,J))                                            0101900
      VISW=0.5*(VIS(I,J)+VIS(I-1,J))                                            0102000
```

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      DN=VISN*AREAN/DYNP(J)                                                  0102100
      DS=VISS*AREAS/DYPS(J)                                                  0102200
      DE=VISE*AREAEW/DXEP(I)                                                 0102300
      DW=VISW*AREAEW/DXPW(I)                                                 0102400
C                                                                            0102500
C---------SOURCE TERMS                                                      0102600
C                                                                            0102700
      SMP=CN-CS+CE-CW                                                        0102800
      CP=AMAX1(0., SMP)                                                      0102900
      CPO=CP                                                                 0103000
C                                                                            0103100
C---------ASSEMBLE MAIN COEFFICIENTS                                         0103200
C                                                                            0103300
      AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                   0103400
      AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                   0103500
      AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                                   0103600
      AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                                   0103700
      DV=0.5*(AREAN+AREAS)                                                   0103800
      VAVG=0.5* (V(I,J+1)+V(I,J))                                            0103900
      SU(I,J)=CPO*W(I,J)                                                     0104000
      IF(INDCOS .EQ. 1) GO TO 101                                            0104100
      SORCE1=-DEN(I,J)*VAVG*W(I,J) /RCV(J)                                   0104200
      SORCE2=-(VISN*RV(J+1)-VISS*RV(J)) *W(I,J)/(DYNPV(J)*                   0104300
     #RCV(J)*RCV(J))                                                         0104400
      SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                                    0104500
      SP(I,J)=-CP                                                            0104600
  101 CONTINUE                                                               0104700
100   CONTINUE                                                               0104800
C                                                                            0104900
CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2 2 2 2 2              0105000
C                                                                            0105100
      CALL PROMOD (8)                                                        0105200
C                                                                            0105300
CHAPTER 3 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION       0105400
C                                                                            0105500
      RESORW=0.                                                              0105600
      DO 300  I=2, NIM1                                                      0105700
      DO 301  J=2,NJM1                                                       0105800
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                        0105900
      RESOR=AN(I,J)*W(I,J+1)+AS(I,J)*W(I,J-1)+AE(I,J)*W(I+1,J)               0106000
     *  +AW(I,J)*W(I-1,J)-AP(I,J)*W(I,J)+SU(I,J)                             0106100
      VOL=RCV(J)*SNS(J)*SEW(I)                                               0106200
      SORVOL=GREAT*VOL                                                       0106300
      IF(-SP(I,J) .GT. 0.5*SORVOL) RESOR=RESOR/SORVOL                        0106400
      IF(J .LE. 2) RESOR=0.                                                  0106500
      RESORW=RESORW+ABS(RESOR)                                               0106600
C                                                                            0106700
C---------UNDER RELAXATION                                                   0106800
C                                                                            0106900
      AP(I,J)=AP(I,J)/URFW                                                   0107000
      SU(I,J)=SU(I,J)+(1.-URFW)*AP(I,J)*W(I,J)                               0107100
301   CONTINUE                                                               0107200
300   CONTINUE                                                               0107300
C                                                                            0107400
CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4 4 4 4               0107500
C                                                                            0107600
      DO 400  N=1, NSWPW                                                     0107700
400   CALL LISOLV(2, 2, NI, JMAX, IT, JT, W,8)                               0107800
  500 CONTINUE                                                               0107900
      RETURN                                                                 0108000
```

```
      END                                                                    0108100
C                                                                            0108200
C-------------------------------------------------------------------         0108300
C                                                                            0108400
      SUBROUTINE CALCP                                                       0108500
CA*************************************************************************** 0108600
C                                                                            0108700
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0      0108800
C                                                                            0108900
      COMMON                                                                 0109000
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                0109100
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),     0109200
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),             0109300
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)     0109400
     #,VISTAR(48,24)                                                         0109500
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                   0109600
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),          0109700
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                     0109800
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),            0109900
     #YND(24),YVND(24)                                                       0110000
      COMMON                                                                 0110100
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)               0110200
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),     0110300
     1       SP(48,24)                                                       0110400
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                  0110500
     2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1      0110600
      RESORM=0.0                                                             0110700
C                                                                            0110800
CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1     0110900
C                                                                            0111000
      DO 100 I=2,NIM1                                                        0111100
      DO 101 J=2,NJM1                                                        0111200
C---------COMPUTE AREAS AND VOLUME                                           0111300
      AREAN=RV(J+1)*SEW(I)                                                   0111400
      AREAS=RV(J)*SEW(I)                                                     0111500
      AREAEW=RCV(J)*SNS(J)                                                   0111600
      VOL=RCV(J)*SNS(J)*SEW(I)                                               0111700
C---------CALCULATE COEFFICIENTS                                             0111800
      DENN=0.5*(DEN(I,J)+DEN(I,J+1))                                         0111900
      DENS=0.5*(DEN(I,J)+DEN(I,J-1))                                         0112000
      DENE=0.5*(DEN(I,J)+DEN(I+1,J))                                         0112100
      DENW=0.5*(DEN(I,J)+DEN(I-1,J))                                         0112200
      AN(I,J)=DENN*AREAN*DV(I,J+1)                                           0112300
      AS(I,J)=DENS*AREAS*DV(I,J)                                             0112400
      AE(I,J)=DENE*AREAEW*DU(I+1,J)                                          0112500
      AW(I,J)=DENW*AREAEW*DU(I,J)                                            0112600
C---------CALCULATE SOURCE TERMS                                             0112700
      CN=DENN*V(I,J+1)*AREAN                                                 0112800
      CS=DENS*V(I,J)*AREAS                                                   0112900
      CE=DENE*U(I+1,J)*AREAEW                                                0113000
      CW=DENW*U(I,J)*AREAEW                                                  0113100
      SMP=CN-CS+CE-CW                                                        0113200
      SP(I,J)=0.0                                                            0113300
      SU(I,J)=-SMP                                                           0113400
C---------COMPUTE SUM OF ABSOLUTE MASS SOURCES                               0113500
      RESORM=RESORM+ABS(SMP)                                                 0113600
  101 CONTINUE                                                               0113700
  100 CONTINUE                                                               0113800
C                                                                            0113900
CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2     0114000
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C                                                                       0114100
      CALL PROMOD (4)                                                   0114200
C                                                                       0114300
CHAPTER  3  3  3  3  3  FINAL COEFFICIENT ASSEMBLY  3  3  3  3  3  3  3 0114400
C                                                                       0114500
      DO 300 I=2,NIM1                                                   0114600
      DO 301 J=2,NJM1                                                   0114700
  301 AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                   0114800
  300 CONTINUE                                                          0114900
C                                                                       0115000
CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4 0115100
C                                                                       0115200
      DO 400 N=1,NSWPP                                                  0115300
  400 CALL LISOLV(2,2,NI,JMAX,IT,JT,PP,4)                               0115400
C                                                                       0115500
CHAPTER  5  5  5  5  CORRECT VELOCITIES AND PRESSURE  5  5  5  5  5  5  0115600
C                                                                       0115700
C---------VELOCITIES                                                   0115800
      DO 503 I=2,NIM1                                                   0115900
      JJ=JMAX(I)                                                        0116000
      DO 501 J=3,JJ                                                     0116100
      V(I,J)=V(I,J)+DV(I,J)*(PP(I,J-1)-PP(I,J))                         0116200
  501 CONTINUE                                                          0116300
      JJ=JMAX(I-1)                                                      0116400
      DO 502 J=2,JJ                                                     0116500
      IF(I .NE. 2) U(I,J)=U(I,J)+DU(I,J)*(PP(I-1,J)-PP(I,J))            0116600
  502 CONTINUE                                                          0116700
  503 CONTINUE                                                          0116800
C---------PRESSURES (WITH PROVISION FOR UNDER-RELAXATION)               0116900
      PPREF=PP(IPREF,JPREF)                                             0117000
      DO 506 I=2,NIM1                                                   0117100
      JJ=JMAX(I)                                                        0117200
      DO 508 J=2,JJ                                                     0117300
      P(I,J)=P(I,J)+URFP*(PP(I,J)-PPREF)                                0117400
C---------PP IS ZEROED AT TOP OF CHAPTER 3, MAIN                        0117500
  508 CONTINUE                                                          0117600
  506 CONTINUE                                                          0117700
      RETURN                                                            0117800
      END                                                               0117900
C                                                                       0118000
C-----------------------------------------------------------------      0118100
C                                                                       0118200
      SUBROUTINE CALCTE                                                 0118300
CA*********************************************************************** 0118400
C                                                                       0118500
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0118600
C                                                                       0118700
      COMMON                                                            0118800
     1/TEN/RESORK,NSWPK,URFK                                            0118900
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0119000
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),        0119100
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0119200
     #,VISTAR(48,24)                                                    0119300
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)              0119400
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),     0119500
     1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                 0119600
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),       0119700
     #YND(24),YVND(24)                                                  0119800
      COMMON                                                            0119900
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)          0120000
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     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),  0120100
     1      SP(48,24)                                                     0120200
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                  0120300
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                      0120400
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                               0120500
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1    0120600
     1/SUSP/SUKD(48,24),SPKD(48,24)                                       0120700
C                                                                         0120800
CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1     0120900
C                                                                         0121000
      PRTE=1.0                                                            0121100
      DO 100 I=2,NIM1                                                     0121200
      DO 101 J=2,NJM1                                                     0121300
C---------COMPUTE AREAS AND VOLUME                                        0121400
      AREAN=RV(J+1)*SEW(I)                                                0121500
      AREAS=RV(J)*SEW(I)                                                  0121600
      AREAEW=RCV(J)*SNS(J)                                                0121700
      VOL=RCV(J)*SNS(J)*SEW(I)                                            0121800
C---------CALCULATE CONVECTION COEFFICIENTS                               0121900
      GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)                               0122000
      GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                 0122100
      GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                               0122200
      GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                 0122300
      CN=GN*AREAN                                                         0122400
      CS=GS*AREAS                                                         0122500
      CE=GE*AREAEW                                                        0122600
      CW=GW*AREAEW                                                        0122700
C---------CALCULATE DIFFUSION COEFFICIENTS                                0122800
      GAMN=0.5*(VIS(I,J)+VIS(I,J+1))/PRTE                                 0122900
      GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRTE                                 0123000
      GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRTE                                 0123100
      GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRTE                                 0123200
      DN=GAMN*AREAN/DYNP(J)                                               0123300
      DS=GAMS*AREAS/DYPS(J)                                               0123400
      DE=GAME*AREAEW/DXEP(I)                                              0123500
       DW=GAMW*AREAEW/DXPW(I)                                             0123600
C---------SOURCE TERMS                                                    0123700
      SMP=CN-CS+CE-CW                                                     0123800
      CP=AMAX1(0.0,SMP)                                                   0123900
      CPO=CP                                                              0124000
      DUDX=(U(I+1,J)-U(I,J))/SEW(I)                                       0124100
      DVDY=(V(I,J+1)-V(I,J))/SNS(J)                                       0124200
      DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+    0124300
     1U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                     0124400
      DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V(  0124500
     1I-1,J)+V(I-1,J+1))/4.)/SEW(I)                                       0124600
      DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))-W(I,J)/R(J)              0124700
      DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))                          0124800
      GEN(I,J)=(2.*(DUDX**2+DVDY**2)+(DUDY+DVDX)**2)*VIS(I,J)             0124900
      IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*(DWDY**2+DWDX**2)      0125000
      IF(RV(J) .EQ. 0.) GO TO 110                                         0125100
      VDR=V(I,J)/RV(J)                                                    0125200
      IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*.5*                    0125300
     #(VDR+V(I,J+1)/RV(J+1))**2                                           0125400
      GO TO 120                                                           0125500
  110 IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*                       0125600
     #0.5*(V(I,J+1)/RV(J+1))**2                                           0125700
  120 CONTINUE                                                            0125800
C---------ASSEMBLE MAIN COEFFICIENTS                                      0125900
      AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                0126000
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      AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                  0126100
      AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                                  0126200
      AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                                  0126300
      SU(I,J)=CPO*TE(I,J)                                                   0126400
      SUKD(I,J)=SU(I,J)                                                     0126500
      SU(I,J)=SU(I,J)+GEN(I,J)*VOL                                          0126600
      SP(I,J)=-CP                                                           0126700
      SPKD(I,J)=SP(I,J)                                                     0126800
      SP(I,J)=SP(I,J)-CD*CMU*DEN(I,J)**2*TE(I,J)*VOL/VIS(I,J)               0126900
  101 CONTINUE                                                              0127000
  100 CONTINUE                                                              0127100
C                                                                           0127200
CHAPTER  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2         0127300
C                                                                           0127400
      CALL PROMOD (6)                                                       0127500
C                                                                           0127600
CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3      0127700
C                                                                           0127800
      RESORK=0.0                                                            0127900
      DO 300 I=2,NIM1                                                       0128000
      DO 301 J=2,NJM1                                                       0128100
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                       0128200
      RESOR=AN(I,J)*TE(I,J+1)+AS(I,J)*TE(I,J-1)+AE(I,J)*TE(I+1,J)           0128300
     1      +AW(I,J)*TE(I-1,J)-AP(I,J)*TE(I,J)+SU(I,J)                      0128400
      VOL=RCV(J)*SNS(J)*SEW(I)                                              0128500
      SORVOL=GREAT*VOL                                                      0128600
      IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                        0128700
      RESORK=RESORK+ABS(RESOR)                                              0128800
C---------UNDER-RELAXATION                                                  0128900
      AP(I,J)=AP(I,J)/URFK                                                  0129000
      SU(I,J)=SU(I,J)+(1.-URFK)*AP(I,J)*TE(I,J)                             0129100
  301 CONTINUE                                                              0129200
  300 CONTINUE                                                              0129300
C                                                                           0129400
CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4     0129500
C                                                                           0129600
      DO 400 N=1,NSWPK                                                      0129700
  400 CALL LISOLV(2,2,NI,JMAX,IT,JT,TE,6)                                   0129800
      RETURN                                                                0129900
      END                                                                   0130000
C                                                                           0130100
C-------------------------------------------------------------------        0130200
C                                                                           0130300
      SUBROUTINE CALCED                                                     0130400
CA*************************************************************************0130500
C                                                                           0130600
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0      0130700
C                                                                           0130800
      COMMON                                                                0130900
     1/TDIS/RESORE,NSWPD,URFE                                               0131000
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                  0131100
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),         0131200
     1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                     0131300
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),           0131400
     #YND(24),YVND(24)                                                      0131500
     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)              0131600
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),    0131700
     1      SP(48,24)                                                       0131800
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),    0131900
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),            0132000
```

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     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0132100
     #,VISTAR(48,24)                                                     0132200
      COMMON                                                             0132300
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                 0132400
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                     0132500
     1/SUSP/SUKD(48,24),SPKD(48,24)                                      0132600
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                              0132700
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1   0132800
C                                                                        0132900
CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1    0133000
C                                                                        0133100
      DO 100 I=2,NIM1                                                    0133200
      JJ=JMAX(I)                                                         0133300
      DO 101 J=2,JJ                                                      0133400
C---------COMPUTE AREAS AND VOLUME                                       0133500
      AREAN=RV(J+1)*SEW(I)                                               0133600
      AREAS=RV(J)*SEW(I)                                                 0133700
      AREAEW=RCV(J)*SNS(J)                                               0133800
      VOL=RCV(J)*SNS(J)*SEW(I)                                           0133900
C---------CALCULATE CONVECTION COEFFICIENTS                              0134000
      GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)                              0134100
      GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                0134200
      GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                              0134300
      GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                0134400
      CN=GN*AREAN                                                        0134500
      CS=GS*AREAS                                                        0134600
      CE=GE*AREAEW                                                       0134700
      CW=GW*AREAEW                                                       0134800
C---------CALCULATE DIFFUSION COEFFICIENTS                               0134900
      GAMN=0.5*(VIS(I,J)+VIS(I,J-1))/PRED                                0135000
      GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRED                                0135100
      GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRED                                0135200
      GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRED                                0135300
      DN=GAMN*AREAN/DYNP(J)                                              0135400
      DS=GAMS*AREAS/DYPS(J)                                              0135500
      DE=GAME*AREAEW/DXEP(I)                                             0135600
       DW=GAMW*AREAEW/DXPW(I)                                            0135700
C---------SOURCE TERMS                                                   0135800
      SMP=CN-CS+CE-CW                                                    0135900
      CP=AMAX1(0.0,SMP)                                                  0136000
      CPO=CP                                                             0136100
C---------ASSEMBLE MAIN COEFFICIENTS                                     0136200
      AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                               0136300
      AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                               0136400
      AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                               0136500
      AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                               0136600
      SU(I,J)=CPO*ED(I,J)                                                0136700
      SUKD(I,J)=SU(I,J)                                                  0136800
      SU(I,J)=SU(I,J)+C1*CMU*GEN(I,J)*VOL*DEN(I,J)*TE(I,J)/VIS(I,J)      0136900
      SP(I,J)=-CP                                                        0137000
      SPKD(I,J)=SP(I,J)                                                  0137100
      SP(I,J)=SP(I,J)-C2*DEN(I,J)*ED(I,J)*VOL/TE(I,J)                    0137200
  101 CONTINUE                                                           0137300
  100 CONTINUE                                                           0137400
C                                                                        0137500
CHAPTER  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2       0137600
C                                                                        0137700
      CALL PROMOD (7)                                                    0137800
C                                                                        0137900
CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3   0138000
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C                                                                       0138100
      RESORE=0.0                                                        0138200
      DO 300 I=2,NIM1                                                   0138300
      DO 301 J=2,NJM1                                                   0138400
      AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                   0138500
      RESOR=AN(I,J)*ED(I,J+1)+AS(I,J)*ED(I,J-1)+AE(I,J)*ED(I+1,J)       0138600
     1      +AW(I,J)*ED(I-1,J)-AP(I,J)*ED(I,J)+SU(I,J)                  0138700
      VOL=RCV(J)*SNS(J)*SEW(I)                                          0138800
      SORVOL=GREAT*VOL                                                  0138900
      IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                    0139000
      RESORE=RESORE+ABS(RESOR)                                          0139100
C---------UNDER-RELAXATION                                              0139200
      AP(I,J)=AP(I,J)/URFE                                              0139300
      SU(I,J)=SU(I,J)+(1.-URFE)*AP(I,J)*ED(I,J)                         0139400
  301 CONTINUE                                                          0139500
  300 CONTINUE                                                          0139600
C                                                                       0139700
CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4  0139800
C                                                                       0139900
      DO 400 N=1,NSWPD                                                  0140000
  400 CALL LISOLV(2,2,NI,JMAX,IT,JT,ED,7)                               0140100
      RETURN                                                            0140200
      END                                                               0140300
C                                                                       0140400
C-----------------------------------------------------------------      0140500
C                                                                       0140600
      SUBROUTINE LISOLV(ISTART,JSTART,NI,JMAX,IT,JT,PHI,NCHAP)          0140700
CA*************************************************************************0140800
C                                                                       0140900
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0141000
C                                                                       0141100
      DIMENSION PHI(IT,JT),A(48),B(48),C(48),D(48),JMAX(IT)             0141200
      COMMON                                                            0141300
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),0141400
     1       SP(48,24)                                                  0141500
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                             0141600
     2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1 0141700
      JSM1=JSTART-1                                                     0141800
      NIM1=NI-1                                                         0141900
      A(JSM1)=0.0                                                       0142000
C---------COMMENCE W-E SWEEP                                            0142100
      DO 100 I=ISTART,NIM1                                              0142200
      C(JSM1)=PHI(I,JSM1)                                               0142300
C---------COMMENCE S-N TRAVERSE                                         0142400
      JI=JMAX(I)                                                        0142500
      IF(NCHAP .EQ. 2) JI=JMAX(I-1)                                     0142600
      DO 101 J=JSTART,JI                                                0142700
C---------ASSEMBLE TDMA COEFFICIENTS                                    0142800
      A(J)=AN(I,J)                                                      0142900
      B(J)=AS(I,J)                                                      0143000
      C(J)=AE(I,J)*PHI(I+1,J)+AW(I,J)*PHI(I-1,J)+SU(I,J)                0143100
      D(J)=AP(I,J)                                                      0143200
C---------CALCULATE COEFFICIENTS OF RECURRENCE FORMULA                  0143300
      TERM=1./(D(J)-B(J)*A(J-1))                                        0143400
      A(J)=A(J)*TERM                                                    0143500
      C(J)=(C(J)+B(J)*C(J-1))*TERM                                      0143600
  101 CONTINUE                                                          0143700
C---------OBTAIN NEW PHI'S                                              0143800
      DO 102 JJ=JSTART,JI                                               0143900
      J=JI+1+JSM1-JJ                                                    0144000
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  102 PHI(I,J)=A(J)*PHI(I,J+1)+C(J)                                      0144100
  100 CONTINUE                                                           0144200
      RETURN                                                             0144300
      END                                                                0144400
C                                                                        0144500
C-----------------------------------------------------------------       0144600
C                                                                        0144700
      SUBROUTINE PRINT(ISTART,JSTART,NI,NJ,IT,JT,X,Y,PHI,HEAD)           0144800
CA*************************************************************************0144900
C                                                                        0145000
      DIMENSION PHI(IT,JT),X(IT),Y(JT),HEAD(9),STORE(48)                 0145100
      ISKIP=1                                                            0145200
      JSKIP=1                                                            0145300
      WRITE(6,110)HEAD                                                   0145400
      ISTA=ISTART-12                                                     0145500
  100 CONTINUE                                                           0145600
      ISTA=ISTA+12                                                       0145700
      IEND=ISTA+11                                                       0145800
      IF(NI.LT.IEND)IEND=NI                                              0145900
      WRITE(6,111)(I,I=ISTA,IEND,ISKIP)                                  0146000
      WRITE(6,114)(X(I),I=ISTA,IEND,ISKIP)                               0146100
      WRITE(6,112)                                                       0146200
      DO 101 JJ=JSTART,NJ,JSKIP                                          0146300
      J=JSTART+NJ-JJ                                                     0146400
      DO 120 I=ISTA,IEND                                                 0146500
      A=PHI(I,J)                                                         0146600
      IF(ABS(A).LT.1.E-20) A=0.0                                         0146700
120   STORE(I)=A                                                         0146800
  101 WRITE(6,113)J,Y(J),(STORE(I),I=ISTA,IEND,ISKIP)                    0146900
      IF(IEND.LT.NI)GO TO 100                                            0147000
      RETURN                                                             0147100
  110 FORMAT(1H0,17(2H*-),7X,9A4,7X,17(2H-*))                            0147200
  111 FORMAT(1H0,13H      I =    ,I2,11I9)                               0147300
  112 FORMAT(8H0 J     Y)                                                0147400
  113 FORMAT(I3,0PF8.5,1X,1P12E9.2)                                      0147500
  114 FORMAT(11H       X = ,F8.5,11F9.5)                                 0147600
      END                                                                0147700
C                                                                        0147800
C-----------------------------------------------------------------       0147900
C                                                                        0148000
      SUBROUTINE PROMOD (NCHAP)                                          0148100
CA*************************************************************************0148200
C                                                                        0148300
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0   0148400
C                                                                        0148500
      COMMON                                                             0148600
     1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)               0148700
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)               0148800
     */WVEL/ RESORW, NSWPW, URFW                                         0148900
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0149000
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),         0149100
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0149200
     #,VISTAR(48,24)                                                     0149300
     1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF            0149400
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)               0149500
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),      0149600
     1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                  0149700
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),        0149800
     #YND(24),YVND(24)                                                   0149900
      COMMON                                                             0150000
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     1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                  0150100
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                     0150200
     2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1          0150300
     1/SUSP/SUKD(48,24),SPKD(48,24)                                             0150400
     1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),        0150500
     1       SP(48,24)                                                          0150600
     1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                        0150700
     1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                            0150800
      IF(NCHAP .EQ. 2) GO TO 1150                                               0150900
      IF(JSTEP .EQ. NJM1) GO TO 1150                                            0151000
C---------OUT OF RANGE VALUES                                                  0151100
      DO 1100 I=2,NI                                                            0151200
      IF(JMAX(I) .EQ. NJM1) GO TO 1150                                          0151300
      JJ=JMAXP1(I)                                                              0151400
      DO 1100 J=JJ,NJM1                                                         0151500
 1100 SP(I,J)=-GREAT                                                            0151600
 1150 CONTINUE                                                                  0151700
      GO TO (1,2,3,4,5,6,7,8),NCHAP                                             0151800
C                                                                               0151900
C                                                                               0152000
C                                                                               0152100
CHAPTER  1  1  1  1  1  1  1  1  PROPERTIES  1  1  1  1  1  1  1  1  1          0152200
C                                                                               0152300
    1 CONTINUE                                                                  0152400
C---------NO MODIFICATIONS FOR THIS PROBLEM                                    0152500
      RETURN                                                                    0152600
C                                                                               0152700
CHAPTER  2  2  2  2  2  2  2  2  U MOMENTUM  2  2  2  2  2  2  2  2  2          0152800
C                                                                               0152900
    2 CONTINUE                                                                  0153000
C---------OUT OF RANGE VALUES                                                  0153100
      IF(JSTEP .EQ. NJM1) GO TO 202                                             0153200
      DO 200 I=3,NI                                                             0153300
      IF(JMAX(I-1) .EQ. NJM1) GO TO 202                                         0153400
      JJ=JMAXP1(I-1)                                                            0153500
      DO 200 J=JJ,NJM1                                                          0153600
      SP(I,J)=-GREAT                                                            0153700
  200 CONTINUE                                                                  0153800
  202 CONTINUE                                                                  0153900
C---------TOP WALL                                                             0154000
      CDTERM=CMU**0.25                                                          0154100
      DO 210 I=3,NIM1                                                           0154200
      J=JMAX(I-1)                                                               0154300
      YP=YV(J+1)-Y(J)                                                           0154400
      SQRTK=SQRT(0.5*(TE(I,J)+TE(I-1,J)))                                       0154500
      DENU=0.5*(DEN(I,J)+DEN(I-1,J))                                            0154600
      YPLUSA=0.5*(YPLUSN(I)+YPLUSN(I-1))                                        0154700
      IF(YPLUSA.LE.11.63)     GO  TO  211                                       0154800
      TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)                           0154900
      GO  TO  212                                                               0155000
  211 TMULT=VISCOS/YP                                                           0155100
  212 CONTINUE                                                                  0155200
  205 SP(I,J)=SP(I,J)-TMULT*SEWU(I)*RV(J+1)                                     0155300
      IF(JMAX(I-1) .NE. JMAX(I)) SP(I,J)=SP(I,J)/2.                             0155400
  210 AN(I,J)=0.                                                                0155500
C---------SIDE WALL                                                            0155600
      IF(JSTEP .EQ. NJM1) GO TO 214                                             0155700
      DO 225 I=3,NIM1                                                           0155800
      IF(JMAX(I-2) .GE. JMAX(I-1)) GO TO 225                                    0155900
      JJ=JMAXP1(I-2)                                                            0156000
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      JI=JMAX(I-1)                                                      0156100
      DO 220 J=JJ,JI                                                    0156200
      AW(I,J)=0.                                                        0156300
  220 CONTINUE                                                          0156400
  225 CONTINUE                                                          0156500
C---------SYMMETRY  AXIS                                               0156600
  214 CONTINUE                                                          0156700
      DO 203 I=1,NI                                                     0156800
  203 AS(I,2)=0.                                                        0156900
C---------OUTLET                                                       0157000
      ARDENT=0.0                                                        0157100
      FLOW=0.0                                                          0157200
      DO 209 J=2,NJM1                                                   0157300
      ARDEN=0.50*(DEN(NIM1,J)+DEN(NIM1-1,J))*RCV(J)*SNS(J)              0157400
      ARDENT=ARDENT+ARDEN                                               0157500
  209 FLOW=FLOW+ARDEN*U(NIM1,J)                                         0157600
      UINC=(FLOWIN-FLOW)/ARDENT                                         0157700
      DO  215  J=2,NJM1                                                 0157800
  215 U(NI,J)=U(NIM1,J)+UINC                                            0157900
      RETURN                                                            0158000
C                                                                       0158100
CHAPTER  3  3  3  3  3  3  3  3  V MOMENTUM  3  3  3  3  3  3  3  3  3  0158200
C                                                                       0158300
    3 CONTINUE                                                          0158400
C---------SIDE WALL                                                    0158500
      IF(JSTEP .EQ. NJM1) GO TO 314                                     0158600
      CDTERM=CMU**0.25                                                  0158700
      DO 325 I=2,NIM1                                                   0158800
      IF(JMAX(I-1) .GE. JMAX(I)) GO TO 325                              0158900
      JJ=JMAXP1(I-1)                                                    0159000
      JI=JMAX(I)                                                        0159100
      DO 320 J=JJ,JI                                                    0159200
      XP=X(I)-XU(I)                                                     0159300
      SQRTK=SQRT(0.5*(TE(I,J)+TE(I,J-1)))                               0159400
      DENV=0.5*(DEN(I,J)+DEN(I,J-1))                                    0159500
      XPLUSA=0.5*(XPLUSW(J)+XPLUSW(J-1))                                0159600
      IF(XPLUSA.LE.11.63)     GO  TO  311                               0159700
      TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)                   0159800
      GO  TO  312                                                       0159900
  311 TMULT=VISCOS/XP                                                   0160000
  312 CONTINUE                                                          0160100
  305 SP(I,J)=SP(I,J)-TMULT*SNSV(J)*RV(J)                               0160200
      IF(J .EQ. JMAXP1(I-1)) SP(I,J)=SP(I,J)/2.                         0160300
  310 AW(I,J)=0.0                                                       0160400
  320 CONTINUE                                                          0160500
  325 CONTINUE                                                          0160600
C---------TOP WALL                                                     0160700
  314 CONTINUE                                                          0160800
      DO 313 I=2,NIM1                                                   0160900
      J=JMAX(I)                                                         0161000
  313 AN(I,J)=0.                                                        0161100
      RETURN                                                            0161200
C                                                                       0161300
CHAPTER  4  4  4  4  4  4  PRESSURE CORRECTION  4  4  4  4  4  4  4  4  0161400
C                                                                       0161500
    4 CONTINUE                                                          0161600
C---------SIDE WALL                                                    0161700
      IF(JSTEP .EQ. NJM1) GO TO 414                                     0161800
      DO 412 I=2,NIM1                                                   0161900
      IF(JMAX(I-1) .GE. JMAX(I)) GO TO 412                              0162000
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      JJ=JMAXP1(I-1)                                                    0162100
      JI=JMAX(I)                                                        0162200
      DO 410 J=JJ,JI                                                    0162300
      AW(I,J)=0.                                                        0162400
  410 CONTINUE                                                          0162500
  412 CONTINUE                                                          0162600
C---------TOP WALL                                                     0162700
  414 CONTINUE                                                          0162800
      DO 402 I=2,NIM1                                                   0162900
      J=JMAX(I)                                                         0163000
  402 AN(I,J)=0.0                                                       0163100
C---------SYMMETRY AXIS                                                0163200
      DO 420 I=2,NIM1                                                   0163300
      AS(I,2)=0.0                                                       0163400
  420 CONTINUE                                                          0163500
C---------OUTLET                                                       0163600
      DO 440 J=2,NJM1                                                   0163700
      AE(NIM1,J)=0.0                                                    0163800
  440 CONTINUE                                                          0163900
      RETURN                                                            0164000
C                                                                       0164100
CHAPTER  5  5  5  5  5  5  5  THERMAL ENERGY  5  5  5  5  5  5  5  5  5 0164200
C                                                                       0164300
    5 CONTINUE                                                          0164400
C---------NO MODIFICATIONS FOR THIS PROBLEM                            0164500
      RETURN                                                            0164600
C                                                                       0164700
CHAPTER  6  6  6  6  6  TURBULENT KINETIC ENERGY  6  6  6  6  6  6  6  6 0164800
C                                                                       0164900
C                                                                       0165000
    6 CONTINUE                                                          0165100
C---------TOP WALL                                                     0165200
      CDTERM=CMU**0.25                                                  0165300
      DO 610 I=2,NIM1                                                   0165400
      J=JMAX(I)                                                         0165500
      DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))                        0165600
      UAVG=U(I,J)*WFE(I)+(1.-WFE(I))*U(I+1,J)                           0165700
      UEFF=SQRT(UAVG*UAVG + W(I,J)*W(I,J))                              0165800
      YP=YV(J+1)-Y(J)                                                   0165900
      DENU=DEN(I,J)                                                     0166000
      SQRTK=SQRT(TE(I,J))                                               0166100
      VOL=RCV(J)*SNS(J)*SEW(I)                                          0166200
      YPLUSN(I)=DENU*SQRTK*CDTERM*YP/VISCOS                             0166300
      IF(YPLUSN(I) .LE. 11.63) GO TO 608                                0166400
      TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSN(I))                0166500
      TAUN(I)=-TMULT*UEFF                                               0166600
      DITERM=DEN(I,J)*(CMU**.75)*SQRTK*ALOG(ELOG*YPLUSN(I))/(CAPPA*YP)  0166700
      GO TO 609                                                         0166800
  608 TAURX=-VISCOS*UAVG/YP                                             0166900
      TAURW=VISCOS*(-W(I,J)/YP - W(I,J)/Y(J))                           0167000
      TAUN(I)=SQRT(TAURX**2+TAURW**2)                                   0167100
      DITERM=DEN(I,J)*(CMU**.75)*SQRTK*YPLUSN(I)/YP                     0167200
  609 DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+U( 0167300
     4I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                     0167400
      GENCOU=TAUN(I)**2/VIS(I,J)                                        0167500
      GENRES=GEN(I,J)-VIS(I,J)*(DUDY**2+(DWDY-W(I,J)/Y(J))**2)          0167600
      GEN(I,J)=GENRES+GENCOU                                            0167700
      SU(I,J)=GEN(I,J)*VOL+SUKD(I,J)                                    0167800
      SP(I,J)=-DITERM*VOL+SPKD(I,J)                                     0167900
      AN(I,J)=0.0                                                       0168000
```

```
  610 CONTINUE                                                          0168100
      TAUN(NI)=TAUN(NIM1)                                               0168200
C---------SIDE WALL                                                    0168300
      IF(JSTEP .EQ. NJM1) GO TO 614                                     0168400
      DO 625 I=2,NIM1                                                   0168500
      IF(JMAX(I-1) .GE. JMAX(I)) GO TO 625                              0168600
      JJ=JMAXP1(I-1)                                                    0168700
      JI=JMAX(I)                                                        0168800
      DO 620 J=JJ,JI                                                    0168900
      DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))                        0169000
      VAVG=V(I,J)*WFN(J)+(1.-WFN(J))*V(I,J+1)                           0169100
      VEFF=SQRT(VAVG*VAVG + W(I,J)*W(I,J))                              0169200
      XP=X(I)-XU(I)                                                     0169300
      DENV=DEN(I,J)                                                     0169400
      SQRTK=SQRT(TE(I,J))                                               0169500
      VOL=RCV(J)*SNS(J)*SEW(I)                                          0169600
      XPLUSW(J)=DENV*SQRTK*CDTERM*XP/VISCOS                             0169700
      IF(XPLUSW(J) .LE. 11.63) GO TO 621                                0169800
      TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSW(J))                0169900
      TAUW(J)=-TMULT*VEFF                                               0170000
      DITERM=DEN(I,J)*(CMU**.75)*SQRTK*ALOG(ELOG*XPLUSW(J))/(CAPPA*XP)  0170100
      GO TO 622                                                         0170200
  621 TAUXR=VISCOS*VAVG/XP                                              0170300
      TAUXW=VISCOS*W(I,J)/XP                                            0170400
      TAUW(J)=SQRT(TAUXR**2+TAUXW**2)                                   0170500
      DITERM=DEN(I,J)*(CMU**.75)*SQRTK*XPLUSW(J)/XP                     0170600
  622 DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V( 0170700
     3I-1,J)+V(I-1,J+1))/4.)/SEW(I)                                     0170800
      GENCOU=TAUW(J)**2/VIS(I,J)                                        0170900
      GENRES=GEN(I,J)-VIS(I,J)*(DVDX**2+DWDX**2)                        0171000
      GEN(I,J)=GENRES+GENCOU                                            0171100
      SU(I,J)=SU(I,J)+SUKD(I,J)+GEN(I,J)*VOL                            0171200
      SP(I,J)=SP(I,J)+SPKD(I,J)-DITERM*VOL                              0171300
      AW(I,J)=0.0                                                       0171400
  620 CONTINUE                                                          0171500
  625 CONTINUE                                                          0171600
      TAUW(NJ)=TAUW(NJM1)                                               0171700
C---------SYMMETRY AXIS                                                0171800
  614 CONTINUE                                                          0171900
      J=2                                                               0172000
      DO 630 I=2,NIM1                                                   0172100
      DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+  0172200
     3U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                   0172300
      VOL=RCV(J)*SNS(J)*SEW(I)                                          0172400
      GEN(I,J)=GEN(I,J)-VIS(I,J)*DUDY**2                                0172500
      SU(I,J)=SUKD(I,J)+GEN(I,J)*VOL                                    0172600
  630 AS(I,2)=0.0                                                       0172700
C---------OUTLET                                                       0172800
      DO 640 J=2,NJM1                                                   0172900
      AE(NIM1,J)=0.0                                                    0173000
  640 CONTINUE                                                          0173100
      RETURN                                                            0173200
C                                                                       0173300
CHAPTER  7  7  7  7  7  7  7  7  DISSIPATION  7  7  7  7  7  7  7  7  7  0173400
C                                                                       0173500
    7 CONTINUE                                                          0173600
C---------TOP WALL                                                     0173700
      DO 710 I=2,NIM1                                                   0173800
      J=JMAX(I)                                                         0173900
      YP=YV(J+1)-Y(J)                                                   0174000
```

```
      TERM=(CMU**.75)/(CAPPA*YP)                                        0174100
      SU(I,J)=GREAT*TERM*TE(I,J)**1.5                                   0174200
  710 SP(I,J)=-GREAT                                                    0174300
C---------SIDE WALL                                                    0174400
      IF(JSTEP .EQ. NJM1) GO TO 714                                     0174500
      DO 725 I=2,NIM1                                                   0174600
      IF(JMAX(I-1) .GE. JMAX(I)) GO TO 725                              0174700
      JJ=JMAXP1(I-1)                                                    0174800
      JI=JMAX(I)                                                        0174900
      DO 720 J=JJ,JI                                                    0175000
      IF(J .EQ. JMAX(I)) GO TO 720                                      0175100
      XP=X(I)-XU(I)                                                     0175200
      TERM=(CMU**.75)/(CAPPA*XP)                                        0175300
      SU(I,J)=GREAT*TERM*TE(I,J)**1.5                                   0175400
      SP(I,J)=-GREAT                                                    0175500
  720 CONTINUE                                                          0175600
  725 CONTINUE                                                          0175700
C---------SYMMETRY  AXIS                                               0175800
  714 CONTINUE                                                          0175900
      DO  730  I=2,NIM1                                                 0176000
  730 AS(I,2)=0.0                                                       0176100
C---------OUTLET                                                       0176200
      DO 740 J=2,NJM1                                                   0176300
      AE(NIM1,J)=0.0                                                    0176400
  740 CONTINUE                                                          0176500
      RETURN                                                            0176600
C                                                                       0176700
CHAPTER 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 0176800
C     SWIRL VELOCITY                                                    0176900
C                                                                       0177000
    8 CONTINUE                                                          0177100
C---------TOP WALL                                                     0177200
      CDTERM=CMU**0.25                                                  0177300
      DO 810 I=2,NIM1                                                   0177400
      J=JMAX(I)                                                         0177500
      YP=YV(J+1)-Y(J)                                                   0177600
      SQRTK=SQRT(TE(I,J))                                               0177700
      DENW=DEN(I,J)                                                     0177800
      YPLUSA=YPLUSN(I)                                                  0177900
      IF(YPLUSA .LE. 11.63) GO TO 811                                   0178000
      TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)-VIS(I,J)/R(J)     0178100
      GO TO 812                                                         0178200
  811 TMULT=VISCOS/YP                                                   0178300
  812 SP(I,J)=SP(I,J)-TMULT*SEW(I)*RV(J+1)                              0178400
      AN(I,J)=0.0                                                       0178500
  810 CONTINUE                                                          0178600
C---------SIDE WALL                                                    0178700
      IF(JSTEP .EQ. NJM1) GO TO 814                                     0178800
      DO 855 I=2,NIM1                                                   0178900
      IF(JMAX(I-1) .GE. JMAX(I)) GO TO 855                              0179000
      JJ=JMAXP1(I-1)                                                    0179100
      JI=JMAX(I)                                                        0179200
      DO 850 J=JJ,JI                                                    0179300
      XP=X(I)-XU(I)                                                     0179400
      SQRTK=SQRT(TE(I,J))                                               0179500
      DENW=DEN(I,J)                                                     0179600
      XPLUSA=XPLUSW(J)                                                  0179700
      IF(XPLUSA .LE. 11.63) GO TO 851                                   0179800
      TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)                   0179900
      GO TO 852                                                         0180000
```

```
851   TMULT=VISCOS/XP                                                        0180100
  852 SP(I,J)=SP(I,J)-TMULT*SNS(J)*RCV(J)                                    0180200
      AW(I,J)=0.                                                             0180300
  850 CONTINUE                                                               0180400
  855 CONTINUE                                                               0180500
C---------SYMMETRY AXIS                                                     0180600
  814 CONTINUE                                                               0180700
C---------FIX W FOR SOLID BODY ROTATION AT J=2 USING W AT J=3               0180800
      DO 860 I=2,NIM1                                                        0180900
      TERM=W(I,3)*R(2)/R(3)                                                  0181000
      SU(I,2)=GREAT*TERM                                                     0181100
  860 SP(I,2)=-GREAT                                                         0181200
C---------OUTLET                                                           0181300
      DO 870  J=2,NJM1                                                       0181400
870   AE(NIM1,J)=0.                                                          0181500
      RETURN                                                                 0181600
      END                                                                    0181700
C                                                                            0181800
C--------------------------------------------------------------------        0181900
C                                                                            0182000
      SUBROUTINE STRMFN                                                      0182100
CA*************************************************************************** 0182200
C                                                                            0182300
CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0      0182400
C                                                                            0182500
      COMMON                                                                 0182600
     1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                   0182700
     */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),     0182800
     *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),             0182900
     *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)     0183000
     #,VISTAR(48,24)                                                         0183100
     1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                   0183200
     1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),          0183300
     1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                     0183400
     #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),            0183500
     #YND(24),YVND(24)                                                       0183600
     1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                  0183700
     2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1      0183800
     1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT               0183900
      LOGICAL INPLOT                                                         0184000
C                                                                            0184100
CHAPTER 1 1 1 1 1 CALCULATE STREAM FCN BASED ON VOLUMETRIC FLOW              0184200
C                                                                            0184300
C                                                                            0184400
      Q=UIN*(RSMALL**2)/2.                                                   0184500
      DO 400 I=2,NI                                                          0184600
      IF(JMAX(I-1) .LT. 5) GO TO 400                                         0184700
      STFN(I,2)=(Y(2)*R(2)*U(I,2)*.5)/Q                                      0184800
      JJ=JMAX(I-1)                                                           0184900
      DO 200 J=3,JJ                                                          0185000
      STFN(I,J)=STFN(I,J-1)+SNSV(J)*(R(J-1)*U(I,J-1)+R(J)*U(I,J))*.5/Q       0185100
  200 CONTINUE                                                               0185200
  400 CONTINUE                                                               0185300
C                                                                            0185400
      DO 800 I=2,NI                                                          0185500
      IJ=JMAXP1(I-1)                                                         0185600
      DO 700 K=1,NSTLN                                                       0185700
      AK=K-1                                                                 0185800
      STVAL(K)=AK*.1                                                         0185900
      JJ=JMAX(I-1)                                                           0186000
```

```
      DO 600 J=2,JJ                                                     0186100
      IF(STFN(I,J) .GE. STVAL(K)) GO TO 650                             0186200
  600 CONTINUE                                                          0186300
      YSTLN(I,K)=RV(IJ)                                                 0186400
      GO TO 670                                                         0186500
  650 IF(J .EQ. 2) YSTLN(I,K)=0.0                                       0186600
      IF(J .EQ. 2) GO TO 670                                            0186700
      SLOPE=(STVAL(K)-STFN(I,J-1))/(STFN(I,J)-STFN(I,J-1))              0186800
      YSTLN(I,K)=Y(J-1)+SLOPE*(Y(J)-Y(J-1))                             0186900
  670 CONTINUE                                                          0187000
      YSTLND(I,K)=YSTLN(I,K)/(2.*RLARGE)                                0187100
  700 CONTINUE                                                          0187200
  800 CONTINUE                                                          0187300
      IF(.NOT. INPLOT) GO TO 745                                        0187400
      N=0                                                               0187500
      DO 730 K=1,11,2                                                   0187600
      N=N+1                                                             0187700
      DO 730 I=1,NIM1                                                   0187800
      YSLPLT(N,I)=YSTLND(I+1,K)                                         0187900
  730 CONTINUE                                                          0188000
      DO 740 I=1,NIM1                                                   0188100
      XUDPLT(I)=XUND(I+1)                                               0188200
  740 CONTINUE                                                          0188300
  745 NPTS=NIM1                                                         0188400
      RETURN                                                            0188500
      END                                                               0188600
C                                                                       0188700
C                                                                       0188800
      SUBROUTINE PLOT  (X,IDIM,IMAX,XAXIS,Y,JDIM,JMAX,YAXES,SYMB L,LA)  0188900
CA*************************************************************** 0189000
C                                                                       0189100
C  SUBROUTINE FOR PLOTTING J CURVES OF Y(J,I) AGAINST X(I).             0189200
C                                                                       0189300
C  X AND Y ARE ASSUMED TO BE IN ANY RANGE EXCEPT THAT NEGATIVE VALUES  * 0189400
C   ARE PLOTTED AS ZERO.                                               * 0189500
C  X AND Y ARE SCALED TO THE RANGE 0. TO 1. BY DIVISION BY THE MAXIMA, * 0189600
C   WHICH ARE ALSO PRINTED.                                             0189700
C  IDIM IS THE VARIABLE DIMENSION FOR X.                                0189800
C  IMAX IS THE NUMBER OF X VALUES.                                      0189900
C  XAXIS STORES THE NAME OF THE X-AXIS.                                 0190000
C  JDIM IS THE VARIABLE DIMENSION FOR Y.                                0190100
C  JMAX IS THE NUMBER OF CURVES TO BE PLOTTED, (UP TO 10).              0190200
C  THE ARRAY YAXES(J) STORES THE NAMES OF THE CURVES.                   0190300
C  THE ARRAY SYMBOL(J) STORES THE SINGLE CHARACTERS USED FOR PLOTTING. * 0190400
C                                                                       0190500
CA*************************************************************** 0190600
      DIMENSION X(IDIM),Y(JDIM,IDIM),YAXES(JDIM),SYMB L(JDIM),          0190700
     1 A(101),YMAX(10)                                                  0190800
      DATA  DOT,CROSS,BLANK/1H.,1H+,1H /                                0190900
C---------SCALING X ARRAY TO THE RANGE 0 TO 50                          0191000
      XMAX=1.E-30                                                       0191100
      DO 1 I=1,IMAX                                                     0191200
       IF(X(I).GT.XMAX) XMAX=X(I)                                       0191300
    1 CONTINUE                                                          0191400
      DO 2 I=1,IMAX                                                     0191500
      X(I)=X(I)/XMAX*50.                                                0191600
       IF(X(I).LT.0.) X(I)=0.                                           0191700
    2 CONTINUE                                                          0191800
C---------SCALING Y ARRAY TO THE RANGE 0 TO 100                         0191900
      DO 3 J=1,JMAX                                                     0192000
```

```
      YMAX(J)=1.E-30                                                    0192100
      DO 4 I=1,IMAX                                                     0192200
       IF(Y(J,I).GT.YMAX(J)) YMAX(J)=Y(J,I)                             0192300
    4 CONTINUE                                                          0192400
      DO 3 I=1,IMAX                                                     0192500
C        NO Y  SCALING                                                  0192600
      Y(J,I)=Y(J,I)*100.0                                               0192700
      IF(LA.EQ.1) Y(J,I)=0.02*Y(J,I)                                    0192800
       IF(Y(J,I).LT.0.) Y(J,I)=0.                                       0192900
    3 CONTINUE                                                          0193000
C---------IDENTIFYING THE VARIOUS CURVES TO BE PLOTTED                  0193100
      WRITE(6,103) XAXIS                                                0193200
      WRITE(6,100) (YAXES(I),I=1,JMAX)                                  0193300
      WRITE(6,106) (SYMB L(I),I=1,JMAX)                                 0193400
      WRITE(6,102) (YMAX(I),I=1,JMAX)                                   0193500
      DO 5 I=1,11                                                       0193600
    5  A(I)=0.1*     (I-1)                                            0193700
      IF(LA .EQ. 1) WRITE(6,120)                                        0193800
      IF(LA .EQ. 0) WRITE(6,115)                                        0193900
      WRITE(6,101) (A(I),I=1,11)                                        0194000
C---------MAIN LOOP.  EACH PASS PRODUCES AN X-CONSTANT LINE.            0194100
      DO 40 II=1,51                                                     0194200
      I=II                                                              0194300
      IF(I.EQ.1.OR.I.EQ.51) GO TO 32                                    0194400
      GO TO 33                                                          0194500
C---------ALLOCATE . OR + AS MARKER ON THE Y-AXIS                       0194600
   32 DO 30 K=1,101                                                     0194700
   30 A(K)=DOT                                                          0194800
      DO 31 K=11,101,10                                                 0194900
   31 A(K)=CROSS                                                        0195000
C---------ALLOCATE . OR + MARK ON THE X-AXIS, ALSO THE APPROPRIATE      0195100
C---------     X VALUE                                                 0195200
   33 A(1)=DOT                                                          0195300
      A(101)=DOT                                                        0195400
      K=I-1                                                             0195500
   46 K=K-5                                                             0195600
      IF(K)48,47,46                                                     0195700
   47 A(1)=CROSS                                                        0195800
      A(101)=CROSS                                                      0195900
   48 XL=0.02*     (I-1)                                                0196000
C---------CHECK IF ANY Y( X(I) ) VALUE LIES ON THIS X-CONSTANT LINE     0196100
C---------IF YES GO TO 41, OTHERWISE GO TO 42                           0196200
      DO 43 K=1,IMAX                                                    0196300
      IFIX=X(K)+1.5                                                     0196400
      IF(IFIX-I)43,41,43                                                0196500
C---------LOCATE  Y(  X(I)  )                                           0196600
   41 DO 44 J=1,JMAX                                                    0196700
      NY=Y(J,K)+1.5                                                     0196800
      A(NY)=SYMB L(J)                                                   0196900
   44 CONTINUE                                                          0197000
      GO TO 42                                                          0197100
   43 CONTINUE                                                          0197200
C---------PRINT X-CONSTANT LINE                                         0197300
  42  CONTINUE                                                          0197400
      IF(LA.EQ.1) GO TO 51                                              0197500
      WRITE(6,105) XL,(A(K),K=1,101),XL                                 0197600
      GO TO 52                                                          0197700
  51  WRITE(6,107) XL,(A(K),K=1,101),XL                                 0197800
  52  CONTINUE                                                          0197900
C---------PUTTING BLANKS INTO X-CONSTANT LINE                           0198000
```

```
      DO 49 K=1,101                                                     0198100
   49 A(K)=BLANK                                                        0198200
   40 CONTINUE                                                          0198300
      DO 50 I=1,11                                                      0198400
   50 A(I)=.1*     (I-1)                                               0198500
      WRITE(6,104)(A(I),I=1,11)                                         0198600
      WRITE(6,130)                                                      0198700
      RETURN                                                            0198800
  100 FORMAT(11H Y-AXES ARE,5X,10(1X,A10))                              0198900
  101 FORMAT(1H0,2X,11F10.1)                                            0199000
  102 FORMAT(15H MAXIMUM VALUES,  10E11.3)                              0199100
  103 FORMAT(11H1X-AXIS IS ,A3)                                         0199200
  104 FORMAT(3X,11F10.1)                                                0199300
  105 FORMAT(2H X,F6.2,3X,101A1,F6.2)                                   0199400
  106 FORMAT(7H SYMBOL,11X,10(1X,A10))                                  0199500
  107 FORMAT(/2H X,F6.2,3X,101A1,F6.2)                                  0199600
  115 FORMAT(//,T50,'RADIAL POSITION R/D',/)                            0199700
  120 FORMAT(//,T50,'RADIAL POSITION 2R/D',/)                           0199800
  130 FORMAT(///,T45,'DIMENSIONLESS STREAMLINE PLOT')                   0199900
      RETURN                                                            0200000
      END                                                               0200100
                  U   VELOCITY                                          0200600
                  V   VELOCITY                                          0200700
                    W VELOCITY                                          0200800
                   PRESSURE                                             0200900
                TEMPERATURE                                             0201000
              TURBULENCE  ENERGY                                        0201100
            TURBULENCE  DISSIPATION                                     0201200
                   VISCOSITY                                            0201300
      DIMENSIONLESS LENGTH SCALE                                        0201400
      DIMENSIONLESS STREAM FUNCTION                                     0201500
    RADIAL COORDINATE OF STREAMLINES                                    0201600
     DIMENSIONLESS U VELOCITY                                           0201700
    DIMENSIONLESS V VELOCITY                                            0201800
    DIMENSIONLESS W VELOCITY                                            0201900
    DIMENSIONLESS PRESSURE                                              0202000
    DIMENSIONLESS TURBULENCE ENERGY                                     0202100
    DIMENSIONLESS STREAMLINE COORDS                                     0202200
     DIMENSIONLESS EFF. VISCOSITY                                       0202300
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1

AXISYMMETRIC,ISOTHERMAL, GT COMBUSTOR FLOWFIELD SIMULATION
USING THE STAIRSTEP APPROXIMATION FOR THE SLOPING EXPANSION WALL
AND THE K-E TURBULENCE MODEL

EXPANSION ANGLE(DEG.) =	4.479E 01
INLET RADIUS(M) =	3.125E-02
COMBUSTOR RADIUS(M) =	6.250E-02
COMBUSTOR LENGTH(M) =	5.004E-01
INLET REYNOLDS NO.(USING DIAM.) =	1.261E 05
LAMINAR VISCOSITY(KG/M/SEC) =	1.800E-05
DENSITY(KG/CU. M) =	1.211E 00

U VELOCITY

I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
J Y												
21 0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.06187	0.00	0.00	0.00	0.00	0.00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
19 0.05937	0.00	0.00	0.00	0.00	0.00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
18 0.05594	0.00	0.00	0.00	0.00	0.00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
17 0.05344	0.00	0.00	0.00	0.00	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
16 0.05078	0.00	0.00	0.00	0.00	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
15 0.04812	0.00	0.00	0.00	0.00	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
14 0.04562	0.00	0.00	0.00	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
13 0.04328	0.00	0.00	0.00	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
12 0.04094	0.00	0.00	0.00	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
11 0.03719	0.00	0.00	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
10 0.03437	0.00	0.00	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
9 0.03219	0.00	0.00	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
8 0.03031	0.00	3.00E 01	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
7 0.02687	0.00	3.00E 01	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
6 0.02187	0.00	3.00E 01	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
5 0.01625	0.00	3.00E 01	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00
4 0.01062	0.00	3.00E 01	1.92E 01	1.33E 01	9.80E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00	7.50E 00

99	0.3567E 00	0.3344E-01	0.5000E-02	0.4762E-02	0.2128E-01	0.8849E 08	0.1188E 02	-0.5459E-01	0.0000	0.1809E 03	0.7885E 03
100	0.3505E 00	0.3331E-01	0.5000E-02	0.4726E-02	0.2044E-01	0.8344E 08	0.1179E 02	-0.5325E-01	0.0000	0.1818E 03	0.7998E 03
101	0.3442E 00	0.3257E-01	0.5000E-02	0.4422E-02	0.1976E-01	0.7834E 08	0.1170E 02	-0.5194E-01	0.0000	0.1827E 03	0.8100E 03
102	0.3379E 00	0.3240E-01	0.5000E-02	0.4415E-02	0.1923E-01	0.7353E 08	0.1162E 02	-0.5067E-01	0.0000	0.1835E 03	0.8193E 03
103	0.3315E 00	0.3167E-01	0.5000E-02	0.4156E-02	0.1882E-01	0.6939E 08	0.1153E 02	-0.4942E-01	0.0000	0.1843E 03	0.8276E 03
104	0.3250E 00	0.3147E-01	0.5000E-02	0.4164E-02	0.1850E-01	0.6523E 08	0.1145E 02	-0.4820E-01	0.0000	0.1851E 03	0.8350E 03
105	0.3184E 00	0.3075E-01	0.5000E-02	0.3932E-02	0.1827E-01	0.6172E 08	0.1137E 02	-0.4701E-01	0.0000	0.1859E 03	0.8415E 03
106	0.3118E 00	0.3052E-01	0.5000E-02	0.3931E-02	0.1812E-01	0.5834E 08	0.1129E 02	-0.4585E-01	0.0000	0.1867E 03	0.8472E 03
107	0.3051E 00	0.2982E-01	0.5000E-02	0.3715E-02	0.1804E-01	0.5489E 08	0.1122E 02	-0.4471E-01	0.0000	0.1874E 03	0.8520E 03
108	0.2985E 00	0.2956E-01	0.5000E-02	0.3685E-02	0.1804E-01	0.5172E 08	0.1114E 02	-0.4360E-01	0.0000	0.1882E 03	0.8560E 03
109	0.2917E 00	0.2887E-01	0.5000E-02	0.3471E-02	0.1809E-01	0.4902E 08	0.1107E 02	-0.4251E-01	0.0000	0.1889E 03	0.8593E 03
110	0.2851E 00	0.2858E-01	0.5000E-02	0.3432E-02	0.1816E-01	0.4596E 08	0.1100E 02	-0.4144E-01	0.0000	0.1896E 03	0.8619E 03
111	0.2783E 00	0.2790E-01	0.5000E-02	0.3216E-02	0.1826E-01	0.4337E 08	0.1093E 02	-0.4040E-01	0.0000	0.1902E 03	0.8638E 03
112	0.2717E 00	0.2760E-01	0.5000E-02	0.3182E-02	0.1838E-01	0.4008E 08	0.1086E 02	-0.3937E-01	0.0000	0.1907E 03	0.8651E 03
113	0.2650E 00	0.2692E-01	0.5000E-02	0.2982E-02	0.1853E-01	0.3751E 08	0.1080E 02	-0.3837E-01	0.0000	0.1913E 03	0.8657E 03
114	0.2584E 00	0.2661E-01	0.5000E-02	0.2954E-02	0.1868E-01	0.3483E 08	0.1073E 02	-0.3739E-01	0.0000	0.1918E 03	0.8657E 03
115	0.2518E 00	0.2594E-01	0.5000E-02	0.2777E-02	0.1886E-01	0.3254E 08	0.1067E 02	-0.3643E-01	0.0000	0.1923E 03	0.8652E 03
116	0.2452E 00	0.2561E-01	0.5000E-02	0.2750E-02	0.1902E-01	0.3062E 08	0.1061E 02	-0.3549E-01	0.0000	0.1928E 03	0.8641E 03
117	0.2387E 00	0.2495E-01	0.5000E-02	0.2593E-02	0.1917E-01	0.2871E 08	0.1055E 02	-0.3456E-01	0.0000	0.1932E 03	0.8626E 03
118	0.2322E 00	0.2461E-01	0.5000E-02	0.2567E-02	0.1932E-01	0.2768E 08	0.1049E 02	-0.3366E-01	0.0000	0.1937E 03	0.8606E 03
119	0.2258E 00	0.2397E-01	0.5000E-02	0.2421E-02	0.1945E-01	0.2610E 08	0.1043E 02	-0.3277E-01	0.0000	0.1941E 03	0.8582E 03
120	0.2195E 00	0.2362E-01	0.5000E-02	0.2385E-02	0.1955E-01	0.2490E 08	0.1038E 02	-0.3190E-01	0.0000	0.1946E 03	0.8553E 03
121	0.2132E 00	0.2298E-01	0.5000E-02	0.2246E-02	0.1964E-01	0.2378E 08	0.1033E 02	-0.3105E-01	0.0000	0.1949E 03	0.8521E 03
122	0.2070E 00	0.2263E-01	0.5000E-02	0.2212E-02	0.1971E-01	0.2300E 08	0.1027E 02	-0.3021E-01	0.0000	0.1953E 03	0.8485E 03
123	0.2009E 00	0.2201E-01	0.5000E-02	0.2076E-02	0.1976E-01	0.2204E 08	0.1022E 02	-0.2939E-01	0.0000	0.1957E 03	0.8446E 03
124	0.1949E 00	0.2166E-01	0.5000E-02	0.2042E-02	0.1980E-01	0.2158E 08	0.1017E 02	-0.2859E-01	0.0000	0.1960E 03	0.8404E 03
125	0.1889E 00	0.2104E-01	0.5000E-02	0.1911E-02	0.1982E-01	0.2045E 08	0.1012E 02	-0.2780E-01	0.0000	0.1963E 03	0.8359E 03
126	0.1831E 00	0.2068E-01	0.5000E-02	0.1885E-02	0.1982E-01	0.1980E 08	0.1008E 02	-0.2703E-01	0.0000	0.1966E 03	0.8312E 03
127	0.1773E 00	0.2008E-01	0.5000E-02	0.1766E-02	0.1979E-01	0.1916E 08	0.1003E 02	-0.2627E-01	0.0000	0.1969E 03	0.8262E 03
128	0.1717E 00	0.1972E-01	0.5000E-02	0.1737E-02	0.1974E-01	0.1847E 08	0.9985E 01	-0.2553E-01	0.0000	0.1972E 03	0.8210E 03
129	0.1661E 00	0.1914E-01	0.5000E-02	0.1636E-02	0.1966E-01	0.1780E 08	0.9941E 01	-0.2481E-01	0.0000	0.1974E 03	0.8156E 03
130	0.1607E 00	0.1878E-01	0.5000E-02	0.1604E-02	0.1957E-01	0.1749E 08	0.9898E 01	-0.2409E-01	0.0000	0.1977E 03	0.8100E 03
131	0.1553E 00	0.1821E-01	0.5000E-02	0.1507E-02	0.1947E-01	0.1680E 08	0.9857E 01	-0.2340E-01	0.0000	0.1979E 03	0.8042E 03
132	0.1501E 00	0.1785E-01	0.5000E-02	0.1479E-02	0.1934E-01	0.1653E 08	0.9816E 01	-0.2271E-01	0.0000	0.1981E 03	0.7983E 03
133	0.1449E 00	0.1730E-01	0.5000E-02	0.1390E-02	0.1919E-01	0.1595E 08	0.9777E 01	-0.2204E-01	0.0000	0.1983E 03	0.7923E 03
134	0.1399E 00	0.1694E-01	0.5000E-02	0.1360E-02	0.1903E-01	0.1541E 08	0.9738E 01	-0.2138E-01	0.0000	0.1985E 03	0.7862E 03
135	0.1350E 00	0.1640E-01	0.5000E-02	0.1275E-02	0.1885E-01	0.1501E 08	0.9701E 01	-0.2074E-01	0.0000	0.1987E 03	0.7800E 03
136	0.1302E 00	0.1605E-01	0.5000E-02	0.1250E-02	0.1866E-01	0.1482E 08	0.9665E 01	-0.2011E-01	0.0000	0.1989E 03	0.7737E 03
137	0.1255E 00	0.1552E-01	0.5000E-02	0.1166E-02	0.1844E-01	0.1440E 08	0.9630E 01	-0.1949E-01	0.0000	0.1991E 03	0.7673E 03
138	0.1209E 00	0.1518E-01	0.5000E-02	0.1145E-02	0.1822E-01	0.1429E 08	0.9595E 01	-0.1889E-01	0.0000	0.1992E 03	0.7608E 03
139	0.1164E 00	0.1467E-01	0.5000E-02	0.1069E-02	0.1798E-01	0.1385E 08	0.9562E 01	-0.1830E-01	0.0000	0.1994E 03	0.7544E 03
140	0.1120E 00	0.1433E-01	0.5000E-02	0.1045E-02	0.1773E-01	0.1346E 08	0.9529E 01	-0.1772E-01	0.0000	0.1995E 03	0.7478E 03
141	0.1077E 00	0.1383E-01	0.5000E-02	0.9787E-03	0.1747E-01	0.1316E 08	0.9498E 01	-0.1715E-01	0.0000	0.1996E 03	0.7413E 03
142	0.1036E 00	0.1350E-01	0.5000E-02	0.9535E-03	0.1720E-01	0.1300E 08	0.9467E 01	-0.1659E-01	0.0000	0.1998E 03	0.7348E 03
143	0.9953E-01	0.1303E-01	0.5000E-02	0.8928E-03	0.1692E-01	0.1263E 08	0.9438E 01	-0.1605E-01	0.0000	0.1999E 03	0.7282E 03
144	0.9561E-01	0.1270E-01	0.5000E-02	0.8723E-03	0.1663E-01	0.1251E 08	0.9409E 01	-0.1552E-01	0.0000	0.2000E 03	0.7217E 03
145	0.9178E-01	0.1224E-01	0.5000E-02	0.8168E-03	0.1634E-01	0.1212E 08	0.9381E 01	-0.1500E-01	0.0000	0.2001E 03	0.7151E 03
146	0.8808E-01	0.1192E-01	0.5000E-02	0.7946E-03	0.1604E-01	0.1186E 08	0.9353E 01	-0.1449E-01	0.0000	0.2002E 03	0.7086E 03
147	0.8446E-01	0.1148E-01	0.5000E-02	0.7415E-03	0.1573E-01	0.1182E 08	0.9327E 01	-0.1399E-01	0.0000	0.2002E 03	0.7021E 03
148	0.8097E-01	0.1116E-01	0.5000E-02	0.7234E-03	0.1541E-01	0.1136E 08	0.9301E 01	-0.1350E-01	0.0000	0.2003E 03	0.6957E 03
149	0.7757E-01	0.1074E-01	0.5000E-02	0.6720E-03	0.1509E-01	0.1121E 08	0.9277E 01	-0.1303E-01	0.0000	0.2004E 03	0.6893E 03
150	0.7428E-01	0.1043E-01	0.5000E-02	0.6583E-03	0.1477E-01	0.1075E 08	0.9253E 01	-0.1256E-01	0.0000	0.2005E 03	0.6829E 03
151	0.7108E-01	0.1003E-01	0.5000E-02	0.6040E-03	0.1445E-01	0.1052E 08	0.9229E 01	-0.1211E-01	0.0000	0.2005E 03	0.6766E 03
152	0.6799E-01	0.9733E-02	0.5000E-02	0.5969E-03	0.1412E-01	0.1027E 08	0.9207E 01	-0.1166E-01	0.0000	0.2006E 03	0.6704E 03

13	0.04328	0.00	0.00	1.02E 00	2.09E 00	4.36E 00	7.93E 00	1.22E 01	1.70E 01	2.23E 01	2.81E 01	3.40E 01	3.91E 01	
12	0.04094	0.00	0.00	1.57E 00	4.77E 00	8.22E 00	1.16E 01	1.55E 01	2.01E 01	2.53E 01	3.09E 01	3.67E 01	4.17E 01	
11	0.03719	0.00	2.35E 00	1.13E 01	1.91E 01	2.00E 01	2.06E 01	2.24E 01	2.53E 01	2.93E 01	3.41E 01	3.92E 01	4.38E 01	
10	0.03437	0.00	1.35E 01	4.60E 01	4.08E 01	3.47E 01	3.07E 01	2.93E 01	2.99E 01	3.20E 01	3.53E 01	3.94E 01	4.34E 01	
9	0.03219	0.00	7.34E 01	7.13E 01	5.51E 01	4.23E 01	3.47E 01	3.14E 01	3.09E 01	3.19E 01	3.42E 01	3.74E 01	4.10E 01	
8	0.03031	2.70E 01	1.37E 01	1.23E 01	1.40E 01	1.76E 01	2.18E 01	2.53E 01	2.74E 01	2.85E 01	3.03E 01	3.34E 01	3.72E 01	
7	0.02687	2.70E 01	8.89E 00	4.04E 00	2.28E 00	1.66E 00	1.77E 00	2.65E 00	4.82E 00	8.91E 00	1.46E 01	2.02E 01	2.56E 01	
6	0.02187	2.70E 01	8.89E 00	4.04E 00	2.23E 00	1.41E 00	9.68E-01	7.12E-01	5.79E-01	6.78E-01	1.39E 00	3.83E 00	8.81E 00	
5	0.01625	2.70E 01	8.89E 00	4.04E 00	2.24E 00	1.41E 00	9.69E-01	7.10E-01	5.43E-01	4.28E-01	3.46E-01	3.82E-01	1.13E 00	
4	0.01062	2.70E 01	8.89E 00	4.04E 00	2.24E 00	1.41E 00	9.70E-01	7.10E-01	5.43E-01	4.29E-01	3.47E-01	2.85E-01	2.38E-01	
3	0.00562	2.70E 01	8.89E 00	4.05E 00	2.24E 00	1.41E 00	9.71E-01	7.11E-01	5.43E-01	4.29E-01	3.47E-01	2.85E-01	2.38E-01	
2	0.00156	2.70E 01	8.89E 00	4.05E 00	2.24E 00	1.41E 00	9.71E-01	7.11E-01	5.44E-01	4.29E-01	3.47E-01	2.86E-01	2.38E-01	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.18E 00	2.30E 00	2.27E 00	2.11E 00	1.88E 00	1.63E 00	1.38E 00	1.17E 00	9.87E-01	8.31E-01	2.70E 01
19	0.05937	1.44E 01	1.51E 01	1.47E 01	1.36E 01	1.20E 01	1.02E 01	8.56E 00	7.10E 00	5.88E 00	4.88E 00	2.70E 01
18	0.05594	2.19E 01	2.27E 01	2.21E 01	2.02E 01	1.77E 01	1.51E 01	1.26E 01	1.04E 01	8.57E 00	7.11E 00	2.70E 01
17	0.05344	2.64E 01	2.72E 01	2.63E 01	2.40E 01	2.10E 01	1.78E 01	1.47E 01	1.21E 01	9.98E 00	8.28E 00	2.70E 01
16	0.05078	3.09E 01	3.17E 01	3.05E 01	2.77E 01	2.42E 01	2.04E 01	1.68E 01	1.37E 01	1.13E 01	9.36E 00	2.70E 01
15	0.04812	3.53E 01	3.60E 01	3.44E 01	3.12E 01	2.71E 01	2.28E 01	1.87E 01	1.53E 01	1.25E 01	1.03E 01	2.70E 01
14	0.04562	3.91E 01	3.97E 01	3.79E 01	3.43E 01	2.98E 01	2.50E 01	2.04E 01	1.66E 01	1.35E 01	1.12E 01	2.70E 01
13	0.04328	4.22E 01	4.28E 01	4.08E 01	3.70E 01	3.21E 01	2.69E 01	2.19E 01	1.77E 01	1.44E 01	1.19E 01	2.70E 01
12	0.04094	4.48E 01	4.53E 01	4.33E 01	3.94E 01	3.42E 01	2.87E 01	2.33E 01	1.88E 01	1.53E 01	1.26E 01	2.70E 01
11	0.03719	4.68E 01	4.75E 01	4.58E 01	4.21E 01	3.69E 01	3.11E 01	2.53E 01	2.04E 01	1.65E 01	1.35E 01	2.70E 01
10	0.03437	4.63E 01	4.74E 01	4.63E 01	4.31E 01	3.83E 01	3.25E 01	2.66E 01	2.14E 01	1.73E 01	1.42E 01	2.70E 01
9	0.03219	4.42E 01	4.60E 01	4.57E 01	4.32E 01	3.89E 01	3.33E 01	2.74E 01	2.21E 01	1.78E 01	1.46E 01	2.70E 01
8	0.03031	4.09E 01	4.36E 01	4.43E 01	4.27E 01	3.90E 01	3.37E 01	2.79E 01	2.26E 01	1.83E 01	1.50E 01	2.70E 01
7	0.02687	3.14E 01	3.65E 01	3.98E 01	4.03E 01	3.82E 01	3.39E 01	2.86E 01	2.33E 01	1.89E 01	1.55E 01	2.70E 01
6	0.02187	1.51E 01	2.24E 01	2.91E 01	3.35E 01	3.47E 01	3.28E 01	2.86E 01	2.39E 01	1.95E 01	1.60E 01	2.70E 01
5	0.01625	3.95E 00	9.21E 00	1.63E 01	2.34E 01	2.83E 01	2.96E 01	2.76E 01	2.38E 01	1.98E 01	1.63E 01	2.70E 01
4	0.01062	5.43E-01	2.56E 00	7.26E 00	1.42E 01	2.12E 01	2.56E 01	2.59E 01	2.34E 01	1.98E 01	1.65E 01	2.70E 01
3	0.00562	2.01E-01	4.96E-01	2.90E 00	8.54E 00	1.64E 01	2.27E 01	2.46E 01	2.29E 01	1.98E 01	1.65E 01	2.70E 01
2	0.00156	2.01E-01	1.78E-01	1.34E 00	6.45E 00	1.45E 01	2.15E 01	2.40E 01	2.27E 01	1.97E 01	1.65E 01	2.70E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- TURBULENCE DISSIPATION -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.53E 01	1.34E 02	2.61E 02	4.31E 02	6.56E 02	9.48E 02	1.31E 03	1.70E 03
19	0.05937	0.00	0.00	0.00	0.00	7.37E 01	2.14E 02	3.61E 02	5.62E 02	8.24E 02	1.15E 03	1.52E 03	1.90E 03
18	0.05594	0.00	0.00	0.00	0.00	1.07E 02	2.93E 02	5.10E 02	8.09E 02	1.19E 03	1.65E 03	2.15E 03	2.61E 03
17	0.05344	0.00	0.00	0.00	5.87E 01	1.41E 02	3.44E 02	6.35E 02	1.04E 03	1.56E 03	2.16E 03	2.81E 03	3.35E 03
16	0.05078	0.00	0.00	0.00	7.34E 01	1.69E 02	4.06E 02	8.05E 02	1.37E 03	2.07E 03	2.87E 03	3.69E 03	4.34E 03
15	0.04812	0.00	0.00	0.00	8.67E 01	1.99E 02	5.10E 02	1.07E 03	1.84E 03	2.76E 03	3.78E 03	4.78E 03	5.51E 03
14	0.04562	0.00	0.00	6.04E 01	1.12E 02	2.63E 02	7.47E 02	1.53E 03	2.53E 03	3.67E 03	4.88E 03	6.01E 03	6.76E 03
13	0.04328	0.00	0.00	1.03E 02	1.83E 02	5.41E 02	1.34E 03	2.36E 03	3.55E 03	4.84E 03	6.16E 03	7.33E 03	8.02E 03
12	0.04094	0.00	0.00	1.95E 02	7.03E 02	1.82E 03	2.81E 03	3.91E 03	5.13E 03	6.44E 03	7.73E 03	8.80E 03	9.32E 03
11	0.03719	0.00	7.56E 02	5.14E 03	8.75E 03	8.57E 03	8.24E 03	8.34E 03	8.82E 03	9.54E 03	1.03E 04	1.09E 04	1.10E 04
10	0.03437	0.00	4.95E 03	3.68E 04	3.07E 04	2.33E 04	1.82E 04	1.51E 04	1.34E 04	1.27E 04	1.24E 04	1.22E 04	1.16E 04
9	0.03219	0.00	6.28E 04	8.44E 04	6.07E 04	3.97E 04	2.67E 04	1.96E 04	1.61E 04	1.42E 04	1.30E 04	1.21E 04	1.12E 04

11	0.29750	2.62E 04	3.55E 04	4.48E 04	5.33E 04	6.06E 04	6.63E 04	7.02E 04	7.25E 04	7.37E 04	7.42E 04	0.00	
10	0.27500	2.66E 04	3.58E 04	4.49E 04	5.34E 04	6.07E 04	6.63E 04	7.02E 04	7.25E 04	7.37E 04	7.41E 04	0.00	
9	0.25750	2.69E 04	3.60E 04	4.51E 04	5.35E 04	6.07E 04	6.63E 04	7.02E 04	7.25E 04	7.37E 04	7.40E 04	0.00	
8	0.24250	2.72E 04	3.62E 04	4.53E 04	5.36E 04	6.08E 04	6.63E 04	7.02E 04	7.25E 04	7.37E 04	7.39E 04	0.00	
7	0.21500	2.77E 04	3.67E 04	4.56E 04	5.38E 04	6.09E 04	6.64E 04	7.03E 04	7.25E 04	7.37E 04	7.38E 04	0.00	
6	0.17500	2.83E 04	3.72E 04	4.60E 04	5.42E 04	6.11E 04	6.66E 04	7.03E 04	7.26E 04	7.37E 04	7.36E 04	0.00	
5	0.13000	2.85E 04	3.75E 04	4.63E 04	5.45E 04	6.14E 04	6.67E 04	7.04E 04	7.26E 04	7.37E 04	7.34E 04	0.00	
4	0.08500	2.85E 04	3.75E 04	4.64E 04	5.47E 04	6.16E 04	6.69E 04	7.05E 04	7.27E 04	7.37E 04	7.32E 04	0.00	
3	0.04500	2.85E 04	3.74E 04	4.64E 04	5.47E 04	6.18E 04	6.71E 04	7.06E 04	7.27E 04	7.37E 04	7.31E 04	0.00	
2	0.01250	2.85E 04	3.74E 04	4.64E 04	5.49E 04	6.19E 04	6.72E 04	7.07E 04	7.27E 04	7.37E 04	7.30E 04	0.00	
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- DIMENSIONLESS TURBULENCE ENERGY -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y												
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		0.00	0.00	0.00	0.00	1.30E-04	3.96E-04	6.18E-04	8.64E-04	1.14E-03	1.46E-03	1.81E-03	2.15E-03
19	0.47500		0.00	0.00	0.00	0.00	1.04E-03	2.83E-03	4.17E-03	5.77E-03	7.63E-03	9.75E-03	1.21E-02	1.43E-02
18	0.44750		0.00	0.00	0.00	0.00	1.34E-03	4.09E-03	6.18E-03	8.69E-03	1.16E-02	1.49E-02	1.85E-02	2.18E-02
17	0.42750		0.00	0.00	0.00	3.63E-04	1.96E-03	4.67E-03	7.26E-03	1.04E-02	1.40E-02	1.81E-02	2.24E-02	2.65E-02
16	0.40625		0.00	0.00	0.00	9.71E-04	2.46E-03	5.19E-03	8.32E-03	1.22E-02	1.65E-02	2.14E-02	2.66E-02	3.12E-02
15	0.38500		0.00	0.00	0.00	1.09E-03	2.86E-03	5.78E-03	9.52E-03	1.41E-02	1.92E-02	2.48E-02	3.06E-02	3.58E-02
14	0.36500		0.00	0.00	3.70E-04	1.50E-03	3.40E-03	6.80E-03	1.11E-02	1.63E-02	2.19E-02	2.81E-02	3.44E-02	3.99E-02
13	0.34625		0.00	0.00	1.14E-03	2.33E-03	4.85E-03	8.81E-03	1.35E-02	1.89E-02	2.48E-02	3.12E-02	3.78E-02	4.34E-02
12	0.32750		0.00	0.00	1.74E-03	5.30E-03	9.14E-03	1.29E-02	1.72E-02	2.23E-02	2.81E-02	3.44E-02	4.08E-02	4.63E-02
11	0.29750		0.00	2.62E-03	1.25E-02	2.13E-02	2.22E-02	2.29E-02	2.49E-02	2.81E-02	3.25E-02	3.78E-02	4.36E-02	4.87E-02
10	0.27500		0.00	1.50E-02	5.11E-02	4.54E-02	3.85E-02	3.41E-02	3.25E-02	3.32E-02	3.55E-02	3.93E-02	4.38E-02	4.82E-02
9	0.25750		0.00	8.16E-02	7.92E-02	6.12E-02	4.70E-02	3.86E-02	3.49E-02	3.43E-02	3.55E-02	3.79E-02	4.16E-02	4.56E-02
8	0.24250		3.00E-02	1.53E-02	1.36E-02	1.56E-02	1.96E-02	2.42E-02	2.81E-02	3.04E-02	3.17E-02	3.36E-02	3.71E-02	4.13E-02
7	0.21500		3.00E-02	9.88E-03	4.49E-03	2.53E-03	1.85E-03	1.97E-03	2.94E-03	5.36E-03	9.90E-03	1.62E-02	2.24E-02	2.84E-02
6	0.17500		3.00E-02	9.88E-03	4.49E-03	2.48E-03	1.56E-03	1.08E-03	7.91E-04	6.43E-04	7.53E-04	1.55E-03	4.26E-03	9.79E-03
5	0.13000		3.00E-02	9.88E-03	4.49E-03	2.48E-03	1.56E-03	1.08E-03	7.88E-04	6.03E-04	4.76E-04	3.85E-04	4.25E-04	1.26E-03
4	0.08500		3.00E-02	9.88E-03	4.49E-03	2.49E-03	1.57E-03	1.08E-03	7.89E-04	6.04E-04	4.77E-04	3.85E-04	3.17E-04	2.65E-04
3	0.04500		3.00E-02	9.88E-03	4.49E-03	2.49E-03	1.57E-03	1.08E-03	7.90E-04	6.04E-04	4.77E-04	3.85E-04	3.17E-04	2.65E-04
2	0.01250		3.00E-02	9.88E-03	4.49E-03	2.49E-03	1.57E-03	1.08E-03	7.90E-04	6.04E-04	4.77E-04	3.86E-04	3.17E-04	2.65E-04
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		2.43E-03	2.56E-03	2.52E-03	2.35E-03	2.09E-03	1.81E-03	1.54E-03	1.30E-03	1.10E-03	9.24E-04	3.00E-02
19	0.47500		1.60E-02	1.67E-02	1.64E-02	1.51E-02	1.33E-02	1.14E-02	9.51E-03	7.89E-03	6.54E-03	5.42E-03	3.00E-02
18	0.44750		2.43E-02	2.52E-02	2.45E-02	2.25E-02	1.97E-02	1.68E-02	1.39E-02	1.15E-02	9.52E-03	7.90E-03	3.00E-02
17	0.42750		2.93E-02	3.03E-02	2.92E-02	2.67E-02	2.33E-02	1.98E-02	1.64E-02	1.35E-02	1.11E-02	9.20E-03	3.00E-02
16	0.40625		3.44E-02	3.53E-02	3.39E-02	3.08E-02	2.68E-02	2.26E-02	1.87E-02	1.53E-02	1.25E-02	1.04E-02	3.00E-02
15	0.38500		3.92E-02	4.00E-02	3.83E-02	3.47E-02	3.02E-02	2.53E-02	2.08E-02	1.69E-02	1.39E-02	1.15E-02	3.00E-02
14	0.36500		4.34E-02	4.41E-02	4.21E-02	3.82E-02	3.31E-02	2.78E-02	2.27E-02	1.84E-02	1.50E-02	1.24E-02	3.00E-02
13	0.34625		4.69E-02	4.76E-02	4.54E-02	4.11E-02	3.57E-02	2.99E-02	2.44E-02	1.97E-02	1.60E-02	1.32E-02	3.00E-02
12	0.32750		4.98E-02	5.04E-02	4.81E-02	4.37E-02	3.80E-02	3.18E-02	2.59E-02	2.09E-02	1.70E-02	1.40E-02	3.00E-02
11	0.29750		5.20E-02	5.28E-02	5.09E-02	4.68E-02	4.10E-02	3.45E-02	2.82E-02	2.27E-02	1.83E-02	1.51E-02	3.00E-02
10	0.27500		5.14E-02	5.27E-02	5.15E-02	4.79E-02	4.26E-02	3.61E-02	2.95E-02	2.38E-02	1.92E-02	1.58E-02	3.00E-02
9	0.25750		4.91E-02	5.11E-02	5.08E-02	4.80E-02	4.32E-02	3.70E-02	3.04E-02	2.46E-02	1.98E-02	1.63E-02	3.00E-02
8	0.24250		4.55E-02	4.85E-02	4.93E-02	4.75E-02	4.33E-02	3.75E-02	3.10E-02	2.51E-02	2.03E-02	1.66E-02	3.00E-02
7	0.21500		3.49E-02	4.06E-02	4.42E-02	4.48E-02	4.25E-02	3.77E-02	3.17E-02	2.59E-02	2.10E-02	1.72E-02	3.00E-02

X 1.00 0.....+.....+.....+.....2.+.....+.....4...+.....+.6.....+.....8...+.....1 1.00
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

DIMENSIONLESS STREAMLINE PLOT

OITER NO	I--- ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	---I I--- FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D ---I
1	0.3029E-02	0.6447E-03	0.9868E 00	0.5894E-04	0.2329E-01	0.3545E 11	0.8722E 01	-0.5813E-03	0.2563E-08	0.2010E 03	0.4750E 03
2	0.5488E-02	0.2432E 00	0.9763E 00	0.1732E 00	0.3818E-01	0.5890E 11	0.8720E 01	-0.5188E-03	0.3109E-07	0.7755E 03	0.4732E 03
3	0.1457E 00	0.3522E 00	0.9498E 00	0.2481E 00	0.3747E-01	0.4344E 11	0.8718E 01	-0.4637E-03	0.1972E-06	0.1405E 04	0.4715E 03
4	0.3280E 00	0.4279E 00	0.9113E 00	0.4365E 00	0.4430E-01	0.1527E 11	0.8716E 01	-0.4334E-03	0.8697E-06	0.1719E 04	0.4698E 03
5	0.4778E 00	0.5016E 00	0.8724E 00	0.4410E 00	0.6300E-01	0.1517E 11	0.8714E 01	-0.4706E-03	0.2997E-05	0.1850E 04	0.4682E 03
6	0.6442E 00	0.5617E 00	0.8366E 00	0.6706E 00	0.7683E-01	0.1509E 11	0.8713E 01	-0.6050E-03	0.8595E-05	0.1894E 04	0.4667E 03
7	0.7738E 00	0.6117E 00	0.8133E 00	0.8115E 00	0.9205E-01	0.1024E 11	0.8711E 01	-0.8027E-03	0.2137E-04	0.1862E 04	0.4653E 03
8	0.8779E 00	0.6951E 00	0.7823E 00	0.1347E 01	0.1043E 00	0.5478E 10	0.8710E 01	-0.9868E-03	0.4740E-04	0.1786E 04	0.4639E 03
9	0.9731E 00	0.6582E 00	0.7617E 00	0.1584E 01	0.1177E 00	0.3815E 10	0.8709E 01	-0.1075E-02	0.9590E-04	0.1704E 04	0.4625E 03
10	0.1095E 01	0.7800E 00	0.7880E 00	0.4551E 01	0.1284E 00	0.5636E 10	0.8707E 01	-0.1057E-02	0.1800E-03	0.1622E 04	0.4612E 03
11	0.1238E 01	0.7418E 00	0.7692E 00	0.2557E 01	0.1278E 00	0.4809E 10	0.8706E 01	-0.9721E-03	0.3176E-03	0.1526E 04	0.4599E 03
12	0.1349E 01	0.8058E 00	0.8207E 00	0.3906E 01	0.1260E 00	0.2741E 10	0.8704E 01	-0.8417E-03	0.5325E-03	0.1451E 04	0.4586E 03
13	0.1472E 01	0.9406E 00	0.7405E 00	0.2596E 01	0.1231E 00	0.1276E 10	0.8702E 01	-0.6344E-03	0.8544E-03	0.1449E 04	0.4573E 03
14	0.1392E 01	0.6632E 00	0.7431E 00	0.1909E 01	0.1164E 00	0.3185E 10	0.8700E 01	-0.5685E-03	0.1319E-02	0.1372E 04	0.4560E 03
15	0.1273E 01	0.6962E 00	0.7222E 00	0.1834E 01	0.1197E 00	0.6314E 10	0.8697E 01	-0.5166E-03	0.1964E-02	0.1380E 04	0.4547E 03
16	0.1167E 01	0.5735E 00	0.7127E 00	0.1849E 01	0.1194E 00	0.6994E 10	0.8694E 01	-0.6730E-03	0.2829E-02	0.1405E 04	0.4535E 03
17	0.1082E 01	0.5374E 00	0.7001E 00	0.1612E 01	0.1245E 00	0.6445E 10	0.8691E 01	-0.1004E-02	0.3946E-02	0.1366E 04	0.4523E 03
18	0.1019E 01	0.5202E 00	0.6834E 00	0.1234E 01	0.1293E 00	0.7175E 10	0.8688E 01	-0.1540E-02	0.5341E-02	0.1370E 04	0.4511E 03
19	0.9717E 00	0.3852E 00	0.6718E 00	0.7121E 00	0.1332E 00	0.7542E 10	0.8684E 01	-0.2090E-02	0.7023E-02	0.1319E 04	0.4498E 03
20	0.9476E 00	0.4252E 00	0.6627E 00	0.6301E 00	0.1387E 00	0.8101E 10	0.8680E 01	-0.2702E-02	0.8991E-02	0.1280E 04	0.4485E 03
21	0.9360E 00	0.3482E 00	0.6541E 00	0.4841E 00	0.1395E 00	0.8166E 10	0.8676E 01	-0.3197E-02	0.1123E-01	0.1231E 04	0.4471E 03
22	0.9484E 00	0.3962E 00	0.6458E 00	0.6058E 00	0.1407E 00	0.7614E 10	0.8672E 01	-0.3723E-02	0.1371E-01	0.1177E 04	0.4456E 03
23	0.9545E 00	0.3465E 00	0.6320E 00	0.4842E 00	0.1408E 00	0.6907E 10	0.8667E 01	-0.4170E-02	0.1641E-01	0.1140E 04	0.4439E 03
24	0.9593E 00	0.3840E 00	0.6216E 00	0.4836E 00	0.1396E 00	0.7024E 10	0.8663E 01	-0.4617E-02	0.1929E-01	0.1107E 04	0.4421E 03
25	0.9444E 00	0.3683E 00	0.6103E 00	0.4421E 00	0.1387E 00	0.7020E 10	0.8658E 01	-0.5117E-02	0.2231E-01	0.1093E 04	0.4401E 03
26	0.9276E 00	0.4004E 00	0.6026E 00	0.4157E 00	0.1372E 00	0.6778E 10	0.8653E 01	-0.5579E-02	0.2544E-01	0.1080E 04	0.4380E 03
27	0.9033E 00	0.3671E 00	0.5971E 00	0.3950E 00	0.1362E 00	0.6360E 10	0.8649E 01	-0.6147E-02	0.2866E-01	0.1073E 04	0.4356E 03
28	0.8839E 00	0.3874E 00	0.5909E 00	0.3806E 00	0.1343E 00	0.6029E 10	0.8644E 01	-0.6614E-02	0.3193E-01	0.1062E 04	0.4331E 03
29	0.8645E 00	0.3645E 00	0.5851E 00	0.3662E 00	0.1317E 00	0.5818E 10	0.8639E 01	-0.7226E-02	0.3524E-01	0.1054E 04	0.4304E 03
30	0.8525E 00	0.3842E 00	0.5798E 00	0.3516E 00	0.1283E 00	0.5640E 10	0.8633E 01	-0.7671E-02	0.3857E-01	0.1042E 04	0.4276E 03
31	0.8403E 00	0.3587E 00	0.5756E 00	0.3484E 00	0.1251E 00	0.5537E 10	0.8628E 01	-0.8238E-02	0.4191E-01	0.1029E 04	0.4246E 03
32	0.8317E 00	0.3716E 00	0.5700E 00	0.3453E 00	0.1222E 00	0.5473E 10	0.8622E 01	-0.8585E-02	0.4525E-01	0.1015E 04	0.4214E 03
33	0.8267E 00	0.3390E 00	0.5651E 00	0.3259E 00	0.1189E 00	0.5417E 10	0.8616E 01	-0.9047E-02	0.4860E-01	0.1000E 04	0.4181E 03
34	0.8191E 00	0.3517E 00	0.5609E 00	0.3342E 00	0.1161E 00	0.5517E 10	0.8610E 01	-0.9295E-02	0.5194E-01	0.9863E 03	0.4147E 03
35	0.8107E 00	0.3319E 00	0.5573E 00	0.3279E 00	0.1139E 00	0.5626E 10	0.8603E 01	-0.9660E-02	0.5527E-01	0.9749E 03	0.4111E 03
36	0.8031E 00	0.3474E 00	0.5531E 00	0.3071E 00	0.1138E 00	0.6387E 10	0.8596E 01	-0.9831E-02	0.5860E-01	0.9672E 03	0.4075E 03
37	0.7959E 00	0.3196E 00	0.5485E 00	0.2942E 00	0.1138E 00	0.7340E 10	0.8589E 01	-0.1012E-01	0.6194E-01	0.9647E 03	0.4038E 03
38	0.7837E 00	0.3242E 00	0.5425E 00	0.3022E 00	0.1140E 00	0.7892E 10	0.8581E 01	-0.1024E-01	0.6528E-01	0.9639E 03	0.4000E 03
39	0.7727E 00	0.2954E 00	0.5361E 00	0.2974E 00	0.1135E 00	0.7968E 10	0.8573E 01	-0.1048E-01	0.6864E-01	0.9643E 03	0.3961E 03
40	0.7577E 00	0.3047E 00	0.5311E 00	0.3033E 00	0.1135E 00	0.7678E 10	0.8564E 01	-0.1059E-01	0.7201E-01	0.9654E 03	0.3922E 03
41	0.7495E 00	0.2796E 00	0.5263E 00	0.3061E 00	0.1128E 00	0.6972E 10	0.8555E 01	-0.1079E-01	0.7540E-01	0.9674E 03	0.3882E 03
42	0.7374E 00	0.2737E 00	0.5206E 00	0.2472E 00	0.1117E 00	0.5832E 10	0.8546E 01	-0.1087E-01	0.7883E-01	0.9680E 03	0.3842E 03
43	0.7273E 00	0.2521E 00	0.5162E 00	0.2415E 00	0.1109E 00	0.5224E 10	0.8536E 01	-0.1102E-01	0.8228E-01	0.9670E 03	0.3802E 03
44	0.7167E 00	0.2554E 00	0.5119E 00	0.2301E 00	0.1104E 00	0.4683E 10	0.8526E 01	-0.1107E-01	0.8578E-01	0.9655E 03	0.3762E 03
45	0.7071E 00	0.2290E 00	0.5084E 00	0.2088E 00	0.1095E 00	0.4099E 10	0.8516E 01	-0.1118E-01	0.8933E-01	0.9641E 03	0.3721E 03

```
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00 1.05E 03 1.06E 03 1.05E 03 1.03E 03 1.03E 03 1.03E 03 1.03E 03 1.03E 03
 19 0.05937      0.00     0.00     0.00     0.00 1.04E 03 1.05E 03 1.04E 03 1.03E 03 1.02E 03 1.02E 03 1.03E 03 1.03E 03
 18 0.05594      0.00     0.00     0.00     0.00 1.03E 03 1.04E 03 1.03E 03 1.02E 03 1.01E 03 1.01E 03 1.02E 03 1.02E 03
 17 0.05344      0.00     0.00     0.00 1.00E 03 1.01E 03 1.03E 03 1.02E 03 1.01E 03 1.00E 03 1.01E 03 1.01E 03 1.01E 03
 16 0.05078      0.00     0.00     0.00 9.84E 02 1.00E 03 1.01E 03 1.00E 03 9.95E 02 9.94E 02 9.97E 02 9.99E 02 9.99E 02
 15 0.04812      0.00     0.00     0.00 9.59E 02 9.87E 02 9.94E 02 9.86E 02 9.82E 02 9.84E 02 9.87E 02 9.89E 02 9.88E 02
 14 0.04562      0.00     0.00 8.90E 02 9.34E 02 9.69E 02 9.75E 02 9.70E 02 9.68E 02 9.73E 02 9.77E 02 9.79E 02 9.76E 02
 13 0.04328      0.00     0.00 8.63E 02 9.13E 02 9.48E 02 9.56E 02 9.52E 02 9.54E 02 9.61E 02 9.67E 02 9.67E 02 9.65E 02
 12 0.04094      0.00     0.00 8.21E 02 8.87E 02 9.24E 02 9.33E 02 9.33E 02 9.39E 02 9.49E 02 9.55E 02 9.55E 02 9.52E 02
 11 0.03719      0.00 5.91E 02 7.39E 02 8.43E 02 8.84E 02 8.94E 02 9.00E 02 9.14E 02 9.27E 02 9.32E 02 9.31E 02 9.29E 02
 10 0.03437      0.00 5.10E 02 6.99E 02 8.06E 02 8.50E 02 8.62E 02 8.73E 02 8.93E 02 9.08E 02 9.12E 02 9.12E 02 9.11E 02
  9 0.03219      0.00 4.04E 02 6.76E 02 7.78E 02 8.23E 02 8.36E 02 8.53E 02 8.76E 02 8.91E 02 8.95E 02 8.95E 02 8.96E 02
  8 0.03031      0.00 3.83E 02 6.45E 02 7.53E 02 7.99E 02 8.15E 02 8.35E 02 8.60E 02 8.74E 02 8.79E 02 8.81E 02 8.83E 02
  7 0.02687      0.00 4.38E 02 6.09E 02 7.13E 02 7.58E 02 7.79E 02 8.03E 02 8.28E 02 8.42E 02 8.49E 02 8.54E 02 8.60E 02
  6 0.02187      0.00 4.61E 02 5.73E 02 6.62E 02 7.01E 02 7.22E 02 7.54E 02 7.76E 02 7.91E 02 8.03E 02 8.14E 02 8.26E 02
  5 0.01625      0.00 4.31E 02 5.31E 02 6.07E 02 6.40E 02 6.66E 02 6.94E 02 7.15E 02 7.35E 02 7.54E 02 7.74E 02 7.93E 02
  4 0.01062      0.00 3.34E 02 4.79E 02 5.53E 02 5.92E 02 6.12E 02 6.38E 02 6.62E 02 6.88E 02 7.15E 02 7.42E 02 7.67E 02
  3 0.00562      0.00 1.42E 02 4.42E 02 5.19E 02 5.52E 02 5.76E 02 6.03E 02 6.30E 02 6.60E 02 6.92E 02 7.23E 02 7.52E 02
  2 0.00156      0.00     0.00 4.16E 02 4.87E 02 5.35E 02 5.61E 02 5.89E 02 6.18E 02 6.50E 02 6.83E 02 7.16E 02 7.46E 02
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =    13       14       15       16       17       18       19       20       21       22       23
        X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  1.03E 03 1.03E 03 1.03E 03 1.03E 03 1.03E 03 1.03E 03 1.02E 03 1.02E 03 1.01E 03 1.01E 03     0.00
 19 0.05937  1.03E 03 1.03E 03 1.02E 03 1.02E 03 1.02E 03 1.02E 03 1.01E 03 1.01E 03 1.00E 03 9.99E 02     0.00
 18 0.05594  1.02E 03 1.01E 03 1.01E 03 1.01E 03 1.01E 03 1.00E 03 9.99E 02 9.95E 02 9.91E 02 9.86E 02     0.00
 17 0.05344  1.01E 03 1.00E 03 1.00E 03 9.98E 02 9.95E 02 9.92E 02 9.88E 02 9.85E 02 9.81E 02 9.77E 02     0.00
 16 0.05078  9.96E 02 9.93E 02 9.89E 02 9.86E 02 9.83E 02 9.80E 02 9.77E 02 9.74E 02 9.71E 02 9.68E 02     0.00
 15 0.04812  9.85E 02 9.81E 02 9.78E 02 9.75E 02 9.72E 02 9.69E 02 9.67E 02 9.64E 02 9.62E 02 9.59E 02     0.00
 14 0.04562  9.73E 02 9.70E 02 9.67E 02 9.64E 02 9.61E 02 9.59E 02 9.57E 02 9.55E 02 9.53E 02 9.51E 02     0.00
 13 0.04328  9.61E 02 9.58E 02 9.56E 02 9.54E 02 9.52E 02 9.50E 02 9.48E 02 9.47E 02 9.45E 02 9.44E 02     0.00
 12 0.04094  9.49E 02 9.47E 02 9.45E 02 9.43E 02 9.42E 02 9.41E 02 9.40E 02 9.39E 02 9.38E 02 9.37E 02     0.00
 11 0.03719  9.28E 02 9.27E 02 9.27E 02 9.27E 02 9.27E 02 9.27E 02 9.27E 02 9.27E 02 9.27E 02 9.28E 02     0.00
 10 0.03437  9.11E 02 9.13E 02 9.14E 02 9.15E 02 9.16E 02 9.17E 02 9.18E 02 9.19E 02 9.20E 02 9.21E 02     0.00
  9 0.03219  8.98E 02 9.01E 02 9.04E 02 9.06E 02 9.08E 02 9.10E 02 9.11E 02 9.13E 02 9.14E 02 9.16E 02     0.00
  8 0.03031  8.87E 02 8.91E 02 8.95E 02 8.99E 02 9.01E 02 9.04E 02 9.06E 02 9.08E 02 9.10E 02 9.12E 02     0.00
  7 0.02687  8.67E 02 8.74E 02 8.80E 02 8.85E 02 8.90E 02 8.93E 02 8.97E 02 9.00E 02 9.03E 02 9.06E 02     0.00
  6 0.02187  8.38E 02 8.50E 02 8.60E 02 8.68E 02 8.74E 02 8.80E 02 8.85E 02 8.89E 02 8.93E 02 8.98E 02     0.00
  5 0.01625  8.11E 02 8.27E 02 8.40E 02 8.51E 02 8.60E 02 8.68E 02 8.74E 02 8.80E 02 8.85E 02 8.90E 02     0.00
  4 0.01062  7.89E 02 8.09E 02 8.25E 02 8.39E 02 8.49E 02 8.58E 02 8.66E 02 8.73E 02 8.79E 02 8.85E 02     0.00
  3 0.00562  7.77E 02 7.99E 02 8.17E 02 8.32E 02 8.44E 02 8.53E 02 8.62E 02 8.69E 02 8.76E 02 8.82E 02     0.00
  2 0.00156  7.72E 02 7.95E 02 8.14E 02 8.29E 02 8.41E 02 8.52E 02 8.60E 02 8.68E 02 8.75E 02 8.81E 02     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                       PRESSURE                   -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =     1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00-1.82E-02-2.06E-02 3.51E-03 1.67E-02 2.00E-02 1.92E-02 1.88E-02 2.03E-02
 19 0.05937      0.00     0.00     0.00     0.00-1.52E-02-2.03E-02 3.19E-03 1.57E-02 1.87E-02 1.80E-02 1.76E-02 1.94E-02
 18 0.05594      0.00     0.00     0.00     0.00-8.45E-03-1.82E-02 3.49E-03 1.50E-02 1.73E-02 1.63E-02 1.57E-02 1.77E-02
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16	0.40625	0.00	0.00	0.00	4.93E-01	4.55E-01	4.26E-01	4.12E-01	4.08E-01	4.08E-01	4.07E-01	4.14E-01	4.30E-01
15	0.38500	0.00	0.00	0.00	5.12E-01	4.66E-01	4.31E-01	4.15E-01	4.11E-01	4.11E-01	4.13E-01	4.27E-01	4.43E-01
14	0.36500	0.00	0.00	5.96E-01	5.38E-01	4.77E-01	4.34E-01	4.15E-01	4.12E-01	4.14E-01	4.22E-01	4.43E-01	4.53E-01
13	0.34625	0.00	0.00	6.26E-01	5.57E-01	4.84E-01	4.34E-01	4.14E-01	4.12E-01	4.17E-01	4.37E-01	4.57E-01	4.61E-01
12	0.32750	0.00	0.00	6.49E-01	5.72E-01	4.88E-01	4.32E-01	4.11E-01	4.12E-01	4.27E-01	4.54E-01	4.68E-01	4.65E-01
11	0.29750	0.00	7.90E-01	6.91E-01	5.90E-01	4.90E-01	4.26E-01	4.06E-01	4.17E-01	4.50E-01	4.76E-01	4.79E-01	4.65E-01
10	0.27500	0.00	8.20E-01	7.32E-01	6.05E-01	4.84E-01	4.14E-01	4.01E-01	4.31E-01	4.71E-01	4.86E-01	4.79E-01	4.57E-01
9	0.25750	0.00	8.56E-01	7.55E-01	6.04E-01	4.70E-01	4.01E-01	4.01E-01	4.46E-01	4.82E-01	4.89E-01	4.74E-01	4.48E-01
8	0.24250	1.00E 00	9.09E-01	7.67E-01	5.93E-01	4.52E-01	3.91E-01	4.06E-01	4.59E-01	4.89E-01	4.88E-01	4.66E-01	4.37E-01
7	0.21500	1.00E 00	9.10E-01	7.52E-01	5.64E-01	4.26E-01	3.82E-01	4.24E-01	4.77E-01	4.90E-01	4.74E-01	4.44E-01	4.10E-01
6	0.17500	1.00E 00	8.96E-01	7.10E-01	5.08E-01	3.85E-01	3.84E-01	4.47E-01	4.68E-01	4.57E-01	4.28E-01	3.92E-01	3.58E-01
5	0.13000	1.00E 00	8.65E-01	6.33E-01	4.23E-01	3.50E-01	3.85E-01	4.00E-01	3.97E-01	3.75E-01	3.45E-01	3.12E-01	2.82E-01
4	0.08500	1.00E 00	8.10E-01	5.11E-01	3.25E-01	2.84E-01	2.93E-01	2.92E-01	2.81E-01	2.62E-01	2.38E-01	2.14E-01	1.92E-01
3	0.04500	1.00E 00	7.01E-01	3.39E-01	1.45E-01	1.71E-01	1.67E-01	1.63E-01	1.55E-01	1.44E-01	1.31E-01	1.17E-01	1.05E-01
2	0.01250	1.00E 00	1.95E-01	9.42E-02	4.04E-02	4.76E-02	4.62E-02	4.54E-02	4.31E-02	4.00E-02	3.62E-02	3.24E-02	2.91E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		3.81E-01	4.04E-01	4.27E-01	4.44E-01	4.54E-01	4.58E-01	4.55E-01	4.49E-01	4.39E-01	4.30E-01	0.00
19	0.47500		4.12E-01	4.32E-01	4.50E-01	4.64E-01	4.73E-01	4.76E-01	4.75E-01	4.70E-01	4.62E-01	4.52E-01	0.00
18	0.44750		4.26E-01	4.42E-01	4.55E-01	4.64E-01	4.68E-01	4.68E-01	4.65E-01	4.58E-01	4.49E-01	4.37E-01	0.00
17	0.42750		4.34E-01	4.45E-01	4.53E-01	4.58E-01	4.59E-01	4.57E-01	4.51E-01	4.43E-01	4.33E-01	4.20E-01	0.00
16	0.40625		4.42E-01	4.47E-01	4.50E-01	4.50E-01	4.48E-01	4.43E-01	4.35E-01	4.25E-01	4.14E-01	4.00E-01	0.00
15	0.38500		4.48E-01	4.47E-01	4.44E-01	4.40E-01	4.35E-01	4.27E-01	4.18E-01	4.06E-01	3.93E-01	3.79E-01	0.00
14	0.36500		4.52E-01	4.45E-01	4.37E-01	4.29E-01	4.21E-01	4.11E-01	4.00E-01	3.88E-01	3.74E-01	3.59E-01	0.00
13	0.34625		4.53E-01	4.41E-01	4.29E-01	4.18E-01	4.07E-01	3.96E-01	3.83E-01	3.70E-01	3.55E-01	3.41E-01	0.00
12	0.32750		4.52E-01	4.35E-01	4.20E-01	4.06E-01	3.92E-01	3.79E-01	3.65E-01	3.52E-01	3.37E-01	3.22E-01	0.00
11	0.29750		4.43E-01	4.21E-01	4.01E-01	3.83E-01	3.67E-01	3.52E-01	3.36E-01	3.22E-01	3.07E-01	2.92E-01	0.00
10	0.27500		4.31E-01	4.06E-01	3.83E-01	3.64E-01	3.46E-01	3.29E-01	3.14E-01	2.99E-01	2.84E-01	2.69E-01	0.00
9	0.25750		4.19E-01	3.92E-01	3.68E-01	3.47E-01	3.29E-01	3.12E-01	2.96E-01	2.81E-01	2.66E-01	2.52E-01	0.00
8	0.24250		4.07E-01	3.79E-01	3.54E-01	3.32E-01	3.13E-01	2.96E-01	2.80E-01	2.66E-01	2.51E-01	2.38E-01	0.00
7	0.21500		3.79E-01	3.50E-01	3.25E-01	3.03E-01	2.84E-01	2.67E-01	2.52E-01	2.38E-01	2.24E-01	2.12E-01	0.00
6	0.17500		3.27E-01	3.00E-01	2.77E-01	2.56E-01	2.38E-01	2.23E-01	2.09E-01	1.96E-01	1.85E-01	1.74E-01	0.00
5	0.13000		2.56E-01	2.33E-01	2.14E-01	1.97E-01	1.82E-01	1.69E-01	1.58E-01	1.48E-01	1.39E-01	1.30E-01	0.00
4	0.08500		1.74E-01	1.58E-01	1.44E-01	1.32E-01	1.22E-01	1.13E-01	1.05E-01	9.78E-02	9.16E-02	8.59E-02	0.00
3	0.04500		9.46E-02	8.59E-02	7.82E-02	7.15E-02	6.57E-02	6.07E-02	5.63E-02	5.25E-02	4.91E-02	4.60E-02	0.00
2	0.01250		2.62E-02	2.38E-02	2.17E-02	1.98E-02	1.82E-02	1.68E-02	1.56E-02	1.45E-02	1.36E-02	1.27E-02	0.00
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAMLINE COORDS -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y												
11	1.00000		0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000		0.00	2.37E-01	2.67E-01	3.23E-01	3.90E-01	4.45E-01	4.67E-01	4.74E-01	4.75E-01	4.75E-01	4.75E-01	4.74E-01
9	0.80000		0.00	2.23E-01	2.47E-01	2.93E-01	3.56E-01	4.11E-01	4.40E-01	4.50E-01	4.52E-01	4.52E-01	4.51E-01	4.51E-01
8	0.70000		0.00	2.09E-01	2.30E-01	2.70E-01	3.29E-01	3.83E-01	4.15E-01	4.27E-01	4.30E-01	4.29E-01	4.28E-01	4.28E-01
7	0.60000		0.00	1.93E-01	2.13E-01	2.50E-01	3.05E-01	3.59E-01	3.92E-01	4.06E-01	4.09E-01	4.07E-01	4.06E-01	4.06E-01
6	0.50000		0.00	1.77E-01	1.95E-01	2.31E-01	2.83E-01	3.36E-01	3.70E-01	3.85E-01	3.87E-01	3.85E-01	3.83E-01	3.83E-01
5	0.40000		0.00	1.57E-01	1.76E-01	2.11E-01	2.62E-01	3.14E-01	3.49E-01	3.64E-01	3.66E-01	3.63E-01	3.60E-01	3.58E-01
4	0.30000		0.00	1.36E-01	1.53E-01	1.89E-01	2.40E-01	2.92E-01	3.28E-01	3.43E-01	3.44E-01	3.40E-01	3.35E-01	3.32E-01
3	0.20000		0.00	1.10E-01	1.29E-01	1.64E-01	2.17E-01	2.69E-01	3.05E-01	3.20E-01	3.20E-01	3.12E-01	3.05E-01	2.99E-01
2	0.10000		0.00	7.75E-02	9.43E-02	1.33E-01	1.86E-01	2.43E-01	2.80E-01	2.94E-01	2.91E-01	2.78E-01	2.65E-01	2.54E-01

MAXIMUM VALUES 0.260E 02 0.320E 02 0.366E 02 0.409E 02 0.455E 02 0.500E 02

RADIAL POSITION 2R/D

```
0          0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.........+.........+.2.......+4.......6+....8....1.........+.........+.........+.........+.........  0.00
 X  0.02   0                          2         4       6      8             1                                .  0.02
 X  0.04   .              0                    2         4       6       8              1                      .  0.04
 X  0.06   .                        0               2         4       6         8               1              .  0.06
 X  0.08   .                                  0               2         4       6         8                    1  0.08
 X  0.10   +                                           0               2         4       6         8          1  0.10
 X  0.12   .                                                 0               2         4       6         8    1  0.12
 X  0.14   .                                           0               2         4       6         8          1  0.14
 X  0.16   .                                                                                                .  0.16
 X  0.18   .                                  0                    2         4       6         8          1  0.18
 X  0.20   +                                                                                                +  0.20
 X  0.22   .                                        0                    2         4       6         8    1  0.22
 X  0.24   .                                                                                                .  0.24
 X  0.26   .                        0                    2         4       6         8                    1  0.26
 X  0.28   .                                                                                                .  0.28
 X  0.30   +              0                    2         4       6         8                    1          0.30
 X  0.32   .                                                                                                .  0.32
 X  0.34   0                          2         4       6         8                    1                    0.34
 X  0.36   .                                                                                                .  0.36
 X  0.38   .                                                                                                .  0.38
 X  0.40   0                          2         4       6         8                    1                    0.40
 X  0.42   .                                                                                                .  0.42
 X  0.44   .                                                                                                .  0.44
 X  0.46   0                          2         4       6         8                    1                    0.46
```

```
  6 0.02187  2.22E 00 3.19E 00 4.00E 00 4.62E 00 5.07E 00 5.37E 00 5.58E 00 5.70E 00 5.75E 00 5.76E 00 5.75E 00
  5 0.01625  8.04E-01 1.99E 00 3.02E 00 3.82E 00 4.41E 00 4.83E 00 5.11E 00 5.28E 00 5.36E 00 5.38E 00 5.38E 00
  4 0.01062 -2.72E-01 1.08E 00 2.26E 00 3.21E 00 3.92E 00 4.42E 00 4.76E 00 4.97E 00 5.07E 00 5.10E 00 5.10E 00
  3 0.00562 -8.76E-01 5.61E-01 1.83E 00 2.87E 00 3.64E 00 4.18E 00 4.57E 00 4.79E 00 4.91E 00 4.94E 00 4.94E 00
  2 0.00156 -1.10E 00 3.73E-01 1.67E 00 2.74E 00 3.53E 00 4.10E 00 4.49E 00 4.73E 00 4.85E 00 4.89E 00 4.89E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 1.35E 00 8.24E-01 1.84E-01-4.95E-02-9.61E-02-7.81E-02-5.27E-02-4.59E-02
 19 0.05766      0.00     0.00     0.00     0.00 4.23E 00 1.94E 00 4.33E-01-1.36E-01-2.50E-01-2.15E-01-1.76E-01-1.58E-01
 18 0.05469      0.00     0.00     0.00     0.00 7.91E 00 2.84E 00 5.86E-01-2.65E-01-4.31E-01-3.94E-01-3.39E-01-2.88E-01
 17 0.05211      0.00     0.00     0.00 4.32E 00 7.91E 00 3.34E 00 6.37E-01-4.13E-01-6.23E-01-5.80E-01-4.87E-01-3.99E-01
 16 0.04945      0.00     0.00     0.00 8.41E 00 8.47E 00 3.75E 00 6.58E-01-5.75E-01-8.39E-01-7.68E-01-6.23E-01-5.01E-01
 15 0.04687      0.00     0.00     0.00 1.26E 01 9.09E 00 4.00E 00 5.86E-01-7.81E-01-1.05E 00-9.15E-01-7.28E-01-5.84E-01
 14 0.04445      0.00     0.00 4.82E 00 1.27E 01 9.47E 00 4.08E 00 4.03E-01-1.01E 00-1.20E 00-1.01E 00-8.00E-01-6.47E-01
 13 0.04211      0.00     0.00 8.97E 00 1.34E 01 9.78E 00 4.01E 00 1.30E-01-1.21E 00-1.30E 00-1.07E 00-8.49E-01-6.96E-01
 12 0.03906      0.00     0.00 1.46E 01 1.47E 01 1.00E 01 3.66E 00-3.18E-01-1.42E 00-1.36E 00-1.10E 00-8.91E-01-7.43E-01
 11 0.03578      0.00 5.49E 00 1.65E 01 1.60E 01 9.93E 00 2.71E 00-8.36E-01-1.47E 00-1.33E 00-1.09E 00-9.03E-01-7.67E-01
 10 0.03328      0.00 1.08E 01 1.81E 01 1.65E 01 9.40E 00 1.76E 00-1.09E 00-1.43E 00-1.27E 00-1.06E 00-8.97E-01-7.73E-01
  9 0.03125      0.00 1.64E 01 1.90E 01 1.65E 01 8.64E 00 9.81E-01-1.19E 00-1.36E 00-1.21E 00-1.03E 00-8.83E-01-7.69E-01
  8 0.02859      0.00 1.53E 01 1.93E 01 1.60E 01 7.32E 00 4.61E-02-1.20E 00-1.25E 00-1.12E 00-9.76E-01-8.58E-01-7.56E-01
  7 0.02437      0.00 1.45E 01 1.92E 01 1.47E 01 4.25E 00-9.08E-01-1.06E 00-1.04E 00-9.63E-01-8.76E-01-7.94E-01-7.09E-01
  6 0.01906      0.00 1.44E 01 1.84E 01 1.12E 01-3.18E-01-8.84E-01-8.18E-01-7.80E-01-7.59E-01-7.23E-01-6.73E-01-6.08E-01
  5 0.01344      0.00 1.46E 01 1.61E 01 2.73E 00-9.34E-01-7.12E-01-5.80E-01-5.36E-01-5.34E-01-5.32E-01-5.04E-01-4.59E-01
  4 0.00812      0.00 1.39E 01 9.01E 00-1.40E 00-8.06E-01-4.81E-01-3.58E-01-3.21E-01-3.23E-01-3.29E-01-3.17E-01-2.88E-01
  3 0.00359      0.00 9.68E 00 6.80E-01-5.70E-01-3.84E-01-2.24E-01-1.61E-01-1.42E-01-1.43E-01-1.46E-01-1.43E-01-1.30E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062 -4.44E-02-3.60E-02-2.46E-02-1.51E-02-9.10E-03-5.77E-03-3.56E-03-2.27E-03-3.54E-04 1.73E-04     0.00
 19 0.05766 -1.35E-01-1.01E-01-6.59E-02-3.91E-02-2.20E-02-1.20E-02-5.30E-03-1.21E-03 2.50E-03 3.77E-04     0.00
 18 0.05469 -2.31E-01-1.68E-01-1.09E-01-6.47E-02-3.64E-02-1.96E-02-8.16E-03-1.17E-03 4.35E-03 5.16E-04     0.00
 17 0.05211 -3.13E-01-2.25E-01-1.46E-01-8.77E-02-4.99E-02-2.71E-02-1.16E-02-2.07E-03 5.10E-03 6.09E-04     0.00
 16 0.04945 -3.91E-01-2.81E-01-1.84E-01-1.11E-01-6.44E-02-3.56E-02-1.59E-02-3.85E-03 5.08E-03 6.80E-04     0.00
 15 0.04687 -4.58E-01-3.31E-01-2.18E-01-1.34E-01-7.84E-02-4.42E-02-2.05E-02-6.16E-03 4.49E-03 7.29E-04     0.00
 14 0.04445 -5.12E-01-3.73E-01-2.48E-01-1.53E-01-9.11E-02-5.22E-02-2.50E-02-8.63E-03 3.58E-03 7.57E-04     0.00
 13 0.04211 -5.55E-01-4.08E-01-2.73E-01-1.71E-01-1.03E-01-5.96E-02-2.94E-02-1.11E-02 2.49E-03 7.68E-04     0.00
 12 0.03906 -6.01E-01-4.46E-01-3.02E-01-1.91E-01-1.17E-01-6.87E-02-3.48E-02-1.44E-02 9.02E-04 7.66E-04     0.00
 11 0.03578 -6.28E-01-4.72E-01-3.24E-01-2.07E-01-1.28E-01-7.62E-02-3.96E-02-1.76E-02-8.17E-04 7.35E-04     0.00
 10 0.03328 -6.38E-01-4.84E-01-3.34E-01-2.16E-01-1.34E-01-8.06E-02-4.25E-02-1.96E-02-2.03E-03 6.98E-04     0.00
  9 0.03125 -6.39E-01-4.87E-01-3.39E-01-2.20E-01-1.37E-01-8.31E-02-4.43E-02-2.09E-02-2.92E-03 6.61E-04     0.00
  8 0.02859 -6.33E-01-4.87E-01-3.41E-01-2.22E-01-1.40E-01-8.54E-02-4.61E-02-2.23E-02-3.96E-03 6.08E-04     0.00
  7 0.02437 -6.01E-01-4.67E-01-3.31E-01-2.18E-01-1.38E-01-8.51E-02-4.66E-02-2.33E-02-5.15E-03 5.18E-04     0.00
  6 0.01906 -5.19E-01-4.09E-01-2.94E-01-1.95E-01-1.24E-01-7.73E-02-4.30E-02-2.20E-02-5.63E-03 3.96E-04     0.00
  5 0.01344 -3.94E-01-3.13E-01-2.28E-01-1.52E-01-9.75E-02-6.09E-02-3.42E-02-1.78E-02-4.95E-03 2.68E-04     0.00
  4 0.00812 -2.49E-01-1.98E-01-1.46E-01-9.72E-02-6.26E-02-3.93E-02-2.21E-02-1.17E-02-3.38E-03 1.54E-04     0.00
  3 0.00359 -1.12E-01-8.94E-02-6.60E-02-4.41E-02-2.84E-02-1.78E-02-1.01E-02-5.34E-03-1.58E-03 6.59E-05     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
```

```
   3 0.00562       0.00 3.00E 01 1.92E 01 1.33E 01 9.80E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00
   2 0.00156       0.00 3.00E 01 1.92E 01 1.33E 01 9.80E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00 7.50E 00
   1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0        I =     13        14        15        16        17        18        19        20        21        22        23
         X =  0.14669   0.17026   0.19643   0.22547   0.25771   0.29349   0.33321   0.37500   0.41679   0.45858   0.50037
0 J      Y
  21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  20 0.06187  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  19 0.05937  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  18 0.05594  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  17 0.05344  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  16 0.05078  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  15 0.04812  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  14 0.04562  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  13 0.04328  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  12 0.04094  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  11 0.03719  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
  10 0.03437  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   9 0.03219  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   8 0.03031  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   7 0.02687  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   6 0.02187  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   5 0.01625  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   4 0.01062  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   3 0.00562  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   2 0.00156  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00  7.50E 00
   1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                           V   VELOCITY           -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =      1         2         3         4         5         6         7         8         9        10        11        12
         X = -0.00393   0.00393   0.01180   0.02054   0.03023   0.04099   0.05294   0.06620   0.08092   0.09726   0.11539   0.13552
0 J      Y
  21 0.06250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  20 0.06062      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  19 0.05766      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  18 0.05469      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  17 0.05211      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  16 0.04945      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  15 0.04687      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  14 0.04445      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  13 0.04211      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  12 0.03906      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  11 0.03578      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  10 0.03328      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   9 0.03125      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   8 0.02859      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   7 0.02437      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   6 0.01906      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   5 0.01344      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   4 0.00812      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   3 0.00359      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   2 0.00000      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   1 0.00000      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0        I =     13        14        15        16        17        18        19        20        21        22        23
         X =  0.15786   0.18266   0.21019   0.24075   0.27467   0.31232   0.35411   0.39590   0.43769   0.47948   0.52127
```

```
  153 0.6500E-01 0.9340E-02 0.5000E-02 0.5468E-03 0.1379E-01 0.1005E 08 0.9185E 01-0.1123E-01     0.0000 0.2007E 03 0.6642E 03
  154 0.6210E-01 0.9059E-02 0.5000E-02 0.5379E-03 0.1346E-01 0.9947E 07 0.9164E 01-0.1080E-01     0.0000 0.2007E 03 0.6581E 03
  155 0.5930E-01 0.8680E-02 0.5000E-02 0.4938E-03 0.1313E-01 0.9740E 07 0.9143E 01-0.1039E-01     0.0000 0.2008E 03 0.6520E 03
  156 0.5659E-01 0.8412E-02 0.5000E-02 0.4847E-03 0.1280E-01 0.9768E 07 0.9123E 01-0.9986E-02     0.0000 0.2008E 03 0.6461E 03
  157 0.5398E-01 0.8049E-02 0.5000E-02 0.4450E-03 0.1247E-01 0.9354E 07 0.9104E 01-0.9592E-02     0.0000 0.2008E 03 0.6402E 03
  158 0.5147E-01 0.7791E-02 0.5000E-02 0.4407E-03 0.1214E-01 0.9029E 07 0.9086E 01-0.9210E-02     0.0000 0.2009E 03 0.6344E 03
  159 0.4904E-01 0.7449E-02 0.5000E-02 0.3977E-03 0.1182E-01 0.9027E 07 0.9068E 01-0.8835E-02     0.0000 0.2009E 03 0.6287E 03
  160 0.4670E-01 0.7194E-02 0.5000E-02 0.3943E-03 0.1149E-01 0.8612E 07 0.9051E 01-0.8472E-02     0.0000 0.2009E 03 0.6230E 03
  161 0.4443E-01 0.6874E-02 0.5000E-02 0.3574E-03 0.1117E-01 0.8510E 07 0.9034E 01-0.8118E-02     0.0000 0.2010E 03 0.6175E 03
  162 0.4227E-01 0.6627E-02 0.5000E-02 0.3549E-03 0.1085E-01 0.8430E 07 0.9018E 01-0.7773E-02     0.0000 0.2010E 03 0.6121E 03
  163 0.4017E-01 0.6325E-02 0.5000E-02 0.3177E-03 0.1053E-01 0.8022E 07 0.9002E 01-0.7438E-02     0.0000 0.2010E 03 0.6067E 03
  164 0.3815E-01 0.6088E-02 0.5000E-02 0.3181E-03 0.1022E-01 0.7807E 07 0.8988E 01-0.7113E-02     0.0000 0.2010E 03 0.6014E 03
  165 0.3622E-01 0.5804E-02 0.5000E-02 0.2833E-03 0.9909E-02 0.7839E 07 0.8973E 01-0.6796E-02     0.0000 0.2010E 03 0.5963E 03
  166 0.3436E-01 0.5581E-02 0.5000E-02 0.2817E-03 0.9604E-02 0.7543E 07 0.8959E 01-0.6488E-02     0.0000 0.2011E 03 0.5912E 03
  167 0.3258E-01 0.5308E-02 0.5000E-02 0.2544E-03 0.9302E-02 0.7539E 07 0.8946E 01-0.6190E-02     0.0000 0.2011E 03 0.5863E 03
  168 0.3087E-01 0.5099E-02 0.5000E-02 0.2492E-03 0.9005E-02 0.7138E 07 0.8933E 01-0.5900E-02     0.0000 0.2011E 03 0.5814E 03
  169 0.2922E-01 0.4843E-02 0.5000E-02 0.2282E-03 0.8714E-02 0.7188E 07 0.8921E 01-0.5620E-02     0.0000 0.2011E 03 0.5766E 03
  170 0.2765E-01 0.4642E-02 0.5000E-02 0.2232E-03 0.8426E-02 0.6757E 07 0.8909E 01-0.5349E-02     0.0000 0.2011E 03 0.5720E 03
  171 0.2615E-01 0.4405E-02 0.5000E-02 0.2029E-03 0.8145E-02 0.6697E 07 0.8898E 01-0.5086E-02     0.0000 0.2011E 03 0.5674E 03
  172 0.2471E-01 0.4217E-02 0.5000E-02 0.2003E-03 0.7868E-02 0.6536E 07 0.8887E 01-0.4831E-02     0.0000 0.2011E 03 0.5630E 03
  173 0.2333E-01 0.3989E-02 0.5000E-02 0.1762E-03 0.7598E-02 0.6100E 07 0.8877E 01-0.4586E-02     0.0000 0.2011E 03 0.5586E 03
  174 0.2201E-01 0.3816E-02 0.5000E-02 0.1769E-03 0.7332E-02 0.6124E 07 0.8867E 01-0.4348E-02     0.0000 0.2011E 03 0.5543E 03
  175 0.2075E-01 0.3601E-02 0.5000E-02 0.1565E-03 0.7072E-02 0.5740E 07 0.8857E 01-0.4119E-02     0.0000 0.2011E 03 0.5502E 03
  176 0.1955E-01 0.3440E-02 0.5000E-02 0.1576E-03 0.6817E-02 0.5787E 07 0.8848E 01-0.3897E-02     0.0000 0.2011E 03 0.5461E 03
  177 0.1840E-01 0.3242E-02 0.5000E-02 0.1403E-03 0.6570E-02 0.5513E 07 0.8839E 01-0.3683E-02     0.0000 0.2011E 03 0.5422E 03
  178 0.1730E-01 0.3090E-02 0.5000E-02 0.1433E-03 0.6328E-02 0.5520E 07 0.8831E 01-0.3478E-02     0.0000 0.2011E 03 0.5383E 03
  179 0.1626E-01 0.2907E-02 0.5000E-02 0.1271E-03 0.6091E-02 0.5040E 07 0.8823E 01-0.3281E-02     0.0000 0.2011E 03 0.5346E 03
  180 0.1526E-01 0.2765E-02 0.5000E-02 0.1234E-03 0.5862E-02 0.4882E 07 0.8815E 01-0.3090E-02     0.0000 0.2011E 03 0.5309E 03
  181 0.1431E-01 0.2591E-02 0.5000E-02 0.1133E-03 0.5637E-02 0.4957E 07 0.8808E 01-0.2908E-02     0.0000 0.2011E 03 0.5274E 03
  182 0.1341E-01 0.2465E-02 0.5000E-02 0.1089E-03 0.5418E-02 0.4687E 07 0.8801E 01-0.2733E-02     0.0000 0.2011E 03 0.5239E 03
  183 0.1255E-01 0.2306E-02 0.5000E-02 0.9695E-04 0.5206E-02 0.4625E 07 0.8794E 01-0.2565E-02     0.0000 0.2011E 03 0.5205E 03
  184 0.1174E-01 0.2186E-02 0.5000E-02 0.1013E-03 0.5001E-02 0.4629E 07 0.8788E 01-0.2404E-02     0.0000 0.2011E 03 0.5173E 03
  185 0.1096E-01 0.2038E-02 0.5000E-02 0.8324E-04 0.4799E-02 0.4128E 07 0.8782E 01-0.2250E-02     0.0000 0.2011E 03 0.5141E 03
  186 0.1023E-01 0.1932E-02 0.5000E-02 0.8520E-04 0.4604E-02 0.3983E 07 0.8777E 01-0.2102E-02     0.0000 0.2011E 03 0.5110E 03
  187 0.9530E-02 0.1796E-02 0.5000E-02 0.7688E-04 0.4416E-02 0.3842E 07 0.8771E 01-0.1961E-02     0.0000 0.2011E 03 0.5080E 03
  188 0.8877E-02 0.1697E-02 0.5000E-02 0.7644E-04 0.4232E-02 0.3895E 07 0.8766E 01-0.1826E-02     0.0000 0.2011E 03 0.5051E 03
  189 0.8248E-02 0.1571E-02 0.5000E-02 0.6637E-04 0.4055E-02 0.3539E 07 0.8761E 01-0.1698E-02     0.0000 0.2011E 03 0.5023E 03
  190 0.7658E-02 0.1483E-02 0.5000E-02 0.7093E-04 0.3882E-02 0.3405E 07 0.8757E 01-0.1576E-02     0.0000 0.2011E 03 0.4996E 03
  191 0.7099E-02 0.1368E-02 0.5000E-02 0.5997E-04 0.3716E-02 0.3515E 07 0.8753E 01-0.1460E-02     0.0000 0.2011E 03 0.4970E 03
  192 0.6572E-02 0.1288E-02 0.5000E-02 0.6507E-04 0.3555E-02 0.3264E 07 0.8749E 01-0.1348E-02     0.0000 0.2011E 03 0.4944E 03
  193 0.6075E-02 0.1184E-02 0.5000E-02 0.5629E-04 0.3400E-02 0.3271E 07 0.8745E 01-0.1244E-02     0.0000 0.2011E 03 0.4919E 03
  194 0.5604E-02 0.1114E-02 0.5000E-02 0.5987E-04 0.3249E-02 0.3039E 07 0.8741E 01-0.1143E-02     0.0000 0.2011E 03 0.4895E 03
  195 0.5164E-02 0.1014E-02 0.5000E-02 0.5340E-04 0.3104E-02 0.2816E 07 0.8738E 01-0.1049E-02     0.0000 0.2010E 03 0.4872E 03
  196 0.4750E-02 0.9538E-03 0.5000E-02 0.6175E-04 0.2965E-02 0.2716E 07 0.8735E 01-0.9598E-03     0.0000 0.2010E 03 0.4850E 03
  197 0.4357E-02 0.8722E-03 0.5000E-02 0.5764E-04 0.2829E-02 0.2791E 07 0.8732E 01-0.8750E-03     0.0000 0.2010E 03 0.4829E 03
  198 0.3991E-02 0.8131E-03 0.5000E-02 0.5925E-04 0.2699E-02 0.2487E 07 0.8729E 01-0.7952E-03     0.0000 0.2010E 03 0.4808E 03
  199 0.3648E-02 0.7468E-03 0.5000E-02 0.6238E-04 0.2574E-02 0.2625E 07 0.8726E 01-0.7192E-03     0.0000 0.2010E 03 0.4788E 03
  200 0.3326E-02 0.6953E-03 0.5000E-02 0.5878E-04 0.2453E-02 0.2379E 07 0.8724E 01-0.6489E-03     0.0000 0.2010E 03 0.4768E 03
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 SWIRL CASE WITH LFS  =  1
            AND NSBR =  0
```

8	0.03031	4.49E 05	9.90E 04	3.74E 04	2.11E 04	1.64E 04	1.54E 04	1.52E 04	1.45E 04	1.31E 04	1.16E 04	1.07E 04	1.00E 04
7	0.02687	4.49E 05	8.07E 04	2.12E 04	7.29E 03	3.21E 03	1.85E 03	1.40E 03	1.39E 03	1.97E 03	3.08E 03	4.44E 03	5.58E 03
6	0.02187	4.49E 05	8.07E 04	2.12E 04	7.24E 03	3.00E 03	1.44E 03	7.66E 02	4.49E 02	3.09E 02	2.64E 02	3.35E 02	8.03E 02
5	0.01625	4.49E 05	8.07E 04	2.12E 04	7.26E 03	3.01E 03	1.44E 03	7.67E 02	4.41E 02	2.70E 02	1.73E 02	1.23E 02	1.10E 02
4	0.01062	4.49E 05	8.07E 04	2.12E 04	7.27E 03	3.02E 03	1.44E 03	7.68E 02	4.42E 02	2.70E 02	1.73E 02	1.15E 02	7.80E 01
3	0.00562	4.49E 05	8.07E 04	2.13E 04	7.27E 03	3.02E 03	1.44E 03	7.69E 02	4.43E 02	2.70E 02	1.73E 02	1.15E 02	7.80E 01
2	0.00156	4.49E 05	8.07E 04	2.13E 04	7.27E 03	3.02E 03	1.45E 03	7.69E 02	4.43E 02	2.71E 02	1.73E 02	1.15E 02	7.81E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		2.03E 03	2.19E 03	2.15E 03	1.93E 03	1.62E 03	1.31E 03	1.02E 03	7.93E 02	6.16E 02	4.77E 02	4.49E 05
19	0.05937		2.18E 03	2.27E 03	2.15E 03	1.88E 03	1.54E 03	1.22E 03	9.41E 02	7.21E 02	5.55E 02	4.28E 02	4.49E 05
18	0.05594		2.88E 03	2.87E 03	2.61E 03	2.18E 03	1.74E 03	1.33E 03	9.98E 02	7.48E 02	5.64E 02	4.31E 02	4.49E 05
17	0.05344		3.63E 03	3.52E 03	3.11E 03	2.55E 03	1.98E 03	1.48E 03	1.09E 03	8.01E 02	5.96E 02	4.50E 02	4.49E 05
16	0.05078		4.59E 03	4.36E 03	3.77E 03	3.02E 03	2.30E 03	1.69E 03	1.22E 03	8.78E 02	6.42E 02	4.80E 02	4.49E 05
15	0.04812		5.71E 03	5.31E 03	4.52E 03	3.57E 03	2.68E 03	1.93E 03	1.36E 03	9.69E 02	6.98E 02	5.16E 02	4.49E 05
14	0.04562		6.85E 03	6.28E 03	5.27E 03	4.13E 03	3.06E 03	2.18E 03	1.52E 03	1.06E 03	7.56E 02	5.54E 02	4.49E 05
13	0.04328		7.97E 03	7.20E 03	5.99E 03	4.66E 03	3.43E 03	2.42E 03	1.67E 03	1.16E 03	8.13E 02	5.91E 02	4.49E 05
12	0.04094		9.05E 03	8.07E 03	6.67E 03	5.16E 03	3.79E 03	2.66E 03	1.82E 03	1.25E 03	8.71E 02	6.28E 02	4.49E 05
11	0.03719		1.03E 04	9.08E 03	7.49E 03	5.83E 03	4.30E 03	3.02E 03	2.05E 03	1.39E 03	9.62E 02	6.86E 02	4.49E 05
10	0.03437		1.07E 04	9.36E 03	7.79E 03	6.14E 03	4.58E 03	3.24E 03	2.21E 03	1.49E 03	1.03E 03	7.28E 02	4.49E 05
9	0.03219		1.03E 04	9.13E 03	7.74E 03	6.21E 03	4.71E 03	3.36E 03	2.31E 03	1.56E 03	1.07E 03	7.58E 02	4.49E 05
8	0.03031		9.38E 03	8.57E 03	7.47E 03	6.14E 03	4.75E 03	3.44E 03	2.37E 03	1.61E 03	1.10E 03	7.80E 02	4.49E 05
7	0.02687		6.34E 03	6.64E 03	6.39E 03	5.66E 03	4.62E 03	3.47E 03	2.45E 03	1.68E 03	1.15E 03	8.15E 02	4.49E 05
6	0.02187		1.78E 03	2.94E 03	3.87E 03	4.22E 03	3.96E 03	3.26E 03	2.43E 03	1.72E 03	1.20E 03	8.51E 02	4.49E 05
5	0.01625		2.03E 02	6.52E 02	1.47E 03	2.32E 03	2.80E 03	2.72E 03	2.25E 03	1.69E 03	1.21E 03	8.70E 02	4.49E 05
4	0.01062		6.56E 01	1.02E 02	3.94E 02	1.02E 03	1.74E 03	2.10E 03	1.98E 03	1.60E 03	1.20E 03	8.72E 02	4.49E 05
3	0.00562		5.42E 01	4.65E 01	1.09E 02	4.74E 02	1.13E 03	1.67E 03	1.76E 03	1.52E 03	1.17E 03	8.67E 02	4.49E 05
2	0.00156		5.43E 01	3.87E 01	4.81E 01	2.58E 02	8.10E 02	1.40E 03	1.61E 03	1.45E 03	1.15E 03	8.60E 02	4.49E 05
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAM FUNCTION -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	0.00	1.00E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00	1.01E 00
19	0.05937		0.00	0.00	0.00	0.00	0.00	1.03E 00	1.04E 00	1.05E 00	1.06E 00	1.06E 00	1.06E 00	1.06E 00
18	0.05594		0.00	0.00	0.00	0.00	0.00	1.05E 00	1.08E 00	1.10E 00	1.11E 00	1.11E 00	1.11E 00	1.11E 00
17	0.05344		0.00	0.00	0.00	0.00	1.01E 00	1.07E 00	1.11E 00	1.13E 00	1.14E 00	1.14E 00	1.14E 00	1.13E 00
16	0.05078		0.00	0.00	0.00	0.00	1.03E 00	1.09E 00	1.13E 00	1.15E 00	1.16E 00	1.17E 00	1.16E 00	1.15E 00
15	0.04812		0.00	0.00	0.00	0.00	1.05E 00	1.10E 00	1.14E 00	1.16E 00	1.17E 00	1.18E 00	1.17E 00	1.15E 00
14	0.04562		0.00	0.00	0.00	1.01E 00	1.06E 00	1.11E 00	1.15E 00	1.17E 00	1.18E 00	1.18E 00	1.17E 00	1.14E 00
13	0.04328		0.00	0.00	0.00	1.03E 00	1.07E 00	1.12E 00	1.14E 00	1.16E 00	1.17E 00	1.16E 00	1.15E 00	1.12E 00
12	0.04094		0.00	0.00	0.00	1.04E 00	1.08E 00	1.11E 00	1.13E 00	1.14E 00	1.15E 00	1.14E 00	1.12E 00	1.09E 00
11	0.03719		0.00	0.00	1.02E 00	1.06E 00	1.07E 00	1.09E 00	1.09E 00	1.09E 00	1.09E 00	1.07E 00	1.05E 00	1.01E 00
10	0.03437		0.00	0.00	1.03E 00	1.04E 00	1.04E 00	1.04E 00	1.03E 00	1.03E 00	1.02E 00	1.00E 00	9.75E-01	9.38E-01
9	0.03219		0.00	0.00	1.00E 00	9.94E-01	9.85E-01	9.77E-01	9.68E-01	9.59E-01	9.46E-01	9.29E-01	9.03E-01	8.68E-01
8	0.03031		0.00	9.41E-01	9.28E-01	9.18E-01	9.10E-01	9.03E-01	8.95E-01	8.86E-01	8.74E-01	8.57E-01	8.33E-01	8.00E-01
7	0.02687		0.00	7.40E-01	7.37E-01	7.35E-01	7.33E-01	7.31E-01	7.29E-01	7.25E-01	7.17E-01	7.05E-01	6.88E-01	6.63E-01
6	0.02187		0.00	4.90E-01	4.89E-01	4.87E-01	4.86E-01	4.86E-01	4.85E-01	4.84E-01	4.82E-01	4.77E-01	4.70E-01	4.58E-01
5	0.01625		0.00	2.70E-01	2.70E-01	2.69E-01	2.69E-01	2.68E-01	2.68E-01	2.67E-01	2.66E-01	2.64E-01	2.61E-01	2.56E-01
4	0.01062		0.00	1.16E-01	1.15E-01	1.15E-01	1.15E-01	1.15E-01	1.15E-01	1.14E-01	1.14E-01	1.13E-01	1.11E-01	1.10E-01

```
  6 0.17500  1.68E-02 2.49E-02 3.23E-02 3.73E-02 3.86E-02 3.64E-02 3.18E-02 2.65E-02 2.17E-02 1.78E-02 3.00E-02
  5 0.13000  4.39E-03 1.02E-02 1.81E-02 2.60E-02 3.14E-02 3.29E-02 3.06E-02 2.65E-02 2.20E-02 1.82E-02 3.00E-02
  4 0.08500  6.03E-04 2.85E-03 8.06E-03 1.58E-02 2.36E-02 2.84E-02 2.88E-02 2.60E-02 2.20E-02 1.83E-02 3.00E-02
  3 0.04500  2.23E-04 5.51E-04 3.22E-03 9.49E-03 1.82E-02 2.52E-02 2.73E-02 2.55E-02 2.19E-02 1.84E-02 3.00E-02
  2 0.01250  2.23E-04 1.97E-04 1.49E-03 7.16E-03 1.61E-02 2.39E-02 2.67E-02 2.53E-02 2.19E-02 1.84E-02 3.00E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-          DIMENSIONLESS LENGTH SCALE          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     2        3        4        5        6        7        8        9       10       11       12       13
       X =  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552  0.15786
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02
 19 0.05937      0.00     0.00     0.00 1.98E-01 3.04E-01 3.22E-01 3.37E-01 3.49E-01 3.62E-01 3.76E-01 3.89E-01 4.01E-01
 18 0.05594      0.00     0.00     0.00 1.98E-01 3.85E-01 4.12E-01 4.33E-01 4.53E-01 4.76E-01 5.04E-01 5.34E-01 5.68E-01
 17 0.05344      0.00     0.00 5.10E-02 2.66E-01 4.01E-01 4.21E-01 4.39E-01 4.59E-01 4.85E-01 5.17E-01 5.54E-01 5.98E-01
 16 0.05078      0.00     0.00 1.78E-01 3.12E-01 3.98E-01 4.07E-01 4.23E-01 4.44E-01 4.71E-01 5.06E-01 5.49E-01 6.00E-01
 15 0.04812      0.00     0.00 1.78E-01 3.32E-01 3.72E-01 3.75E-01 3.92E-01 4.15E-01 4.46E-01 4.84E-01 5.32E-01 5.88E-01
 14 0.04562      0.00 5.10E-02 2.23E-01 3.25E-01 3.24E-01 3.32E-01 3.54E-01 3.83E-01 4.16E-01 4.59E-01 5.10E-01 5.70E-01
 13 0.04328      0.00 1.60E-01 2.64E-01 2.69E-01 2.67E-01 2.88E-01 3.16E-01 3.49E-01 3.87E-01 4.32E-01 4.87E-01 5.51E-01
 12 0.04094      0.00 1.60E-01 2.37E-01 2.07E-01 2.24E-01 2.49E-01 2.80E-01 3.16E-01 3.56E-01 4.04E-01 4.63E-01 5.30E-01
 11 0.03719  7.64E-02 1.18E-01 1.53E-01 1.67E-01 1.82E-01 2.03E-01 2.31E-01 2.66E-01 3.07E-01 3.60E-01 4.23E-01 4.96E-01
 10 0.03437  1.60E-01 1.35E-01 1.36E-01 1.40E-01 1.50E-01 1.68E-01 1.94E-01 2.28E-01 2.70E-01 3.25E-01 3.94E-01 4.72E-01
  9 0.03219  1.60E-01 1.14E-01 1.08E-01 1.11E-01 1.23E-01 1.44E-01 1.71E-01 2.03E-01 2.45E-01 3.03E-01 3.74E-01 4.57E-01
  8 0.03031  8.22E-03 1.83E-02 3.98E-02 7.22E-02 1.06E-01 1.34E-01 1.58E-01 1.86E-01 2.29E-01 2.90E-01 3.63E-01 4.47E-01
  7 0.02687  5.26E-03 6.13E-03 7.54E-03 1.07E-02 2.04E-02 4.93E-02 1.22E-01 2.17E-01 2.88E-01 3.28E-01 3.71E-01 4.44E-01
  6 0.02187  5.26E-03 6.13E-03 7.37E-03 8.88E-03 1.06E-02 1.25E-02 1.57E-02 2.89E-02 9.94E-02 3.58E-01 5.21E-01 5.29E-01
  5 0.01625  5.26E-03 6.13E-03 7.37E-03 8.88E-03 1.06E-02 1.25E-02 1.45E-02 1.66E-02 1.89E-02 3.08E-02 1.74E-01 6.18E-01
  4 0.01062  5.26E-03 6.13E-03 7.37E-03 8.88E-03 1.06E-02 1.25E-02 1.45E-02 1.66E-02 1.89E-02 2.13E-02 2.38E-02 9.77E-02
  3 0.00562  5.26E-03 6.13E-03 7.37E-03 8.88E-03 1.06E-02 1.25E-02 1.45E-02 1.66E-02 1.89E-02 2.13E-02 2.38E-02 2.65E-02
  2 0.00156  5.26E-03 6.13E-03 7.37E-03 8.88E-03 1.06E-02 1.25E-02 1.45E-02 1.66E-02 1.89E-02 2.13E-02 2.38E-02 2.65E-02
0      I =    14       15       16       17       18       19       20       21       22       23
       X =  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.54E-02 5.00E-03
 19 0.05937  4.12E-01 4.20E-01 4.26E-01 4.29E-01 4.29E-01 4.26E-01 4.19E-01 4.12E-01 4.03E-01 5.00E-03
 18 0.05594  6.03E-01 6.36E-01 6.65E-01 6.89E-01 7.05E-01 7.13E-01 7.14E-01 7.11E-01 7.04E-01 5.00E-03
 17 0.05344  6.46E-01 6.93E-01 7.38E-01 7.78E-01 8.09E-01 8.30E-01 8.42E-01 8.47E-01 8.47E-01 5.00E-03
 16 0.05078  6.56E-01 7.15E-01 7.72E-01 8.25E-01 8.71E-01 9.05E-01 9.29E-01 9.45E-01 9.54E-01 5.00E-03
 15 0.04812  6.51E-01 7.16E-01 7.82E-01 8.45E-01 9.02E-01 9.49E-01 9.84E-01 1.01E 00 1.03E 00 5.00E-03
 14 0.04562  6.38E-01 7.09E-01 7.80E-01 8.51E-01 9.16E-01 9.72E-01 1.02E 00 1.05E 00 1.08E 00 5.00E-03
 13 0.04328  6.22E-01 6.97E-01 7.74E-01 8.50E-01 9.21E-01 9.84E-01 1.04E 00 1.08E 00 1.11E 00 5.00E-03
 12 0.04094  6.05E-01 6.84E-01 7.65E-01 8.45E-01 9.22E-01 9.90E-01 1.05E 00 1.10E 00 1.14E 00 5.00E-03
 11 0.03719  5.78E-01 6.63E-01 7.50E-01 8.36E-01 9.19E-01 9.94E-01 1.06E 00 1.11E 00 1.16E 00 5.00E-03
 10 0.03437  5.58E-01 6.48E-01 7.39E-01 8.28E-01 9.15E-01 9.94E-01 1.06E 00 1.12E 00 1.18E 00 5.00E-03
  9 0.03219  5.46E-01 6.39E-01 7.32E-01 8.24E-01 9.13E-01 9.95E-01 1.07E 00 1.13E 00 1.18E 00 5.00E-03
  8 0.03031  5.38E-01 6.32E-01 7.27E-01 8.21E-01 9.12E-01 9.95E-01 1.07E 00 1.13E 00 1.19E 00 5.00E-03
  7 0.02687  5.32E-01 6.27E-01 7.24E-01 8.19E-01 9.12E-01 9.97E-01 1.07E 00 1.14E 00 1.20E 00 5.00E-03
  6 0.02187  5.75E-01 6.50E-01 7.36E-01 8.27E-01 9.20E-01 1.01E 00 1.08E 00 1.15E 00 1.20E 00 5.00E-03
  5 0.01625  6.86E-01 7.16E-01 7.79E-01 8.58E-01 9.46E-01 1.03E 00 1.10E 00 1.16E 00 1.22E 00 5.00E-03
  4 0.01062  6.42E-01 7.93E-01 8.35E-01 9.01E-01 9.85E-01 1.07E 00 1.13E 00 1.18E 00 1.23E 00 5.00E-03
  3 0.00562  1.20E-01 7.23E-01 8.43E-01 9.40E-01 1.03E 00 1.11E 00 1.16E 00 1.20E 00 1.24E 00 5.00E-03
  2 0.00156  3.09E-02 5.14E-01 1.02E 00 1.09E 00 1.14E 00 1.17E 00 1.19E 00 1.22E 00 1.25E 00 5.00E-03
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-          DIMENSIONLESS EFF. VISCOSITY          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
```

46	0.6925E 00	0.2280E 00	0.5048E 00	0.1976E 00	0.1081E 00	0.3631E 10	0.8505E 01	-0.1121E-01	0.9293E-01	0.9615E 03	0.3680E 03
47	0.6786E 00	0.2054E 00	0.5010E 00	0.1917E 00	0.1062E 00	0.3210E 10	0.8495E 01	-0.1127E-01	0.9659E-01	0.9608E 03	0.3639E 03
48	0.6614E 00	0.2040E 00	0.4989E 00	0.1857E 00	0.1043E 00	0.2895E 10	0.8483E 01	-0.1129E-01	0.1003E 00	0.9606E 03	0.3598E 03
49	0.6449E 00	0.1847E 00	0.4972E 00	0.1850E 00	0.1020E 00	0.2728E 10	0.8472E 01	-0.1133E-01	0.1041E 00	0.9606E 03	0.3557E 03
50	0.6235E 00	0.1837E 00	0.4947E 00	0.1756E 00	0.9925E-01	0.2562E 10	0.8460E 01	-0.1134E-01	0.1080E 00	0.9605E 03	0.3515E 03
51	0.6035E 00	0.1654E 00	0.4933E 00	0.1670E 00	0.9618E-01	0.2366E 10	0.8448E 01	-0.1137E-01	0.1120E 00	0.9612E 03	0.3474E 03
52	0.5807E 00	0.1651E 00	0.4912E 00	0.1675E 00	0.9316E-01	0.2113E 10	0.8435E 01	-0.1137E-01	0.1162E 00	0.9609E 03	0.3432E 03
53	0.5598E 00	0.1492E 00	0.4888E 00	0.1627E 00	0.8980E-01	0.1919E 10	0.8423E 01	-0.1139E-01	0.1204E 00	0.9617E 03	0.3390E 03
54	0.5378E 00	0.1486E 00	0.4865E 00	0.1574E 00	0.8618E-01	0.1785E 10	0.8410E 01	-0.1140E-01	0.1248E 00	0.9615E 03	0.3349E 03
55	0.5176E 00	0.1342E 00	0.4842E 00	0.1517E 00	0.8257E-01	0.1655E 10	0.8397E 01	-0.1141E-01	0.1293E 00	0.9621E 03	0.3307E 03
56	0.4968E 00	0.1348E 00	0.4819E 00	0.1498E 00	0.7885E-01	0.1528E 10	0.8383E 01	-0.1143E-01	0.1340E 00	0.9618E 03	0.3266E 03
57	0.4793E 00	0.1234E 00	0.4806E 00	0.1436E 00	0.7523E-01	0.1388E 10	0.8369E 01	-0.1145E-01	0.1388E 00	0.9621E 03	0.3224E 03
58	0.4603E 00	0.1251E 00	0.4785E 00	0.1388E 00	0.7163E-01	0.1255E 10	0.8356E 01	-0.1149E-01	0.1439E 00	0.9619E 03	0.3183E 03
59	0.4442E 00	0.1151E 00	0.4768E 00	0.1360E 00	0.6813E-01	0.1137E 10	0.8342E 01	-0.1151E-01	0.1492E 00	0.9620E 03	0.3142E 03
60	0.4274E 00	0.1163E 00	0.4755E 00	0.1351E 00	0.6467E-01	0.1035E 10	0.8327E 01	-0.1157E-01	0.1547E 00	0.9614E 03	0.3101E 03
61	0.4133E 00	0.1064E 00	0.4735E 00	0.1352E 00	0.6138E-01	0.9309E 09	0.8313E 01	-0.1161E-01	0.1605E 00	0.9611E 03	0.3061E 03
62	0.3981E 00	0.1070E 00	0.4710E 00	0.1337E 00	0.5814E-01	0.8278E 09	0.8298E 01	-0.1169E-01	0.1666E 00	0.9603E 03	0.3021E 03
63	0.3857E 00	0.9819E-01	0.4686E 00	0.1343E 00	0.5499E-01	0.7283E 09	0.8283E 01	-0.1176E-01	0.1730E 00	0.9598E 03	0.2981E 03
64	0.3727E 00	0.9860E-01	0.4662E 00	0.1331E 00	0.5189E-01	0.6368E 09	0.8267E 01	-0.1187E-01	0.1798E 00	0.9590E 03	0.2943E 03
65	0.3618E 00	0.9017E-01	0.4633E 00	0.1330E 00	0.4893E-01	0.5534E 09	0.8252E 01	-0.1197E-01	0.1870E 00	0.9586E 03	0.2906E 03
66	0.3496E 00	0.9072E-01	0.4603E 00	0.1317E 00	0.4605E-01	0.4786E 09	0.8236E 01	-0.1211E-01	0.1946E 00	0.9579E 03	0.2869E 03
67	0.3392E 00	0.8383E-01	0.4571E 00	0.1320E 00	0.4332E-01	0.4112E 09	0.8220E 01	-0.1225E-01	0.2027E 00	0.9577E 03	0.2834E 03
68	0.3279E 00	0.8493E-01	0.4541E 00	0.1302E 00	0.4068E-01	0.3511E 09	0.8203E 01	-0.1244E-01	0.2113E 00	0.9573E 03	0.2801E 03
69	0.3186E 00	0.7909E-01	0.4506E 00	0.1291E 00	0.3807E-01	0.2967E 09	0.8186E 01	-0.1262E-01	0.2205E 00	0.9572E 03	0.2769E 03
70	0.3082E 00	0.8038E-01	0.4471E 00	0.1261E 00	0.3551E-01	0.2486E 09	0.8169E 01	-0.1285E-01	0.2304E 00	0.9569E 03	0.2740E 03
71	0.2992E 00	0.7526E-01	0.4434E 00	0.1246E 00	0.3311E-01	0.2060E 09	0.8151E 01	-0.1309E-01	0.2409E 00	0.9568E 03	0.2713E 03
72	0.2891E 00	0.7632E-01	0.4396E 00	0.1216E 00	0.3082E-01	0.1686E 09	0.8133E 01	-0.1338E-01	0.2522E 00	0.9565E 03	0.2689E 03
73	0.2805E 00	0.7194E-01	0.4360E 00	0.1201E 00	0.2858E-01	0.1360E 09	0.8114E 01	-0.1367E-01	0.2644E 00	0.9565E 03	0.2669E 03
74	0.2709E 00	0.7291E-01	0.4321E 00	0.1170E 00	0.2646E-01	0.1070E 09	0.8095E 01	-0.1401E-01	0.2775E 00	0.9562E 03	0.2651E 03
75	0.2627E 00	0.6898E-01	0.4283E 00	0.1145E 00	0.2447E-01	0.8290E 08	0.8075E 01	-0.1436E-01	0.2915E 00	0.9562E 03	0.2638E 03
76	0.2539E 00	0.6964E-01	0.4245E 00	0.1109E 00	0.2255E-01	0.7230E 08	0.8054E 01	-0.1477E-01	0.3067E 00	0.9559E 03	0.2628E 03
77	0.2463E 00	0.6610E-01	0.4209E 00	0.1083E 00	0.2079E-01	0.7008E 08	0.8033E 01	-0.1518E-01	0.3231E 00	0.9559E 03	0.2623E 03
78	0.2382E 00	0.6684E-01	0.4172E 00	0.1054E 00	0.1921E-01	0.6881E 08	0.8010E 01	-0.1565E-01	0.3407E 00	0.9557E 03	0.2623E 03
79	0.2312E 00	0.6375E-01	0.4135E 00	0.1032E 00	0.1787E-01	0.6749E 08	0.7987E 01	-0.1612E-01	0.3598E 00	0.9557E 03	0.2628E 03
80	0.2235E 00	0.6411E-01	0.4097E 00	0.1006E 00	0.1665E-01	0.6591E 08	0.7964E 01	-0.1663E-01	0.3803E 00	0.9556E 03	0.2637E 03
81	0.2168E 00	0.6081E-01	0.4060E 00	0.9883E-01	0.1570E-01	0.6473E 08	0.7939E 01	-0.1716E-01	0.4025E 00	0.9556E 03	0.2653E 03
82	0.2094E 00	0.6053E-01	0.4022E 00	0.9675E-01	0.1494E-01	0.6364E 08	0.7913E 01	-0.1772E-01	0.4264E 00	0.9554E 03	0.2673E 03
83	0.2031E 00	0.5729E-01	0.3983E 00	0.9526E-01	0.1425E-01	0.6241E 08	0.7886E 01	-0.1829E-01	0.4522E 00	0.9553E 03	0.2699E 03
84	0.1962E 00	0.5680E-01	0.3943E 00	0.9357E-01	0.1363E-01	0.6065E 08	0.7858E 01	-0.1889E-01	0.4799E 00	0.9550E 03	0.2730E 03
85	0.1902E 00	0.5406E-01	0.3901E 00	0.9250E-01	0.1306E-01	0.5883E 08	0.7829E 01	-0.1948E-01	0.5098E 00	0.9549E 03	0.2766E 03
86	0.1836E 00	0.5350E-01	0.3858E 00	0.9121E-01	0.1257E-01	0.5743E 08	0.7798E 01	-0.2010E-01	0.5420E 00	0.9546E 03	0.2808E 03
87	0.1777E 00	0.5119E-01	0.3815E 00	0.9057E-01	0.1208E-01	0.5651E 08	0.7766E 01	-0.2070E-01	0.5766E 00	0.9544E 03	0.2854E 03
88	0.1713E 00	0.5078E-01	0.3769E 00	0.8957E-01	0.1163E-01	0.5588E 08	0.7733E 01	-0.2132E-01	0.6136E 00	0.9542E 03	0.2905E 03
89	0.1655E 00	0.4915E-01	0.3723E 00	0.8896E-01	0.1118E-01	0.5530E 08	0.7699E 01	-0.2192E-01	0.6534E 00	0.9540E 03	0.2960E 03
90	0.1593E 00	0.4868E-01	0.3677E 00	0.8846E-01	0.1076E-01	0.5378E 08	0.7663E 01	-0.2251E-01	0.6959E 00	0.9537E 03	0.3018E 03
91	0.1540E 00	0.4759E-01	0.3628E 00	0.8840E-01	0.1037E-01	0.5223E 08	0.7626E 01	-0.2307E-01	0.7412E 00	0.9535E 03	0.3080E 03
92	0.1485E 00	0.4704E-01	0.3577E 00	0.8826E-01	0.1000E-01	0.4987E 08	0.7588E 01	-0.2362E-01	0.7895E 00	0.9532E 03	0.3145E 03
93	0.1436E 00	0.4622E-01	0.3523E 00	0.8788E-01	0.9639E-02	0.4733E 08	0.7548E 01	-0.2412E-01	0.8409E 00	0.9531E 03	0.3213E 03
94	0.1387E 00	0.4556E-01	0.3468E 00	0.8746E-01	0.9313E-02	0.4433E 08	0.7507E 01	-0.2459E-01	0.8954E 00	0.9528E 03	0.3282E 03
95	0.1342E 00	0.4501E-01	0.3410E 00	0.8685E-01	0.8998E-02	0.4139E 08	0.7465E 01	-0.2500E-01	0.9530E 00	0.9527E 03	0.3353E 03
96	0.1292E 00	0.4435E-01	0.3351E 00	0.8600E-01	0.8685E-02	0.3818E 08	0.7422E 01	-0.2538E-01	0.1014E 01	0.9525E 03	0.3425E 03
97	0.1246E 00	0.4417E-01	0.3290E 00	0.8507E-01	0.8390E-02	0.3529E 08	0.7378E 01	-0.2569E-01	0.1078E 01	0.9523E 03	0.3498E 03
98	0.1199E 00	0.4344E-01	0.3228E 00	0.8385E-01	0.8128E-02	0.3222E 08	0.7332E 01	-0.2595E-01	0.1145E 01	0.9522E 03	0.3571E 03
99	0.1156E 00	0.4337E-01	0.3164E 00	0.8253E-01	0.7889E-02	0.2916E 08	0.7287E 01	-0.2613E-01	0.1216E 01	0.9521E 03	0.3643E 03

17	0.05344	0.00	0.00	0.00	-2.67E-02	-1.09E-02	-1.48E-02	4.33E-03	1.44E-02	1.60E-02	1.46E-02	1.41E-02	1.67E-02
16	0.05078	0.00	0.00	0.00	-1.96E-02	-1.59E-02	-1.18E-02	5.10E-03	1.36E-02	1.42E-02	1.25E-02	1.25E-02	1.55E-02
15	0.04812	0.00	0.00	0.00	-1.03E-02	-1.70E-02	-9.62E-03	5.71E-03	1.24E-02	1.21E-02	1.03E-02	1.10E-02	1.42E-02
14	0.04562	0.00	0.00	-2.75E-02	-1.23E-02	-1.57E-02	-7.81E-03	5.81E-03	1.06E-02	9.52E-03	8.36E-03	9.82E-03	1.24E-02
13	0.04328	0.00	0.00	-2.31E-02	-1.94E-02	-1.61E-02	-6.89E-03	5.05E-03	8.37E-03	6.71E-03	6.78E-03	8.34E-03	9.95E-03
12	0.04094	0.00	0.00	-1.08E-02	-2.06E-02	-1.69E-02	-6.84E-03	3.53E-03	5.35E-03	4.41E-03	5.28E-03	5.93E-03	6.12E-03
11	0.03719	0.00	-5.70E-03	-1.12E-02	-2.21E-02	-2.02E-02	-9.04E-03	-1.19E-03	-1.27E-04	6.95E-04	1.45E-03	-4.84E-04	-2.26E-03
10	0.03437	0.00	-2.45E-03	-1.86E-02	-2.82E-02	-2.49E-02	-1.25E-02	-5.39E-03	-5.07E-03	-2.48E-03	-3.50E-03	-7.42E-03	-1.06E-02
9	0.03219	0.00	6.50E-03	-2.31E-02	-3.54E-02	-3.01E-02	-1.71E-02	-1.12E-02	-8.84E-03	-6.55E-03	-8.95E-03	-1.40E-02	-1.83E-02
8	0.03031	0.00	3.06E-03	-3.01E-02	-4.29E-02	-3.64E-02	-2.31E-02	-1.56E-02	-1.28E-02	-1.09E-02	-1.44E-02	-2.03E-02	-2.57E-02
7	0.02687	0.00	-2.45E-02	-4.78E-02	-6.00E-02	-4.87E-02	-3.01E-02	-2.76E-02	-2.23E-02	-2.16E-02	-2.69E-02	-3.42E-02	-4.06E-02
6	0.02187	0.00	-5.91E-02	-7.73E-02	-8.72E-02	-7.00E-02	-5.89E-02	-4.79E-02	-4.15E-02	-4.34E-02	-5.00E-02	-5.71E-02	-6.47E-02
5	0.01625	0.00	-9.58E-02	-1.13E-01	-1.20E-01	-1.11E-01	-6.13E-02	-7.17E-02	-7.07E-02	-7.34E-02	-7.87E-02	-8.44E-02	-9.18E-02
4	0.01062	0.00	-1.32E-01	-1.48E-01	-1.63E-01	-1.27E-01	-1.03E-01	-9.93E-02	-1.01E-01	-1.03E-01	-1.05E-01	-1.09E-01	-1.15E-01
3	0.00562	0.00	-1.74E-01	-1.75E-01	-1.77E-01	-1.50E-01	-1.30E-01	-1.21E-01	-1.21E-01	-1.22E-01	-1.21E-01	-1.24E-01	-1.29E-01
2	0.00156	0.00	-2.11E-01	-1.87E-01	-1.90E-01	-1.60E-01	-1.41E-01	-1.30E-01	-1.29E-01	-1.29E-01	-1.28E-01	-1.30E-01	-1.35E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.54E-02	3.49E-02	4.88E-02	6.91E-02	9.60E-02	1.30E-01	1.69E-01	2.09E-01	2.49E-01	2.89E-01	0.00
19	0.05937	2.45E-02	3.38E-02	4.70E-02	6.65E-02	9.17E-02	1.24E-01	1.60E-01	1.97E-01	2.34E-01	2.69E-01	0.00
18	0.05594	2.32E-02	3.20E-02	4.39E-02	6.12E-02	8.29E-02	1.10E-01	1.41E-01	1.72E-01	2.01E-01	2.29E-01	0.00
17	0.05344	2.19E-02	3.01E-02	4.08E-02	5.61E-02	7.46E-02	9.79E-02	1.24E-01	1.49E-01	1.73E-01	1.95E-01	0.00
16	0.05078	2.04E-02	2.72E-02	3.64E-02	4.90E-02	6.39E-02	8.28E-02	1.03E-01	1.22E-01	1.40E-01	1.55E-01	0.00
15	0.04812	1.82E-02	2.35E-02	3.07E-02	4.05E-02	5.15E-02	6.55E-02	7.95E-02	9.28E-02	1.04E-01	1.13E-01	0.00
14	0.04562	1.51E-02	1.89E-02	2.41E-02	3.10E-02	3.83E-02	4.74E-02	5.58E-02	6.36E-02	6.93E-02	7.33E-02	0.00
13	0.04328	1.12E-02	1.36E-02	1.68E-02	2.07E-02	2.46E-02	2.90E-02	3.23E-02	3.51E-02	3.59E-02	3.52E-02	0.00
12	0.04094	6.06E-03	7.08E-03	8.37E-03	9.23E-03	9.79E-03	9.76E-03	7.98E-03	5.97E-03	2.13E-03	-2.65E-03	0.00
11	0.03719	-4.71E-03	-6.00E-03	-7.84E-03	-1.13E-02	-1.63E-02	-2.33E-02	-3.26E-02	-4.16E-02	-5.20E-02	-6.24E-02	0.00
10	0.03437	-1.47E-02	-1.77E-02	-2.19E-02	-2.85E-02	-3.76E-02	-4.92E-02	-6.35E-02	-7.71E-02	-9.18E-02	-1.06E-01	0.00
9	0.03219	-2.33E-02	-2.79E-02	-3.38E-02	-4.27E-02	-5.48E-02	-6.98E-02	-8.76E-02	-1.04E-01	-1.22E-01	-1.38E-01	0.00
8	0.03031	-3.16E-02	-3.72E-02	-4.45E-02	-5.53E-02	-6.95E-02	-8.73E-02	-1.08E-01	-1.27E-01	-1.47E-01	-1.65E-01	0.00
7	0.02687	-4.78E-02	-5.52E-02	-6.47E-02	-7.88E-02	-9.66E-02	-1.19E-01	-1.43E-01	-1.67E-01	-1.90E-01	-2.11E-01	0.00
6	0.02187	-7.31E-02	-8.20E-02	-9.41E-02	-1.12E-01	-1.34E-01	-1.61E-01	-1.90E-01	-2.19E-01	-2.46E-01	-2.69E-01	0.00
5	0.01625	-1.01E-01	-1.11E-01	-1.25E-01	-1.45E-01	-1.70E-01	-2.01E-01	-2.34E-01	-2.66E-01	-2.97E-01	-3.22E-01	0.00
4	0.01062	-1.24E-01	-1.34E-01	-1.49E-01	-1.72E-01	-1.98E-01	-2.31E-01	-2.66E-01	-3.01E-01	-3.33E-01	-3.59E-01	0.00
3	0.00562	-1.37E-01	-1.49E-01	-1.64E-01	-1.87E-01	-2.15E-01	-2.48E-01	-2.85E-01	-3.20E-01	-3.54E-01	-3.80E-01	0.00
2	0.00156	-1.43E-01	-1.54E-01	-1.70E-01	-1.93E-01	-2.21E-01	-2.54E-01	-2.91E-01	-3.27E-01	-3.61E-01	-3.88E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- TURBULENCE ENERGY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.13E 00	9.62E-01	8.85E-01	8.22E-01	7.71E-01	7.30E-01	7.04E-01	7.16E-01
19	0.05937	0.00	0.00	0.00	0.00	3.50E 00	4.61E 00	3.94E 00	3.22E 00	2.66E 00	2.25E 00	2.01E 00	2.16E 00
18	0.05594	0.00	0.00	0.00	0.00	5.19E 00	4.90E 00	4.23E 00	3.57E 00	3.03E 00	2.61E 00	2.36E 00	2.96E 00
17	0.05344	0.00	0.00	0.00	1.67E 00	4.77E 00	4.60E 00	3.95E 00	3.40E 00	2.95E 00	2.59E 00	2.50E 00	3.83E 00
16	0.05078	0.00	0.00	0.00	5.89E 00	5.70E 00	4.76E 00	3.85E 00	3.20E 00	2.74E 00	2.42E 00	2.76E 00	5.20E 00
15	0.04812	0.00	0.00	0.00	7.47E 00	5.99E 00	4.66E 00	3.63E 00	2.93E 00	2.46E 00	2.22E 00	3.66E 00	7.16E 00
14	0.04562	0.00	0.00	2.16E 00	7.72E 00	5.99E 00	4.53E 00	3.46E 00	2.72E 00	2.23E 00	2.42E 00	5.58E 00	9.49E 00
13	0.04328	0.00	0.00	8.47E 00	8.62E 00	6.03E 00	4.46E 00	3.41E 00	2.64E 00	2.22E 00	3.88E 00	8.28E 00	1.19E 01

1	0.00000	0.00	0.00	0.00	6.78E-02	1.43E-01	2.07E-01	2.49E-01	2.60E-01	2.44E-01	2.12E-01	1.79E-01	1.38E-01

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0	J	Y											
11	1.00000		5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000		4.75E-01	4.76E-01	4.77E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01
9	0.80000		4.52E-01	4.54E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01
8	0.70000		4.30E-01	4.32E-01	4.32E-01	4.32E-01	4.32E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01
7	0.60000		4.07E-01	4.08E-01	4.09E-01	4.08E-01	4.07E-01	4.06E-01	4.05E-01	4.04E-01	4.04E-01	4.05E-01	4.05E-01
6	0.50000		3.83E-01	3.84E-01	3.83E-01	3.81E-01	3.79E-01	3.77E-01	3.76E-01	3.75E-01	3.75E-01	3.75E-01	3.75E-01
5	0.40000		3.58E-01	3.57E-01	3.55E-01	3.52E-01	3.48E-01	3.46E-01	3.43E-01	3.42E-01	3.42E-01	3.42E-01	3.42E-01
4	0.30000		3.29E-01	3.26E-01	3.22E-01	3.17E-01	3.12E-01	3.08E-01	3.05E-01	3.03E-01	3.03E-01	3.03E-01	3.03E-01
3	0.20000		2.94E-01	2.88E-01	2.81E-01	2.74E-01	2.67E-01	2.61E-01	2.58E-01	2.55E-01	2.54E-01	2.54E-01	2.54E-01
2	0.10000		2.45E-01	2.34E-01	2.22E-01	2.11E-01	2.01E-01	1.94E-01	1.89E-01	1.86E-01	1.85E-01	1.85E-01	1.85E-01
1	0.00000		7.29E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS PRESSURE -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y												
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		0.00	0.00	0.00	0.00	3.90E 05	3.93E 05	3.89E 05	3.84E 05	3.83E 05	3.83E 05	3.84E 05	3.84E 05
19	0.47500		0.00	0.00	0.00	0.00	3.87E 05	3.90E 05	3.86E 05	3.82E 05	3.80E 05	3.81E 05	3.81E 05	3.82E 05
18	0.44750		0.00	0.00	0.00	0.00	3.81E 05	3.85E 05	3.81E 05	3.77E 05	3.76E 05	3.77E 05	3.78E 05	3.78E 05
17	0.42750		0.00	0.00	0.00	3.72E 05	3.77E 05	3.81E 05	3.77E 05	3.74E 05	3.73E 05	3.74E 05	3.75E 05	3.75E 05
16	0.40625		0.00	0.00	0.00	3.66E 05	3.73E 05	3.75E 05	3.72E 05	3.70E 05	3.70E 05	3.71E 05	3.71E 05	3.71E 05
15	0.38500		0.00	0.00	0.00	3.56E 05	3.67E 05	3.69E 05	3.66E 05	3.65E 05	3.65E 05	3.67E 05	3.68E 05	3.67E 05
14	0.36500		0.00	0.00	3.31E 05	3.47E 05	3.60E 05	3.62E 05	3.60E 05	3.60E 05	3.61E 05	3.63E 05	3.64E 05	3.63E 05
13	0.34625		0.00	0.00	3.21E 05	3.39E 05	3.52E 05	3.55E 05	3.54E 05	3.55E 05	3.57E 05	3.59E 05	3.59E 05	3.58E 05
12	0.32750		0.00	0.00	3.05E 05	3.30E 05	3.43E 05	3.47E 05	3.47E 05	3.49E 05	3.53E 05	3.55E 05	3.55E 05	3.54E 05
11	0.29750		0.00	2.20E 05	2.75E 05	3.13E 05	3.29E 05	3.32E 05	3.34E 05	3.40E 05	3.45E 05	3.46E 05	3.46E 05	3.45E 05
10	0.27500		0.00	1.89E 05	2.60E 05	3.00E 05	3.16E 05	3.20E 05	3.24E 05	3.32E 05	3.37E 05	3.39E 05	3.39E 05	3.38E 05
9	0.25750		0.00	1.50E 05	2.51E 05	2.89E 05	3.06E 05	3.11E 05	3.17E 05	3.25E 05	3.31E 05	3.33E 05	3.33E 05	3.33E 05
8	0.24250		0.00	1.42E 05	2.40E 05	2.80E 05	2.97E 05	3.03E 05	3.10E 05	3.20E 05	3.25E 05	3.27E 05	3.27E 05	3.28E 05
7	0.21500		0.00	1.63E 05	2.26E 05	2.65E 05	2.82E 05	2.89E 05	2.99E 05	3.08E 05	3.13E 05	3.15E 05	3.17E 05	3.19E 05
6	0.17500		0.00	1.71E 05	2.13E 05	2.46E 05	2.60E 05	2.68E 05	2.80E 05	2.88E 05	2.94E 05	2.98E 05	3.03E 05	3.07E 05
5	0.13000		0.00	1.60E 05	1.97E 05	2.26E 05	2.38E 05	2.47E 05	2.58E 05	2.66E 05	2.73E 05	2.80E 05	2.88E 05	2.95E 05
4	0.08500		0.00	1.24E 05	1.78E 05	2.06E 05	2.20E 05	2.27E 05	2.37E 05	2.46E 05	2.56E 05	2.66E 05	2.76E 05	2.85E 05
3	0.04500		0.00	5.27E 04	1.64E 05	1.93E 05	2.05E 05	2.14E 05	2.24E 05	2.34E 05	2.45E 05	2.57E 05	2.69E 05	2.79E 05
2	0.01250		0.00	0.00	1.55E 05	1.81E 05	1.99E 05	2.09E 05	2.19E 05	2.30E 05	2.41E 05	2.54E 05	2.66E 05	2.77E 05
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		3.84E 05	3.84E 05	3.84E 05	3.83E 05	3.83E 05	3.81E 05	3.80E 05	3.78E 05	3.76E 05	3.74E 05	0.00
19	0.47500		3.82E 05	3.81E 05	3.81E 05	3.80E 05	3.79E 05	3.78E 05	3.76E 05	3.75E 05	3.73E 05	3.71E 05	0.00
18	0.44750		3.77E 05	3.77E 05	3.76E 05	3.75E 05	3.74E 05	3.72E 05	3.71E 05	3.70E 05	3.68E 05	3.66E 05	0.00
17	0.42750		3.74E 05	3.73E 05	3.72E 05	3.71E 05	3.70E 05	3.68E 05	3.67E 05	3.66E 05	3.65E 05	3.63E 05	0.00
16	0.40625		3.70E 05	3.69E 05	3.68E 05	3.67E 05	3.65E 05	3.64E 05	3.63E 05	3.62E 05	3.61E 05	3.60E 05	0.00
15	0.38500		3.66E 05	3.65E 05	3.63E 05	3.62E 05	3.61E 05	3.60E 05	3.59E 05	3.58E 05	3.57E 05	3.56E 05	0.00
14	0.36500		3.62E 05	3.60E 05	3.59E 05	3.58E 05	3.57E 05	3.56E 05	3.56E 05	3.55E 05	3.54E 05	3.53E 05	0.00
13	0.34625		3.57E 05	3.56E 05	3.55E 05	3.54E 05	3.54E 05	3.53E 05	3.52E 05	3.52E 05	3.51E 05	3.51E 05	0.00
12	0.32750		3.53E 05	3.52E 05	3.51E 05	3.51E 05	3.50E 05	3.50E 05	3.49E 05	3.49E 05	3.49E 05	3.48E 05	0.00
11	0.29750		3.45E 05	3.45E 05	3.45E 05	3.45E 05	3.44E 05	3.44E 05	3.44E 05	3.44E 05	3.45E 05	3.45E 05	0.00

```
X  0.48   .                                                                  .  0.48
X  0.50   +                                                                  +  0.50
X  0.52   0                    2                   4                   6     8  1  0.52
X  0.54   .                                                                  .  0.54
X  0.56   .                                                                  .  0.56
X  0.58   0                    2                   4                   6     8  1  0.58
X  0.60   +                                                                  +  0.60
X  0.62   .                                                                  .  0.62
X  0.64   .                                                                  .  0.64
X  0.66   0                    2                   4                   6     8  1  0.66
X  0.68   .                                                                  .  0.68
X  0.70   +                                                                  +  0.70
X  0.72   .                                                                  .  0.72
X  0.74   0                    2                   4                   6     8  1  0.74
X  0.76   .                                                                  .  0.76
X  0.78   .                                                                  .  0.78
X  0.80   +                                                                  +  0.80
X  0.82   .                                                                  .  0.82
X  0.84   0                    2                   4                   6     8  1  0.84
X  0.86   .                                                                  .  0.86
X  0.88   .                                                                  .  0.88
X  0.90   +                                                                  +  0.90
X  0.92   0                    2                   4                   6     8  1  0.92
X  0.94   .                                                                  .  0.94
X  0.96   .                                                                  .  0.96
X  0.98   .                                                                  .  0.98
X  1.00   0.....+.....+.....+.....+.....+2.....+.....4.+.....+6.....+8.....1  1.00
```

W VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.45E 01	1.45E 01	1.45E 01	1.44E 01	1.44E 01	1.44E 01	1.46E 01	1.56E 01
19	0.05937	0.00	0.00	0.00	0.00	1.50E 01	1.49E 01	1.49E 01	1.50E 01	1.50E 01	1.52E 01	1.57E 01	1.67E 01
18	0.05594	0.00	0.00	0.00	0.00	1.55E 01	1.51E 01	1.50E 01	1.51E 01	1.52E 01	1.56E 01	1.64E 01	1.73E 01
17	0.05344	0.00	0.00	0.00	1.75E 01	1.63E 01	1.55E 01	1.53E 01	1.53E 01	1.55E 01	1.61E 01	1.69E 01	1.77E 01
16	0.05078	0.00	0.00	0.00	1.82E 01	1.65E 01	1.56E 01	1.54E 01	1.55E 01	1.59E 01	1.67E 01	1.75E 01	1.80E 01
15	0.04812	0.00	0.00	0.00	1.89E 01	1.67E 01	1.56E 01	1.54E 01	1.57E 01	1.65E 01	1.74E 01	1.80E 01	1.82E 01
14	0.04562	0.00	0.00	2.27E 01	1.99E 01	1.69E 01	1.55E 01	1.54E 01	1.61E 01	1.72E 01	1.80E 01	1.83E 01	1.83E 01
13	0.04328	0.00	0.00	2.36E 01	2.00E 01	1.67E 01	1.53E 01	1.56E 01	1.67E 01	1.79E 01	1.84E 01	1.85E 01	1.83E 01
12	0.04094	0.00	0.00	2.46E 01	2.02E 01	1.65E 01	1.52E 01	1.59E 01	1.74E 01	1.84E 01	1.87E 01	1.86E 01	1.82E 01
11	0.03719	0.00	3.12E 01	2.63E 01	2.04E 01	1.63E 01	1.53E 01	1.68E 01	1.83E 01	1.89E 01	1.88E 01	1.84E 01	1.77E 01
10	0.03437	0.00	3.28E 01	2.71E 01	2.03E 01	1.59E 01	1.55E 01	1.75E 01	1.87E 01	1.90E 01	1.86E 01	1.80E 01	1.72E 01
9	0.03219	0.00	3.47E 01	2.76E 01	1.99E 01	1.55E 01	1.58E 01	1.79E 01	1.88E 01	1.88E 01	1.83E 01	1.75E 01	1.67E 01
8	0.03031	4.28E 01	3.68E 01	2.77E 01	1.93E 01	1.52E 01	1.61E 01	1.80E 01	1.86E 01	1.84E 01	1.78E 01	1.70E 01	1.62E 01
7	0.02687	4.28E 01	3.65E 01	2.67E 01	1.83E 01	1.49E 01	1.65E 01	1.78E 01	1.79E 01	1.75E 01	1.68E 01	1.59E 01	1.50E 01
6	0.02187	4.28E 01	3.53E 01	2.45E 01	1.65E 01	1.46E 01	1.59E 01	1.61E 01	1.59E 01	1.54E 01	1.46E 01	1.38E 01	1.29E 01
5	0.01625	4.28E 01	3.31E 01	2.10E 01	1.41E 01	1.32E 01	1.32E 01	1.30E 01	1.26E 01	1.21E 01	1.15E 01	1.08E 01	1.01E 01
4	0.01062	4.28E 01	2.97E 01	1.60E 01	8.75E 00	9.82E 00	9.29E 00	8.96E 00	8.64E 00	8.27E 00	7.83E 00	7.35E 00	6.86E 00
3	0.00562	4.28E 01	2.41E 01	8.10E 00	5.58E 00	5.58E 00	5.14E 00	4.90E 00	4.71E 00	4.51E 00	4.27E 00	4.00E 00	3.73E 00
2	0.00156	4.28E 01	6.70E 00	2.25E 00	1.55E 00	1.55E 00	1.43E 00	1.36E 00	1.31E 00	1.25E 00	1.19E 00	1.11E 00	1.04E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.68E 01	1.80E 01	1.89E 01	1.94E 01	1.96E 01	1.96E 01	1.93E 01	1.89E 01	1.84E 01	1.81E 01	0.00
19	0.05937	1.78E 01	1.88E 01	1.96E 01	2.00E 01	2.03E 01	2.03E 01	2.02E 01	2.00E 01	1.98E 01	1.95E 01	0.00
18	0.05594	1.82E 01	1.89E 01	1.94E 01	1.98E 01	1.99E 01	1.99E 01	1.98E 01	1.96E 01	1.94E 01	1.91E 01	0.00
17	0.05344	1.83E 01	1.88E 01	1.92E 01	1.94E 01	1.95E 01	1.94E 01	1.93E 01	1.91E 01	1.88E 01	1.86E 01	0.00
16	0.05078	1.83E 01	1.86E 01	1.88E 01	1.89E 01	1.89E 01	1.88E 01	1.86E 01	1.84E 01	1.81E 01	1.78E 01	0.00
15	0.04812	1.83E 01	1.84E 01	1.84E 01	1.84E 01	1.83E 01	1.81E 01	1.78E 01	1.76E 01	1.73E 01	1.70E 01	0.00
14	0.04562	1.82E 01	1.81E 01	1.80E 01	1.78E 01	1.76E 01	1.74E 01	1.71E 01	1.68E 01	1.65E 01	1.62E 01	0.00
13	0.04328	1.80E 01	1.77E 01	1.75E 01	1.72E 01	1.70E 01	1.67E 01	1.64E 01	1.61E 01	1.58E 01	1.55E 01	0.00
12	0.04094	1.77E 01	1.73E 01	1.70E 01	1.66E 01	1.63E 01	1.59E 01	1.56E 01	1.53E 01	1.50E 01	1.47E 01	0.00
11	0.03719	1.71E 01	1.65E 01	1.60E 01	1.56E 01	1.51E 01	1.47E 01	1.44E 01	1.40E 01	1.37E 01	1.34E 01	0.00
10	0.03437	1.65E 01	1.58E 01	1.52E 01	1.47E 01	1.42E 01	1.38E 01	1.34E 01	1.31E 01	1.27E 01	1.24E 01	0.00
9	0.03219	1.59E 01	1.52E 01	1.45E 01	1.40E 01	1.35E 01	1.30E 01	1.26E 01	1.23E 01	1.20E 01	1.17E 01	0.00
8	0.03031	1.53E 01	1.46E 01	1.39E 01	1.33E 01	1.28E 01	1.24E 01	1.20E 01	1.16E 01	1.13E 01	1.10E 01	0.00
7	0.02687	1.42E 01	1.34E 01	1.27E 01	1.21E 01	1.15E 01	1.11E 01	1.07E 01	1.04E 01	1.01E 01	9.81E 00	0.00
6	0.02187	1.21E 01	1.14E 01	1.07E 01	1.01E 01	9.61E 00	9.19E 00	8.84E 00	8.54E 00	8.27E 00	8.04E 00	0.00
5	0.01625	9.43E 00	8.79E 00	8.20E 00	7.70E 00	7.29E 00	6.94E 00	6.65E 00	6.41E 00	6.20E 00	6.01E 00	0.00
4	0.01062	6.38E 00	5.93E 00	5.51E 00	5.15E 00	4.85E 00	4.61E 00	4.40E 00	4.23E 00	4.09E 00	3.96E 00	0.00
3	0.00562	3.47E 00	3.21E 00	2.98E 00	2.78E 00	2.61E 00	2.48E 00	2.36E 00	2.27E 00	2.19E 00	2.12E 00	0.00
2	0.00156	9.63E-01	8.92E-01	8.27E-01	7.71E-01	7.25E-01	6.88E-01	6.56E-01	6.30E-01	6.08E-01	5.88E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRESSURE

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

W VELOCITY

0 J	Y												
21	0.06250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.05766	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18	0.05469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
17	0.05211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16	0.04945	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	0.04687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14	0.04445	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13	0.04211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.03906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11	0.03578	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.03328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	0.03125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.02859	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	0.02437	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	0.01906	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.01344	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	0.00812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00353	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

0 J	Y													
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.05937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18	0.05594	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
17	0.05344	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16	0.05078	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	0.04812	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14	0.04562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13	0.04328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.04094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11	0.03719	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.03437	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	0.03219	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.03031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	0.02687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	0.02187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.01625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	0.01062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.05937	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.05594	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 0.000

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 0.000

COMPUTED INLET SWIRL NUMBER = 0.0000

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	-2.13E 00	-3.42E 00	-4.17E 00	-4.66E 00	-4.95E 00	-5.00E 00	-4.75E 00
19	0.05937	0.00	0.00	0.00	0.00	0.00	-2.14E 00	-3.20E 00	-3.85E 00	-4.26E 00	-4.47E 00	-4.45E 00	-4.14E 00
18	0.05594	0.00	0.00	0.00	0.00	0.00	-2.06E 00	-2.78E 00	-3.26E 00	-3.55E 00	-3.65E 00	-3.54E 00	-3.17E 00
17	0.05344	0.00	0.00	0.00	0.00	-2.28E 00	-1.97E 00	-2.39E 00	-2.71E 00	-2.87E 00	-2.87E 00	-2.69E 00	-2.27E 00
16	0.05078	0.00	0.00	0.00	0.00	-2.07E 00	-1.74E 00	-1.87E 00	-1.97E 00	-1.96E 00	-1.83E 00	-1.55E 00	-1.08E 00
15	0.04812	0.00	0.00	0.00	0.00	-1.91E 00	-1.39E 00	-1.19E 00	-1.03E 00	-8.15E-01	-5.36E-01	-1.55E-01	3.59E-01
14	0.04562	0.00	0.00	0.00	-2.64E 00	-1.82E 00	-9.16E-01	-3.24E-01	1.25E-01	5.41E-01	9.63E-01	1.43E 00	1.97E 00
13	0.04328	0.00	0.00	0.00	-2.51E 00	-1.60E 00	-1.67E-01	8.07E-01	1.52E 00	2.12E 00	2.66E 00	3.19E 00	3.72E 00
12	0.04094	0.00	0.00	0.00	-2.45E 00	-9.37E-01	1.15E 00	2.41E 00	3.33E 00	4.06E 00	4.68E 00	5.24E 00	5.71E 00
11	0.03719	0.00	0.00	-4.99E 00	-2.39E-01	2.69E 00	4.74E 00	6.20E 00	7.29E 00	8.10E 00	8.72E 00	9.20E 00	9.47E 00
10	0.03437	0.00	0.00	1.89E 00	5.74E 00	7.91E 00	9.53E 00	1.08E 01	1.16E 01	1.22E 01	1.26E 01	1.28E 01	1.28E 01
9	0.03219	0.00	0.00	1.09E 01	1.29E 01	1.41E 01	1.51E 01	1.57E 01	1.60E 01	1.62E 01	1.62E 01	1.61E 01	1.56E 01
8	0.03031	0.00	3.00E 01	2.73E 01	2.53E 01	2.37E 01	2.22E 01	2.11E 01	2.03E 01	1.99E 01	1.96E 01	1.91E 01	1.82E 01
7	0.02687	0.00	3.00E 01	2.98E 01	2.97E 01	2.95E 01	2.93E 01	2.90E 01	2.84E 01	2.74E 01	2.61E 01	2.45E 01	2.28E 01
6	0.02187	0.00	3.00E 01	2.99E 01	2.98E 01	2.97E 01	2.97E 01	2.97E 01	2.96E 01	2.94E 01	2.91E 01	2.83E 01	2.71E 01
5	0.01625	0.00	3.00E 01	2.99E 01	2.98E 01	2.98E 01	2.97E 01	2.97E 01	2.96E 01	2.95E 01	2.93E 01	2.89E 01	2.83E 01
4	0.01062	0.00	3.00E 01	2.99E 01	2.99E 01	2.98E 01	2.98E 01	2.97E 01	2.97E 01	2.95E 01	2.93E 01	2.89E 01	2.84E 01
3	0.00562	0.00	3.00E 01	3.00E 01	2.99E 01	2.98E 01	2.98E 01	2.97E 01	2.97E 01	2.95E 01	2.93E 01	2.89E 01	2.84E 01
2	0.00156	0.00	3.00E 01	3.00E 01	2.99E 01	2.98E 01	2.98E 01	2.98E 01	2.97E 01	2.95E 01	2.93E 01	2.89E 01	2.84E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	-4.13E 00	-3.16E 00	-1.94E 00	-5.76E-01	8.54E-01	2.12E 00	3.28E 00	4.21E 00	4.92E 00	5.40E 00	5.40E 00
19	0.05937	-3.49E 00	-2.51E 00	-1.29E 00	4.47E-02	1.39E 00	2.62E 00	3.73E 00	4.63E 00	5.31E 00	5.77E 00	5.77E 00
18	0.05594	-2.49E 00	-1.53E 00	-3.80E-01	8.49E-01	2.07E 00	3.20E 00	4.22E 00	5.04E 00	5.66E 00	6.07E 00	6.07E 00
17	0.05344	-1.59E 00	-6.68E-01	3.98E-01	1.52E 00	2.62E 00	3.66E 00	4.59E 00	5.34E 00	5.90E 00	6.27E 00	6.27E 00
16	0.05078	-4.10E-01	4.31E-01	1.38E 00	2.36E 00	3.31E 00	4.21E 00	5.03E 00	5.69E 00	6.18E 00	6.50E 00	6.50E 00
15	0.04812	9.98E-01	1.73E 00	2.52E 00	3.32E 00	4.09E 00	4.84E 00	5.53E 00	6.07E 00	6.48E 00	6.74E 00	6.74E 00
14	0.04562	2.55E 00	3.15E 00	3.75E 00	4.35E 00	4.93E 00	5.51E 00	6.04E 00	6.47E 00	6.79E 00	6.99E 00	6.99E 00
13	0.04328	4.21E 00	4.64E 00	5.04E 00	5.43E 00	5.80E 00	6.19E 00	6.57E 00	6.87E 00	7.09E 00	7.23E 00	7.23E 00
12	0.04094	6.07E 00	6.31E 00	6.47E 00	6.61E 00	6.75E 00	6.94E 00	7.13E 00	7.30E 00	7.41E 00	7.48E 00	7.48E 00
11	0.03719	9.50E 00	9.32E 00	9.02E 00	8.70E 00	8.43E 00	8.24E 00	8.12E 00	8.04E 00	7.96E 00	7.91E 00	7.91E 00
10	0.03437	1.24E 01	1.18E 01	1.11E 01	1.04E 01	9.79E 00	9.31E 00	8.92E 00	8.62E 00	8.40E 00	8.24E 00	8.24E 00
9	0.03219	1.49E 01	1.39E 01	1.28E 01	1.18E 01	1.09E 01	1.02E 01	9.57E 00	9.10E 00	8.74E 00	8.50E 00	8.50E 00

3	0.00562	0.00	3.24E-02	3.24E-02	3.23E-02	3.22E-02	3.22E-02	3.21E-02	3.20E-02	3.19E-02	3.16E-02	3.13E-02	3.07E-02
2	0.00156	0.00	2.50E-03	2.50E-03	2.49E-03	2.49E-03	2.48E-03	2.48E-03	2.47E-03	2.46E-03	2.44E-03	2.41E-03	2.37E-03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		1.01E 00	1.00E 00	1.00E 00	9.98E-01	9.95E-01	9.92E-01	9.89E-01	9.87E-01	9.86E-01	9.85E-01	9.85E-01
19	0.05937		1.05E 00	1.03E 00	1.02E 00	1.00E 00	9.83E-01	9.67E-01	9.53E-01	9.42E-01	9.33E-01	9.27E-01	9.27E-01
18	0.05594		1.09E 00	1.06E 00	1.03E 00	9.95E-01	9.60E-01	9.28E-01	9.00E-01	8.77E-01	8.59E-01	8.47E-01	8.47E-01
17	0.05344		1.11E 00	1.07E 00	1.03E 00	9.84E-01	9.38E-01	8.96E-01	8.58E-01	8.28E-01	8.05E-01	7.90E-01	7.90E-01
16	0.05078		1.12E 00	1.07E 00	1.02E 00	9.66E-01	9.10E-01	8.59E-01	8.13E-01	7.76E-01	7.48E-01	7.29E-01	7.29E-01
15	0.04812		1.11E 00	1.06E 00	1.00E 00	9.41E-01	8.77E-01	8.18E-01	7.66E-01	7.23E-01	6.91E-01	6.70E-01	6.70E-01
14	0.04562		1.10E 00	1.04E 00	9.79E-01	9.10E-01	8.41E-01	7.77E-01	7.20E-01	6.73E-01	6.38E-01	6.15E-01	6.15E-01
13	0.04328		1.08E 00	1.02E 00	9.48E-01	8.75E-01	8.03E-01	7.36E-01	6.75E-01	6.26E-01	5.89E-01	5.65E-01	5.65E-01
12	0.04094		1.04E 00	9.80E-01	9.10E-01	8.35E-01	7.61E-01	6.91E-01	6.29E-01	5.78E-01	5.40E-01	5.15E-01	5.15E-01
11	0.03719		9.65E-01	9.03E-01	8.33E-01	7.59E-01	6.85E-01	6.16E-01	5.53E-01	5.02E-01	4.63E-01	4.38E-01	4.38E-01
10	0.03437		8.90E-01	8.31E-01	7.64E-01	6.93E-01	6.23E-01	5.56E-01	4.94E-01	4.44E-01	4.07E-01	3.83E-01	3.83E-01
9	0.03219		8.22E-01	7.67E-01	7.04E-01	6.38E-01	5.72E-01	5.07E-01	4.48E-01	4.00E-01	3.64E-01	3.41E-01	3.41E-01
8	0.03031		7.58E-01	7.08E-01	6.50E-01	5.89E-01	5.26E-01	4.65E-01	4.09E-01	3.63E-01	3.29E-01	3.07E-01	3.07E-01
7	0.02687		6.31E-01	5.92E-01	5.45E-01	4.94E-01	4.40E-01	3.87E-01	3.38E-01	2.97E-01	2.67E-01	2.47E-01	2.47E-01
6	0.02187		4.41E-01	4.18E-01	3.88E-01	3.54E-01	3.16E-01	2.77E-01	2.39E-01	2.07E-01	1.84E-01	1.69E-01	1.69E-01
5	0.01625		2.49E-01	2.39E-01	2.26E-01	2.09E-01	1.87E-01	1.64E-01	1.40E-01	1.20E-01	1.05E-01	9.60E-02	9.60E-02
4	0.01062		1.07E-01	1.04E-01	9.95E-02	9.31E-02	8.43E-02	7.36E-02	6.26E-02	5.33E-02	4.64E-02	4.20E-02	4.20E-02
3	0.00562		3.00E-02	2.92E-02	2.82E-02	2.67E-02	2.43E-02	2.12E-02	1.80E-02	1.53E-02	1.32E-02	1.19E-02	1.19E-02
2	0.00156		2.32E-03	2.26E-03	2.19E-03	2.08E-03	1.90E-03	1.66E-03	1.41E-03	1.19E-03	1.03E-03	9.25E-04	9.25E-04
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- RADIAL COORDINATE OF STREAMLINES -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0	J	Y												
11	1.00000		0.00	3.12E-02	3.21E-02	3.25E-02	3.28E-02	3.30E-02	3.32E-02	3.35E-02	3.39E-02	3.44E-02	3.53E-02	3.67E-02
10	0.90000		0.00	2.96E-02	2.98E-02	3.00E-02	3.01E-02	3.03E-02	3.04E-02	3.07E-02	3.10E-02	3.14E-02	3.21E-02	3.32E-02
9	0.80000		0.00	2.79E-02	2.80E-02	2.81E-02	2.82E-02	2.83E-02	2.83E-02	2.85E-02	2.87E-02	2.90E-02	2.95E-02	3.03E-02
8	0.70000		0.00	2.61E-02	2.61E-02	2.62E-02	2.62E-02	2.62E-02	2.63E-02	2.64E-02	2.65E-02	2.68E-02	2.72E-02	2.78E-02
7	0.60000		0.00	2.41E-02	2.41E-02	2.42E-02	2.42E-02	2.42E-02	2.42E-02	2.43E-02	2.44E-02	2.46E-02	2.49E-02	2.53E-02
6	0.50000		0.00	2.21E-02	2.21E-02	2.21E-02	2.22E-02	2.22E-02	2.22E-02	2.22E-02	2.23E-02	2.24E-02	2.26E-02	2.29E-02
5	0.40000		0.00	1.96E-02	1.96E-02	1.96E-02	1.96E-02	1.97E-02	1.97E-02	1.97E-02	1.97E-02	1.98E-02	2.00E-02	2.03E-02
4	0.30000		0.00	1.70E-02	1.70E-02	1.70E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.71E-02	1.72E-02	1.73E-02	1.75E-02
3	0.20000		0.00	1.37E-02	1.37E-02	1.37E-02	1.37E-02	1.37E-02	1.38E-02	1.38E-02	1.38E-02	1.39E-02	1.40E-02	1.41E-02
2	0.10000		0.00	9.69E-03	9.70E-03	9.71E-03	9.72E-03	9.73E-03	9.74E-03	9.75E-03	9.78E-03	9.83E-03	9.91E-03	1.00E-02
1	0.00000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0	J	Y											
11	1.00000		3.89E-02	4.22E-02	4.77E-02	5.88E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000		3.48E-02	3.71E-02	4.05E-02	4.50E-02	5.00E-02	5.37E-02	5.60E-02	5.72E-02	5.78E-02	5.82E-02	5.82E-02
9	0.80000		3.15E-02	3.33E-02	3.59E-02	3.92E-02	4.31E-02	4.70E-02	5.00E-02	5.20E-02	5.32E-02	5.39E-02	5.39E-02
8	0.70000		2.87E-02	3.01E-02	3.20E-02	3.47E-02	3.79E-02	4.14E-02	4.46E-02	4.70E-02	4.85E-02	4.95E-02	4.95E-02
7	0.60000		2.61E-02	2.71E-02	2.87E-02	3.07E-02	3.34E-02	3.64E-02	3.95E-02	4.20E-02	4.38E-02	4.49E-02	4.49E-02
6	0.50000		2.34E-02	2.42E-02	2.54E-02	2.71E-02	2.93E-02	3.19E-02	3.47E-02	3.71E-02	3.90E-02	4.02E-02	4.02E-02
5	0.40000		2.07E-02	2.13E-02	2.22E-02	2.35E-02	2.53E-02	2.74E-02	2.99E-02	3.22E-02	3.40E-02	3.53E-02	3.52E-02
4	0.30000		1.77E-02	1.82E-02	1.88E-02	1.98E-02	2.12E-02	2.29E-02	2.50E-02	2.70E-02	2.87E-02	2.99E-02	2.99E-02
3	0.20000		1.43E-02	1.46E-02	1.51E-02	1.58E-02	1.68E-02	1.81E-02	1.97E-02	2.14E-02	2.29E-02	2.39E-02	2.39E-02

0 I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J Y												
21 0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20 0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.30E 00	6.76E 00	8.19E 00	9.50E 00	1.08E 01	1.21E 01	1.33E 01	1.44E 01
19 0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	7.35E 01	1.85E 02	2.37E 02	2.91E 02	3.48E 02	4.07E 02	4.69E 02	5.28E 02
18 0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	8.30E 01	2.81E 02	3.69E 02	4.59E 02	5.55E 02	6.61E 02	7.78E 02	8.97E 02
17 0.42750	1.00E 00	1.00E 00	1.00E 00	1.20E 01	1.34E 02	3.13E 02	4.08E 02	5.09E 02	6.18E 02	7.41E 02	8.79E 02	1.02E 03
16 0.40625	1.00E 00	1.00E 00	1.00E 00	6.40E 01	1.77E 02	3.26E 02	4.23E 02	5.30E 02	6.49E 02	7.83E 02	9.38E 02	1.10E 03
15 0.38500	1.00E 00	1.00E 00	1.00E 00	6.76E 01	2.03E 02	3.22E 02	4.17E 02	5.29E 02	6.54E 02	7.97E 02	9.64E 02	1.14E 03
14 0.36500	1.00E 00	1.00E 00	1.21E 01	9.89E 01	2.16E 02	3.04E 02	3.99E 02	5.14E 02	6.44E 02	7.93E 02	9.67E 02	1.16E 03
13 0.34625	1.00E 00	1.00E 00	6.24E 01	1.46E 02	2.14E 02	2.86E 02	3.81E 02	4.95E 02	6.26E 02	7.77E 02	9.55E 02	1.15E 03
12 0.32750	1.00E 00	1.00E 00	7.70E 01	1.97E 02	2.26E 02	2.90E 02	3.72E 02	4.76E 02	6.01E 02	7.50E 02	9.28E 02	1.13E 03
11 0.29750	1.00E 00	4.54E 01	1.51E 02	2.54E 02	2.84E 02	3.14E 02	3.64E 02	4.41E 02	5.45E 02	6.80E 02	8.53E 02	1.06E 03
10 0.27500	1.00E 00	2.24E 02	3.48E 02	3.29E 02	3.13E 02	3.16E 02	3.46E 02	4.03E 02	4.88E 02	6.09E 02	7.74E 02	9.82E 02
9 0.25750	1.00E 00	5.21E 02	3.66E 02	3.04E 02	2.74E 02	2.75E 02	3.06E 02	3.61E 02	4.35E 02	5.43E 02	7.02E 02	9.09E 02
8 0.24250	1.00E 00	1.25E 01	2.53E 01	5.74E 01	1.16E 02	1.88E 02	2.56E 02	3.14E 02	3.77E 02	4.77E 02	6.34E 02	8.38E 02
7 0.21500	1.00E 00	6.94E 00	5.66E 00	5.31E 00	6.21E 00	1.13E 01	3.14E 01	1.02E 02	2.46E 02	4.17E 02	5.58E 02	7.12E 02
6 0.17500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.98E 00	4.95E 00	5.00E 00	5.51E 00	1.00E 01	4.53E 01	2.66E 02	5.86E 02
5 0.13000	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	8.21E 00	7.11E 01
4 0.08500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.30E 00	5.40E 00
3 0.04500	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.30E 00	5.40E 00
2 0.01250	1.00E 00	6.94E 00	5.66E 00	5.17E 00	4.99E 00	4.95E 00	4.98E 00	5.04E 00	5.12E 00	5.21E 00	5.31E 00	5.40E 00
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0 I =	13	14	15	16	17	18	19	20	21	22	23
X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J Y											
21 0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20 0.49500	1.52E 01	1.56E 01	1.55E 01	1.50E 01	1.42E 01	1.33E 01	1.23E 01	1.14E 01	1.06E 01	9.78E 00	1.00E 00
19 0.47500	5.77E 02	6.06E 02	6.11E 02	5.95E 02	5.63E 02	5.21E 02	4.72E 02	4.24E 02	3.79E 02	3.39E 02	1.00E 00
18 0.44750	1.01E 03	1.09E 03	1.13E 03	1.13E 03	1.10E 03	1.04E 03	9.57E 02	8.72E 02	7.89E 02	7.12E 02	1.00E 00
17 0.42750	1.16E 03	1.28E 03	1.35E 03	1.37E 03	1.35E 03	1.29E 03	1.21E 03	1.11E 03	1.01E 03	9.24E 02	1.00E 00
16 0.40625	1.26E 03	1.40E 03	1.50E 03	1.54E 03	1.54E 03	1.49E 03	1.41E 03	1.31E 03	1.20E 03	1.11E 03	1.00E 00
15 0.38500	1.32E 03	1.48E 03	1.59E 03	1.66E 03	1.67E 03	1.63E 03	1.55E 03	1.46E 03	1.35E 03	1.25E 03	1.00E 00
14 0.36500	1.35E 03	1.52E 03	1.65E 03	1.73E 03	1.76E 03	1.73E 03	1.66E 03	1.57E 03	1.46E 03	1.37E 03	1.00E 00
13 0.34625	1.36E 03	1.54E 03	1.69E 03	1.78E 03	1.82E 03	1.81E 03	1.75E 03	1.65E 03	1.55E 03	1.45E 03	1.00E 00
12 0.32750	1.34E 03	1.54E 03	1.71E 03	1.82E 03	1.87E 03	1.87E 03	1.81E 03	1.72E 03	1.62E 03	1.53E 03	1.00E 00
11 0.29750	1.29E 03	1.51E 03	1.70E 03	1.84E 03	1.92E 03	1.94E 03	1.89E 03	1.81E 03	1.71E 03	1.62E 03	1.00E 00
10 0.27500	1.22E 03	1.46E 03	1.67E 03	1.84E 03	1.94E 03	1.98E 03	1.94E 03	1.86E 03	1.77E 03	1.68E 03	1.00E 00
9 0.25750	1.15E 03	1.40E 03	1.64E 03	1.82E 03	1.94E 03	1.99E 03	1.97E 03	1.90E 03	1.80E 03	1.72E 03	1.00E 00
8 0.24250	1.08E 03	1.34E 03	1.59E 03	1.80E 03	1.94E 03	2.01E 03	1.99E 03	1.92E 03	1.83E 03	1.74E 03	1.00E 00
7 0.21500	9.42E 02	1.22E 03	1.50E 03	1.74E 03	1.92E 03	2.01E 03	2.02E 03	1.96E 03	1.87E 03	1.78E 03	1.00E 00
6 0.17500	7.80E 02	1.03E 03	1.33E 03	1.61E 03	1.85E 03	1.99E 03	2.04E 03	2.00E 03	1.92E 03	1.83E 03	1.00E 00
5 0.13000	4.66E 02	7.89E 02	1.09E 03	1.43E 03	1.73E 03	1.95E 03	2.05E 03	2.04E 03	1.96E 03	1.86E 03	1.00E 00
4 0.08500	2.82E 01	3.90E 02	8.09E 02	1.19E 03	1.57E 03	1.89E 03	2.05E 03	2.07E 03	1.99E 03	1.89E 03	1.00E 00
3 0.04500	5.50E 00	3.30E 01	4.67E 02	9.33E 02	1.44E 03	1.86E 03	2.08E 03	2.10E 03	2.02E 03	1.91E 03	1.00E 00
2 0.01250	5.50E 00	5.93E 00	2.26E 02	9.78E 02	1.58E 03	2.00E 03	2.17E 03	2.15E 03	2.05E 03	1.92E 03	1.00E 00
1-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	2.807E-04

100	0.1111E 00	0.4262E-01	0.3099E 00	0.8115E-01	0.7659E-02	0.2631E 08	0.7240E 01	-0.2625E-01	0.1289E 01	0.9520E 03	0.3716E 03
101	0.1069E 00	0.4259E-01	0.3034E 00	0.7953E-01	0.7462E-02	0.2379E 08	0.7193E 01	-0.2630E-01	0.1366E 01	0.9520E 03	0.3788E 03
102	0.1028E 00	0.4182E-01	0.2967E 00	0.7780E-01	0.7283E-02	0.2369E 08	0.7145E 01	-0.2627E-01	0.1445E 01	0.9520E 03	0.3859E 03
103	0.9922E-01	0.4183E-01	0.2901E 00	0.7611E-01	0.7133E-02	0.2366E 08	0.7097E 01	-0.2617E-01	0.1527E 01	0.9520E 03	0.3929E 03
104	0.9573E-01	0.4101E-01	0.2834E 00	0.7427E-01	0.7017E-02	0.2328E 08	0.7049E 01	-0.2599E-01	0.1612E 01	0.9521E 03	0.3997E 03
105	0.9240E-01	0.4085E-01	0.2767E 00	0.7238E-01	0.6913E-02	0.2287E 08	0.7002E 01	-0.2573E-01	0.1699E 01	0.9522E 03	0.4064E 03
106	0.8905E-01	0.3999E-01	0.2700E 00	0.7045E-01	0.6832E-02	0.2211E 08	0.6954E 01	-0.2541E-01	0.1788E 01	0.9523E 03	0.4129E 03
107	0.8601E-01	0.3967E-01	0.2633E 00	0.6844E-01	0.6757E-02	0.2160E 08	0.6907E 01	-0.2501E-01	0.1879E 01	0.9525E 03	0.4193E 03
108	0.8283E-01	0.3875E-01	0.2567E 00	0.6646E-01	0.6690E-02	0.2066E 08	0.6860E 01	-0.2454E-01	0.1972E 01	0.9527E 03	0.4254E 03
109	0.7982E-01	0.3831E-01	0.2502E 00	0.6453E-01	0.6633E-02	0.1971E 08	0.6814E 01	-0.2400E-01	0.2067E 01	0.9529E 03	0.4314E 03
110	0.7710E-01	0.3736E-01	0.2438E 00	0.6249E-01	0.6582E-02	0.1880E 08	0.6769E 01	-0.2340E-01	0.2163E 01	0.9532E 03	0.4372E 03
111	0.7452E-01	0.3681E-01	0.2374E 00	0.6057E-01	0.6540E-02	0.1788E 08	0.6725E 01	-0.2275E-01	0.2260E 01	0.9535E 03	0.4428E 03
112	0.7183E-01	0.3582E-01	0.2312E 00	0.5864E-01	0.6506E-02	0.1729E 08	0.6682E 01	-0.2204E-01	0.2358E 01	0.9539E 03	0.4482E 03
113	0.6951E-01	0.3520E-01	0.2251E 00	0.5682E-01	0.6471E-02	0.1650E 08	0.6640E 01	-0.2128E-01	0.2456E 01	0.9543E 03	0.4534E 03
114	0.6724E-01	0.3419E-01	0.2192E 00	0.5485E-01	0.6438E-02	0.1587E 08	0.6599E 01	-0.2048E-01	0.2555E 01	0.9547E 03	0.4584E 03
115	0.6497E-01	0.3348E-01	0.2134E 00	0.5308E-01	0.6401E-02	0.1526E 08	0.6560E 01	-0.1964E-01	0.2654E 01	0.9551E 03	0.4633E 03
116	0.6270E-01	0.3245E-01	0.2078E 00	0.5125E-01	0.6366E-02	0.1454E 08	0.6523E 01	-0.1877E-01	0.2753E 01	0.9556E 03	0.4679E 03
117	0.6064E-01	0.3168E-01	0.2023E 00	0.4967E-01	0.6347E-02	0.1354E 08	0.6486E 01	-0.1787E-01	0.2852E 01	0.9560E 03	0.4724E 03
118	0.5860E-01	0.3063E-01	0.1970E 00	0.4792E-01	0.6323E-02	0.1268E 08	0.6452E 01	-0.1695E-01	0.2950E 01	0.9566E 03	0.4767E 03
119	0.5677E-01	0.2982E-01	0.1919E 00	0.4640E-01	0.6286E-02	0.1208E 08	0.6419E 01	-0.1602E-01	0.3048E 01	0.9571E 03	0.4809E 03
120	0.5505E-01	0.2879E-01	0.1869E 00	0.4490E-01	0.6232E-02	0.1104E 08	0.6387E 01	-0.1507E-01	0.3146E 01	0.9576E 03	0.4849E 03
121	0.5334E-01	0.2795E-01	0.1821E 00	0.4349E-01	0.6164E-02	0.1022E 08	0.6358E 01	-0.1412E-01	0.3242E 01	0.9582E 03	0.4887E 03
122	0.5168E-01	0.2693E-01	0.1774E 00	0.4203E-01	0.6090E-02	0.9267E 07	0.6330E 01	-0.1317E-01	0.3337E 01	0.9588E 03	0.4924E 03
123	0.5021E-01	0.2609E-01	0.1729E 00	0.4072E-01	0.6032E-02	0.8293E 07	0.6303E 01	-0.1223E-01	0.3431E 01	0.9594E 03	0.4959E 03
124	0.4879E-01	0.2510E-01	0.1685E 00	0.3941E-01	0.6014E-02	0.7505E 07	0.6279E 01	-0.1129E-01	0.3524E 01	0.9600E 03	0.4993E 03
125	0.4734E-01	0.2430E-01	0.1643E 00	0.3823E-01	0.5988E-02	0.7066E 07	0.6256E 01	-0.1036E-01	0.3616E 01	0.9607E 03	0.5025E 03
126	0.4601E-01	0.2338E-01	0.1603E 00	0.3710E-01	0.5949E-02	0.7899E 07	0.6235E 01	-0.9446E-02	0.3706E 01	0.9613E 03	0.5056E 03
127	0.4476E-01	0.2260E-01	0.1564E 00	0.3591E-01	0.5903E-02	0.8964E 07	0.6215E 01	-0.8552E-02	0.3795E 01	0.9620E 03	0.5086E 03
128	0.4367E-01	0.2173E-01	0.1526E 00	0.3496E-01	0.5851E-02	0.1008E 08	0.6197E 01	-0.7679E-02	0.3882E 01	0.9626E 03	0.5114E 03
129	0.4265E-01	0.2099E-01	0.1490E 00	0.3396E-01	0.5796E-02	0.1093E 08	0.6180E 01	-0.6829E-02	0.3968E 01	0.9633E 03	0.5141E 03
130	0.4166E-01	0.2016E-01	0.1454E 00	0.3297E-01	0.5735E-02	0.1205E 08	0.6165E 01	-0.6006E-02	0.4052E 01	0.9640E 03	0.5167E 03
131	0.4068E-01	0.1945E-01	0.1421E 00	0.3201E-01	0.5677E-02	0.1305E 08	0.6152E 01	-0.5211E-02	0.4134E 01	0.9647E 03	0.5192E 03
132	0.3983E-01	0.1867E-01	0.1388E 00	0.3124E-01	0.5641E-02	0.1366E 08	0.6139E 01	-0.4445E-02	0.4215E 01	0.9654E 03	0.5216E 03
133	0.3903E-01	0.1800E-01	0.1357E 00	0.3036E-01	0.5612E-02	0.1473E 08	0.6129E 01	-0.3710E-02	0.4294E 01	0.9661E 03	0.5238E 03
134	0.3824E-01	0.1727E-01	0.1327E 00	0.2961E-01	0.5574E-02	0.1540E 08	0.6119E 01	-0.3007E-02	0.4372E 01	0.9668E 03	0.5260E 03
135	0.3754E-01	0.1663E-01	0.1298E 00	0.2881E-01	0.5531E-02	0.1629E 08	0.6111E 01	-0.2337E-02	0.4447E 01	0.9675E 03	0.5280E 03
136	0.3690E-01	0.1596E-01	0.1270E 00	0.2814E-01	0.5480E-02	0.1734E 08	0.6104E 01	-0.1699E-02	0.4521E 01	0.9682E 03	0.5300E 03
137	0.3638E-01	0.1537E-01	0.1243E 00	0.2750E-01	0.5430E-02	0.1820E 08	0.6098E 01	-0.1096E-02	0.4594E 01	0.9689E 03	0.5318E 03
138	0.3593E-01	0.1475E-01	0.1217E 00	0.2685E-01	0.5380E-02	0.1878E 08	0.6094E 01	-0.5268E-03	0.4665E 01	0.9696E 03	0.5336E 03
139	0.3552E-01	0.1422E-01	0.1192E 00	0.2621E-01	0.5334E-02	0.1940E 08	0.6090E 01	0.9399E-05	0.4734E 01	0.9703E 03	0.5353E 03
140	0.3521E-01	0.1365E-01	0.1167E 00	0.2558E-01	0.5300E-02	0.2016E 08	0.6087E 01	0.5118E-03	0.4801E 01	0.9711E 03	0.5368E 03
141	0.3489E-01	0.1317E-01	0.1144E 00	0.2505E-01	0.5273E-02	0.2073E 08	0.6086E 01	0.9811E-03	0.4867E 01	0.9718E 03	0.5383E 03
142	0.3459E-01	0.1265E-01	0.1121E 00	0.2452E-01	0.5241E-02	0.2168E 08	0.6085E 01	0.1418E-02	0.4931E 01	0.9725E 03	0.5397E 03
143	0.3434E-01	0.1221E-01	0.1100E 00	0.2402E-01	0.5206E-02	0.2210E 08	0.6085E 01	0.1824E-02	0.4994E 01	0.9732E 03	0.5410E 03
144	0.3415E-01	0.1175E-01	0.1079E 00	0.2360E-01	0.5168E-02	0.2281E 08	0.6086E 01	0.2196E-02	0.5056E 01	0.9739E 03	0.5423E 03
145	0.3401E-01	0.1136E-01	0.1058E 00	0.2309E-01	0.5133E-02	0.2349E 08	0.6087E 01	0.2540E-02	0.5116E 01	0.9746E 03	0.5434E 03
146	0.3388E-01	0.1095E-01	0.1039E 00	0.2266E-01	0.5101E-02	0.2387E 08	0.6090E 01	0.2854E-02	0.5174E 01	0.9753E 03	0.5445E 03
147	0.3377E-01	0.1061E-01	0.1020E 00	0.2225E-01	0.5073E-02	0.2445E 08	0.6093E 01	0.3139E-02	0.5231E 01	0.9760E 03	0.5455E 03
148	0.3362E-01	0.1024E-01	0.1001E 00	0.2184E-01	0.5057E-02	0.2503E 08	0.6096E 01	0.3397E-02	0.5287E 01	0.9767E 03	0.5464E 03
149	0.3345E-01	0.9932E-02	0.9835E-01	0.2150E-01	0.5040E-02	0.2544E 08	0.6100E 01	0.3629E-02	0.5342E 01	0.9774E 03	0.5472E 03
150	0.3327E-01	0.9607E-02	0.9663E-01	0.2112E-01	0.5018E-02	0.2606E 08	0.6105E 01	0.3836E-02	0.5395E 01	0.9781E 03	0.5480E 03
151	0.3306E-01	0.9335E-02	0.9497E-01	0.2083E-01	0.4992E-02	0.2633E 08	0.6110E 01	0.4018E-02	0.5447E 01	0.9788E 03	0.5487E 03
152	0.3283E-01	0.9055E-02	0.9335E-01	0.2045E-01	0.4965E-02	0.2675E 08	0.6115E 01	0.4177E-02	0.5498E 01	0.9795E 03	0.5494E 03
153	0.3256E-01	0.8830E-02	0.9178E-01	0.2026E-01	0.4934E-02	0.2703E 08	0.6121E 01	0.4314E-02	0.5548E 01	0.9802E 03	0.5499E 03

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  12 0.04094       0.00      0.00 1.31E 01 9.12E 00 5.85E 00 4.41E 00 3.49E 00 2.79E 00 3.06E 00 6.87E 00 1.15E 01 1.44E 01
  11 0.03719       0.00 4.53E 00 1.70E 01 9.00E 00 5.45E 00 4.56E 00 4.06E 00 4.32E 00 8.09E 00 1.35E 01 1.68E 01 1.83E 01
  10 0.03437       0.00 3.19E 01 1.87E 01 7.65E 00 4.90E 00 5.28E 00 6.10E 00 9.39E 00 1.45E 01 1.82E 01 2.01E 01 2.05E 01
   9 0.03219       0.00 5.28E 01 1.54E 01 4.95E 00 4.70E 00 6.83E 00 9.88E 00 1.45E 01 1.88E 01 2.12E 01 2.22E 01 2.19E 01
   8 0.03031   2.70E 01 8.97E 00 3.77E 00 2.50E 00 5.44E 00 9.22E 00 1.36E 01 1.86E 01 2.17E 01 2.33E 01 2.36E 01 2.29E 01
   7 0.02687   2.70E 01 8.92E 00 3.86E 00 3.03E 00 8.12E 00 1.41E 01 2.12E 01 2.43E 01 2.55E 01 2.59E 01 2.54E 01 2.41E 01
   6 0.02187   2.70E 01 8.92E 00 3.99E 00 4.56E 00 1.51E 01 2.82E 01 2.87E 01 2.79E 01 2.80E 01 2.77E 01 2.66E 01 2.48E 01
   5 0.01625   2.70E 01 8.94E 00 4.36E 00 9.14E 00 3.32E 01 2.88E 01 2.83E 01 2.78E 01 2.79E 01 2.75E 01 2.63E 01 2.43E 01
   4 0.01062   2.70E 01 8.98E 00 6.06E 00 2.24E 01 2.62E 01 2.53E 01 2.63E 01 2.63E 01 2.67E 01 2.63E 01 2.51E 01 2.33E 01
   3 0.00562   2.70E 01 9.04E 00 1.36E 01 3.50E 01 2.34E 01 2.39E 01 2.49E 01 2.51E 01 2.55E 01 2.52E 01 2.41E 01 2.24E 01
   2 0.00156   2.70E 01 9.15E 00 2.86E 01 3.06E 01 2.29E 01 2.35E 01 2.46E 01 2.48E 01 2.51E 01 2.49E 01 2.38E 01 2.22E 01
   1-0.00156       0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 0        I =     13       14       15       16       17       18       19       20       21       22       23
          X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
 0 J      Y
  21 0.06312       0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187   8.48E-01 1.05E 00 1.17E 00 1.20E 00 1.16E 00 1.10E 00 1.04E 00 9.77E-01 9.27E-01 9.07E-01 2.70E 01
  19 0.05937   3.26E 00 4.56E 00 5.17E 00 5.11E 00 4.65E 00 4.03E 00 3.43E 00 2.91E 00 2.50E 00 2.46E 00 2.70E 01
  18 0.05594   4.95E 00 6.76E 00 7.48E 00 7.30E 00 6.59E 00 5.70E 00 4.85E 00 4.14E 00 3.59E 00 3.66E 00 2.70E 01
  17 0.05344   6.35E 00 8.20E 00 8.81E 00 8.47E 00 7.60E 00 6.56E 00 5.58E 00 4.80E 00 4.19E 00 4.32E 00 2.70E 01
  16 0.05078   8.07E 00 9.78E 00 1.01E 01 9.58E 00 8.52E 00 7.33E 00 6.24E 00 5.38E 00 4.72E 00 4.90E 00 2.70E 01
  15 0.04812   1.00E 01 1.14E 01 1.14E 01 1.06E 01 9.34E 00 7.99E 00 6.81E 00 5.87E 00 5.17E 00 5.38E 00 2.70E 01
  14 0.04562   1.20E 01 1.29E 01 1.26E 01 1.15E 01 1.00E 01 8.54E 00 7.27E 00 6.28E 00 5.54E 00 5.75E 00 2.70E 01
  13 0.04328   1.39E 01 1.43E 01 1.36E 01 1.22E 01 1.06E 01 9.00E 00 7.65E 00 6.61E 00 5.83E 00 6.04E 00 2.70E 01
  12 0.04094   1.57E 01 1.55E 01 1.45E 01 1.29E 01 1.11E 01 9.39E 00 7.97E 00 6.88E 00 6.08E 00 6.27E 00 2.70E 01
  11 0.03719   1.83E 01 1.73E 01 1.57E 01 1.38E 01 1.17E 01 9.90E 00 8.39E 00 7.24E 00 6.39E 00 6.54E 00 2.70E 01
  10 0.03437   1.99E 01 1.84E 01 1.64E 01 1.43E 01 1.21E 01 1.02E 01 8.62E 00 7.44E 00 6.57E 00 6.67E 00 2.70E 01
   9 0.03219   2.08E 01 1.90E 01 1.68E 01 1.45E 01 1.23E 01 1.04E 01 8.76E 00 7.56E 00 6.67E 00 6.73E 00 2.70E 01
   8 0.03031   2.14E 01 1.94E 01 1.71E 01 1.47E 01 1.25E 01 1.04E 01 8.83E 00 7.62E 00 6.72E 00 6.75E 00 2.70E 01
   7 0.02687   2.22E 01 1.99E 01 1.74E 01 1.49E 01 1.26E 01 1.05E 01 8.91E 00 7.68E 00 6.76E 00 6.73E 00 2.70E 01
   6 0.02187   2.25E 01 2.00E 01 1.74E 01 1.49E 01 1.25E 01 1.05E 01 8.91E 00 7.68E 00 6.76E 00 6.63E 00 2.70E 01
   5 0.01625   2.20E 01 1.95E 01 1.70E 01 1.46E 01 1.23E 01 1.04E 01 8.82E 00 7.61E 00 6.70E 00 6.48E 00 2.70E 01
   4 0.01062   2.11E 01 1.88E 01 1.65E 01 1.42E 01 1.21E 01 1.02E 01 8.71E 00 7.53E 00 6.63E 00 6.33E 00 2.70E 01
   3 0.00562   2.05E 01 1.84E 01 1.61E 01 1.39E 01 1.19E 01 1.01E 01 8.64E 00 7.48E 00 6.59E 00 6.25E 00 2.70E 01
   2 0.00156   2.03E 01 1.82E 01 1.60E 01 1.39E 01 1.19E 01 1.01E 01 8.63E 00 7.48E 00 6.59E 00 6.24E 00 2.70E 01
   1-0.00156       0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                  TURBULENCE  DISSIPATION        -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
 0        I =      1        2        3        4        5        6        7        8        9       10       11       12
          X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
 0 J      Y
  21 0.06312       0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187       0.00      0.00     0.00     0.00 7.58E 02 5.92E 02 5.22E 02 4.68E 02 4.25E 02 3.92E 02 3.71E 02 3.81E 02
  19 0.05937       0.00      0.00     0.00     0.00 5.31E 02 8.54E 02 6.99E 02 5.41E 02 4.28E 02 3.51E 02 3.05E 02 3.12E 02
  18 0.05594       0.00      0.00     0.00     0.00 9.58E 02 1.07E 03 8.55E 02 6.42E 02 4.82E 02 3.71E 02 3.03E 02 3.22E 02
  17 0.05344       0.00      0.00     0.00 6.76E 02 1.43E 03 1.30E 03 9.73E 02 7.09E 02 5.22E 02 3.94E 02 3.27E 02 3.84E 02
  16 0.05078       0.00      0.00     0.00 1.28E 03 1.81E 03 1.50E 03 1.07E 03 7.49E 02 5.37E 02 4.01E 02 3.64E 02 4.91E 02
  15 0.04812       0.00      0.00     0.00 1.84E 03 2.29E 03 1.72E 03 1.15E 03 7.71E 02 5.32E 02 3.95E 02 4.47E 02 6.55E 02
  14 0.04562       0.00      0.00 9.95E 02 3.68E 03 2.87E 03 1.93E 03 1.23E 03 7.89E 02 5.26E 02 4.28E 02 6.21E 02 8.71E 02
  13 0.04328       0.00      0.00 2.46E 03 4.50E 03 3.26E 03 2.10E 03 1.31E 03 8.15E 02 5.46E 02 5.88E 02 8.98E 02 1.12E 03
  12 0.04094       0.00      0.00 4.74E 03 5.63E 03 3.62E 03 2.27E 03 1.41E 03 8.84E 02 6.87E 02 9.41E 02 1.27E 03 1.40E 03
  11 0.03719       0.00 2.02E 03 1.35E 04 7.41E 03 4.06E 03 2.54E 03 1.65E 03 1.22E 03 1.45E 03 1.85E 03 1.96E 03 1.85E 03
  10 0.03437       0.00 1.80E 04 1.69E 04 7.91E 03 4.25E 03 2.95E 03 2.23E 03 2.20E 03 2.50E 03 2.57E 03 2.41E 03 2.12E 03
   9 0.03219       0.00 3.83E 04 1.96E 04 7.40E 03 4.41E 03 3.59E 03 3.19E 03 3.21E 03 3.23E 03 3.01E 03 2.66E 03 2.26E 03
   8 0.03031   4.49E 05 8.12E 04 1.90E 04 6.53E 03 4.92E 03 4.52E 03 4.09E 03 3.96E 03 3.68E 03 3.27E 03 2.81E 03 2.35E 03
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 10 0.27500  3.39E 05 3.39E 05 3.40E 05 3.40E 05 3.40E 05 3.41E 05 3.41E 05 3.41E 05 3.42E 05 3.42E 05     0.00
  9 0.25750  3.34E 05 3.35E 05 3.36E 05 3.37E 05 3.37E 05 3.38E 05 3.39E 05 3.39E 05 3.40E 05 3.40E 05     0.00
  8 0.24250  3.30E 05 3.31E 05 3.33E 05 3.34E 05 3.35E 05 3.36E 05 3.37E 05 3.37E 05 3.38E 05 3.39E 05     0.00
  7 0.21500  3.22E 05 3.25E 05 3.27E 05 3.29E 05 3.31E 05 3.32E 05 3.33E 05 3.34E 05 3.35E 05 3.37E 05     0.00
  6 0.17500  3.12E 05 3.16E 05 3.19E 05 3.22E 05 3.25E 05 3.27E 05 3.29E 05 3.30E 05 3.32E 05 3.34E 05     0.00
  5 0.13000  3.01E 05 3.07E 05 3.12E 05 3.16E 05 3.20E 05 3.22E 05 3.25E 05 3.27E 05 3.29E 05 3.31E 05     0.00
  4 0.08500  2.93E 05 3.01E 05 3.07E 05 3.12E 05 3.16E 05 3.19E 05 3.22E 05 3.24E 05 3.27E 05 3.29E 05     0.00
  3 0.04500  2.89E 05 2.97E 05 3.04E 05 3.09E 05 3.13E 05 3.17E 05 3.20E 05 3.23E 05 3.25E 05 3.28E 05     0.00
  2 0.01250  2.87E 05 2.95E 05 3.02E 05 3.08E 05 3.13E 05 3.16E 05 3.20E 05 3.22E 05 3.25E 05 3.27E 05     0.00
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS TURBULENCE ENERGY        -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J     Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00 1.26E-03 1.07E-03 9.83E-04 9.13E-04 8.56E-04 8.11E-04 7.82E-04 7.96E-04
 19 0.47500      0.00     0.00     0.00     0.00 3.89E-03 5.12E-03 4.38E-03 3.57E-03 2.95E-03 2.51E-03 2.23E-03 2.40E-03
 18 0.44750      0.00     0.00     0.00     0.00 5.77E-03 5.44E-03 4.70E-03 3.97E-03 3.37E-03 2.90E-03 2.63E-03 3.29E-03
 17 0.42750      0.00     0.00     0.00 1.85E-03 5.30E-03 5.11E-03 4.39E-03 3.78E-03 3.28E-03 2.88E-03 2.77E-03 4.26E-03
 16 0.40625      0.00     0.00     0.00 6.54E-03 6.34E-03 5.29E-03 4.27E-03 3.55E-03 3.05E-03 2.69E-03 3.06E-03 5.78E-03
 15 0.38500      0.00     0.00     0.00 8.30E-03 6.66E-03 5.17E-03 4.04E-03 3.25E-03 2.73E-03 2.47E-03 4.07E-03 7.95E-03
 14 0.36500      0.00     0.00 2.40E-03 8.57E-03 6.66E-03 5.03E-03 3.85E-03 3.02E-03 2.48E-03 2.69E-03 6.20E-03 1.05E-02
 13 0.34625      0.00     0.00 9.41E-03 9.58E-03 6.70E-03 4.95E-03 3.78E-03 2.93E-03 2.47E-03 4.31E-03 9.20E-03 1.33E-02
 12 0.32750      0.00     0.00 1.46E-02 1.01E-02 6.49E-03 4.90E-03 3.88E-03 3.10E-03 3.40E-03 7.64E-03 1.28E-02 1.60E-02
 11 0.29750      0.00 5.04E-03 1.89E-02 1.00E-02 6.06E-03 5.07E-03 4.52E-03 4.79E-03 8.99E-03 1.50E-02 1.87E-02 2.03E-02
 10 0.27500      0.00 3.55E-02 2.08E-02 8.50E-03 5.44E-03 5.87E-03 6.77E-03 1.04E-02 1.61E-02 2.03E-02 2.24E-02 2.28E-02
  9 0.25750      0.00 5.87E-02 1.71E-02 5.50E-03 5.22E-03 7.59E-03 1.10E-02 1.62E-02 2.09E-02 2.36E-02 2.47E-02 2.44E-02
  8 0.24250  3.00E-02 9.97E-03 4.19E-03 2.78E-03 6.04E-03 1.02E-02 1.52E-02 2.06E-02 2.41E-02 2.58E-02 2.62E-02 2.54E-02
  7 0.21500  3.00E-02 9.91E-03 4.29E-03 3.37E-03 9.03E-03 1.56E-02 2.35E-02 2.70E-02 2.84E-02 2.88E-02 2.82E-02 2.68E-02
  6 0.17500  3.00E-02 9.91E-03 4.44E-03 5.07E-03 1.68E-02 3.13E-02 3.19E-02 3.10E-02 3.11E-02 3.07E-02 2.95E-02 2.75E-02
  5 0.13000  3.00E-02 9.93E-03 4.85E-03 1.02E-02 3.69E-02 3.20E-02 3.15E-02 3.08E-02 3.11E-02 3.06E-02 2.92E-02 2.70E-02
  4 0.08500  3.00E-02 9.97E-03 6.73E-03 2.49E-02 2.91E-02 2.82E-02 2.92E-02 2.93E-02 2.96E-02 2.93E-02 2.79E-02 2.58E-02
  3 0.04500  3.00E-02 1.00E-02 1.51E-02 3.89E-02 2.60E-02 2.65E-02 2.77E-02 2.79E-02 2.83E-02 2.80E-02 2.68E-02 2.49E-02
  2 0.01250  3.00E-02 1.02E-02 3.18E-02 3.40E-02 2.55E-02 2.61E-02 2.73E-02 2.76E-02 2.79E-02 2.76E-02 2.64E-02 2.46E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
        X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J     Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500  9.42E-04 1.17E-03 1.31E-03 1.33E-03 1.29E-03 1.22E-03 1.15E-03 1.09E-03 1.03E-03 1.01E-03 3.00E-02
 19 0.47500  3.62E-03 5.06E-03 5.74E-03 5.67E-03 5.16E-03 4.48E-03 3.81E-03 3.24E-03 2.78E-03 2.74E-03 3.00E-02
 18 0.44750  5.49E-03 7.51E-03 8.31E-03 8.11E-03 7.33E-03 6.33E-03 5.38E-03 4.60E-03 3.99E-03 4.06E-03 3.00E-02
 17 0.42750  7.05E-03 9.11E-03 9.79E-03 9.41E-03 8.45E-03 7.29E-03 6.20E-03 5.33E-03 4.65E-03 4.80E-03 3.00E-02
 16 0.40625  8.97E-03 1.09E-02 1.13E-02 1.06E-02 9.47E-03 8.14E-03 6.93E-03 5.97E-03 5.24E-03 5.44E-03 3.00E-02
 15 0.38500  1.11E-02 1.27E-02 1.27E-02 1.18E-02 1.04E-02 8.88E-03 7.56E-03 6.53E-03 5.74E-03 5.97E-03 3.00E-02
 14 0.36500  1.33E-02 1.43E-02 1.40E-02 1.27E-02 1.11E-02 9.49E-03 8.08E-03 6.98E-03 6.15E-03 6.39E-03 3.00E-02
 13 0.34625  1.54E-02 1.58E-02 1.51E-02 1.36E-02 1.18E-02 1.00E-02 8.49E-03 7.34E-03 6.48E-03 6.71E-03 3.00E-02
 12 0.32750  1.74E-02 1.73E-02 1.61E-02 1.43E-02 1.23E-02 1.04E-02 8.85E-03 7.65E-03 6.75E-03 6.97E-03 3.00E-02
 11 0.29750  2.03E-02 1.93E-02 1.75E-02 1.53E-02 1.31E-02 1.10E-02 9.32E-03 8.04E-03 7.10E-03 7.27E-03 3.00E-02
 10 0.27500  2.21E-02 2.04E-02 1.83E-02 1.58E-02 1.35E-02 1.13E-02 9.58E-03 8.27E-03 7.30E-03 7.42E-03 3.00E-02
  9 0.25750  2.31E-02 2.11E-02 1.87E-02 1.62E-02 1.37E-02 1.15E-02 9.73E-03 8.40E-03 7.41E-03 7.48E-03 3.00E-02
  8 0.24250  2.38E-02 2.16E-02 1.90E-02 1.64E-02 1.38E-02 1.16E-02 9.82E-03 8.47E-03 7.47E-03 7.50E-03 3.00E-02
  7 0.21500  2.46E-02 2.21E-02 1.93E-02 1.65E-02 1.40E-02 1.17E-02 9.90E-03 8.53E-03 7.52E-03 7.47E-03 3.00E-02
  6 0.17500  2.50E-02 2.22E-02 1.93E-02 1.65E-02 1.39E-02 1.17E-02 9.90E-03 8.53E-03 7.51E-03 7.36E-03 3.00E-02
```

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

DIMENSIONLESS STREAMLINE PLOT

OITER NO	I--- ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	---I DISP	I--- FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D ---I
1	0.1858E-01	0.5481E-02	0.3263E 00	0.4266E-02	0.8002E-02	0.8003E 10	0.6449E 01	0.2087E-02	0.7142E 01	0.1008E 04	0.5421E 03
2	0.1834E-01	0.2116E 00	0.2914E 00	0.3076E-01	0.1090E-01	0.1089E 11	0.6454E 01	0.1957E-02	0.7159E 01	0.1285E 04	0.5416E 03
3	0.9687E-01	0.2966E 00	0.2658E 00	0.5350E-01	0.1144E-01	0.1032E 11	0.6455E 01	0.8270E-03	0.7175E 01	0.1617E 04	0.5412E 03
4	0.2601E 00	0.2640E 00	0.2451E 00	0.4110E-01	0.1072E-01	0.6243E 10	0.6456E 01	0.5264E-03	0.7192E 01	0.1644E 04	0.5409E 03
5	0.2764E 00	0.2809E 00	0.2308E 00	0.5134E-01	0.1281E-01	0.6140E 10	0.6457E 01	0.5040E-03	0.7208E 01	0.1620E 04	0.5406E 03
6	0.3025E 00	0.2946E 00	0.2229E 00	0.5906E-01	0.1424E-01	0.7208E 10	0.6459E 01	0.5156E-03	0.7225E 01	0.1572E 04	0.5403E 03
7	0.3253E 00	0.3002E 00	0.2195E 00	0.6339E-01	0.1522E-01	0.7277E 10	0.6460E 01	0.5369E-03	0.7241E 01	0.1515E 04	0.5401E 03
8	0.3415E 00	0.3003E 00	0.2182E 00	0.6554E-01	0.1564E-01	0.7277E 10	0.6461E 01	0.5603E-03	0.7258E 01	0.1458E 04	0.5399E 03
9	0.3517E 00	0.2984E 00	0.2175E 00	0.6908E-01	0.1583E-01	0.6482E 10	0.6463E 01	0.5848E-03	0.7275E 01	0.1403E 04	0.5397E 03
10	0.3582E 00	0.3014E 00	0.2166E 00	0.7202E-01	0.1602E-01	0.5491E 10	0.6464E 01	0.6091E-03	0.7291E 01	0.1353E 04	0.5395E 03
11	0.3646E 00	0.3080E 00	0.2157E 00	0.7366E-01	0.1623E-01	0.4625E 10	0.6465E 01	0.6342E-03	0.7308E 01	0.1309E 04	0.5393E 03
12	0.3687E 00	0.3137E 00	0.2155E 00	0.7526E-01	0.1659E-01	0.3991E 10	0.6467E 01	0.6610E-03	0.7325E 01	0.1272E 04	0.5392E 03
13	0.3722E 00	0.3185E 00	0.2154E 00	0.7638E-01	0.1702E-01	0.3592E 10	0.6468E 01	0.6893E-03	0.7342E 01	0.1241E 04	0.5391E 03
14	0.3757E 00	0.3221E 00	0.2151E 00	0.7769E-01	0.1752E-01	0.3395E 10	0.6470E 01	0.7193E-03	0.7358E 01	0.1216E 04	0.5389E 03
15	0.3803E 00	0.3241E 00	0.2151E 00	0.7927E-01	0.1817E-01	0.3246E 10	0.6471E 01	0.7510E-03	0.7375E 01	0.1197E 04	0.5388E 03
16	0.3860E 00	0.3253E 00	0.2151E 00	0.8044E-01	0.1886E-01	0.3120E 10	0.6473E 01	0.7840E-03	0.7392E 01	0.1182E 04	0.5387E 03
17	0.3910E 00	0.3256E 00	0.2148E 00	0.8144E-01	0.1974E-01	0.3006E 10	0.6475E 01	0.8177E-03	0.7409E 01	0.1171E 04	0.5387E 03
18	0.3943E 00	0.3241E 00	0.2145E 00	0.8353E-01	0.2151E-01	0.2901E 10	0.6477E 01	0.8515E-03	0.7426E 01	0.1162E 04	0.5386E 03
19	0.3954E 00	0.3216E 00	0.2141E 00	0.8613E-01	0.2340E-01	0.2823E 10	0.6479E 01	0.8859E-03	0.7442E 01	0.1156E 04	0.5385E 03
20	0.3950E 00	0.3188E 00	0.2141E 00	0.8806E-01	0.2514E-01	0.2744E 10	0.6481E 01	0.9199E-03	0.7459E 01	0.1150E 04	0.5385E 03
21	0.3943E 00	0.3142E 00	0.2138E 00	0.8891E-01	0.2666E-01	0.2664E 10	0.6483E 01	0.9529E-03	0.7476E 01	0.1146E 04	0.5385E 03
22	0.3920E 00	0.3087E 00	0.2132E 00	0.8899E-01	0.2783E-01	0.2583E 10	0.6485E 01	0.9851E-03	0.7492E 01	0.1143E 04	0.5385E 03
23	0.3885E 00	0.3029E 00	0.2121E 00	0.8890E-01	0.2880E-01	0.2502E 10	0.6487E 01	0.1016E-02	0.7509E 01	0.1140E 04	0.5385E 03
24	0.3846E 00	0.2975E 00	0.2110E 00	0.8893E-01	0.2955E-01	0.2421E 10	0.6489E 01	0.1045E-02	0.7526E 01	0.1138E 04	0.5385E 03
25	0.3801E 00	0.2923E 00	0.2099E 00	0.8689E-01	0.3002E-01	0.2339E 10	0.6491E 01	0.1070E-02	0.7542E 01	0.1136E 04	0.5386E 03
26	0.3757E 00	0.2874E 00	0.2084E 00	0.8446E-01	0.3022E-01	0.2256E 10	0.6494E 01	0.1092E-02	0.7559E 01	0.1135E 04	0.5387E 03
27	0.3712E 00	0.2814E 00	0.2066E 00	0.8235E-01	0.3054E-01	0.2171E 10	0.6496E 01	0.1110E-02	0.7575E 01	0.1134E 04	0.5388E 03
28	0.3668E 00	0.2757E 00	0.2054E 00	0.7982E-01	0.3067E-01	0.2088E 10	0.6499E 01	0.1122E-02	0.7592E 01	0.1133E 04	0.5390E 03
29	0.3621E 00	0.2706E 00	0.2042E 00	0.7810E-01	0.3076E-01	0.2007E 10	0.6501E 01	0.1127E-02	0.7608E 01	0.1132E 04	0.5392E 03
30	0.3576E 00	0.2657E 00	0.2027E 00	0.7673E-01	0.3076E-01	0.1928E 10	0.6504E 01	0.1122E-02	0.7625E 01	0.1132E 04	0.5395E 03
31	0.3526E 00	0.2608E 00	0.2014E 00	0.7555E-01	0.3077E-01	0.1850E 10	0.6506E 01	0.1106E-02	0.7641E 01	0.1131E 04	0.5399E 03
32	0.3486E 00	0.2552E 00	0.2000E 00	0.7512E-01	0.3102E-01	0.1774E 10	0.6509E 01	0.1078E-02	0.7658E 01	0.1131E 04	0.5404E 03
33	0.3451E 00	0.2494E 00	0.1986E 00	0.7500E-01	0.3118E-01	0.1699E 10	0.6511E 01	0.1032E-02	0.7674E 01	0.1130E 04	0.5409E 03
34	0.3406E 00	0.2440E 00	0.1975E 00	0.7544E-01	0.3137E-01	0.1625E 10	0.6514E 01	0.9685E-03	0.7690E 01	0.1129E 04	0.5416E 03
35	0.3358E 00	0.2386E 00	0.1963E 00	0.7614E-01	0.3165E-01	0.1551E 10	0.6516E 01	0.8828E-03	0.7706E 01	0.1128E 04	0.5424E 03
36	0.3311E 00	0.2331E 00	0.1948E 00	0.7718E-01	0.3201E-01	0.1477E 10	0.6519E 01	0.7733E-03	0.7723E 01	0.1128E 04	0.5433E 03
37	0.3264E 00	0.2278E 00	0.1931E 00	0.7822E-01	0.3235E-01	0.1404E 10	0.6521E 01	0.6360E-03	0.7739E 01	0.1127E 04	0.5444E 03
38	0.3215E 00	0.2225E 00	0.1916E 00	0.7959E-01	0.3267E-01	0.1336E 10	0.6523E 01	0.4696E-03	0.7755E 01	0.1126E 04	0.5457E 03
39	0.3162E 00	0.2177E 00	0.1903E 00	0.8126E-01	0.3306E-01	0.1271E 10	0.6525E 01	0.2702E-03	0.7772E 01	0.1126E 04	0.5472E 03
40	0.3110E 00	0.2126E 00	0.1887E 00	0.8317E-01	0.3339E-01	0.1205E 10	0.6527E 01	0.3428E-04	0.7788E 01	0.1125E 04	0.5489E 03
41	0.3058E 00	0.2072E 00	0.1868E 00	0.8461E-01	0.3358E-01	0.1133E 10	0.6528E 01	-0.2246E-03	0.7805E 01	0.1125E 04	0.5508E 03
42	0.3016E 00	0.2009E 00	0.1849E 00	0.8547E-01	0.3370E-01	0.1057E 10	0.6530E 01	-0.5077E-03	0.7821E 01	0.1125E 04	0.5530E 03
43	0.2971E 00	0.1959E 00	0.1831E 00	0.8670E-01	0.3379E-01	0.9826E 09	0.6530E 01	-0.8153E-03	0.7838E 01	0.1125E 04	0.5554E 03
44	0.2923E 00	0.1913E 00	0.1820E 00	0.8785E-01	0.3379E-01	0.9113E 09	0.6531E 01	-0.1146E-02	0.7855E 01	0.1125E 04	0.5580E 03
45	0.2877E 00	0.1868E 00	0.1807E 00	0.8892E-01	0.3370E-01	0.8448E 09	0.6531E 01	-0.1501E-02	0.7872E 01	0.1125E 04	0.5610E 03
46	0.2832E 00	0.1822E 00	0.1790E 00	0.8997E-01	0.3355E-01	0.7828E 09	0.6530E 01	-0.1877E-02	0.7889E 01	0.1126E 04	0.5643E 03

21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.20E 03	1.22E 03	1.17E 03	1.15E 03	1.15E 03	1.16E 03	1.17E 03	1.18E 03
19	0.05937	0.00	0.00	0.00	0.00	1.18E 03	1.20E 03	1.15E 03	1.14E 03	1.14E 03	1.15E 03	1.16E 03	1.17E 03
18	0.05594	0.00	0.00	0.00	0.00	1.13E 03	1.17E 03	1.13E 03	1.12E 03	1.12E 03	1.14E 03	1.14E 03	1.15E 03
17	0.05344	0.00	0.00	0.00	1.18E 03	1.12E 03	1.14E 03	1.11E 03	1.10E 03	1.11E 03	1.12E 03	1.13E 03	1.13E 03
16	0.05078	0.00	0.00	0.00	1.12E 03	1.12E 03	1.11E 03	1.08E 03	1.08E 03	1.09E 03	1.10E 03	1.11E 03	1.11E 03
15	0.04812	0.00	0.00	0.00	1.05E 03	1.09E 03	1.07E 03	1.06E 03	1.06E 03	1.08E 03	1.09E 03	1.09E 03	1.09E 03
14	0.04562	0.00	0.00	1.13E 03	1.03E 03	1.06E 03	1.04E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	1.07E 03	1.07E 03
13	0.04328	0.00	0.00	1.06E 03	1.03E 03	1.02E 03	1.01E 03	1.01E 03	1.02E 03	1.04E 03	1.04E 03	1.05E 03	1.05E 03
12	0.04094	0.00	0.00	9.47E 02	9.97E 02	9.86E 02	9.76E 02	9.81E 02	1.00E 03	1.01E 03	1.02E 03	1.02E 03	1.02E 03
11	0.03719	0.00	7.80E 02	8.43E 02	9.29E 02	9.28E 02	9.23E 02	9.38E 02	9.59E 02	9.72E 02	9.79E 02	9.83E 02	9.86E 02
10	0.03437	0.00	6.20E 02	8.03E 02	8.77E 02	8.81E 02	8.83E 02	9.04E 02	9.24E 02	9.37E 02	9.45E 02	9.51E 02	9.57E 02
9	0.03219	0.00	4.38E 02	7.61E 02	8.37E 02	8.45E 02	8.53E 02	8.76E 02	8.95E 02	9.08E 02	9.18E 02	9.26E 02	9.34E 02
8	0.03031	0.00	3.80E 02	7.13E 02	8.06E 02	8.19E 02	8.28E 02	8.51E 02	8.69E 02	8.83E 02	8.94E 02	9.04E 02	9.14E 02
7	0.02687	0.00	4.41E 02	6.55E 02	7.51E 02	7.69E 02	7.84E 02	8.03E 02	8.20E 02	8.35E 02	8.50E 02	8.64E 02	8.78E 02
6	0.02187	0.00	4.56E 02	5.94E 02	6.74E 02	6.93E 02	7.13E 02	7.30E 02	7.48E 02	7.67E 02	7.88E 02	8.09E 02	8.29E 02
5	0.01625	0.00	4.09E 02	5.25E 02	5.86E 02	6.19E 02	6.35E 02	6.53E 02	6.75E 02	6.99E 02	7.26E 02	7.54E 02	7.81E 02
4	0.01062	0.00	2.99E 02	4.54E 02	5.22E 02	5.46E 02	5.69E 02	5.92E 02	6.17E 02	6.46E 02	6.79E 02	7.12E 02	7.44E 02
3	0.00562	0.00	1.18E 02	3.94E 02	4.43E 02	4.96E 02	5.28E 02	5.55E 02	5.84E 02	6.16E 02	6.51E 02	6.88E 02	7.23E 02
2	0.00156	0.00	0.00	3.67E 02	4.24E 02	4.77E 02	5.12E 02	5.42E 02	5.71E 02	6.04E 02	6.41E 02	6.79E 02	7.15E 02
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.19E 03	1.18E 03	1.18E 03	1.17E 03	1.17E 03	0.00
19	0.05937	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.17E 03	1.16E 03	1.16E 03	1.15E 03	1.15E 03	0.00
18	0.05594	1.15E 03	1.15E 03	1.15E 03	1.14E 03	1.14E 03	1.14E 03	1.13E 03	1.13E 03	1.13E 03	1.12E 03	0.00
17	0.05344	1.13E 03	1.13E 03	1.13E 03	1.12E 03	1.12E 03	1.12E 03	1.11E 03	1.11E 03	1.10E 03	1.10E 03	0.00
16	0.05078	1.11E 03	1.11E 03	1.10E 03	1.10E 03	1.10E 03	1.09E 03	1.09E 03	1.09E 03	1.08E 03	1.08E 03	0.00
15	0.04812	1.09E 03	1.08E 03	1.08E 03	1.08E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	1.06E 03	1.06E 03	0.00
14	0.04562	1.07E 03	1.06E 03	1.06E 03	1.06E 03	1.05E 03	1.05E 03	1.05E 03	1.05E 03	1.05E 03	1.04E 03	0.00
13	0.04328	1.05E 03	1.04E 03	1.04E 03	1.04E 03	1.04E 03	1.03E 03	1.03E 03	1.03E 03	1.03E 03	1.03E 03	0.00
12	0.04094	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.02E 03	1.01E 03	1.01E 03	1.01E 03	1.01E 03	0.00
11	0.03719	9.88E 02	9.89E 02	9.89E 02	9.88E 02	9.88E 02	9.88E 02	9.88E 02	9.88E 02	9.89E 02	9.89E 02	0.00
10	0.03437	9.61E 02	9.64E 02	9.66E 02	9.67E 02	9.68E 02	9.69E 02	9.70E 02	9.71E 02	9.72E 02	9.73E 02	0.00
9	0.03219	9.40E 02	9.45E 02	9.48E 02	9.51E 02	9.52E 02	9.54E 02	9.56E 02	9.58E 02	9.60E 02	9.62E 02	0.00
8	0.03031	9.22E 02	9.29E 02	9.34E 02	9.37E 02	9.40E 02	9.43E 02	9.45E 02	9.48E 02	9.50E 02	9.52E 02	0.00
7	0.02687	8.91E 02	9.00E 02	9.08E 02	9.14E 02	9.18E 02	9.23E 02	9.27E 02	9.30E 02	9.33E 02	9.37E 02	0.00
6	0.02187	8.47E 02	8.62E 02	8.74E 02	8.83E 02	8.91E 02	8.97E 02	9.03E 02	9.08E 02	9.13E 02	9.17E 02	0.00
5	0.01625	8.05E 02	8.26E 02	8.42E 02	8.55E 02	8.65E 02	8.74E 02	8.82E 02	8.88E 02	8.94E 02	9.00E 02	0.00
4	0.01062	7.73E 02	7.98E 02	8.18E 02	8.34E 02	8.47E 02	8.57E 02	8.66E 02	8.74E 02	8.80E 02	8.87E 02	0.00
3	0.00562	7.55E 02	7.82E 02	8.05E 02	8.22E 02	8.36E 02	8.48E 02	8.58E 02	8.66E 02	8.73E 02	8.80E 02	0.00
2	0.00156	7.48E 02	7.77E 02	8.00E 02	8.18E 02	8.32E 02	8.44E 02	8.55E 02	8.63E 02	8.70E 02	8.78E 02	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- PRESSURE -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	-1.38E-03	-2.87E-03	8.58E-05	1.85E-03	3.49E-03	5.45E-03	9.37E-03	1.53E-02
19	0.05937	0.00	0.00	0.00	0.00	-1.03E-03	-2.77E-03	-8.45E-05	1.54E-03	3.30E-03	5.17E-03	9.46E-03	1.57E-02
18	0.05594	0.00	0.00	0.00	0.00	-2.03E-04	-2.70E-03	7.69E-05	1.41E-03	3.13E-03	4.84E-03	9.24E-03	1.54E-02
17	0.05344	0.00	0.00	0.00	-8.41E-03	-1.78E-03	-2.00E-03	2.77E-04	1.28E-03	2.72E-03	4.57E-03	9.08E-03	1.50E-02

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 17 0.05344        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 16 0.05078        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 15 0.04812        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 14 0.04562        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 13 0.04328        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 12 0.04094        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 11 0.03719        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 10 0.03437        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  9 0.03219        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  8 0.03031        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  7 0.02687        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  6 0.02187        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  5 0.01625        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  4 0.01062        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  3 0.00562        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  2 0.00156        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  1-0.00156        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                               TURBULENCE  ENERGY             -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =       1           2           3           4           5           6           7           8           9          10          11          12
       X = -0.00393     0.00393     0.01180     0.02054     0.03023     0.04099     0.05294     0.06620     0.08092     0.09726     0.11539     0.13552
0 J     Y
 21 0.06312        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 20 0.06187        0.00        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 19 0.05937        0.00        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 18 0.05594        0.00        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 17 0.05344        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 16 0.05078        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 15 0.04812        0.00        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 14 0.04562        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 13 0.04328        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 12 0.04094        0.00        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 11 0.03719        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 10 0.03437        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  9 0.03219        0.00    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  8 0.03031    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  7 0.02687    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  6 0.02187    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  5 0.01625    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  4 0.01062    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  3 0.00562    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  2 0.00156    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  1-0.00156        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
0      I =      13          14          15          16          17          18          19          20          21          22          23
       X =  0.15786     0.18266     0.21019     0.24075     0.27467     0.31232     0.35411     0.39590     0.43769     0.47948     0.52127
0 J     Y
 21 0.06312        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
 20 0.06187    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 19 0.05937    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 18 0.05594    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 17 0.05344    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 16 0.05078    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 15 0.04812    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 14 0.04562    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
 13 0.04328    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
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  8 0.03031  1.70E 01 1.57E 01 1.43E 01 1.30E 01 1.19E 01 1.09E 01 1.01E 01 9.51E 00 9.04E 00 8.72E 00 8.73E 00
  7 0.02687  2.10E 01 1.91E 01 1.71E 01 1.53E 01 1.37E 01 1.24E 01 1.12E 01 1.03E 01 9.59E 00 9.13E 00 9.13E 00
  6 0.02187  2.53E 01 2.32E 01 2.09E 01 1.86E 01 1.64E 01 1.45E 01 1.28E 01 1.14E 01 1.04E 01 9.70E 00 9.70E 00
  5 0.01625  2.73E 01 2.58E 01 2.39E 01 2.16E 01 1.91E 01 1.67E 01 1.44E 01 1.26E 01 1.12E 01 1.03E 01 1.03E 01
  4 0.01062  2.78E 01 2.68E 01 2.55E 01 2.36E 01 2.12E 01 1.85E 01 1.58E 01 1.35E 01 1.18E 01 1.07E 01 1.07E 01
  3 0.00562  2.78E 01 2.71E 01 2.61E 01 2.46E 01 2.24E 01 1.96E 01 1.66E 01 1.41E 01 1.22E 01 1.10E 01 1.10E 01
  2 0.00156  2.78E 01 2.71E 01 2.63E 01 2.50E 01 2.28E 01 1.99E 01 1.69E 01 1.43E 01 1.23E 01 1.11E 01 1.11E 01
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                      V   VELOCITY              -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =      1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00-3.96E-01-2.17E-01-1.12E-01-6.75E-02-3.48E-02-5.59E-03 2.47E-02 5.51E-02
 19 0.05766      0.00     0.00     0.00     0.00-1.05E 00-5.13E-01-2.74E-01-1.61E-01-7.75E-02-2.47E-03 7.51E-02 1.52E-01
 18 0.05469      0.00     0.00     0.00     0.00-1.72E 00-7.35E-01-4.05E-01-2.33E-01-1.02E-01 1.64E-02 1.38E-01 2.57E-01
 17 0.05211      0.00     0.00     0.00-6.54E-01-1.73E 00-8.69E-01-4.92E-01-2.75E-01-1.07E-01 4.55E-02 2.03E-01 3.55E-01
 16 0.04945      0.00     0.00     0.00-1.30E 00-1.73E 00-9.46E-01-5.41E-01-2.88E-01-8.99E-02 9.22E-02 2.81E-01 4.60E-01
 15 0.04687      0.00     0.00     0.00-1.92E 00-1.69E 00-9.50E-01-5.37E-01-2.64E-01-4.73E-02 1.56E-01 3.68E-01 5.65E-01
 14 0.04445      0.00     0.00-7.92E-01-1.81E 00-1.57E 00-8.72E-01-4.77E-01-2.04E-01 1.78E-02 2.32E-01 4.58E-01 6.64E-01
 13 0.04211      0.00     0.00-1.57E 00-1.67E 00-1.32E 00-7.14E-01-3.67E-01-1.13E-01 1.02E-01 3.19E-01 5.49E-01 7.57E-01
 12 0.03906      0.00     0.00-2.62E 00-1.28E 00-7.74E-01-4.19E-01-1.64E-01 4.40E-02 2.36E-01 4.46E-01 6.71E-01 8.69E-01
 11 0.03578      0.00-2.17E 00-9.00E-01-3.06E-01-1.57E-01-1.69E-02 1.18E-01 2.48E-01 3.95E-01 5.81E-01 7.83E-01 9.54E-01
 10 0.03328      0.00-1.72E 00 2.38E-01 2.81E-01 2.43E-01 2.61E-01 3.08E-01 3.77E-01 4.92E-01 6.58E-01 8.34E-01 9.81E-01
  9 0.03125      0.00 1.09E 00 7.46E-01 5.76E-01 4.53E-01 3.93E-01 3.81E-01 4.24E-01 5.32E-01 6.86E-01 8.40E-01 9.69E-01
  8 0.02859      0.00 2.23E-01 1.69E-01 1.23E-01 1.04E-01 1.49E-01 2.47E-01 3.82E-01 5.31E-01 6.66E-01 7.90E-01 9.07E-01
  7 0.02437      0.00 1.35E-01 1.26E-01 8.04E-02 3.69E-02 3.26E-02 6.72E-02 1.31E-01 2.27E-01 3.62E-01 5.24E-01 6.73E-01
  6 0.01906      0.00 7.65E-02 8.55E-02 6.21E-02 3.50E-02 3.07E-02 5.33E-02 9.39E-02 1.46E-01 2.04E-01 2.72E-01 3.66E-01
  5 0.01344      0.00 4.24E-02 5.34E-02 4.28E-02 2.74E-02 2.45E-02 3.91E-02 6.67E-02 1.03E-01 1.42E-01 1.76E-01 2.04E-01
  4 0.00812      0.00 2.23E-02 3.00E-02 2.54E-02 1.74E-02 1.58E-02 2.42E-02 4.06E-02 6.21E-02 8.55E-02 1.06E-01 1.21E-01
  3 0.00359      0.00 9.31E-03 1.28E-02 1.12E-02 7.86E-03 7.17E-03 1.08E-02 1.80E-02 2.74E-02 3.78E-02 4.70E-02 5.33E-02
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =     13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062  7.82E-02 8.92E-02 8.93E-02 8.45E-02 6.76E-02 5.53E-02 4.24E-02 3.25E-02 2.17E-02-6.18E-05     0.00
 19 0.05766  2.09E-01 2.35E-01 2.34E-01 2.16E-01 1.76E-01 1.43E-01 1.10E-01 8.41E-02 5.61E-02-1.84E-04     0.00
 18 0.05469  3.45E-01 3.82E-01 3.76E-01 3.43E-01 2.81E-01 2.29E-01 1.76E-01 1.34E-01 8.90E-02-3.25E-04     0.00
 17 0.05211  4.65E-01 5.09E-01 4.97E-01 4.50E-01 3.72E-01 3.03E-01 2.32E-01 1.76E-01 1.17E-01-4.53E-04     0.00
 16 0.04945  5.87E-01 6.35E-01 6.15E-01 5.55E-01 4.61E-01 3.75E-01 2.87E-01 2.18E-01 1.44E-01-5.81E-04     0.00
 15 0.04687  7.02E-01 7.49E-01 7.22E-01 6.49E-01 5.42E-01 4.41E-01 3.38E-01 2.56E-01 1.68E-01-6.92E-04     0.00
 14 0.04445  8.03E-01 8.48E-01 8.13E-01 7.29E-01 6.11E-01 4.99E-01 3.82E-01 2.89E-01 1.89E-01-7.78E-04     0.00
 13 0.04211  8.93E-01 9.32E-01 8.89E-01 7.98E-01 6.72E-01 5.49E-01 4.20E-01 3.18E-01 2.08E-01-8.37E-04     0.00
 12 0.03906  9.94E-01 1.02E 00 9.74E-01 8.74E-01 7.41E-01 6.08E-01 4.66E-01 3.51E-01 2.29E-01-8.80E-04     0.00
 11 0.03578  1.06E 00 1.08E 00 1.03E 00 9.25E-01 7.91E-01 6.53E-01 5.01E-01 3.78E-01 2.45E-01-8.58E-04     0.00
 10 0.03328  1.07E 00 1.09E 00 1.04E 00 9.44E-01 8.16E-01 6.77E-01 5.20E-01 3.92E-01 2.54E-01-8.03E-04     0.00
  9 0.03125  1.05E 00 1.07E 00 1.03E 00 9.47E-01 8.25E-01 6.89E-01 5.31E-01 4.00E-01 2.59E-01-7.40E-04     0.00
  8 0.02859  9.95E-01 1.03E 00 1.00E 00 9.35E-01 8.28E-01 6.97E-01 5.39E-01 4.05E-01 2.62E-01-6.49E-04     0.00
  7 0.02437  7.91E-01 8.69E-01 8.95E-01 8.70E-01 7.96E-01 6.83E-01 5.31E-01 3.99E-01 2.57E-01-5.14E-04     0.00
  6 0.01906  4.73E-01 5.76E-01 6.61E-01 7.05E-01 6.89E-01 6.11E-01 4.81E-01 3.61E-01 2.31E-01-3.79E-04     0.00
  5 0.01344  2.44E-01 3.12E-01 4.00E-01 4.82E-01 5.15E-01 4.77E-01 3.80E-01 2.85E-01 1.82E-01-2.66E-04     0.00
  4 0.00812  1.26E-01 1.47E-01 2.04E-01 2.77E-01 3.21E-01 3.07E-01 2.46E-01 1.84E-01 1.17E-01-1.67E-04     0.00
```

2	0.10000	1.02E-02	1.04E-02	1.06E-02	1.10E-02	1.15E-02	1.23E-02	1.33E-02	1.46E-02	1.57E-02	1.66E-02	1.66E-02	
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

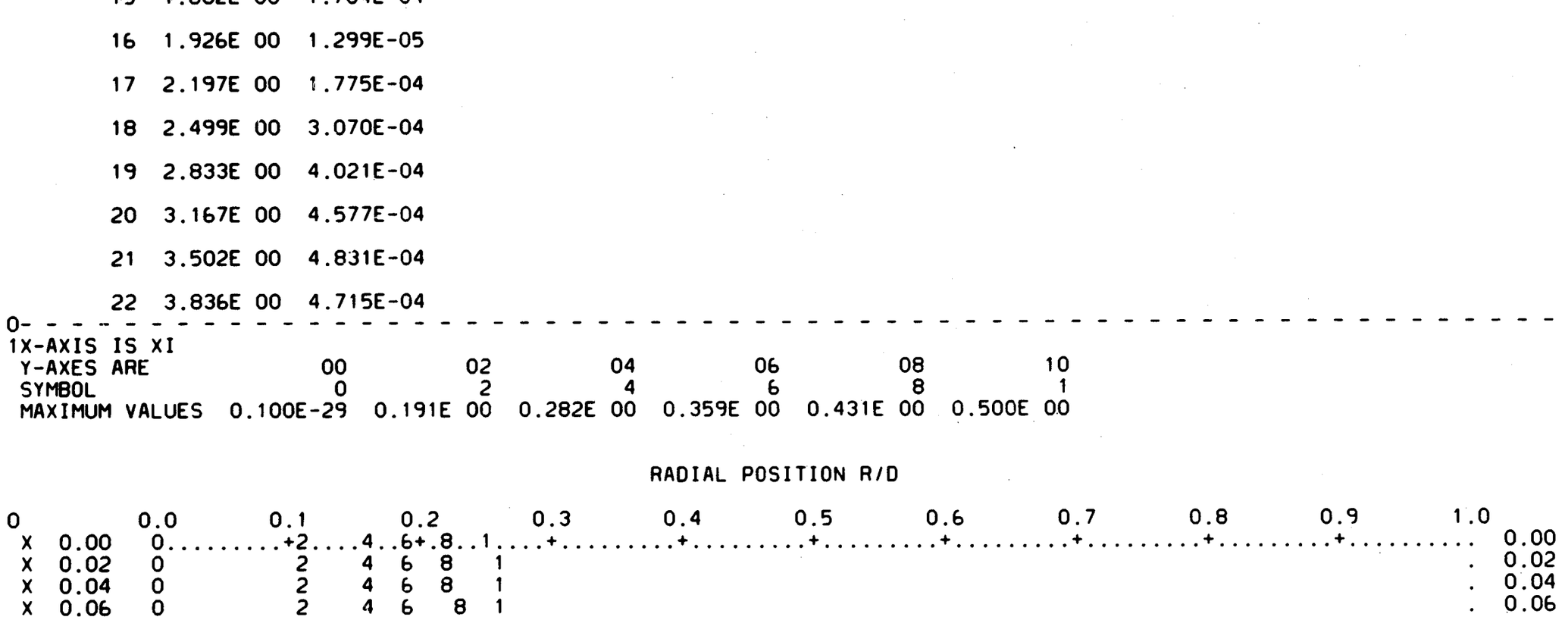
DIMENSIONLESS U VELOCITY

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	-7.10E-02	-1.14E-01	-1.39E-01	-1.55E-01	-1.65E-01	-1.67E-01	-1.58E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	-7.13E-02	-1.07E-01	-1.28E-01	-1.42E-01	-1.49E-01	-1.48E-01	-1.38E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	-6.86E-02	-9.26E-02	-1.09E-01	-1.18E-01	-1.22E-01	-1.18E-01	-1.06E-01
17	0.42750	0.00	0.00	0.00	0.00	-7.60E-02	-6.56E-02	-7.97E-02	-9.03E-02	-9.57E-02	-9.58E-02	-8.96E-02	-7.56E-02
16	0.40625	0.00	0.00	0.00	0.00	-6.91E-02	-5.80E-02	-6.22E-02	-6.57E-02	-6.55E-02	-6.11E-02	-5.18E-02	-3.61E-02
15	0.38500	0.00	0.00	0.00	0.00	-6.38E-02	-4.65E-02	-3.96E-02	-3.42E-02	-2.72E-02	-1.79E-02	-5.17E-03	1.20E-02
14	0.36500	0.00	0.00	0.00	-8.81E-02	-6.08E-02	-3.05E-02	-1.08E-02	4.15E-03	1.80E-02	3.21E-02	4.78E-02	6.56E-02
13	0.34625	0.00	0.00	0.00	-8.37E-02	-5.33E-02	-5.56E-03	2.69E-02	5.08E-02	7.06E-02	8.86E-02	1.06E-01	1.24E-01
12	0.32750	0.00	0.00	0.00	-8.17E-02	-3.12E-02	3.83E-02	8.02E-02	1.11E-01	1.35E-01	1.56E-01	1.75E-01	1.90E-01
11	0.29750	0.00	0.00	-1.66E-01	-7.96E-03	8.97E-02	1.58E-01	2.07E-01	2.43E-01	2.70E-01	2.91E-01	3.07E-01	3.16E-01
10	0.27500	0.00	0.00	6.28E-02	1.91E-01	2.64E-01	3.18E-01	3.58E-01	3.88E-01	4.08E-01	4.21E-01	4.28E-01	4.27E-01
9	0.25750	0.00	0.00	3.65E-01	4.30E-01	4.70E-01	5.02E-01	5.23E-01	5.34E-01	5.38E-01	5.40E-01	5.36E-01	5.22E-01
8	0.24250	0.00	1.00E 00	9.09E-01	8.44E-01	7.88E-01	7.40E-01	7.02E-01	6.77E-01	6.63E-01	6.53E-01	6.36E-01	6.07E-01
7	0.21500	0.00	1.00E 00	9.93E-01	9.88E-01	9.84E-01	9.78E-01	9.66E-01	9.46E-01	9.13E-01	8.69E-01	8.16E-01	7.60E-01
6	0.17500	0.00	1.00E 00	9.96E-01	9.92E-01	9.90E-01	9.90E-01	9.89E-01	9.87E-01	9.81E-01	9.69E-01	9.44E-01	9.02E-01
5	0.13000	0.00	1.00E 00	9.97E-01	9.95E-01	9.93E-01	9.92E-01	9.90E-01	9.88E-01	9.84E-01	9.76E-01	9.63E-01	9.44E-01
4	0.08500	0.00	1.00E 00	9.98E-01	9.96E-01	9.94E-01	9.93E-01	9.91E-01	9.89E-01	9.84E-01	9.76E-01	9.64E-01	9.47E-01
3	0.04500	0.00	1.00E 00	9.99E-01	9.96E-01	9.95E-01	9.93E-01	9.92E-01	9.89E-01	9.84E-01	9.77E-01	9.64E-01	9.48E-01
2	0.01250	0.00	1.00E 00	9.99E-01	9.97E-01	9.95E-01	9.93E-01	9.92E-01	9.89E-01	9.85E-01	9.77E-01	9.65E-01	9.48E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	-1.38E-01	-1.05E-01	-6.46E-02	-1.92E-02	2.85E-02	7.08E-02	1.09E-01	1.40E-01	1.64E-01	1.80E-01	1.80E-01
19	0.47500	-1.16E-01	-8.35E-02	-4.30E-02	1.49E-03	4.64E-02	8.74E-02	1.24E-01	1.54E-01	1.77E-01	1.92E-01	1.92E-01
18	0.44750	-8.31E-02	-5.11E-02	-1.27E-02	2.83E-02	6.89E-02	1.07E-01	1.41E-01	1.68E-01	1.89E-01	2.02E-01	2.02E-01
17	0.42750	-5.29E-02	-2.23E-02	1.33E-02	5.07E-02	8.75E-02	1.22E-01	1.53E-01	1.78E-01	1.97E-01	2.09E-01	2.09E-01
16	0.40625	-1.37E-02	1.44E-02	4.59E-02	7.85E-02	1.10E-01	1.40E-01	1.68E-01	1.90E-01	2.06E-01	2.17E-01	2.17E-01
15	0.38500	3.33E-02	5.77E-02	8.40E-02	1.11E-01	1.36E-01	1.61E-01	1.84E-01	2.02E-01	2.16E-01	2.25E-01	2.25E-01
14	0.36500	8.49E-02	1.05E-01	1.25E-01	1.45E-01	1.64E-01	1.84E-01	2.01E-01	2.16E-01	2.26E-01	2.33E-01	2.33E-01
13	0.34625	1.40E-01	1.55E-01	1.68E-01	1.81E-01	1.93E-01	2.06E-01	2.19E-01	2.29E-01	2.36E-01	2.41E-01	2.41E-01
12	0.32750	2.02E-01	2.10E-01	2.16E-01	2.20E-01	2.25E-01	2.31E-01	2.38E-01	2.43E-01	2.47E-01	2.49E-01	2.49E-01
11	0.29750	3.17E-01	3.11E-01	3.01E-01	2.90E-01	2.81E-01	2.75E-01	2.71E-01	2.68E-01	2.65E-01	2.64E-01	2.64E-01
10	0.27500	4.14E-01	3.94E-01	3.71E-01	3.47E-01	3.26E-01	3.10E-01	2.97E-01	2.87E-01	2.80E-01	2.75E-01	2.75E-01
9	0.25750	4.96E-01	4.63E-01	4.28E-01	3.94E-01	3.64E-01	3.39E-01	3.19E-01	3.03E-01	2.91E-01	2.83E-01	2.83E-01
8	0.24250	5.68E-01	5.24E-01	4.78E-01	4.35E-01	3.96E-01	3.64E-01	3.38E-01	3.17E-01	3.01E-01	2.91E-01	2.91E-01
7	0.21500	7.00E-01	6.35E-01	5.71E-01	5.11E-01	4.58E-01	4.12E-01	3.73E-01	3.43E-01	3.20E-01	3.04E-01	3.04E-01
6	0.17500	8.44E-01	7.74E-01	6.97E-01	6.20E-01	5.48E-01	4.83E-01	4.26E-01	3.80E-01	3.46E-01	3.23E-01	3.23E-01
5	0.13000	9.11E-01	8.62E-01	7.97E-01	7.20E-01	6.38E-01	5.57E-01	4.81E-01	4.19E-01	3.73E-01	3.43E-01	3.43E-01
4	0.08500	9.26E-01	8.95E-01	8.49E-01	7.86E-01	7.07E-01	6.17E-01	5.26E-01	4.51E-01	3.94E-01	3.58E-01	3.58E-01
3	0.04500	9.27E-01	9.02E-01	8.70E-01	8.20E-01	7.46E-01	6.52E-01	5.53E-01	4.69E-01	4.07E-01	3.67E-01	3.67E-01
2	0.01250	9.27E-01	9.03E-01	8.76E-01	8.32E-01	7.60E-01	6.65E-01	5.63E-01	4.76E-01	4.11E-01	3.70E-01	3.70E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS V VELOCITY

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415



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       3  9.443E-02  6.627E-05

       4  1.643E-01  5.671E-05

       5  2.419E-01  5.335E-05

       6  3.280E-01  1.702E-04

       7  4.235E-01  2.800E-04

       8  5.296E-01  3.737E-04

       9  6.473E-01  4.566E-04

      10  7.780E-01  5.230E-04

      11  9.231E-01  5.607E-04

      12  1.084E 00  5.500E-04

      13  1.263E 00  4.763E-04

      14  1.461E 00  3.423E-04

      15  1.682E 00  1.704E-04

      16  1.926E 00  1.299E-05

      17  2.197E 00  1.775E-04

      18  2.499E 00  3.070E-04

      19  2.833E 00  4.021E-04

      20  3.167E 00  4.577E-04

      21  3.502E 00  4.831E-04

      22  3.836E 00  4.715E-04
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1X-AXIS IS XI
 Y-AXES ARE             00         02         04         06         08         10
 SYMBOL                  0          2          4          6          8          1
 MAXIMUM VALUES  0.100E-29  0.191E 00  0.282E 00  0.359E 00  0.431E 00  0.500E 00


                                                 RADIAL POSITION R/D

0         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.........+2....4..6+.8..1....+.........+.........+.........+.........+.........+.........+.........   0.00
 X  0.02   0          2    4  6  8  1                                                                         .   0.02
 X  0.04   0          2    4  6  8  1                                                                         .   0.04
 X  0.06   0          2    4  6   8 1                                                                         .   0.06
```

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 154 0.3228E-01  0.8589E-02 0.9026E-01  0.1988E-01  0.4902E-02 0.2751E  08 0.6127E  01  0.4431E-02 0.5596E  01  0.9809E  03 0.5504E  03
 155 0.3199E-01  0.8393E-02 0.8877E-01  0.1959E-01  0.4870E-02 0.2782E  08 0.6133E  01  0.4528E-02 0.5644E  01  0.9815E  03 0.5509E  03
 156 0.3169E-01  0.8193E-02 0.8733E-01  0.1942E-01  0.4841E-02 0.2830E  08 0.6140E  01  0.4607E-02 0.5691E  01  0.9822E  03 0.5513E  03
 157 0.3137E-01  0.8029E-02 0.8593E-01  0.1905E-01  0.4817E-02 0.2844E  08 0.6147E  01  0.4668E-02 0.5736E  01  0.9829E  03 0.5517E  03
 158 0.3104E-01  0.7853E-02 0.8456E-01  0.1889E-01  0.4801E-02 0.2889E  08 0.6154E  01  0.4714E-02 0.5781E  01  0.9835E  03 0.5519E  03
 159 0.3070E-01  0.7706E-02 0.8323E-01  0.1860E-01  0.4780E-02 0.2921E  08 0.6161E  01  0.4744E-02 0.5824E  01  0.9842E  03 0.5522E  03
 160 0.3034E-01  0.7564E-02 0.8193E-01  0.1844E-01  0.4756E-02 0.2963E  08 0.6169E  01  0.4760E-02 0.5867E  01  0.9849E  03 0.5524E  03
 161 0.2998E-01  0.7445E-02 0.8066E-01  0.1813E-01  0.4729E-02 0.2989E  08 0.6177E  01  0.4763E-02 0.5909E  01  0.9855E  03 0.5525E  03
 162 0.2961E-01  0.7324E-02 0.7941E-01  0.1798E-01  0.4697E-02 0.2982E  08 0.6184E  01  0.4755E-02 0.5950E  01  0.9862E  03 0.5527E  03
 163 0.2923E-01  0.7228E-02 0.7820E-01  0.1772E-01  0.4662E-02 0.3003E  08 0.6192E  01  0.4735E-02 0.5991E  01  0.9868E  03 0.5527E  03
 164 0.2885E-01  0.7129E-02 0.7701E-01  0.1759E-01  0.4624E-02 0.3039E  08 0.6200E  01  0.4705E-02 0.6030E  01  0.9874E  03 0.5527E  03
 165 0.2847E-01  0.7051E-02 0.7584E-01  0.1734E-01  0.4583E-02 0.3064E  08 0.6208E  01  0.4667E-02 0.6069E  01  0.9881E  03 0.5527E  03
 166 0.2809E-01  0.6980E-02 0.7470E-01  0.1710E-01  0.4539E-02 0.3068E  08 0.6216E  01  0.4619E-02 0.6107E  01  0.9887E  03 0.5527E  03
 167 0.2771E-01  0.6913E-02 0.7358E-01  0.1698E-01  0.4492E-02 0.3085E  08 0.6224E  01  0.4566E-02 0.6145E  01  0.9893E  03 0.5526E  03
 168 0.2734E-01  0.6853E-02 0.7248E-01  0.1685E-01  0.4443E-02 0.3102E  08 0.6232E  01  0.4505E-02 0.6182E  01  0.9900E  03 0.5525E  03
 169 0.2696E-01  0.6805E-02 0.7139E-01  0.1661E-01  0.4391E-02 0.3139E  08 0.6240E  01  0.4440E-02 0.6218E  01  0.9906E  03 0.5524E  03
 170 0.2659E-01  0.6754E-02 0.7033E-01  0.1647E-01  0.4337E-02 0.3145E  08 0.6248E  01  0.4368E-02 0.6254E  01  0.9912E  03 0.5522E  03
 171 0.2622E-01  0.6707E-02 0.6928E-01  0.1632E-01  0.4281E-02 0.3151E  08 0.6256E  01  0.4293E-02 0.6289E  01  0.9918E  03 0.5520E  03
 172 0.2585E-01  0.6660E-02 0.6825E-01  0.1604E-01  0.4224E-02 0.3169E  08 0.6263E  01  0.4214E-02 0.6323E  01  0.9924E  03 0.5518E  03
 173 0.2549E-01  0.6624E-02 0.6724E-01  0.1596E-01  0.4165E-02 0.3184E  08 0.6271E  01  0.4133E-02 0.6357E  01  0.9930E  03 0.5516E  03
 174 0.2514E-01  0.6575E-02 0.6623E-01  0.1580E-01  0.4104E-02 0.3186E  08 0.6279E  01  0.4049E-02 0.6391E  01  0.9936E  03 0.5514E  03
 175 0.2479E-01  0.6546E-02 0.6525E-01  0.1560E-01  0.4042E-02 0.3192E  08 0.6286E  01  0.3963E-02 0.6424E  01  0.9942E  03 0.5511E  03
 176 0.2446E-01  0.6501E-02 0.6427E-01  0.1545E-01  0.3979E-02 0.3210E  08 0.6294E  01  0.3876E-02 0.6456E  01  0.9948E  03 0.5508E  03
 177 0.2412E-01  0.6464E-02 0.6331E-01  0.1533E-01  0.3915E-02 0.3205E  08 0.6301E  01  0.3790E-02 0.6488E  01  0.9954E  03 0.5505E  03
 178 0.2380E-01  0.6434E-02 0.6237E-01  0.1522E-01  0.3849E-02 0.3208E  08 0.6309E  01  0.3703E-02 0.6520E  01  0.9960E  03 0.5502E  03
 179 0.2349E-01  0.6390E-02 0.6143E-01  0.1499E-01  0.3784E-02 0.3241E  08 0.6316E  01  0.3617E-02 0.6551E  01  0.9965E  03 0.5499E  03
 180 0.2318E-01  0.6360E-02 0.6051E-01  0.1489E-01  0.3718E-02 0.3235E  08 0.6323E  01  0.3532E-02 0.6582E  01  0.9971E  03 0.5496E  03
 181 0.2288E-01  0.6321E-02 0.5960E-01  0.1475E-01  0.3651E-02 0.3219E  08 0.6330E  01  0.3446E-02 0.6612E  01  0.9977E  03 0.5493E  03
 182 0.2259E-01  0.6292E-02 0.5870E-01  0.1458E-01  0.3584E-02 0.3238E  08 0.6337E  01  0.3364E-02 0.6642E  01  0.9982E  03 0.5489E  03
 183 0.2231E-01  0.6249E-02 0.5781E-01  0.1449E-01  0.3517E-02 0.3235E  08 0.6344E  01  0.3284E-02 0.6672E  01  0.9988E  03 0.5486E  03
 184 0.2204E-01  0.6224E-02 0.5693E-01  0.1426E-01  0.3450E-02 0.3221E  08 0.6350E  01  0.3206E-02 0.6701E  01  0.9994E  03 0.5482E  03
 185 0.2178E-01  0.6180E-02 0.5606E-01  0.1419E-01  0.3382E-02 0.3225E  08 0.6357E  01  0.3130E-02 0.6730E  01  0.9999E  03 0.5479E  03
 186 0.2153E-01  0.6149E-02 0.5520E-01  0.1405E-01  0.3315E-02 0.3230E  08 0.6363E  01  0.3056E-02 0.6759E  01  0.1000E  04 0.5475E  03
 187 0.2128E-01  0.6104E-02 0.5435E-01  0.1387E-01  0.3249E-02 0.3228E  08 0.6370E  01  0.2986E-02 0.6787E  01  0.1001E  04 0.5471E  03
 188 0.2104E-01  0.6077E-02 0.5352E-01  0.1374E-01  0.3182E-02 0.3224E  08 0.6376E  01  0.2920E-02 0.6815E  01  0.1002E  04 0.5468E  03
 189 0.2082E-01  0.6030E-02 0.5269E-01  0.1357E-01  0.3116E-02 0.3231E  08 0.6382E  01  0.2856E-02 0.6843E  01  0.1002E  04 0.5464E  03
 190 0.2060E-01  0.5996E-02 0.5187E-01  0.1344E-01  0.3051E-02 0.3220E  08 0.6388E  01  0.2795E-02 0.6870E  01  0.1003E  04 0.5461E  03
 191 0.2039E-01  0.5951E-02 0.5107E-01  0.1331E-01  0.2986E-02 0.3236E  08 0.6394E  01  0.2737E-02 0.6897E  01  0.1003E  04 0.5457E  03
 192 0.2018E-01  0.5913E-02 0.5027E-01  0.1316E-01  0.2921E-02 0.3212E  08 0.6400E  01  0.2683E-02 0.6923E  01  0.1004E  04 0.5453E  03
 193 0.1998E-01  0.5867E-02 0.4948E-01  0.1309E-01  0.2858E-02 0.3218E  08 0.6406E  01  0.2633E-02 0.6950E  01  0.1004E  04 0.5450E  03
 194 0.1979E-01  0.5827E-02 0.4871E-01  0.1292E-01  0.2795E-02 0.3206E  08 0.6412E  01  0.2586E-02 0.6976E  01  0.1005E  04 0.5446E  03
 195 0.1960E-01  0.5782E-02 0.4794E-01  0.1279E-01  0.2733E-02 0.3204E  08 0.6418E  01  0.2543E-02 0.7002E  01  0.1005E  04 0.5443E  03
 196 0.1942E-01  0.5736E-02 0.4718E-01  0.1265E-01  0.2672E-02 0.3192E  08 0.6423E  01  0.2502E-02 0.7027E  01  0.1006E  04 0.5439E  03
 197 0.1924E-01  0.5689E-02 0.4644E-01  0.1247E-01  0.2611E-02 0.3197E  08 0.6429E  01  0.2466E-02 0.7052E  01  0.1006E  04 0.5436E  03
 198 0.1907E-01  0.5640E-02 0.4571E-01  0.1247E-01  0.2552E-02 0.3177E  08 0.6434E  01  0.2432E-02 0.7077E  01  0.1007E  04 0.5432E  03
 199 0.1891E-01  0.5590E-02 0.4498E-01  0.1232E-01  0.2494E-02 0.3169E  08 0.6440E  01  0.2401E-02 0.7102E  01  0.1007E  04 0.5429E  03
 200 0.1874E-01  0.5541E-02 0.4427E-01  0.1216E-01  0.2436E-02 0.3169E  08 0.6445E  01  0.2373E-02 0.7126E  01  0.1008E  04 0.5426E  03
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 SWIRL CASE WITH LFS  =  2
            AND NSBR =  0

 CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =      0.500
```

7	0.02687	4.49E 05	8.08E 04	1.96E 04	7.35E 03	6.44E 03	6.38E 03	5.68E 03	4.78E 03	4.10E 03	3.51E 03	2.95E 03	2.42E 03
6	0.02187	4.49E 05	8.09E 04	2.02E 04	9.07E 03	1.01E 04	1.14E 04	5.95E 03	4.72E 03	4.04E 03	3.46E 03	2.89E 03	2.35E 03
5	0.01625	4.49E 05	8.10E 04	2.10E 04	1.27E 04	1.91E 04	7.00E 03	4.69E 03	3.95E 03	3.52E 03	3.09E 03	2.61E 03	2.13E 03
4	0.01062	4.49E 05	8.13E 04	2.38E 04	2.08E 04	7.11E 03	4.25E 03	3.55E 03	3.19E 03	2.95E 03	2.64E 03	2.26E 03	1.87E 03
3	0.00562	4.49E 05	8.17E 04	3.14E 04	1.10E 04	4.19E 03	3.17E 03	2.90E 03	2.70E 03	2.54E 03	2.32E 03	2.01E 03	1.69E 03
2	0.00156	4.49E 05	8.25E 04	3.11E 04	6.44E 03	3.17E 03	2.71E 03	2.59E 03	2.44E 03	2.32E 03	2.14E 03	1.87E 03	1.58E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		4.90E 02	6.76E 02	8.00E 02	8.26E 02	7.90E 02	7.26E 02	6.62E 02	6.07E 02	5.61E 02	5.43E 02	4.49E 05
19	0.05937		4.25E 02	5.73E 02	6.57E 02	6.59E 02	6.08E 02	5.34E 02	4.60E 02	3.98E 02	3.46E 02	3.37E 02	4.49E 05
18	0.05594		4.49E 02	5.73E 02	6.23E 02	6.02E 02	5.36E 02	4.55E 02	3.78E 02	3.16E 02	2.67E 02	2.68E 02	4.49E 05
17	0.05344		5.23E 02	6.24E 02	6.45E 02	6.01E 02	5.22E 02	4.34E 02	3.55E 02	2.92E 02	2.45E 02	2.51E 02	4.49E 05
16	0.05078		6.44E 02	7.15E 02	6.98E 02	6.25E 02	5.27E 02	4.29E 02	3.46E 02	2.82E 02	2.35E 02	2.45E 02	4.49E 05
15	0.04812		8.03E 02	8.30E 02	7.68E 02	6.61E 02	5.43E 02	4.34E 02	3.45E 02	2.80E 02	2.32E 02	2.43E 02	4.49E 05
14	0.04562		9.81E 02	9.51E 02	8.41E 02	7.01E 02	5.62E 02	4.42E 02	3.48E 02	2.80E 02	2.32E 02	2.43E 02	4.49E 05
13	0.04328		1.16E 03	1.07E 03	9.10E 02	7.39E 02	5.82E 02	4.51E 02	3.52E 02	2.82E 02	2.33E 02	2.43E 02	4.49E 05
12	0.04094		1.35E 03	1.18E 03	9.76E 02	7.74E 02	6.00E 02	4.59E 02	3.56E 02	2.84E 02	2.34E 02	2.43E 02	4.49E 05
11	0.03719		1.62E 03	1.34E 03	1.06E 03	8.21E 02	6.23E 02	4.70E 02	3.61E 02	2.86E 02	2.35E 02	2.40E 02	4.49E 05
10	0.03437		1.77E 03	1.43E 03	1.11E 03	8.44E 02	6.34E 02	4.75E 02	3.62E 02	2.86E 02	2.34E 02	2.37E 02	4.49E 05
9	0.03219		1.85E 03	1.47E 03	1.13E 03	8.54E 02	6.37E 02	4.75E 02	3.61E 02	2.85E 02	2.33E 02	2.33E 02	4.49E 05
8	0.03031		1.90E 03	1.49E 03	1.14E 03	8.57E 02	6.37E 02	4.74E 02	3.59E 02	2.82E 02	2.30E 02	2.29E 02	4.49E 05
7	0.02687		1.92E 03	1.49E 03	1.14E 03	8.49E 02	6.30E 02	4.67E 02	3.53E 02	2.77E 02	2.25E 02	2.20E 02	4.49E 05
6	0.02187		1.86E 03	1.44E 03	1.09E 03	8.16E 02	6.06E 02	4.50E 02	3.40E 02	2.66E 02	2.16E 02	2.06E 02	4.49E 05
5	0.01625		1.69E 03	1.32E 03	1.01E 03	7.61E 02	5.70E 02	4.26E 02	3.24E 02	2.54E 02	2.05E 02	1.91E 02	4.49E 05
4	0.01062		1.51E 03	1.19E 03	9.22E 02	7.05E 02	5.34E 02	4.03E 02	3.08E 02	2.43E 02	1.97E 02	1.79E 02	4.49E 05
3	0.00562		1.38E 03	1.11E 03	8.64E 02	6.68E 02	5.11E 02	3.89E 02	2.99E 02	2.36E 02	1.91E 02	1.72E 02	4.49E 05
2	0.00156		1.31E 03	1.06E 03	8.34E 02	6.50E 02	5.00E 02	3.82E 02	2.95E 02	2.33E 02	1.89E 02	1.69E 02	4.49E 05
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAM FUNCTION -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	0.00	9.99E-01	9.89E-01	9.84E-01	9.82E-01	9.82E-01	9.83E-01	9.83E-01
19	0.05937		0.00	0.00	0.00	0.00	0.00	9.69E-01	9.27E-01	9.05E-01	8.99E-01	9.00E-01	9.02E-01	9.02E-01
18	0.05594		0.00	0.00	0.00	0.00	0.00	9.08E-01	8.30E-01	7.90E-01	7.79E-01	7.81E-01	7.85E-01	7.85E-01
17	0.05344		0.00	0.00	0.00	0.00	9.87E-01	8.53E-01	7.53E-01	7.01E-01	6.88E-01	6.92E-01	6.97E-01	6.97E-01
16	0.05078		0.00	0.00	0.00	0.00	9.41E-01	7.86E-01	6.63E-01	6.03E-01	5.89E-01	5.96E-01	6.03E-01	6.02E-01
15	0.04812		0.00	0.00	0.00	0.00	8.87E-01	7.08E-01	5.68E-01	5.01E-01	4.89E-01	4.98E-01	5.08E-01	5.09E-01
14	0.04562		0.00	0.00	0.00	9.94E-01	8.30E-01	6.28E-01	4.75E-01	4.05E-01	3.95E-01	4.08E-01	4.20E-01	4.25E-01
13	0.04328		0.00	0.00	0.00	9.62E-01	7.68E-01	5.47E-01	3.87E-01	3.16E-01	3.09E-01	3.26E-01	3.43E-01	3.52E-01
12	0.04094		0.00	0.00	0.00	9.14E-01	6.95E-01	4.62E-01	2.99E-01	2.31E-01	2.29E-01	2.51E-01	2.72E-01	2.86E-01
11	0.03719		0.00	0.00	9.88E-01	8.18E-01	5.67E-01	3.25E-01	1.67E-01	1.10E-01	1.19E-01	1.50E-01	1.77E-01	1.95E-01
10	0.03437		0.00	0.00	9.37E-01	7.27E-01	4.63E-01	2.25E-01	7.95E-02	3.68E-02	5.64E-02	9.17E-02	1.21E-01	1.41E-01
9	0.03219		0.00	0.00	8.59E-01	6.39E-01	3.79E-01	1.53E-01	2.22E-02	-5.87E-03	2.05E-02	5.67E-02	8.51E-02	1.05E-01
8	0.03031		0.00	9.41E-01	7.75E-01	5.59E-01	3.09E-01	9.77E-02	-1.68E-02	-3.22E-02	-2.25E-03	3.28E-02	6.00E-02	8.00E-02
7	0.02687		0.00	7.40E-01	6.09E-01	4.16E-01	1.93E-01	1.51E-02	-6.41E-02	-5.94E-02	-2.87E-02	1.70E-03	2.55E-02	4.39E-02
6	0.02187		0.00	4.90E-01	3.93E-01	2.37E-01	6.24E-02	-6.13E-02	-8.29E-02	-6.53E-02	-4.18E-02	-2.04E-02	-2.72E-03	1.20E-02
5	0.01625		0.00	2.70E-01	2.02E-01	8.92E-02	-2.46E-02	-7.05E-02	-6.11E-02	-4.80E-02	-3.50E-02	-2.29E-02	-1.21E-02	-2.52E-03
4	0.01062		0.00	1.16E-01	7.37E-02	6.84E-03	-3.59E-02	-3.47E-02	-3.01E-02	-2.43E-02	-1.90E-02	-1.37E-02	-8.72E-03	-4.10E-03
3	0.00562		0.00	3.24E-02	1.54E-02	-9.04E-03	-1.21E-02	-1.04E-02	-9.03E-03	-7.45E-03	-5.97E-03	-4.49E-03	-3.03E-03	-1.64E-03

5	0.13000	2.44E-02	2.17E-02	1.89E-02	1.62E-02	1.37E-02	1.16E-02	9.80E-03	8.46E-03	7.44E-03	7.20E-03	3.00E-02
4	0.08500	2.35E-02	2.09E-02	1.83E-02	1.58E-02	1.34E-02	1.14E-02	9.67E-03	8.37E-03	7.37E-03	7.04E-03	3.00E-02
3	0.04500	2.28E-02	2.04E-02	1.79E-02	1.55E-02	1.32E-02	1.12E-02	9.59E-03	8.31E-03	7.32E-03	6.94E-03	3.00E-02
2	0.01250	2.25E-02	2.02E-02	1.78E-02	1.54E-02	1.32E-02	1.12E-02	9.59E-03	8.31E-03	7.32E-03	6.93E-03	3.00E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS LENGTH SCALE

I =		2	3	4	5	6	7	8	9	10	11	12	13
X =		0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	1.85E-01	1.79E-01	1.71E-01	1.62E-01	1.54E-01	1.50E-01	1.62E-01	2.22E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.62E-01	1.63E-01	1.68E-01	1.75E-01	1.82E-01	1.92E-01	2.52E-01	3.91E-01
17	0.05344	0.00	0.00	5.09E-02	1.17E-01	1.22E-01	1.29E-01	1.42E-01	1.55E-01	1.69E-01	1.93E-01	3.13E-01	4.89E-01
16	0.05078	0.00	0.00	1.78E-01	1.20E-01	1.11E-01	1.13E-01	1.22E-01	1.35E-01	1.51E-01	2.01E-01	3.86E-01	5.70E-01
15	0.04812	0.00	0.00	1.78E-01	1.02E-01	9.37E-02	9.60E-02	1.04E-01	1.16E-01	1.34E-01	2.51E-01	4.68E-01	6.33E-01
14	0.04562	0.00	5.09E-02	9.31E-02	8.18E-02	7.98E-02	8.36E-02	9.08E-02	1.02E-01	1.41E-01	3.40E-01	5.37E-01	6.78E-01
13	0.04328	0.00	1.60E-01	9.00E-02	7.28E-02	7.17E-02	7.69E-02	8.41E-02	9.69E-02	2.07E-01	4.25E-01	5.88E-01	7.11E-01
12	0.04094	0.00	1.60E-01	7.84E-02	6.24E-02	6.52E-02	7.42E-02	8.42E-02	1.25E-01	3.06E-01	4.90E-01	6.27E-01	7.37E-01
11	0.03719	7.64E-02	8.31E-02	5.83E-02	5.01E-02	6.13E-02	7.95E-02	1.17E-01	2.55E-01	4.28E-01	5.62E-01	6.74E-01	7.74E-01
10	0.03437	1.60E-01	7.64E-02	4.28E-02	4.08E-02	6.59E-02	1.08E-01	2.09E-01	3.54E-01	4.85E-01	6.00E-01	7.04E-01	7.99E-01
9	0.03219	1.60E-01	4.92E-02	2.38E-02	3.70E-02	7.96E-02	1.56E-01	2.76E-01	4.04E-01	5.20E-01	6.28E-01	7.27E-01	8.19E-01
8	0.03031	5.29E-03	6.18E-03	9.69E-03	4.12E-02	9.91E-02	1.97E-01	3.23E-01	4.40E-01	5.49E-01	6.51E-01	7.46E-01	8.36E-01
7	0.02687	5.27E-03	6.19E-03	1.15E-02	5.75E-02	1.32E-01	2.74E-01	4.01E-01	5.03E-01	6.01E-01	6.94E-01	7.83E-01	8.68E-01
6	0.02187	5.27E-03	6.32E-03	1.72E-02	9.31E-02	2.10E-01	4.14E-01	4.99E-01	5.86E-01	6.73E-01	7.58E-01	8.39E-01	9.18E-01
5	0.01625	5.28E-03	6.94E-03	3.47E-02	1.60E-01	3.53E-01	5.14E-01	5.92E-01	6.71E-01	7.48E-01	8.25E-01	9.00E-01	9.76E-01
4	0.01062	5.30E-03	1.00E-02	8.16E-02	3.01E-01	4.80E-01	6.08E-01	6.78E-01	7.48E-01	8.18E-01	8.89E-01	9.59E-01	1.03E 00
3	0.00562	5.32E-03	2.56E-02	3.00E-01	4.32E-01	5.87E-01	6.86E-01	7.48E-01	8.11E-01	8.75E-01	9.42E-01	1.01E 00	1.07E 00
2	0.00156	5.36E-03	7.87E-02	4.21E-01	5.53E-01	6.73E-01	7.52E-01	8.09E-01	8.68E-01	9.29E-01	9.91E-01	1.05E 00	1.11E 00

I =		14	15	16	17	18	19	20	21	22	23
X =		0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
J	Y										
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	5.00E-03
19	0.05937	2.72E-01	2.86E-01	2.80E-01	2.64E-01	2.42E-01	2.20E-01	2.00E-01	1.83E-01	1.83E-01	5.00E-03
18	0.05594	4.90E-01	5.25E-01	5.24E-01	5.05E-01	4.79E-01	4.51E-01	4.27E-01	4.08E-01	4.17E-01	5.00E-03
17	0.05344	6.02E-01	6.49E-01	6.56E-01	6.42E-01	6.19E-01	5.95E-01	5.75E-01	5.60E-01	5.71E-01	5.00E-03
16	0.05078	6.84E-01	7.41E-01	7.59E-01	7.55E-01	7.39E-01	7.22E-01	7.07E-01	6.96E-01	7.08E-01	5.00E-03
15	0.04812	7.41E-01	8.05E-01	8.34E-01	8.41E-01	8.34E-01	8.24E-01	8.15E-01	8.10E-01	8.20E-01	5.00E-03
14	0.04562	7.79E-01	8.48E-01	8.86E-01	9.02E-01	9.05E-01	9.01E-01	8.98E-01	8.97E-01	9.07E-01	5.00E-03
13	0.04328	8.07E-01	8.78E-01	9.24E-01	9.48E-01	9.58E-01	9.61E-01	9.63E-01	9.66E-01	9.76E-01	5.00E-03
12	0.04094	8.30E-01	9.03E-01	9.54E-01	9.85E-01	1.00E 00	1.01E 00	1.02E 00	1.02E 00	1.03E 00	5.00E-03
11	0.03719	8.62E-01	9.37E-01	9.94E-01	1.03E 00	1.06E 00	1.08E 00	1.09E 00	1.10E 00	1.11E 00	5.00E-03
10	0.03437	8.85E-01	9.60E-01	1.02E 00	1.06E 00	1.10E 00	1.12E 00	1.14E 00	1.15E 00	1.16E 00	5.00E-03
9	0.03219	9.03E-01	9.77E-01	1.04E 00	1.09E 00	1.12E 00	1.15E 00	1.17E 00	1.18E 00	1.20E 00	5.00E-03
8	0.03031	9.18E-01	9.92E-01	1.05E 00	1.10E 00	1.14E 00	1.17E 00	1.19E 00	1.21E 00	1.23E 00	5.00E-03
7	0.02687	9.48E-01	1.02E 00	1.08E 00	1.13E 00	1.17E 00	1.20E 00	1.23E 00	1.25E 00	1.27E 00	5.00E-03
6	0.02187	9.93E-01	1.06E 00	1.12E 00	1.17E 00	1.22E 00	1.25E 00	1.28E 00	1.30E 00	1.33E 00	5.00E-03
5	0.01625	1.05E 00	1.11E 00	1.17E 00	1.22E 00	1.26E 00	1.30E 00	1.32E 00	1.35E 00	1.38E 00	5.00E-03
4	0.01062	1.10E 00	1.16E 00	1.21E 00	1.26E 00	1.30E 00	1.33E 00	1.36E 00	1.39E 00	1.42E 00	5.00E-03
3	0.00562	1.14E 00	1.20E 00	1.24E 00	1.29E 00	1.33E 00	1.36E 00	1.39E 00	1.42E 00	1.45E 00	5.00E-03
2	0.00156	1.17E 00	1.23E 00	1.27E 00	1.31E 00	1.34E 00	1.38E 00	1.40E 00	1.43E 00	1.48E 00	5.00E-03

DIMENSIONLESS EFF. VISCOSITY

I =	1	2	3	4	5	6	7	8	9	10	11	12

47	0.2791E 00	0.1785E 00	0.1769E 00	0.9076E-01	0.3335E-01	0.7250E 09	0.6529E 01	-0.2277E-02	0.7906E 01	0.1126E 04	0.5678E 03
48	0.2750E 00	0.1752E 00	0.1749E 00	0.9134E-01	0.3307E-01	0.6710E 09	0.6528E 01	-0.2697E-02	0.7924E 01	0.1127E 04	0.5718E 03
49	0.2712E 00	0.1722E 00	0.1731E 00	0.9167E-01	0.3271E-01	0.6202E 09	0.6525E 01	-0.3137E-02	0.7942E 01	0.1127E 04	0.5760E 03
50	0.2678E 00	0.1691E 00	0.1716E 00	0.9175E-01	0.3232E-01	0.5727E 09	0.6523E 01	-0.3596E-02	0.7961E 01	0.1128E 04	0.5806E 03
51	0.2645E 00	0.1662E 00	0.1702E 00	0.9160E-01	0.3186E-01	0.5283E 09	0.6519E 01	-0.4072E-02	0.7980E 01	0.1129E 04	0.5856E 03
52	0.2614E 00	0.1636E 00	0.1685E 00	0.9113E-01	0.3137E-01	0.4900E 09	0.6515E 01	-0.4563E-02	0.8000E 01	0.1129E 04	0.5909E 03
53	0.2580E 00	0.1612E 00	0.1664E 00	0.9043E-01	0.3084E-01	0.4558E 09	0.6510E 01	-0.5066E-02	0.8020E 01	0.1130E 04	0.5966E 03
54	0.2543E 00	0.1595E 00	0.1639E 00	0.8953E-01	0.3029E-01	0.4230E 09	0.6505E 01	-0.5578E-02	0.8042E 01	0.1131E 04	0.6027E 03
55	0.2505E 00	0.1579E 00	0.1613E 00	0.8851E-01	0.2972E-01	0.3928E 09	0.6499E 01	-0.6097E-02	0.8064E 01	0.1132E 04	0.6091E 03
56	0.2471E 00	0.1564E 00	0.1586E 00	0.8726E-01	0.2914E-01	0.3640E 09	0.6492E 01	-0.6622E-02	0.8087E 01	0.1133E 04	0.6159E 03
57	0.2441E 00	0.1549E 00	0.1561E 00	0.8580E-01	0.2856E-01	0.3370E 09	0.6484E 01	-0.7146E-02	0.8111E 01	0.1134E 04	0.6230E 03
58	0.2414E 00	0.1534E 00	0.1540E 00	0.8429E-01	0.2797E-01	0.3119E 09	0.6475E 01	-0.7668E-02	0.8136E 01	0.1134E 04	0.6305E 03
59	0.2383E 00	0.1520E 00	0.1517E 00	0.8260E-01	0.2737E-01	0.2879E 09	0.6466E 01	-0.8185E-02	0.8162E 01	0.1135E 04	0.6382E 03
60	0.2346E 00	0.1509E 00	0.1491E 00	0.8078E-01	0.2675E-01	0.2660E 09	0.6456E 01	-0.8691E-02	0.8189E 01	0.1136E 04	0.6463E 03
61	0.2309E 00	0.1498E 00	0.1463E 00	0.7881E-01	0.2612E-01	0.2453E 09	0.6445E 01	-0.9182E-02	0.8217E 01	0.1137E 04	0.6546E 03
62	0.2274E 00	0.1489E 00	0.1432E 00	0.7684E-01	0.2550E-01	0.2270E 09	0.6433E 01	-0.9656E-02	0.8247E 01	0.1138E 04	0.6632E 03
63	0.2239E 00	0.1479E 00	0.1400E 00	0.7473E-01	0.2487E-01	0.2112E 09	0.6421E 01	-0.1011E-01	0.8277E 01	0.1138E 04	0.6720E 03
64	0.2206E 00	0.1467E 00	0.1365E 00	0.7263E-01	0.2423E-01	0.1960E 09	0.6408E 01	-0.1053E-01	0.8309E 01	0.1139E 04	0.6809E 03
65	0.2172E 00	0.1453E 00	0.1331E 00	0.7045E-01	0.2360E-01	0.1819E 09	0.6394E 01	-0.1093E-01	0.8343E 01	0.1140E 04	0.6901E 03
66	0.2137E 00	0.1438E 00	0.1298E 00	0.6828E-01	0.2296E-01	0.1690E 09	0.6379E 01	-0.1129E-01	0.8377E 01	0.1140E 04	0.6994E 03
67	0.2100E 00	0.1422E 00	0.1268E 00	0.6608E-01	0.2233E-01	0.1569E 09	0.6364E 01	-0.1162E-01	0.8413E 01	0.1141E 04	0.7087E 03
68	0.2065E 00	0.1405E 00	0.1236E 00	0.6393E-01	0.2171E-01	0.1459E 09	0.6348E 01	-0.1190E-01	0.8451E 01	0.1142E 04	0.7182E 03
69	0.2035E 00	0.1389E 00	0.1203E 00	0.6176E-01	0.2108E-01	0.1355E 09	0.6331E 01	-0.1214E-01	0.8489E 01	0.1142E 04	0.7277E 03
70	0.2006E 00	0.1372E 00	0.1168E 00	0.5954E-01	0.2047E-01	0.1261E 09	0.6315E 01	-0.1233E-01	0.8529E 01	0.1143E 04	0.7373E 03
71	0.1973E 00	0.1356E 00	0.1133E 00	0.5733E-01	0.1986E-01	0.1173E 09	0.6297E 01	-0.1248E-01	0.8570E 01	0.1143E 04	0.7468E 03
72	0.1940E 00	0.1338E 00	0.1098E 00	0.5512E-01	0.1925E-01	0.1093E 09	0.6279E 01	-0.1257E-01	0.8612E 01	0.1144E 04	0.7563E 03
73	0.1910E 00	0.1316E 00	0.1062E 00	0.5294E-01	0.1866E-01	0.1019E 09	0.6261E 01	-0.1261E-01	0.8655E 01	0.1144E 04	0.7658E 03
74	0.1876E 00	0.1292E 00	0.1026E 00	0.5087E-01	0.1807E-01	0.9501E 08	0.6243E 01	-0.1260E-01	0.8699E 01	0.1144E 04	0.7751E 03
75	0.1843E 00	0.1267E 00	0.9894E-01	0.4876E-01	0.1748E-01	0.8910E 08	0.6225E 01	-0.1253E-01	0.8744E 01	0.1145E 04	0.7844E 03
76	0.1813E 00	0.1241E 00	0.9547E-01	0.4678E-01	0.1690E-01	0.8415E 08	0.6206E 01	-0.1241E-01	0.8789E 01	0.1145E 04	0.7935E 03
77	0.1783E 00	0.1215E 00	0.9217E-01	0.4482E-01	0.1633E-01	0.8031E 08	0.6187E 01	-0.1224E-01	0.8836E 01	0.1146E 04	0.8025E 03
78	0.1754E 00	0.1189E 00	0.8885E-01	0.4288E-01	0.1577E-01	0.7693E 08	0.6169E 01	-0.1202E-01	0.8882E 01	0.1146E 04	0.8113E 03
79	0.1723E 00	0.1162E 00	0.8559E-01	0.4100E-01	0.1521E-01	0.7415E 08	0.6150E 01	-0.1174E-01	0.8930E 01	0.1146E 04	0.8200E 03
80	0.1694E 00	0.1135E 00	0.8234E-01	0.3920E-01	0.1466E-01	0.7186E 08	0.6132E 01	-0.1142E-01	0.8978E 01	0.1146E 04	0.8285E 03
81	0.1665E 00	0.1109E 00	0.7910E-01	0.3743E-01	0.1412E-01	0.6990E 08	0.6114E 01	-0.1106E-01	0.9025E 01	0.1147E 04	0.8367E 03
82	0.1635E 00	0.1084E 00	0.7595E-01	0.3575E-01	0.1359E-01	0.6822E 08	0.6096E 01	-0.1065E-01	0.9073E 01	0.1147E 04	0.8448E 03
83	0.1605E 00	0.1057E 00	0.7285E-01	0.3411E-01	0.1306E-01	0.6636E 08	0.6079E 01	-0.1021E-01	0.9121E 01	0.1147E 04	0.8527E 03
84	0.1579E 00	0.1030E 00	0.6982E-01	0.3257E-01	0.1255E-01	0.6516E 08	0.6062E 01	-0.9725E-02	0.9169E 01	0.1147E 04	0.8603E 03
85	0.1553E 00	0.1001E 00	0.6682E-01	0.3107E-01	0.1204E-01	0.6376E 08	0.6046E 01	-0.9215E-02	0.9217E 01	0.1148E 04	0.8676E 03
86	0.1526E 00	0.9718E-01	0.6393E-01	0.2962E-01	0.1155E-01	0.6338E 08	0.6030E 01	-0.8678E-02	0.9264E 01	0.1148E 04	0.8748E 03
87	0.1498E 00	0.9423E-01	0.6116E-01	0.2828E-01	0.1107E-01	0.6286E 08	0.6014E 01	-0.8118E-02	0.9310E 01	0.1148E 04	0.8817E 03
88	0.1471E 00	0.9127E-01	0.5853E-01	0.2692E-01	0.1061E-01	0.6273E 08	0.6000E 01	-0.7539E-02	0.9356E 01	0.1148E 04	0.8884E 03
89	0.1445E 00	0.8831E-01	0.5606E-01	0.2564E-01	0.1016E-01	0.6264E 08	0.5986E 01	-0.6946E-02	0.9402E 01	0.1148E 04	0.8948E 03
90	0.1420E 00	0.8537E-01	0.5367E-01	0.2441E-01	0.9728E-02	0.6237E 08	0.5972E 01	-0.6342E-02	0.9446E 01	0.1148E 04	0.9010E 03
91	0.1396E 00	0.8245E-01	0.5131E-01	0.2332E-01	0.9325E-02	0.6199E 08	0.5960E 01	-0.5731E-02	0.9490E 01	0.1149E 04	0.9074E 03
92	0.1374E 00	0.7959E-01	0.4908E-01	0.2219E-01	0.8847E-02	0.5803E 08	0.5948E 01	-0.5149E-02	0.9533E 01	0.1149E 04	0.9133E 03
93	0.1352E 00	0.7692E-01	0.4697E-01	0.2095E-01	0.8411E-02	0.5643E 08	0.5937E 01	-0.4575E-02	0.9575E 01	0.1149E 04	0.9187E 03
94	0.1330E 00	0.7444E-01	0.4496E-01	0.1992E-01	0.8015E-02	0.5579E 08	0.5926E 01	-0.4002E-02	0.9616E 01	0.1149E 04	0.9239E 03
95	0.1309E 00	0.7195E-01	0.4300E-01	0.1901E-01	0.7655E-02	0.5575E 08	0.5917E 01	-0.3426E-02	0.9657E 01	0.1149E 04	0.9287E 03
96	0.1287E 00	0.6945E-01	0.4110E-01	0.1808E-01	0.7326E-02	0.5559E 08	0.5908E 01	-0.2851E-02	0.9696E 01	0.1149E 04	0.9333E 03
97	0.1266E 00	0.6694E-01	0.3928E-01	0.1724E-01	0.7049E-02	0.5547E 08	0.5900E 01	-0.2279E-02	0.9734E 01	0.1150E 04	0.9377E 03
98	0.1247E 00	0.6445E-01	0.3757E-01	0.1646E-01	0.6814E-02	0.5509E 08	0.5892E 01	-0.1712E-02	0.9771E 01	0.1150E 04	0.9418E 03
99	0.1228E 00	0.6197E-01	0.3600E-01	0.1570E-01	0.6596E-02	0.5476E 08	0.5886E 01	-0.1155E-02	0.9807E 01	0.1150E 04	0.9458E 03
100	0.1210E 00	0.5955E-01	0.3456E-01	0.1498E-01	0.6381E-02	0.5457E 08	0.5880E 01	-0.6085E-03	0.9842E 01	0.1150E 04	0.9495E 03

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  16 0.05078      0.00     0.00     0.00-6.19E-03-3.21E-03-1.19E-03 5.63E-04 9.58E-04 2.24E-03 4.19E-03 9.01E-03 1.44E-02
  15 0.04812      0.00     0.00     0.00-3.04E-03-3.72E-03-5.77E-04 9.51E-04 7.60E-04 1.53E-03 3.81E-03 8.49E-03 1.30E-02
  14 0.04562      0.00     0.00-1.88E-02-5.08E-03-3.56E-03 3.91E-05 1.13E-03 3.76E-04 1.07E-03 3.28E-03 7.42E-03 1.10E-02
  13 0.04328      0.00     0.00-1.64E-02-8.04E-03-3.88E-03 2.74E-04 1.03E-03 6.08E-05 6.86E-04 2.70E-03 6.22E-03 8.68E-03
  12 0.04094      0.00     0.00-1.29E-02-9.11E-03-4.02E-03 4.95E-04 5.52E-04-6.94E-04-1.21E-04 1.42E-03 4.12E-03 5.45E-03
  11 0.03719      0.00-2.30E-02-1.45E-02-9.62E-03-4.19E-03 4.64E-05-7.38E-04-2.40E-03-2.39E-03-2.00E-03-1.36E-03-2.15E-03
  10 0.03437      0.00-2.16E-02-1.94E-02-1.13E-02-4.82E-03-1.45E-03-2.41E-03-4.28E-03-4.99E-03-5.68E-03-6.48E-03-9.41E-03
   9 0.03219      0.00-2.18E-02-2.26E-02-1.30E-02-6.41E-03-3.24E-03-4.43E-03-6.38E-03-7.54E-03-9.13E-03-1.11E-02-1.57E-02
   8 0.03031      0.00-2.52E-02-2.62E-02-1.73E-02-8.66E-03-5.65E-03-6.37E-03-8.41E-03-1.02E-02-1.24E-02-1.57E-02-2.16E-02
   7 0.02687      0.00-3.58E-02-3.29E-02-2.53E-02-1.28E-02-1.18E-02-1.17E-02-1.42E-02-1.70E-02-2.10E-02-2.64E-02-3.45E-02
   6 0.02187      0.00-4.54E-02-4.39E-02-3.55E-02-2.55E-02-2.32E-02-2.35E-02-2.62E-02-3.07E-02-3.68E-02-4.49E-02-5.55E-02
   5 0.01625      0.00-5.63E-02-5.57E-02-5.14E-02-3.85E-02-4.01E-02-4.05E-02-4.35E-02-4.88E-02-5.66E-02-6.67E-02-7.89E-02
   4 0.01062      0.00-6.68E-02-6.79E-02-6.56E-02-5.86E-02-5.78E-02-5.79E-02-6.03E-02-6.57E-02-7.44E-02-8.56E-02-9.87E-02
   3 0.00562      0.00-7.92E-02-7.90E-02-7.97E-02-7.32E-02-7.04E-02-6.94E-02-7.16E-02-7.67E-02-8.57E-02-9.75E-02-1.11E-01
   2 0.00156      0.00-8.62E-02-8.40E-02-8.39E-02-7.92E-02-7.53E-02-7.39E-02-7.60E-02-8.10E-02-9.00E-02-1.02E-01-1.16E-01
   1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0        I =     13       14       15       16       17       18       19       20       21       22       23
         X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J      Y
  21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187  2.40E-02 3.60E-02 4.90E-02 6.22E-02 7.60E-02 9.01E-02 1.04E-01 1.16E-01 1.27E-01 1.39E-01     0.00
  19 0.05937  2.43E-02 3.53E-02 4.68E-02 5.87E-02 7.10E-02 8.38E-02 9.67E-02 1.08E-01 1.18E-01 1.29E-01     0.00
  18 0.05594  2.37E-02 3.33E-02 4.26E-02 5.19E-02 6.16E-02 7.21E-02 8.26E-02 9.20E-02 1.01E-01 1.10E-01     0.00
  17 0.05344  2.29E-02 3.10E-02 3.86E-02 4.58E-02 5.36E-02 6.20E-02 7.05E-02 7.80E-02 8.50E-02 9.20E-02     0.00
  16 0.05078  2.13E-02 2.78E-02 3.34E-02 3.82E-02 4.41E-02 5.00E-02 5.63E-02 6.16E-02 6.69E-02 7.17E-02     0.00
  15 0.04812  1.88E-02 2.35E-02 2.70E-02 2.92E-02 3.31E-02 3.68E-02 4.11E-02 4.42E-02 4.76E-02 5.01E-02     0.00
  14 0.04562  1.57E-02 1.84E-02 1.97E-02 2.00E-02 2.18E-02 2.33E-02 2.58E-02 2.70E-02 2.88E-02 2.92E-02     0.00
  13 0.04328  1.17E-02 1.26E-02 1.21E-02 1.03E-02 1.05E-02 1.02E-02 1.09E-02 1.05E-02 1.05E-02 9.36E-03     0.00
  12 0.04094  6.79E-03 5.59E-03 3.36E-03-8.24E-05-1.62E-03-3.61E-03-4.35E-03-6.39E-03-7.73E-03-1.06E-02     0.00
  11 0.03719 -3.61E-03-7.77E-03-1.25E-02-1.81E-02-2.21E-02-2.63E-02-2.92E-02-3.35E-02-3.66E-02-4.19E-02     0.00
  10 0.03437 -1.30E-02-1.92E-02-2.59E-02-3.28E-02-3.82E-02-4.38E-02-4.81E-02-5.36E-02-5.81E-02-6.49E-02     0.00
   9 0.03219 -2.13E-02-2.90E-02-3.70E-02-4.48E-02-5.08E-02-5.74E-02-6.27E-02-6.91E-02-7.47E-02-8.21E-02     0.00
   8 0.03031 -2.87E-02-3.79E-02-4.68E-02-5.52E-02-6.17E-02-6.90E-02-7.51E-02-8.20E-02-8.86E-02-9.67E-02     0.00
   7 0.02687 -4.38E-02-5.46E-02-6.46E-02-7.39E-02-8.11E-02-8.93E-02-9.64E-02-1.04E-01-1.12E-01-1.21E-01     0.00
   6 0.02187 -6.69E-02-7.86E-02-8.93E-02-9.90E-02-1.07E-01-1.16E-01-1.24E-01-1.33E-01-1.41E-01-1.51E-01     0.00
   5 0.01625 -9.14E-02-1.03E-01-1.14E-01-1.23E-01-1.31E-01-1.41E-01-1.49E-01-1.58E-01-1.67E-01-1.79E-01     0.00
   4 0.01062 -1.11E-01-1.23E-01-1.33E-01-1.42E-01-1.50E-01-1.59E-01-1.68E-01-1.77E-01-1.86E-01-1.98E-01     0.00
   3 0.00562 -1.23E-01-1.35E-01-1.44E-01-1.52E-01-1.60E-01-1.69E-01-1.79E-01-1.87E-01-1.96E-01-2.09E-01     0.00
   2 0.00156 -1.28E-01-1.39E-01-1.48E-01-1.56E-01-1.64E-01-1.73E-01-1.82E-01-1.91E-01-2.00E-01-2.12E-01     0.00
   1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                        TURBULENCE  ENERGY           -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =      1        2        3        4        5        6        7        8        9       10       11       12
         X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J      Y
  21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187      0.00     0.00     0.00     0.00 2.68E 00 2.24E 00 1.86E 00 1.61E 00 1.43E 00 1.32E 00 1.39E 00 1.76E 00
  19 0.05937      0.00     0.00     0.00     0.00 1.36E 01 1.29E 01 9.95E 00 7.64E 00 5.97E 00 5.01E 00 5.83E 00 8.61E 00
  18 0.05594      0.00     0.00     0.00     0.00 1.79E 01 1.33E 01 1.03E 01 8.24E 00 6.77E 00 6.57E 00 9.60E 00 1.38E 01
  17 0.05344      0.00     0.00     0.00 6.32E 00 1.05E 01 8.85E 00 7.73E 00 6.97E 00 6.56E 00 8.46E 00 1.33E 01 1.75E 01
  16 0.05078      0.00     0.00     0.00 2.04E 01 1.24E 01 8.95E 00 7.21E 00 6.49E 00 7.40E 00 1.22E 01 1.78E 01 2.14E 01
  15 0.04812      0.00     0.00     0.00 1.75E 01 1.04E 01 7.82E 00 6.54E 00 6.68E 00 1.06E 01 1.73E 01 2.25E 01 2.51E 01
  14 0.04562      0.00     0.00 7.91E 00 1.05E 01 8.68E 00 7.51E 00 6.93E 00 9.10E 00 1.58E 01 2.24E 01 2.66E 01 2.82E 01
  13 0.04328      0.00     0.00 2.31E 01 1.20E 01 9.00E 00 8.39E 00 8.94E 00 1.38E 01 2.12E 01 2.69E 01 3.00E 01 3.07E 01
  12 0.04094      0.00     0.00 1.88E 01 9.90E 00 9.05E 00 9.85E 00 1.26E 01 1.95E 01 2.63E 01 3.07E 01 3.28E 01 3.28E 01
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  12 0.04094    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  11 0.03719    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
  10 0.03437    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   9 0.03219    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   8 0.03031    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   7 0.02687    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   6 0.02187    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   5 0.01625    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   4 0.01062    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   3 0.00562    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   2 0.00156    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01    2.70E 01
   1-0.00156        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                     TURBULENCE  DISSIPATION          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =       1           2           3           4           5           6           7           8           9          10          11          12
         X = -0.00393     0.00393     0.01180     0.02054     0.03023     0.04099     0.05294     0.06620     0.08092     0.09726     0.11539     0.13552
0 J      Y
  21 0.06312        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  20 0.06187        0.00        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  19 0.05937        0.00        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  18 0.05594        0.00        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  17 0.05344        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  16 0.05078        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  15 0.04812        0.00        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  14 0.04562        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  13 0.04328        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  12 0.04094        0.00        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  11 0.03719        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  10 0.03437        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   9 0.03219        0.00    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   8 0.03031    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   7 0.02687    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   6 0.02187    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   5 0.01625    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   4 0.01062    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   3 0.00562    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   2 0.00156    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   1-0.00156        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
0        I =      13          14          15          16          17          18          19          20          21          22          23
         X =  0.15786     0.18266     0.21019     0.24075     0.27467     0.31232     0.35411     0.39590     0.43769     0.47948     0.52127
0 J      Y
  21 0.06312        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00        0.00
  20 0.06187    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  19 0.05937    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  18 0.05594    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  17 0.05344    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  16 0.05078    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  15 0.04812    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  14 0.04562    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  13 0.04328    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  12 0.04094    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  11 0.03719    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
  10 0.03437    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   9 0.03219    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
   8 0.03031    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05    4.49E 05
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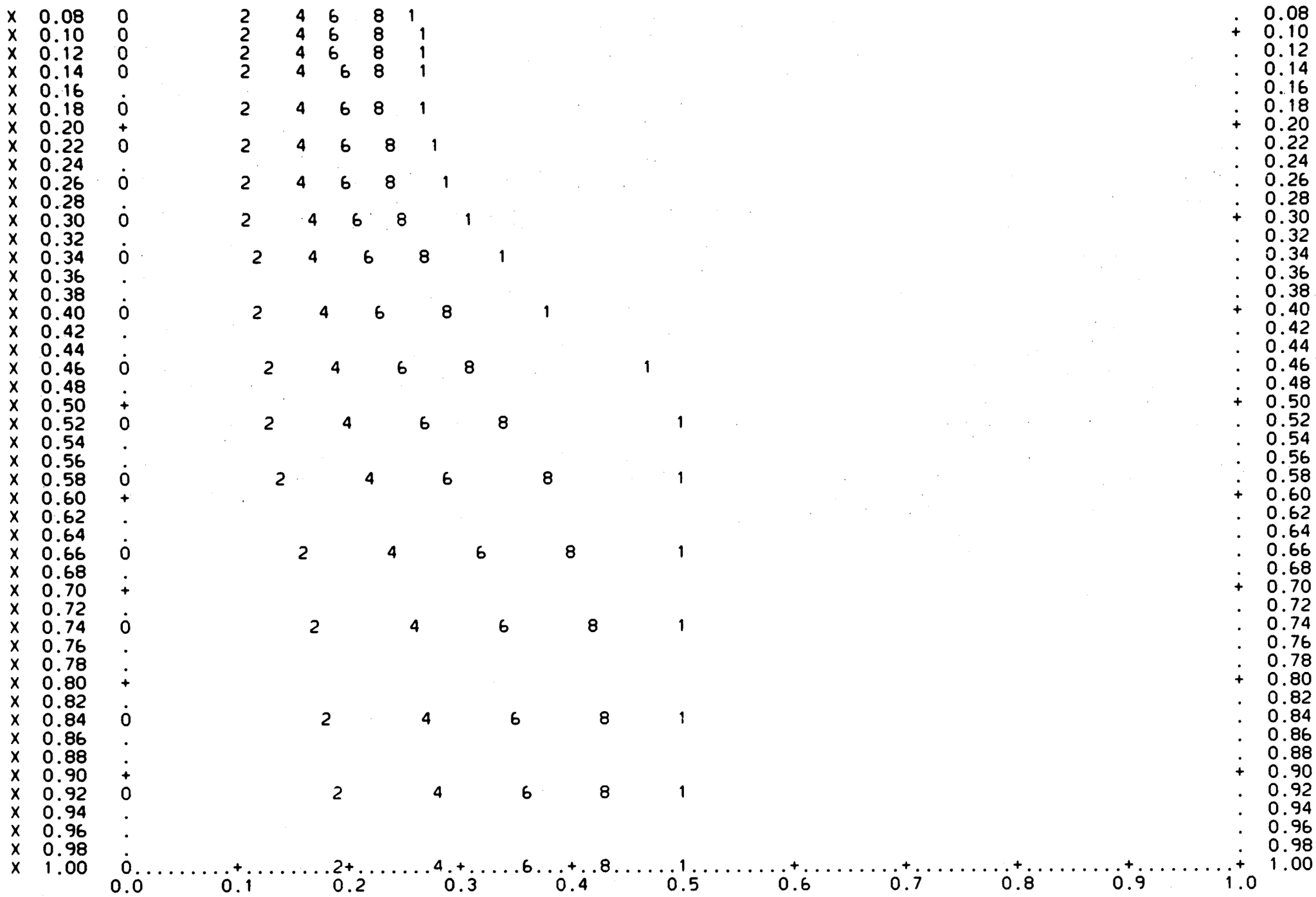
  3 0.00359  5.49E-02 5.62E-02 8.12E-02 1.20E-01 1.44E-01 1.39E-01 1.12E-01 8.35E-02 5.30E-02-7.75E-05     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 19 0.05937      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 18 0.05594      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 17 0.05344      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 16 0.05078      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 15 0.04812      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 14 0.04562      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 13 0.04328      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 12 0.04094      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 11 0.03719      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 10 0.03437      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  9 0.03219      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  8 0.03031      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  7 0.02687      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  6 0.02187      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  5 0.01625      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  4 0.01062      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  3 0.00562      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  2 0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 19 0.05937      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 18 0.05594      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 17 0.05344      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 16 0.05078      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 15 0.04812      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 14 0.04562      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 13 0.04328      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 12 0.04094      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 11 0.03719      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 10 0.03437      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  9 0.03219      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  8 0.03031      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  7 0.02687      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  6 0.02187      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  5 0.01625      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  4 0.01062      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  3 0.00562      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  2 0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
```

```
0 J    Y
 21 0.50000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.48500      0.00     0.00     0.00     0.00-1.32E-02-7.22E-03-3.74E-03-2.25E-03-1.16E-03-1.86E-04 8.25E-04 1.84E-03
 19 0.46125      0.00     0.00     0.00     0.00-3.51E-02-1.71E-02-9.14E-03-5.37E-03-2.58E-03-8.24E-05 2.50E-03 5.06E-03
 18 0.43750      0.00     0.00     0.00     0.00-5.75E-02-2.45E-02-1.35E-02-7.75E-03-3.39E-03 5.46E-04 4.61E-03 8.58E-03
 17 0.41687      0.00     0.00     0.00-2.18E-02-5.76E-02-2.90E-02-1.64E-02-9.15E-03-3.56E-03 1.52E-03 6.77E-03 1.18E-02
 16 0.39562      0.00     0.00     0.00-4.34E-02-5.78E-02-3.15E-02-1.80E-02-9.60E-03-3.00E-03 3.07E-03 9.38E-03 1.53E-02
 15 0.37500      0.00     0.00     0.00-6.41E-02-5.65E-02-3.17E-02-1.79E-02-8.79E-03-1.58E-03 5.19E-03 1.23E-02 1.88E-02
 14 0.35562      0.00     0.00-2.64E-02-6.02E-02-5.22E-02-2.91E-02-1.59E-02-6.80E-03 5.92E-04 7.74E-03 1.53E-02 2.21E-02
 13 0.33687      0.00     0.00-5.22E-02-5.56E-02-4.39E-02-2.38E-02-1.22E-02-3.77E-03 3.41E-03 1.06E-02 1.83E-02 2.52E-02
 12 0.31250      0.00     0.00-8.74E-02-4.26E-02-2.58E-02-1.40E-02-5.45E-03 1.47E-03 7.88E-03 1.49E-02 2.24E-02 2.90E-02
 11 0.28625      0.00-7.25E-02-3.00E-02-1.02E-02-5.23E-03-5.62E-04 3.94E-03 8.27E-03 1.32E-02 1.94E-02 2.61E-02 3.18E-02
 10 0.26625      0.00-5.72E-02 7.92E-03 9.36E-03 8.10E-03 8.69E-03 1.03E-02 1.26E-02 1.64E-02 2.19E-02 2.78E-02 3.27E-02
  9 0.25000      0.00 3.63E-02 2.49E-02 1.92E-02 1.51E-02 1.31E-02 1.27E-02 1.41E-02 1.77E-02 2.29E-02 2.80E-02 3.23E-02
  8 0.22875      0.00 7.42E-03 5.63E-03 4.10E-03 3.46E-03 4.97E-03 8.23E-03 1.27E-02 1.77E-02 2.22E-02 2.63E-02 3.02E-02
  7 0.19500      0.00 4.50E-03 4.19E-03 2.68E-03 1.23E-03 1.09E-03 2.24E-03 4.38E-03 7.56E-03 1.21E-02 1.75E-02 2.24E-02
  6 0.15250      0.00 2.55E-03 2.85E-03 2.07E-03 1.17E-03 1.02E-03 1.78E-03 3.13E-03 4.86E-03 6.80E-03 9.06E-03 1.22E-02
  5 0.10750      0.00 1.41E-03 1.78E-03 1.43E-03 9.13E-04 8.16E-04 1.30E-03 2.22E-03 3.42E-03 4.73E-03 5.88E-03 6.81E-03
  4 0.06500      0.00 7.45E-04 9.99E-04 8.48E-04 5.81E-04 5.27E-04 8.06E-04 1.35E-03 2.07E-03 2.85E-03 3.55E-03 4.02E-03
  3 0.02875      0.00 3.10E-04 4.28E-04 3.72E-04 2.62E-04 2.39E-04 3.60E-04 5.99E-04 9.15E-04 1.26E-03 1.57E-03 1.78E-03
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0     I =     13       14       15       16       17       18       19       20       21       22       23
       X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J    Y
 21 0.50000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.48500  2.61E-03 2.97E-03 2.98E-03 2.82E-03 2.25E-03 1.84E-03 1.41E-03 1.08E-03 7.25E-04-2.06E-06     0.00
 19 0.46125  6.97E-03 7.84E-03 7.80E-03 7.21E-03 5.85E-03 4.77E-03 3.66E-03 2.80E-03 1.87E-03-6.13E-06     0.00
 18 0.43750  1.15E-02 1.27E-02 1.25E-02 1.14E-02 9.38E-03 7.64E-03 5.85E-03 4.47E-03 2.97E-03-1.08E-05     0.00
 17 0.41687  1.55E-02 1.70E-02 1.66E-02 1.50E-02 1.24E-02 1.01E-02 7.72E-03 5.88E-03 3.89E-03-1.51E-05     0.00
 16 0.39562  1.96E-02 2.12E-02 2.05E-02 1.85E-02 1.54E-02 1.25E-02 9.57E-03 7.27E-03 4.79E-03-1.94E-05     0.00
 15 0.37500  2.34E-02 2.50E-02 2.41E-02 2.16E-02 1.81E-02 1.47E-02 1.13E-02 8.53E-03 5.60E-03-2.31E-05     0.00
 14 0.35562  2.68E-02 2.83E-02 2.71E-02 2.43E-02 2.04E-02 1.66E-02 1.27E-02 9.63E-03 6.31E-03-2.59E-05     0.00
 13 0.33687  2.98E-02 3.11E-02 2.96E-02 2.66E-02 2.24E-02 1.83E-02 1.40E-02 1.06E-02 6.92E-03-2.79E-05     0.00
 12 0.31250  3.31E-02 3.41E-02 3.25E-02 2.91E-02 2.47E-02 2.03E-02 1.55E-02 1.17E-02 7.63E-03-2.93E-05     0.00
 11 0.28625  3.53E-02 3.59E-02 3.42E-02 3.08E-02 2.64E-02 2.18E-02 1.67E-02 1.26E-02 8.18E-03-2.86E-05     0.00
 10 0.26625  3.57E-02 3.63E-02 3.46E-02 3.15E-02 2.72E-02 2.26E-02 1.73E-02 1.31E-02 8.47E-03-2.68E-05     0.00
  9 0.25000  3.51E-02 3.58E-02 3.44E-02 3.16E-02 2.75E-02 2.30E-02 1.77E-02 1.33E-02 8.62E-03-2.47E-05     0.00
  8 0.22875  3.32E-02 3.43E-02 3.35E-02 3.12E-02 2.76E-02 2.32E-02 1.80E-02 1.35E-02 8.73E-03-2.16E-05     0.00
  7 0.19500  2.64E-02 2.90E-02 2.98E-02 2.90E-02 2.65E-02 2.28E-02 1.77E-02 1.33E-02 8.57E-03-1.71E-05     0.00
  6 0.15250  1.58E-02 1.92E-02 2.20E-02 2.35E-02 2.30E-02 2.04E-02 1.60E-02 1.20E-02 7.71E-03-1.26E-05     0.00
  5 0.10750  8.14E-03 1.04E-02 1.33E-02 1.61E-02 1.72E-02 1.59E-02 1.27E-02 9.49E-03 6.05E-03-8.86E-06     0.00
  4 0.06500  4.21E-03 4.89E-03 6.80E-03 9.24E-03 1.07E-02 1.02E-02 8.19E-03 6.13E-03 3.90E-03-5.57E-06     0.00
  3 0.02875  1.83E-03 1.87E-03 2.71E-03 4.00E-03 4.78E-03 4.63E-03 3.72E-03 2.78E-03 1.77E-03-2.58E-06     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-        DIMENSIONLESS W VELOCITY               -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0     I =      1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 19 0.47500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 18 0.44750      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
```



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI
Y-AXES ARE 00 02 04 06 08 10

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 45.000

COMPUTED INLET SWIRL NUMBER = 0.6678

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = 0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	2.09E 00	5.53E 00	7.19E 00	7.63E 00	7.52E 00	7.32E 00	7.26E 00
19	0.05937	0.00	0.00	0.00	0.00	0.00	3.77E 00	6.51E 00	8.03E 00	8.48E 00	8.41E 00	8.28E 00	8.29E 00
18	0.05594	0.00	0.00	0.00	0.00	0.00	5.34E 00	7.76E 00	9.03E 00	9.33E 00	9.21E 00	9.07E 00	9.13E 00
17	0.05344	0.00	0.00	0.00	0.00	4.29E 00	6.42E 00	8.89E 00	9.95E 00	1.01E 01	9.86E 00	9.68E 00	9.71E 00
16	0.05078	0.00	0.00	0.00	0.00	5.40E 00	7.93E 00	1.01E 01	1.09E 01	1.09E 01	1.06E 01	1.03E 01	1.02E 01
15	0.04812	0.00	0.00	0.00	0.00	6.58E 00	9.37E 00	1.12E 01	1.18E 01	1.16E 01	1.12E 01	1.09E 01	1.05E 01
14	0.04562	0.00	0.00	0.00	3.16E 00	7.80E 00	1.07E 01	1.21E 01	1.24E 01	1.20E 01	1.15E 01	1.10E 01	1.05E 01
13	0.04328	0.00	0.00	0.00	6.03E 00	9.85E 00	1.21E 01	1.28E 01	1.26E 01	1.21E 01	1.15E 01	1.08E 01	1.01E 01
12	0.04094	0.00	0.00	0.00	8.33E 00	1.17E 01	1.32E 01	1.32E 01	1.25E 01	1.17E 01	1.09E 01	1.02E 01	9.58E 00
11	0.03719	0.00	0.00	2.89E 00	1.09E 01	1.40E 01	1.43E 01	1.32E 01	1.17E 01	1.01E 01	9.19E 00	8.77E 00	8.45E 00
10	0.03437	0.00	0.00	1.25E 01	1.59E 01	1.64E 01	1.48E 01	1.23E 01	9.61E 00	8.03E 00	7.63E 00	7.60E 00	7.48E 00
9	0.03219	0.00	0.00	1.87E 01	1.93E 01	1.75E 01	1.43E 01	1.07E 01	7.49E 00	6.35E 00	6.44E 00	6.66E 00	6.68E 00
8	0.03031	0.00	3.00E 01	2.39E 01	2.10E 01	1.75E 01	1.32E 01	8.73E 00	5.60E 00	5.00E 00	5.45E 00	5.85E 00	5.98E 00
7	0.02687	0.00	3.00E 01	2.55E 01	2.16E 01	1.68E 01	1.13E 01	5.16E 00	2.31E 00	2.76E 00	3.71E 00	4.35E 00	4.68E 00
6	0.02187	0.00	3.00E 01	2.64E 01	2.13E 01	1.44E 01	6.63E 00	-1.31E 00	-1.25E 00	1.20E-01	1.36E 00	2.21E 00	2.80E 00
5	0.01625	0.00	3.00E 01	2.59E 01	1.87E 01	8.43E 00	-5.97E 00	-5.21E 00	-3.85E 00	-2.34E 00	-1.02E 00	2.78E-02	8.94E-01
4	0.01062	0.00	3.00E 01	2.31E 01	1.18E 01	-7.34E 00	-8.39E 00	-7.24E 00	-5.72E 00	-4.29E 00	-2.94E 00	-1.70E 00	-5.93E-01
3	0.00562	0.00	3.00E 01	1.71E 01	-5.82E 00	-1.09E 01	-9.51E 00	-8.26E 00	-6.79E 00	-5.41E 00	-4.05E 00	-2.71E 00	-1.44E 00
2	0.00156	0.00	3.00E 01	6.81E 00	-1.50E 01	-1.19E 01	-9.92E 00	-8.62E 00	-7.18E 00	-5.82E 00	-4.45E 00	-3.07E 00	-1.74E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	7.45E 00	7.89E 00	8.28E 00	8.47E 00	8.53E 00	8.51E 00	8.48E 00	8.46E 00	8.46E 00	8.50E 00	8.51E 00
19	0.05937	8.53E 00	8.83E 00	9.00E 00	9.02E 00	8.97E 00	8.91E 00	8.87E 00	8.86E 00	8.89E 00	8.94E 00	8.95E 00
18	0.05594	9.33E 00	9.41E 00	9.34E 00	9.18E 00	9.03E 00	8.91E 00	8.82E 00	8.79E 00	8.78E 00	8.80E 00	8.81E 00
17	0.05344	9.76E 00	9.62E 00	9.40E 00	9.16E 00	8.96E 00	8.80E 00	8.70E 00	8.64E 00	8.62E 00	8.62E 00	8.63E 00
16	0.05078	1.00E 01	9.69E 00	9.34E 00	9.04E 00	8.81E 00	8.64E 00	8.52E 00	8.45E 00	8.41E 00	8.40E 00	8.40E 00
15	0.04812	1.01E 01	9.58E 00	9.17E 00	8.85E 00	8.60E 00	8.43E 00	8.30E 00	8.22E 00	8.18E 00	8.16E 00	8.16E 00
14	0.04562	9.87E 00	9.34E 00	8.92E 00	8.59E 00	8.36E 00	8.19E 00	8.07E 00	8.00E 00	7.95E 00	7.93E 00	7.93E 00
13	0.04328	9.53E 00	9.01E 00	8.61E 00	8.31E 00	8.10E 00	7.95E 00	7.84E 00	7.77E 00	7.73E 00	7.70E 00	7.70E 00
12	0.04094	9.06E 00	8.59E 00	8.23E 00	7.98E 00	7.81E 00	7.69E 00	7.60E 00	7.54E 00	7.50E 00	7.47E 00	7.47E 00
11	0.03719	8.09E 00	7.76E 00	7.53E 00	7.38E 00	7.29E 00	7.23E 00	7.19E 00	7.15E 00	7.12E 00	7.09E 00	7.09E 00
10	0.03437	7.26E 00	7.06E 00	6.94E 00	6.89E 00	6.88E 00	6.88E 00	6.87E 00	6.86E 00	6.84E 00	6.82E 00	6.81E 00
9	0.03219	6.58E 00	6.49E 00	6.46E 00	6.50E 00	6.55E 00	6.60E 00	6.63E 00	6.64E 00	6.63E 00	6.61E 00	6.61E 00
8	0.03031	5.98E 00	5.98E 00	6.05E 00	6.16E 00	6.27E 00	6.36E 00	6.43E 00	6.46E 00	6.46E 00	6.44E 00	6.44E 00

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  2 0.00156        0.00 2.50E-03 5.67E-04-1.25E-03-9.92E-04-8.27E-04-7.18E-04-5.98E-04-4.85E-04-3.71E-04-2.56E-04-1.45E-04
  1-0.00156        0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0        I =     13       14       15       16       17       18       19       20       21       22       23
         X =  0.14669  0.17026  0.19643  0.22547  0.25771  0.29349  0.33321  0.37500  0.41679  0.45858  0.50037
0 J      Y
 21 0.06312        0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187    9.82E-01 9.80E-01 9.79E-01 9.78E-01 9.78E-01 9.78E-01 9.78E-01 9.78E-01 9.78E-01 9.78E-01 9.78E-01
 19 0.05937    8.99E-01 8.94E-01 8.90E-01 8.88E-01 8.88E-01 8.88E-01 8.88E-01 8.88E-01 8.88E-01 8.88E-01 8.88E-01
 18 0.05594    7.79E-01 7.71E-01 7.66E-01 7.65E-01 7.66E-01 7.67E-01 7.69E-01 7.69E-01 7.69E-01 7.68E-01 7.68E-01
 17 0.05344    6.90E-01 6.82E-01 6.78E-01 6.79E-01 6.82E-01 6.85E-01 6.87E-01 6.88E-01 6.88E-01 6.86E-01 6.86E-01
 16 0.05078    5.96E-01 5.91E-01 5.90E-01 5.93E-01 5.98E-01 6.02E-01 6.06E-01 6.07E-01 6.07E-01 6.06E-01 6.06E-01
 15 0.04812    5.06E-01 5.04E-01 5.07E-01 5.13E-01 5.20E-01 5.26E-01 5.30E-01 5.32E-01 5.33E-01 5.32E-01 5.31E-01
 14 0.04562    4.26E-01 4.28E-01 4.35E-01 4.43E-01 4.52E-01 4.59E-01 4.65E-01 4.67E-01 4.68E-01 4.67E-01 4.67E-01
 13 0.04328    3.57E-01 3.63E-01 3.72E-01 3.83E-01 3.94E-01 4.02E-01 4.08E-01 4.11E-01 4.12E-01 4.12E-01 4.11E-01
 12 0.04094    2.95E-01 3.04E-01 3.15E-01 3.28E-01 3.40E-01 3.49E-01 3.56E-01 3.60E-01 3.61E-01 3.61E-01 3.60E-01
 11 0.03719    2.09E-01 2.22E-01 2.36E-01 2.51E-01 2.64E-01 2.74E-01 2.82E-01 2.86E-01 2.88E-01 2.88E-01 2.87E-01
 10 0.03437    1.56E-01 1.71E-01 1.87E-01 2.02E-01 2.16E-01 2.26E-01 2.34E-01 2.38E-01 2.40E-01 2.40E-01 2.40E-01
  9 0.03219    1.21E-01 1.37E-01 1.53E-01 1.69E-01 1.82E-01 1.92E-01 2.00E-01 2.04E-01 2.06E-01 2.06E-01 2.06E-01
  8 0.03031    9.63E-02 1.12E-01 1.28E-01 1.44E-01 1.56E-01 1.67E-01 1.74E-01 1.78E-01 1.80E-01 1.80E-01 1.80E-01
  7 0.02687    5.97E-02 7.50E-02 9.01E-02 1.04E-01 1.16E-01 1.25E-01 1.32E-01 1.36E-01 1.38E-01 1.38E-01 1.38E-01
  6 0.02187    2.52E-02 3.78E-02 5.01E-02 6.13E-02 7.06E-02 7.78E-02 8.31E-02 8.62E-02 8.78E-02 8.81E-02 8.80E-02
  5 0.01625    6.24E-03 1.46E-02 2.26E-02 2.98E-02 3.57E-02 4.03E-02 4.36E-02 4.56E-02 4.67E-02 4.69E-02 4.69E-02
  4 0.01062    1.59E-04 4.18E-03 7.99E-03 1.14E-02 1.42E-02 1.63E-02 1.79E-02 1.89E-02 1.94E-02 1.95E-02 1.95E-02
  3 0.00562   -3.65E-04 8.37E-04 1.97E-03 2.98E-03 3.80E-03 4.43E-03 4.90E-03 5.18E-03 5.34E-03 5.38E-03 5.37E-03
  2 0.00156   -4.34E-05 5.21E-05 1.42E-04 2.21E-04 2.86E-04 3.37E-04 3.74E-04 3.96E-04 4.08E-04 4.12E-04 4.11E-04
  1-0.00156        0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-          RADIAL COORDINATE OF STREAMLINES        -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =      1        2        3        4        5        6        7        8        9       10       11       12
         X =  0.00000  0.00000  0.00787  0.01617  0.02539  0.03561  0.04697  0.05957  0.07356  0.08909  0.10632  0.12545
0 J      Y
 11 1.00000        0.00 3.12E-02 3.91E-02 4.69E-02 5.47E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02
 10 0.90000        0.00 2.96E-02 3.33E-02 4.04E-02 4.87E-02 5.56E-02 5.84E-02 5.92E-02 5.94E-02 5.94E-02 5.93E-02 5.93E-02
  9 0.80000        0.00 2.79E-02 3.09E-02 3.66E-02 4.45E-02 5.14E-02 5.50E-02 5.62E-02 5.65E-02 5.65E-02 5.64E-02 5.64E-02
  8 0.70000        0.00 2.61E-02 2.88E-02 3.37E-02 4.11E-02 4.79E-02 5.19E-02 5.34E-02 5.38E-02 5.37E-02 5.35E-02 5.35E-02
  7 0.60000        0.00 2.41E-02 2.67E-02 3.13E-02 3.82E-02 4.48E-02 4.90E-02 5.07E-02 5.11E-02 5.09E-02 5.07E-02 5.07E-02
  6 0.50000        0.00 2.21E-02 2.43E-02 2.89E-02 3.54E-02 4.20E-02 4.63E-02 4.81E-02 4.84E-02 4.82E-02 4.79E-02 4.78E-02
  5 0.40000        0.00 1.96E-02 2.20E-02 2.64E-02 3.27E-02 3.92E-02 4.36E-02 4.55E-02 4.58E-02 4.54E-02 4.50E-02 4.48E-02
  4 0.30000        0.00 1.70E-02 1.91E-02 2.36E-02 3.01E-02 3.65E-02 4.10E-02 4.28E-02 4.30E-02 4.25E-02 4.19E-02 4.14E-02
  3 0.20000        0.00 1.37E-02 1.62E-02 2.05E-02 2.71E-02 3.36E-02 3.81E-02 4.00E-02 4.00E-02 3.91E-02 3.81E-02 3.74E-02
  2 0.10000        0.00 9.69E-03 1.18E-02 1.67E-02 2.33E-02 3.04E-02 3.50E-02 3.68E-02 3.63E-02 3.48E-02 3.31E-02 3.18E-02
  1 0.00000        0.00     0.00         0.00 8.47E-03 1.78E-02 2.59E-02 3.11E-02 3.25E-02 3.05E-02 2.65E-02 2.24E-02 1.72E-02
0        I =     13       14       15       16       17       18       19       20       21       22       23
         X =  0.14669  0.17026  0.19643  0.22547  0.25771  0.29349  0.33321  0.37500  0.41679  0.45858  0.50037
0 J      Y
 11 1.00000    6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02 6.25E-02
 10 0.90000    5.94E-02 5.95E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02 5.97E-02
  9 0.80000    5.65E-02 5.68E-02 5.69E-02 5.69E-02 5.69E-02 5.69E-02 5.68E-02 5.68E-02 5.68E-02 5.69E-02 5.69E-02
  8 0.70000    5.37E-02 5.39E-02 5.41E-02 5.40E-02 5.40E-02 5.39E-02 5.38E-02 5.38E-02 5.38E-02 5.39E-02 5.39E-02
  7 0.60000    5.09E-02 5.11E-02 5.11E-02 5.10E-02 5.08E-02 5.07E-02 5.06E-02 5.05E-02 5.05E-02 5.06E-02 5.06E-02
  6 0.50000    4.79E-02 4.80E-02 4.79E-02 4.77E-02 4.74E-02 4.72E-02 4.70E-02 4.69E-02 4.69E-02 4.69E-02 4.69E-02
  5 0.40000    4.47E-02 4.46E-02 4.43E-02 4.39E-02 4.35E-02 4.32E-02 4.29E-02 4.28E-02 4.27E-02 4.27E-02 4.28E-02
  4 0.30000    4.11E-02 4.08E-02 4.02E-02 3.96E-02 3.90E-02 3.85E-02 3.81E-02 3.79E-02 3.78E-02 3.78E-02 3.78E-02
  3 0.20000    3.67E-02 3.60E-02 3.51E-02 3.42E-02 3.34E-02 3.27E-02 3.22E-02 3.19E-02 3.17E-02 3.17E-02 3.17E-02
  2 0.10000    3.06E-02 2.92E-02 2.78E-02 2.64E-02 2.51E-02 2.42E-02 2.36E-02 2.33E-02 2.31E-02 2.31E-02 2.31E-02
```

		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y												
	21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
	20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.13E 01	1.05E 01	1.01E 01	9.74E 00	9.46E 00	9.24E 00	9.09E 00	9.16E 00
	19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.41E 02	1.51E 02	1.35E 02	1.17E 02	1.01E 02	8.87E 01	8.13E 01	9.12E 01
	18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.71E 02	1.36E 02	1.27E 02	1.21E 02	1.16E 02	1.12E 02	1.13E 02	1.65E 02
	17	0.42750	1.00E 00	1.00E 00	1.00E 00	2.59E 01	9.74E 01	9.99E 01	9.81E 01	9.96E 01	1.02E 02	1.04E 02	1.17E 02	2.33E 02
	16	0.40625	1.00E 00	1.00E 00	1.00E 00	1.64E 02	1.10E 02	9.22E 01	8.48E 01	8.37E 01	8.58E 01	8.98E 01	1.28E 02	3.35E 02
	15	0.38500	1.00E 00	1.00E 00	1.00E 00	1.85E 02	9.58E 01	7.75E 01	7.03E 01	6.84E 01	6.98E 01	7.67E 01	1.83E 02	4.75E 02
	14	0.36500	1.00E 00	1.00E 00	2.93E 01	9.89E 01	7.68E 01	6.52E 01	5.99E 01	5.77E 01	5.84E 01	8.40E 01	3.05E 02	6.28E 02
	13	0.34625	1.00E 00	1.00E 00	1.78E 02	1.01E 02	6.87E 01	5.83E 01	5.47E 01	5.27E 01	5.57E 01	1.56E 02	4.64E 02	7.70E 02
	12	0.32750	1.00E 00	1.00E 00	2.21E 02	9.06E 01	5.81E 01	5.29E 01	5.35E 01	5.42E 01	8.35E 01	3.05E 02	6.29E 02	9.03E 02
	11	0.29750	1.00E 00	6.26E 01	1.31E 02	6.71E 01	4.53E 01	5.05E 01	6.17E 01	9.32E 01	2.76E 02	5.95E 02	8.74E 02	1.09E 03
	10	0.27500	1.00E 00	3.44E 02	1.26E 02	4.58E 01	3.52E 01	5.83E 01	1.02E 02	2.44E 02	5.11E 02	7.85E 02	1.02E 03	1.21E 03
	9	0.25750	1.00E 00	4.42E 02	7.39E 01	2.11E 01	3.13E 01	7.98E 01	1.87E 02	4.00E 02	6.64E 02	9.09E 02	1.12E 03	1.29E 03
	8	0.24250	1.00E 00	7.00E 00	5.54E 00	6.80E 00	3.74E 01	1.15E 02	2.76E 02	5.27E 02	7.78E 02	1.00E 03	1.20E 03	1.35E 03
	7	0.21500	1.00E 00	6.96E 00	5.60E 00	8.59E 00	6.31E 01	1.89E 02	4.79E 02	7.49E 02	9.64E 02	1.16E 03	1.33E 03	1.46E 03
	6	0.17500	1.00E 00	6.96E 00	5.78E 00	1.49E 01	1.38E 02	4.24E 02	8.39E 02	9.99E 02	1.17E 03	1.34E 03	1.48E 03	1.58E 03
	5	0.13000	1.00E 00	6.97E 00	6.49E 00	4.07E 01	3.51E 02	7.17E 02	1.04E 03	1.18E 03	1.34E 03	1.49E 03	1.60E 03	1.68E 03
	4	0.08500	1.00E 00	7.01E 00	1.03E 01	1.47E 02	5.84E 02	9.15E 02	1.18E 03	1.32E 03	1.46E 03	1.59E 03	1.69E 03	1.75E 03
	3	0.04500	1.00E 00	7.06E 00	3.67E 01	6.73E 02	7.91E 02	1.09E 03	1.30E 03	1.42E 03	1.55E 03	1.66E 03	1.75E 03	1.81E 03
	2	0.01250	1.00E 00	7.14E 00	1.60E 02	8.83E 02	1.00E 03	1.24E 03	1.41E 03	1.53E 03	1.65E 03	1.75E 03	1.83E 03	1.88E 03
	1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
	21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
	20	0.49500	9.88E 00	1.09E 01	1.15E 01	1.16E 01	1.14E 01	1.11E 01	1.08E 01	1.05E 01	1.03E 01	1.02E 01	1.00E 00
	19	0.47500	1.53E 02	2.21E 02	2.47E 02	2.40E 02	2.16E 02	1.85E 02	1.55E 02	1.31E 02	1.11E 02	1.10E 02	1.00E 00
	18	0.44750	3.31E 02	4.83E 02	5.45E 02	5.37E 02	4.92E 02	4.34E 02	3.77E 02	3.31E 02	2.94E 02	3.03E 02	1.00E 00
	17	0.42750	4.68E 02	6.54E 02	7.30E 02	7.24E 02	6.71E 02	6.02E 02	5.34E 02	4.78E 02	4.35E 02	4.51E 02	1.00E 00
	16	0.40625	6.14E 02	8.11E 02	8.95E 02	8.91E 02	8.36E 02	7.59E 02	6.84E 02	6.22E 02	5.75E 02	5.95E 02	1.00E 00
	15	0.38500	7.59E 02	9.48E 02	1.03E 03	1.03E 03	9.74E 02	8.94E 02	8.15E 02	7.49E 02	6.99E 02	7.22E 02	1.00E 00
	14	0.36500	8.89E 02	1.06E 03	1.14E 03	1.14E 03	1.08E 03	1.00E 03	9.22E 02	8.54E 02	8.02E 02	8.26E 02	1.00E 00
	13	0.34625	1.00E 03	1.15E 03	1.23E 03	1.22E 03	1.17E 03	1.09E 03	1.01E 03	9.39E 02	8.86E 02	9.10E 02	1.00E 00
	12	0.32750	1.11E 03	1.24E 03	1.30E 03	1.30E 03	1.24E 03	1.16E 03	1.08E 03	1.01E 03	9.59E 02	9.83E 02	1.00E 00
	11	0.29750	1.25E 03	1.36E 03	1.41E 03	1.40E 03	1.34E 03	1.26E 03	1.18E 03	1.11E 03	1.06E 03	1.08E 03	1.00E 00
	10	0.27500	1.35E 03	1.44E 03	1.47E 03	1.46E 03	1.40E 03	1.33E 03	1.25E 03	1.18E 03	1.12E 03	1.14E 03	1.00E 00
	9	0.25750	1.41E 03	1.49E 03	1.52E 03	1.50E 03	1.45E 03	1.37E 03	1.29E 03	1.22E 03	1.16E 03	1.18E 03	1.00E 00
	8	0.24250	1.46E 03	1.53E 03	1.55E 03	1.53E 03	1.48E 03	1.40E 03	1.32E 03	1.25E 03	1.19E 03	1.21E 03	1.00E 00
	7	0.21500	1.55E 03	1.60E 03	1.61E 03	1.58E 03	1.52E 03	1.44E 03	1.36E 03	1.29E 03	1.23E 03	1.25E 03	1.00E 00
	6	0.17500	1.65E 03	1.68E 03	1.68E 03	1.64E 03	1.58E 03	1.50E 03	1.41E 03	1.34E 03	1.28E 03	1.29E 03	1.00E 00
	5	0.13000	1.73E 03	1.75E 03	1.73E 03	1.69E 03	1.62E 03	1.54E 03	1.46E 03	1.39E 03	1.33E 03	1.33E 03	1.00E 00
	4	0.08500	1.79E 03	1.80E 03	1.78E 03	1.73E 03	1.66E 03	1.57E 03	1.49E 03	1.42E 03	1.36E 03	1.36E 03	1.00E 00
	3	0.04500	1.84E 03	1.85E 03	1.82E 03	1.76E 03	1.68E 03	1.60E 03	1.51E 03	1.44E 03	1.38E 03	1.38E 03	1.00E 00
	2	0.01250	1.90E 03	1.90E 03	1.86E 03	1.79E 03	1.71E 03	1.62E 03	1.53E 03	1.46E 03	1.39E 03	1.40E 03	1.00E 00
	1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	3.545E-03

101	0.1192E 00	0.5718E-01	0.3320E-01	0.1429E-01	0.6170E-02	0.5412E 08	0.5875E 01	-0.7744E-04	0.9875E 01	0.1150E 04	0.9531E 03
102	0.1176E 00	0.5487E-01	0.3190E-01	0.1367E-01	0.5965E-02	0.5359E 08	0.5871E 01	0.4376E-03	0.9908E 01	0.1150E 04	0.9565E 03
103	0.1160E 00	0.5262E-01	0.3067E-01	0.1307E-01	0.5793E-02	0.5309E 08	0.5867E 01	0.9351E-03	0.9939E 01	0.1150E 04	0.9597E 03
104	0.1144E 00	0.5047E-01	0.2951E-01	0.1248E-01	0.5647E-02	0.5256E 08	0.5865E 01	0.1413E-02	0.9969E 01	0.1150E 04	0.9628E 03
105	0.1129E 00	0.4838E-01	0.2842E-01	0.1192E-01	0.5523E-02	0.5186E 08	0.5862E 01	0.1869E-02	0.9998E 01	0.1150E 04	0.9657E 03
106	0.1114E 00	0.4645E-01	0.2741E-01	0.1144E-01	0.5394E-02	0.5145E 08	0.5861E 01	0.2304E-02	0.1003E 02	0.1151E 04	0.9684E 03
107	0.1101E 00	0.4460E-01	0.2652E-01	0.1093E-01	0.5260E-02	0.5089E 08	0.5860E 01	0.2716E-02	0.1005E 02	0.1151E 04	0.9709E 03
108	0.1087E 00	0.4278E-01	0.2567E-01	0.1044E-01	0.5122E-02	0.5007E 08	0.5860E 01	0.3105E-02	0.1008E 02	0.1151E 04	0.9734E 03
109	0.1074E 00	0.4100E-01	0.2484E-01	0.1000E-01	0.4991E-02	0.4947E 08	0.5861E 01	0.3471E-02	0.1010E 02	0.1151E 04	0.9757E 03
110	0.1061E 00	0.3926E-01	0.2407E-01	0.9578E-02	0.4874E-02	0.4870E 08	0.5862E 01	0.3814E-02	0.1013E 02	0.1151E 04	0.9778E 03
111	0.1048E 00	0.3757E-01	0.2334E-01	0.9157E-02	0.4775E-02	0.4804E 08	0.5864E 01	0.4134E-02	0.1015E 02	0.1151E 04	0.9798E 03
112	0.1036E 00	0.3593E-01	0.2267E-01	0.8816E-02	0.4692E-02	0.4714E 08	0.5866E 01	0.4430E-02	0.1017E 02	0.1151E 04	0.9817E 03
113	0.1024E 00	0.3434E-01	0.2207E-01	0.8446E-02	0.4611E-02	0.4632E 08	0.5869E 01	0.4704E-02	0.1019E 02	0.1151E 04	0.9834E 03
114	0.1011E 00	0.3279E-01	0.2156E-01	0.8085E-02	0.4524E-02	0.4532E 08	0.5873E 01	0.4956E-02	0.1021E 02	0.1151E 04	0.9851E 03
115	0.9975E-01	0.3131E-01	0.2108E-01	0.7786E-02	0.4436E-02	0.4452E 08	0.5877E 01	0.5186E-02	0.1023E 02	0.1151E 04	0.9866E 03
116	0.9837E-01	0.2997E-01	0.2062E-01	0.7692E-02	0.4437E-02	0.4602E 08	0.5882E 01	0.6268E-02	0.1025E 02	0.1151E 04	0.9879E 03
117	0.9503E-01	0.3662E-01	0.2024E-01	0.7238E-02	0.4422E-02	0.4671E 08	0.5888E 01	0.6710E-02	0.1027E 02	0.1151E 04	0.9891E 03
118	0.9398E-01	0.3164E-01	0.1991E-01	0.6970E-02	0.4413E-02	0.4614E 08	0.5894E 01	0.6976E-02	0.1028E 02	0.1152E 04	0.9901E 03
119	0.9214E-01	0.3045E-01	0.1962E-01	0.6705E-02	0.4407E-02	0.4495E 08	0.5901E 01	0.7133E-02	0.1030E 02	0.1152E 04	0.9910E 03
120	0.9041E-01	0.2880E-01	0.1942E-01	0.6460E-02	0.4391E-02	0.4353E 08	0.5909E 01	0.7255E-02	0.1031E 02	0.1152E 04	0.9918E 03
121	0.8853E-01	0.2755E-01	0.1926E-01	0.6268E-02	0.4370E-02	0.4205E 08	0.5917E 01	0.7347E-02	0.1033E 02	0.1152E 04	0.9926E 03
122	0.8676E-01	0.2622E-01	0.1911E-01	0.6073E-02	0.4346E-02	0.4040E 08	0.5925E 01	0.7421E-02	0.1034E 02	0.1152E 04	0.9932E 03
123	0.8499E-01	0.2499E-01	0.1901E-01	0.5865E-02	0.4329E-02	0.3905E 08	0.5934E 01	0.7476E-02	0.1035E 02	0.1152E 04	0.9937E 03
124	0.8322E-01	0.2384E-01	0.1894E-01	0.5716E-02	0.4324E-02	0.3774E 08	0.5943E 01	0.7516E-02	0.1037E 02	0.1152E 04	0.9942E 03
125	0.8143E-01	0.2284E-01	0.1894E-01	0.5544E-02	0.4322E-02	0.3648E 08	0.5952E 01	0.7540E-02	0.1038E 02	0.1152E 04	0.9946E 03
126	0.7964E-01	0.2194E-01	0.1897E-01	0.5356E-02	0.4316E-02	0.3490E 08	0.5961E 01	0.7549E-02	0.1039E 02	0.1152E 04	0.9949E 03
127	0.7786E-01	0.2120E-01	0.1901E-01	0.5507E-02	0.4401E-02	0.3570E 08	0.5972E 01	0.8594E-02	0.1040E 02	0.1152E 04	0.9951E 03
128	0.7423E-01	0.2712E-01	0.1913E-01	0.5156E-02	0.4479E-02	0.3538E 08	0.5984E 01	0.8843E-02	0.1041E 02	0.1153E 04	0.9951E 03
129	0.7297E-01	0.2322E-01	0.1928E-01	0.5044E-02	0.4542E-02	0.3426E 08	0.5996E 01	0.8929E-02	0.1042E 02	0.1153E 04	0.9951E 03
130	0.7071E-01	0.2288E-01	0.1944E-01	0.4922E-02	0.4589E-02	0.3263E 08	0.6008E 01	0.8852E-02	0.1043E 02	0.1153E 04	0.9950E 03
131	0.6875E-01	0.2171E-01	0.1960E-01	0.4865E-02	0.4623E-02	0.3142E 08	0.6021E 01	0.8751E-02	0.1044E 02	0.1153E 04	0.9948E 03
132	0.6659E-01	0.2122E-01	0.1978E-01	0.4767E-02	0.4644E-02	0.3003E 08	0.6033E 01	0.8613E-02	0.1045E 02	0.1153E 04	0.9946E 03
133	0.6458E-01	0.2036E-01	0.1995E-01	0.4679E-02	0.4653E-02	0.2830E 08	0.6045E 01	0.8467E-02	0.1046E 02	0.1153E 04	0.9943E 03
134	0.6256E-01	0.1970E-01	0.2012E-01	0.4589E-02	0.4663E-02	0.2696E 08	0.6058E 01	0.8311E-02	0.1047E 02	0.1153E 04	0.9940E 03
135	0.6058E-01	0.1899E-01	0.2030E-01	0.4538E-02	0.4695E-02	0.2573E 08	0.6070E 01	0.8148E-02	0.1048E 02	0.1153E 04	0.9936E 03
136	0.5863E-01	0.1834E-01	0.2047E-01	0.4436E-02	0.4718E-02	0.2449E 08	0.6082E 01	0.7979E-02	0.1049E 02	0.1154E 04	0.9932E 03
137	0.5673E-01	0.1766E-01	0.2063E-01	0.4402E-02	0.4733E-02	0.2333E 08	0.6095E 01	0.7805E-02	0.1049E 02	0.1154E 04	0.9927E 03
138	0.5485E-01	0.1702E-01	0.2079E-01	0.4315E-02	0.4740E-02	0.2226E 08	0.6107E 01	0.7625E-02	0.1050E 02	0.1154E 04	0.9922E 03
139	0.5302E-01	0.1639E-01	0.2094E-01	0.4283E-02	0.4738E-02	0.2148E 08	0.6119E 01	0.7441E-02	0.1051E 02	0.1154E 04	0.9917E 03
140	0.5122E-01	0.1577E-01	0.2109E-01	0.4224E-02	0.4731E-02	0.2061E 08	0.6130E 01	0.7252E-02	0.1052E 02	0.1154E 04	0.9911E 03
141	0.4946E-01	0.1517E-01	0.2123E-01	0.4171E-02	0.4717E-02	0.1970E 08	0.6142E 01	0.7061E-02	0.1052E 02	0.1154E 04	0.9905E 03
142	0.4774E-01	0.1459E-01	0.2135E-01	0.4161E-02	0.4699E-02	0.1902E 08	0.6153E 01	0.6865E-02	0.1053E 02	0.1154E 04	0.9899E 03
143	0.4606E-01	0.1404E-01	0.2148E-01	0.4124E-02	0.4674E-02	0.1839E 08	0.6165E 01	0.6667E-02	0.1054E 02	0.1154E 04	0.9893E 03
144	0.4443E-01	0.1351E-01	0.2159E-01	0.4113E-02	0.4643E-02	0.1737E 08	0.6176E 01	0.6467E-02	0.1055E 02	0.1155E 04	0.9886E 03
145	0.4284E-01	0.1302E-01	0.2169E-01	0.4052E-02	0.4609E-02	0.1702E 08	0.6187E 01	0.6265E-02	0.1055E 02	0.1155E 04	0.9879E 03
146	0.4130E-01	0.1254E-01	0.2177E-01	0.4052E-02	0.4570E-02	0.1628E 08	0.6197E 01	0.6063E-02	0.1056E 02	0.1155E 04	0.9872E 03
147	0.3981E-01	0.1209E-01	0.2185E-01	0.3982E-02	0.4526E-02	0.1548E 08	0.6208E 01	0.5860E-02	0.1057E 02	0.1155E 04	0.9865E 03
148	0.3838E-01	0.1168E-01	0.2192E-01	0.3976E-02	0.4478E-02	0.1486E 08	0.6218E 01	0.5657E-02	0.1058E 02	0.1155E 04	0.9858E 03
149	0.3699E-01	0.1127E-01	0.2197E-01	0.3975E-02	0.4427E-02	0.1442E 08	0.6228E 01	0.5454E-02	0.1058E 02	0.1155E 04	0.9851E 03
150	0.3565E-01	0.1088E-01	0.2202E-01	0.3940E-02	0.4372E-02	0.1377E 08	0.6238E 01	0.5253E-02	0.1059E 02	0.1155E 04	0.9844E 03
151	0.3435E-01	0.1055E-01	0.2205E-01	0.3964E-02	0.4314E-02	0.1311E 08	0.6247E 01	0.5052E-02	0.1060E 02	0.1156E 04	0.9836E 03
152	0.3309E-01	0.1024E-01	0.2207E-01	0.3955E-02	0.4253E-02	0.1246E 08	0.6256E 01	0.4854E-02	0.1061E 02	0.1156E 04	0.9829E 03
153	0.3189E-01	0.9935E-02	0.2208E-01	0.3914E-02	0.4189E-02	0.1197E 08	0.6265E 01	0.4658E-02	0.1061E 02	0.1156E 04	0.9822E 03
154	0.3073E-01	0.9646E-02	0.2208E-01	0.3899E-02	0.4124E-02	0.1143E 08	0.6274E 01	0.4464E-02	0.1062E 02	0.1156E 04	0.9815E 03

11	0.03719	0.00	1.13E 01	1.27E 01	8.34E 00	1.01E 01	1.35E 01	2.10E 01	2.85E 01	3.31E 01	3.56E 01	3.64E 01	3.54E 01	
10	0.03437	0.00	3.84E 01	1.47E 01	8.29E 00	1.28E 01	2.06E 01	2.76E 01	3.30E 01	3.63E 01	3.79E 01	3.81E 01	3.67E 01	
9	0.03219	0.00	4.08E 01	1.02E 01	7.77E 00	1.62E 01	2.53E 01	3.10E 01	3.51E 01	3.78E 01	3.91E 01	3.89E 01	3.73E 01	
8	0.03031	2.70E 01	8.98E 00	4.32E 00	8.35E 00	2.02E 01	2.85E 01	3.26E 01	3.61E 01	3.85E 01	3.97E 01	3.94E 01	3.76E 01	
7	0.02687	2.70E 01	8.95E 00	4.92E 00	1.15E 01	2.73E 01	3.21E 01	3.41E 01	3.70E 01	3.91E 01	4.01E 01	3.96E 01	3.77E 01	
6	0.02187	2.70E 01	8.97E 00	6.59E 00	1.92E 01	4.16E 01	3.27E 01	3.45E 01	3.69E 01	3.88E 01	3.97E 01	3.91E 01	3.72E 01	
5	0.01625	2.70E 01	9.03E 00	1.17E 01	3.74E 01	3.29E 01	3.22E 01	3.37E 01	3.58E 01	3.75E 01	3.82E 01	3.76E 01	3.58E 01	
4	0.01062	2.70E 01	9.28E 00	2.69E 01	5.82E 01	3.11E 01	3.15E 01	3.27E 01	3.44E 01	3.59E 01	3.66E 01	3.60E 01	3.44E 01	
3	0.00562	2.70E 01	1.04E 01	6.47E 01	4.48E 01	3.11E 01	3.10E 01	3.20E 01	3.35E 01	3.49E 01	3.55E 01	3.50E 01	3.34E 01	
2	0.00156	2.70E 01	1.78E 01	4.80E 01	4.09E 01	3.10E 01	3.09E 01	3.19E 01	3.33E 01	3.46E 01	3.52E 01	3.47E 01	3.32E 01	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		2.09E 00	2.19E 00	2.12E 00	1.96E 00	1.80E 00	1.65E 00	1.53E 00	1.43E 00	1.35E 00	1.33E 00	2.70E 01
19	0.05937		1.06E 01	1.09E 01	9.95E 00	8.49E 00	6.97E 00	5.60E 00	4.52E 00	3.71E 00	3.11E 00	3.17E 00	2.70E 01
18	0.05594		1.61E 01	1.59E 01	1.42E 01	1.20E 01	9.75E 00	7.78E 00	6.22E 00	5.05E 00	4.17E 00	4.40E 00	2.70E 01
17	0.05344		1.92E 01	1.85E 01	1.64E 01	1.37E 01	1.11E 01	8.85E 00	7.07E 00	5.74E 00	4.75E 00	5.11E 00	2.70E 01
16	0.05078		2.23E 01	2.09E 01	1.83E 01	1.52E 01	1.23E 01	9.78E 00	7.81E 00	6.36E 00	5.28E 00	5.75E 00	2.70E 01
15	0.04812		2.51E 01	2.30E 01	1.99E 01	1.64E 01	1.33E 01	1.05E 01	8.43E 00	6.88E 00	5.72E 00	6.28E 00	2.70E 01
14	0.04562		2.74E 01	2.48E 01	2.12E 01	1.74E 01	1.40E 01	1.12E 01	8.93E 00	7.29E 00	6.08E 00	6.68E 00	2.70E 01
13	0.04328		2.92E 01	2.61E 01	2.22E 01	1.82E 01	1.46E 01	1.16E 01	9.32E 00	7.62E 00	6.37E 00	6.98E 00	2.70E 01
12	0.04094		3.08E 01	2.73E 01	2.31E 01	1.89E 01	1.52E 01	1.20E 01	9.65E 00	7.90E 00	6.61E 00	7.21E 00	2.70E 01
11	0.03719		3.27E 01	2.87E 01	2.41E 01	1.97E 01	1.58E 01	1.25E 01	1.01E 01	8.25E 00	6.91E 00	7.47E 00	2.70E 01
10	0.03437		3.36E 01	2.94E 01	2.47E 01	2.01E 01	1.61E 01	1.28E 01	1.03E 01	8.44E 00	7.08E 00	7.58E 00	2.70E 01
9	0.03219		3.41E 01	2.97E 01	2.49E 01	2.03E 01	1.63E 01	1.30E 01	1.04E 01	8.55E 00	7.18E 00	7.61E 00	2.70E 01
8	0.03031		3.43E 01	2.99E 01	2.50E 01	2.04E 01	1.64E 01	1.30E 01	1.05E 01	8.61E 00	7.23E 00	7.62E 00	2.70E 01
7	0.02687		3.44E 01	2.99E 01	2.51E 01	2.04E 01	1.64E 01	1.31E 01	1.06E 01	8.68E 00	7.29E 00	7.56E 00	2.70E 01
6	0.02187		3.39E 01	2.95E 01	2.48E 01	2.03E 01	1.63E 01	1.31E 01	1.06E 01	8.70E 00	7.31E 00	7.39E 00	2.70E 01
5	0.01625		3.28E 01	2.87E 01	2.41E 01	1.98E 01	1.61E 01	1.29E 01	1.05E 01	8.63E 00	7.26E 00	7.16E 00	2.70E 01
4	0.01062		3.16E 01	2.79E 01	2.35E 01	1.94E 01	1.58E 01	1.27E 01	1.03E 01	8.55E 00	7.20E 00	6.94E 00	2.70E 01
3	0.00562		3.09E 01	2.73E 01	2.31E 01	1.91E 01	1.56E 01	1.26E 01	1.03E 01	8.51E 00	7.16E 00	6.82E 00	2.70E 01
2	0.00156		3.07E 01	2.72E 01	2.30E 01	1.91E 01	1.56E 01	1.26E 01	1.03E 01	8.54E 00	7.19E 00	6.81E 00	2.70E 01
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- TURBULENCE DISSIPATION -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	2.75E 03	2.10E 03	1.60E 03	1.29E 03	1.08E 03	9.52E 02	1.03E 03	1.46E 03
19	0.05937		0.00	0.00	0.00	0.00	4.06E 03	3.71E 03	2.61E 03	1.84E 03	1.33E 03	1.03E 03	1.03E 03	1.38E 03
18	0.05594		0.00	0.00	0.00	0.00	6.14E 03	4.28E 03	2.91E 03	2.03E 03	1.46E 03	1.18E 03	1.33E 03	1.66E 03
17	0.05344		0.00	0.00	0.00	4.99E 03	4.68E 03	3.20E 03	2.28E 03	1.73E 03	1.39E 03	1.41E 03	1.73E 03	2.01E 03
16	0.05078		0.00	0.00	0.00	8.28E 03	4.83E 03	3.10E 03	2.13E 03	1.63E 03	1.52E 03	1.89E 03	2.30E 03	2.44E 03
15	0.04812		0.00	0.00	0.00	6.59E 03	4.40E 03	2.92E 03	2.03E 03	1.69E 03	2.01E 03	2.62E 03	2.93E 03	2.88E 03
14	0.04562		0.00	0.00	6.98E 03	6.20E 03	4.43E 03	3.04E 03	2.19E 03	2.15E 03	2.82E 03	3.38E 03	3.49E 03	3.25E 03
13	0.04328		0.00	0.00	1.11E 04	6.78E 03	4.80E 03	3.41E 03	2.68E 03	2.98E 03	3.70E 03	4.05E 03	3.95E 03	3.55E 03
12	0.04094		0.00	0.00	8.11E 03	6.68E 03	5.25E 03	3.99E 03	3.46E 03	3.98E 03	4.50E 03	4.59E 03	4.30E 03	3.78E 03
11	0.03719		0.00	7.91E 03	1.14E 04	7.80E 03	6.33E 03	5.20E 03	5.16E 03	5.52E 03	5.51E 03	5.20E 03	4.68E 03	4.01E 03
10	0.03437		0.00	2.38E 04	1.55E 04	9.30E 03	8.00E 03	7.14E 03	6.27E 03	6.10E 03	5.83E 03	5.39E 03	4.79E 03	4.07E 03
9	0.03219		0.00	2.60E 04	1.70E 04	1.05E 04	9.77E 03	8.06E 03	6.56E 03	6.19E 03	5.86E 03	5.39E 03	4.79E 03	4.06E 03
8	0.03031		4.49E 05	8.13E 04	2.02E 04	1.21E 04	1.16E 04	8.26E 03	6.45E 03	6.08E 03	5.77E 03	5.32E 03	4.73E 03	4.02E 03
7	0.02687		4.49E 05	8.10E 04	2.20E 04	1.47E 04	1.42E 04	7.44E 03	5.92E 03	5.69E 03	5.46E 03	5.09E 03	4.55E 03	3.88E 03

7	0.02687	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
6	0.02187	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
5	0.01625	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
4	0.01062	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
3	0.00562	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
2	0.00156	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	4.49E 05	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

OITER NO	ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D
1	0.6787E 00	0.1181E-02	0.5000E-02	0.2642E 01	0.8179E 02	0.8238E 13	0.7521E 01	0.7749E-02	0.0000	-0.7551E 03	0.1457E 06
2	0.1576E 01	0.1801E 01	0.5000E-02	0.3124E 01	0.1160E 02	0.2599E 13	0.7589E 01	0.2470E-01	0.0000	0.2324E 03	0.4591E 05
3	0.4946E 00	0.1098E 01	0.5000E-02	0.2938E 01	0.1955E 01	0.8020E 12	0.7641E 01	0.2002E-01	0.0000	0.4365E 03	0.1437E 05
4	0.6271E 00	0.7586E 00	0.5000E-02	0.6430E 01	0.3193E 00	0.2445E 12	0.7681E 01	0.1782E-01	0.0000	0.8011E 02	0.4567E 04
5	0.6817E 00	0.6851E 00	0.5000E-02	0.5212E 01	0.5459E-01	0.7195E 11	0.7720E 01	0.1843E-01	0.0000	0.1078E 03	0.1517E 04
6	0.6710E 00	0.7365E 00	0.5000E-02	0.4380E 01	0.2346E-01	0.3958E 11	0.7765E 01	0.2416E-01	0.0000	0.1664E 03	0.5447E 03
7	0.6368E 00	0.6548E 00	0.5000E-02	0.4840E 01	0.4553E-01	0.9424E 11	0.7821E 01	0.3176E-01	0.0000	0.1065E 03	0.2165E 03
8	0.6962E 00	0.5374E 00	0.5000E-02	0.5425E 01	0.4709E-01	0.9336E 11	0.7895E 01	0.4516E-01	0.0000	0.1169E 03	0.9639E 02
9	0.6922E 00	0.5629E 00	0.5000E-02	0.5965E 01	0.2722E-01	0.5048E 11	0.7990E 01	0.6081E-01	0.0000	0.1390E 03	0.5829E 02
10	0.7249E 00	0.4238E 00	0.5000E-02	0.5816E 01	0.2336E-01	0.9570E 10	0.8114E 01	0.7937E-01	0.0000	0.1271E 03	0.3893E 02
11	0.7290E 00	0.4058E 00	0.5000E-02	0.5851E 01	0.2378E-01	0.1612E 11	0.8272E 01	0.9966E-01	0.0000	0.1248E 03	0.3188E 02
12	0.7453E 00	0.3284E 00	0.5000E-02	0.5480E 01	0.2254E-01	0.2046E 11	0.8469E 01	0.1195E 00	0.0000	0.1345E 03	0.2677E 02
13	0.7535E 00	0.3102E 00	0.5000E-02	0.4813E 01	0.2072E-01	0.1941E 11	0.8709E 01	0.1399E 00	0.0000	0.1333E 03	0.2418E 02
14	0.7479E 00	0.2389E 00	0.5000E-02	0.3660E 01	0.1811E-01	0.1493E 11	0.8988E 01	0.1570E 00	0.0000	0.1437E 03	0.2148E 02
15	0.7437E 00	0.2318E 00	0.5000E-02	0.2611E 01	0.1602E-01	0.1068E 11	0.9308E 01	0.1721E 00	0.0000	0.1459E 03	0.1918E 02
16	0.7365E 00	0.1866E 00	0.5000E-02	0.1655E 01	0.1495E-01	0.6581E 10	0.9664E 01	0.1841E 00	0.0000	0.1438E 03	0.1659E 02
17	0.7250E 00	0.1844E 00	0.5000E-02	0.1260E 01	0.1369E-01	0.2946E 10	0.1005E 02	0.1919E 00	0.0000	0.1427E 03	0.1396E 02
18	0.7236E 00	0.1627E 00	0.5000E-02	0.9442E 00	0.1381E-01	0.4492E 09	0.1047E 02	0.1960E 00	0.0000	0.1429E 03	0.1129E 02
19	0.7005E 00	0.1710E 00	0.5000E-02	0.7356E 00	0.1389E-01	0.2009E 10	0.1091E 02	0.1967E 00	0.0000	0.1408E 03	0.8881E 01
20	0.6961E 00	0.1499E 00	0.5000E-02	0.7537E 00	0.1390E-01	0.2366E 10	0.1136E 02	0.1940E 00	0.0000	0.1383E 03	0.7128E 01
21	0.6714E 00	0.1581E 00	0.5000E-02	0.6270E 00	0.1355E-01	0.2056E 10	0.1183E 02	0.1894E 00	0.0000	0.1386E 03	0.6852E 01
22	0.6606E 00	0.1409E 00	0.5000E-02	0.4631E 00	0.1344E-01	0.1484E 10	0.1230E 02	0.1831E 00	0.0000	0.1355E 03	0.8707E 01
23	0.6439E 00	0.1473E 00	0.5000E-02	0.4194E 00	0.1329E-01	0.7987E 09	0.1277E 02	0.1758E 00	0.0000	0.1325E 03	0.1126E 02
24	0.6332E 00	0.1295E 00	0.5000E-02	0.3250E 00	0.1354E-01	0.2177E 09	0.1325E 02	0.1691E 00	0.0000	0.1308E 03	0.1435E 02
25	0.6121E 00	0.1345E 00	0.5000E-02	0.3301E 00	0.1416E-01	0.5195E 09	0.1372E 02	0.1621E 00	0.0000	0.1279E 03	0.1765E 02
26	0.6023E 00	0.1156E 00	0.5000E-02	0.2666E 00	0.1469E-01	0.7614E 09	0.1419E 02	0.1574E 00	0.0000	0.1239E 03	0.2110E 02
27	0.5787E 00	0.1192E 00	0.5000E-02	0.2520E 00	0.1527E-01	0.8969E 09	0.1466E 02	0.1540E 00	0.0000	0.1204E 03	0.2465E 02
28	0.5682E 00	0.1022E 00	0.5000E-02	0.2470E 00	0.1598E-01	0.8871E 09	0.1513E 02	0.1527E 00	0.0000	0.1155E 03	0.2833E 02
29	0.5483E 00	0.1042E 00	0.5000E-02	0.2225E 00	0.1648E-01	0.8141E 09	0.1560E 02	0.1534E 00	0.0000	0.1101E 03	0.3225E 02
30	0.5349E 00	0.9086E-01	0.5000E-02	0.2181E 00	0.1740E-01	0.6968E 09	0.1607E 02	0.1564E 00	0.0000	0.1046E 03	0.3642E 02
31	0.5206E 00	0.9214E-01	0.5000E-02	0.2059E 00	0.1834E-01	0.5370E 09	0.1654E 02	0.1615E 00	0.0000	0.9832E 02	0.4088E 02
32	0.5053E 00	0.8251E-01	0.5000E-02	0.1965E 00	0.1946E-01	0.3829E 09	0.1702E 02	0.1685E 00	0.0000	0.9186E 02	0.4565E 02
33	0.4970E 00	0.8262E-01	0.5000E-02	0.1899E 00	0.2067E-01	0.2335E 09	0.1750E 02	0.1769E 00	0.0000	0.8482E 02	0.5081E 02
34	0.4848E 00	0.7495E-01	0.5000E-02	0.1832E 00	0.2202E-01	0.1767E 09	0.1800E 02	0.1871E 00	0.0000	0.7769E 02	0.5636E 02
35	0.4796E 00	0.7543E-01	0.5000E-02	0.1743E 00	0.2354E-01	0.2376E 09	0.1850E 02	0.1981E 00	0.0000	0.7029E 02	0.6235E 02
36	0.4731E 00	0.6942E-01	0.5000E-02	0.1639E 00	0.2513E-01	0.2687E 09	0.1902E 02	0.2099E 00	0.0000	0.6241E 02	0.6876E 02
37	0.4673E 00	0.6959E-01	0.5000E-02	0.1532E 00	0.2686E-01	0.2731E 09	0.1955E 02	0.2221E 00	0.0000	0.5387E 02	0.7562E 02
38	0.4632E 00	0.6546E-01	0.5000E-02	0.1428E 00	0.2857E-01	0.2476E 09	0.2009E 02	0.2345E 00	0.0000	0.4485E 02	0.8288E 02
39	0.4571E 00	0.6639E-01	0.5000E-02	0.1319E 00	0.3046E-01	0.2168E 09	0.2063E 02	0.2459E 00	0.0000	0.3537E 02	0.9901E 02
40	0.4528E 00	0.6260E-01	0.5000E-02	0.1219E 00	0.3240E-01	0.1799E 09	0.2117E 02	0.2568E 00	0.0000	0.2531E 02	0.1151E 03
41	0.4459E 00	0.6435E-01	0.5000E-02	0.1121E 00	0.3444E-01	0.1396E 09	0.2170E 02	0.2660E 00	0.0000	0.1472E 02	0.1322E 03
42	0.4392E 00	0.6141E-01	0.5000E-02	0.1033E 00	0.3656E-01	0.1119E 09	0.2221E 02	0.2728E 00	0.0000	0.3652E 01	0.1506E 03
43	0.4297E 00	0.6357E-01	0.5000E-02	0.9426E-01	0.3875E-01	0.8820E 08	0.2269E 02	0.2759E 00	0.0000	-0.7829E 01	0.1697E 03
44	0.4203E 00	0.6214E-01	0.5000E-02	0.8642E-01	0.4098E-01	0.7321E 08	0.2310E 02	0.2738E 00	0.0000	-0.1941E 02	0.1890E 03

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          X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J      Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00 8.90E 00 4.85E 00 3.12E 00 3.78E 00 7.48E 00 1.52E 01 2.80E 01 4.65E 01
 19 0.05937      0.00     0.00     0.00     0.00 9.12E 00 5.38E 00 3.54E 00 4.09E 00 7.65E 00 1.52E 01 2.77E 01 4.59E 01
 18 0.05594      0.00     0.00     0.00     0.00 8.07E 00 5.15E 00 3.56E 00 4.14E 00 7.67E 00 1.51E 01 2.75E 01 4.55E 01
 17 0.05344      0.00     0.00     0.00 5.02E 00 6.19E 00 4.76E 00 3.43E 00 4.07E 00 7.62E 00 1.50E 01 2.74E 01 4.54E 01
 16 0.05078      0.00     0.00     0.00 6.09E 00 5.73E 00 4.36E 00 3.23E 00 3.98E 00 7.59E 00 1.50E 01 2.74E 01 4.54E 01
 15 0.04812      0.00     0.00     0.00 5.62E 00 5.37E 00 4.06E 00 3.08E 00 3.94E 00 7.62E 00 1.51E 01 2.75E 01 4.55E 01
 14 0.04562      0.00     0.00 1.46E 00 4.08E 00 5.18E 00 3.93E 00 3.05E 00 4.01E 00 7.75E 00 1.53E 01 2.77E 01 4.57E 01
 13 0.04328      0.00     0.00 2.66E 00 4.20E 00 5.27E 00 4.02E 00 3.20E 00 4.21E 00 8.00E 00 1.56E 01 2.81E 01 4.61E 01
 12 0.04094      0.00     0.00 1.69E 00 4.14E 00 5.54E 00 4.31E 00 3.53E 00 4.58E 00 8.40E 00 1.60E 01 2.86E 01 4.66E 01
 11 0.03719      0.00-2.32E 01-2.31E 00 4.37E 00 6.26E 00 5.06E 00 4.35E 00 5.48E 00 9.39E 00 1.72E 01 2.99E 01 4.79E 01
 10 0.03437      0.00-2.25E 01-1.94E 00 5.33E 00 6.79E 00 5.69E 00 5.13E 00 6.37E 00 1.04E 01 1.83E 01 3.11E 01 4.91E 01
  9 0.03219      0.00-3.78E 01 2.85E 00 5.70E 00 7.04E 00 6.23E 00 5.84E 00 7.15E 00 1.13E 01 1.94E 01 3.23E 01 5.02E 01
  8 0.03031      0.00-1.05E 01 1.66E 00 5.82E 00 7.64E 00 7.06E 00 6.60E 00 7.84E 00 1.21E 01 2.04E 01 3.33E 01 5.12E 01
  7 0.02687      0.00-6.90E 00 9.52E-01 5.37E 00 7.49E 00 7.53E 00 7.67E 00 9.58E 00 1.43E 01 2.26E 01 3.52E 01 5.28E 01
  6 0.02187      0.00-3.78E 00 7.55E-01 4.49E 00 6.73E 00 7.47E 00 8.18E 00 1.04E 01 1.52E 01 2.36E 01 3.68E 01 5.46E 01
  5 0.01625      0.00-1.79E 00 9.78E-01 3.97E 00 6.19E 00 7.39E 00 8.54E 00 1.10E 01 1.59E 01 2.43E 01 3.73E 01 5.49E 01
  4 0.01062      0.00-6.91E-01 1.25E 00 3.74E 00 5.88E 00 7.34E 00 8.78E 00 1.14E 01 1.63E 01 2.48E 01 3.76E 01 5.51E 01
  3 0.00562      0.00-1.75E-01 1.42E 00 3.65E 00 5.74E 00 7.32E 00 8.90E 00 1.16E 01 1.66E 01 2.50E 01 3.78E 01 5.53E 01
  2 0.00156      0.00     0.00 1.48E 00 3.62E 00 5.69E 00 7.31E 00 8.94E 00 1.17E 01 1.67E 01 2.51E 01 3.79E 01 5.53E 01
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =     13       14       15       16       17       18       19       20       21       22       23
          X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J      Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  7.00E 01 9.60E 01 1.22E 02 1.45E 02 1.65E 02 1.80E 02 1.90E 02 1.96E 02 1.99E 02 2.01E 02     0.00
 19 0.05937  6.91E 01 9.50E 01 1.21E 02 1.44E 02 1.64E 02 1.79E 02 1.90E 02 1.96E 02 1.99E 02 2.01E 02     0.00
 18 0.05594  6.84E 01 9.41E 01 1.20E 02 1.43E 02 1.64E 02 1.79E 02 1.90E 02 1.96E 02 1.99E 02 2.01E 02     0.00
 17 0.05344  6.82E 01 9.39E 01 1.20E 02 1.43E 02 1.63E 02 1.79E 02 1.89E 02 1.96E 02 1.99E 02 2.01E 02     0.00
 16 0.05078  6.82E 01 9.38E 01 1.19E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.99E 02 2.01E 02     0.00
 15 0.04812  6.83E 01 9.38E 01 1.19E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.99E 02 2.01E 02     0.00
 14 0.04562  6.85E 01 9.40E 01 1.19E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.99E 02 2.00E 02     0.00
 13 0.04328  6.89E 01 9.43E 01 1.20E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.99E 02 2.00E 02     0.00
 12 0.04094  6.93E 01 9.46E 01 1.20E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.99E 02 2.00E 02     0.00
 11 0.03719  7.05E 01 9.55E 01 1.20E 02 1.43E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.98E 02 2.00E 02     0.00
 10 0.03437  7.15E 01 9.62E 01 1.21E 02 1.44E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.98E 02 1.99E 02     0.00
  9 0.03219  7.24E 01 9.69E 01 1.21E 02 1.44E 02 1.63E 02 1.78E 02 1.89E 02 1.95E 02 1.98E 02 1.99E 02     0.00
  8 0.03031  7.32E 01 9.75E 01 1.22E 02 1.44E 02 1.64E 02 1.79E 02 1.89E 02 1.95E 02 1.98E 02 1.99E 02     0.00
  7 0.02687  7.46E 01 9.86E 01 1.23E 02 1.45E 02 1.64E 02 1.79E 02 1.89E 02 1.95E 02 1.98E 02 1.99E 02     0.00
  6 0.02187  7.61E 01 1.00E 02 1.24E 02 1.46E 02 1.65E 02 1.79E 02 1.89E 02 1.95E 02 1.98E 02 1.98E 02     0.00
  5 0.01625  7.68E 01 1.01E 02 1.25E 02 1.47E 02 1.65E 02 1.80E 02 1.90E 02 1.95E 02 1.98E 02 1.97E 02     0.00
  4 0.01062  7.67E 01 1.01E 02 1.25E 02 1.47E 02 1.66E 02 1.80E 02 1.90E 02 1.96E 02 1.98E 02 1.97E 02     0.00
  3 0.00562  7.68E 01 1.01E 02 1.25E 02 1.47E 02 1.66E 02 1.80E 02 1.90E 02 1.96E 02 1.98E 02 1.97E 02     0.00
  2 0.00156  7.68E 01 1.01E 02 1.25E 02 1.48E 02 1.67E 02 1.81E 02 1.90E 02 1.96E 02 1.98E 02 1.96E 02     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                        PRESSURE                    -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1        2        3        4        5        6        7        8        9       10       11       12
          X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J      Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00-2.35E-04-1.13E-04 8.10E-05 3.21E-04 4.62E-04 5.56E-04 7.25E-04 1.10E-03
 19 0.05937      0.00     0.00     0.00     0.00-2.36E-04-1.18E-04 7.35E-05 3.14E-04 4.53E-04 5.59E-04 7.29E-04 1.07E-03
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  17 0.42750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  16 0.40625      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  15 0.38500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  14 0.36500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  13 0.34625      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  12 0.32750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  11 0.29750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  10 0.27500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   9 0.25750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   8 0.24250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   7 0.21500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   6 0.17500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   5 0.13000      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   4 0.08500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   3 0.04500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   2 0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   1-0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0         I =      13        14        15        16        17        18        19        20        21        22        23
          X =   1.26289   1.46130   1.68153   1.92598   2.19733   2.49852   2.83285   3.16718   3.50150   3.83583   4.17015
0 J       Y
  21 0.50500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  20 0.49500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  19 0.47500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  18 0.44750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  17 0.42750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  16 0.40625      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  15 0.38500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  14 0.36500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  13 0.34625      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  12 0.32750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  11 0.29750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
  10 0.27500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   9 0.25750      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   8 0.24250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   7 0.21500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   6 0.17500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   5 0.13000      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   4 0.08500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   3 0.04500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   2 0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
   1-0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-            DIMENSIONLESS STREAMLINE COORDS         -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0         I =       1         2         3         4         5         6         7         8         9        10        11        12
          X =   0.00000   0.00000   0.06295   0.12937   0.20308   0.28491   0.37574   0.47656   0.58847   0.71269   0.85058   1.00363
0 J       Y
  11 1.00000      0.00  2.50E-01  2.57E-01  2.60E-01  2.62E-01  2.64E-01  2.66E-01  2.68E-01  2.71E-01  2.75E-01  2.83E-01  2.93E-01
  10 0.90000      0.00  2.37E-01  2.39E-01  2.40E-01  2.41E-01  2.42E-01  2.43E-01  2.45E-01  2.48E-01  2.51E-01  2.57E-01  2.66E-01
   9 0.80000      0.00  2.23E-01  2.24E-01  2.25E-01  2.25E-01  2.26E-01  2.27E-01  2.28E-01  2.29E-01  2.32E-01  2.36E-01  2.42E-01
   8 0.70000      0.00  2.09E-01  2.09E-01  2.09E-01  2.10E-01  2.10E-01  2.10E-01  2.11E-01  2.12E-01  2.14E-01  2.17E-01  2.22E-01
   7 0.60000      0.00  1.93E-01  1.93E-01  1.93E-01  1.93E-01  1.94E-01  1.94E-01  1.94E-01  1.95E-01  1.97E-01  1.99E-01  2.03E-01
   6 0.50000      0.00  1.77E-01  1.77E-01  1.77E-01  1.77E-01  1.77E-01  1.77E-01  1.78E-01  1.78E-01  1.79E-01  1.81E-01  1.83E-01
   5 0.40000      0.00  1.57E-01  1.57E-01  1.57E-01  1.57E-01  1.57E-01  1.57E-01  1.58E-01  1.58E-01  1.59E-01  1.60E-01  1.62E-01
   4 0.30000      0.00  1.36E-01  1.36E-01  1.36E-01  1.36E-01  1.37E-01  1.37E-01  1.37E-01  1.37E-01  1.38E-01  1.38E-01  1.40E-01
   3 0.20000      0.00  1.10E-01  1.10E-01  1.10E-01  1.10E-01  1.10E-01  1.10E-01  1.10E-01  1.10E-01  1.11E-01  1.12E-01  1.13E-01
```

SYMBOL 0 2 4 6 8 1
MAXIMUM VALUES 0.100E-29 0.191E 02 0.282E 02 0.359E 02 0.431E 02 0.500E 02

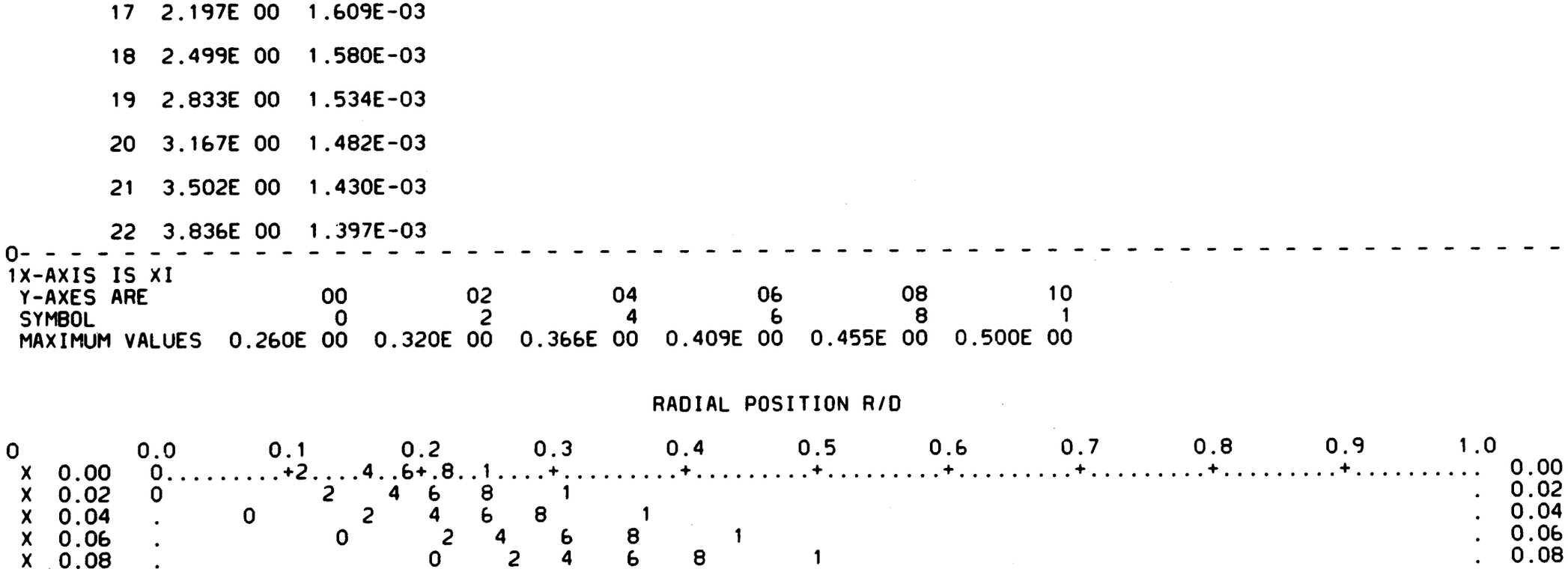
RADIAL POSITION 2R/D

		0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
X	0.00	0	.....	+	.....	+	.2.....	+4.....	6+....8....1	.....	+	.....	+	.....	0.00
X	0.02	0			2		4	6	8	1				. 0.02
X	0.04	0			2		4	6	8	1				. 0.04
X	0.06	0			2		4	6	8	1				. 0.06
X	0.08	0			2		4	6	8	1				. 0.08
X	0.10	0			2		4	6	8	1				+ 0.10
X	0.12	0			2		4	6	8	1				. 0.12
X	0.14	0			2		4	6	8	1				. 0.14
X	0.16	.												. 0.16
X	0.18	0			2		4	6	8	1				. 0.18
X	0.20	+												+ 0.20
X	0.22	0			2		4	6	8	1				. 0.22
X	0.24	.												. 0.24
X	0.26	0			2		4	6	8	1				. 0.26
X	0.28	.												. 0.28
X	0.30	0			2		4	6	8	1				+ 0.30
X	0.32	.												. 0.32
X	0.34	0			2		4	6	8	1				. 0.34
X	0.36	.												. 0.36
X	0.38	.												. 0.38
X	0.40	0			2		4	6	8	1				+ 0.40
X	0.42	.												. 0.42
X	0.44	.												. 0.44

```
  7 0.02687  4.87E 00 5.05E 00 5.29E 00 5.54E 00 5.77E 00 5.95E 00 6.08E 00 6.14E 00 6.17E 00 6.16E 00 6.15E 00
  6 0.02187  3.27E 00 3.73E 00 4.21E 00 4.67E 00 5.07E 00 5.37E 00 5.59E 00 5.72E 00 5.78E 00 5.78E 00 5.77E 00
  5 0.01625  1.67E 00 2.42E 00 3.15E 00 3.82E 00 4.38E 00 4.81E 00 5.12E 00 5.31E 00 5.40E 00 5.42E 00 5.41E 00
  4 0.01062  4.31E-01 1.40E 00 2.33E 00 3.16E 00 3.85E 00 4.37E 00 4.76E 00 4.99E 00 5.12E 00 5.15E 00 5.14E 00
  3 0.00562 -2.68E-01 8.33E-01 1.87E 00 2.79E 00 3.55E 00 4.13E 00 4.56E 00 4.82E 00 4.96E 00 5.00E 00 4.99E 00
  2 0.00156 -5.21E-01 6.25E-01 1.70E 00 2.66E 00 3.44E 00 4.04E 00 4.48E 00 4.75E 00 4.90E 00 4.94E 00 4.93E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                        V   VELOCITY              -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =      1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 3.90E-01 5.75E-01 2.51E-01 6.04E-02-1.41E-02-2.15E-02-6.73E-03 1.76E-02
 19 0.05766      0.00     0.00     0.00     0.00 1.53E 00 1.34E 00 6.32E-01 1.60E-01-2.74E-02-4.57E-02-5.32E-03 5.26E-02
 18 0.05469      0.00     0.00     0.00     0.00 3.20E 00 2.06E 00 9.75E-01 2.35E-01-5.29E-02-7.27E-02 3.14E-03 8.46E-02
 17 0.05211      0.00     0.00     0.00 1.23E 00 3.91E 00 2.74E 00 1.25E 00 2.71E-01-9.40E-02-1.04E-01 8.39E-03 9.38E-02
 16 0.04945      0.00     0.00     0.00 2.89E 00 4.80E 00 3.40E 00 1.50E 00 2.80E-01-1.55E-01-1.44E-01-4.51E-03 7.01E-02
 15 0.04687      0.00     0.00     0.00 4.95E 00 5.78E 00 4.00E 00 1.70E 00 2.58E-01-2.30E-01-1.97E-01-5.33E-02 1.55E-02
 14 0.04445      0.00     0.00 9.45E-01 6.47E 00 6.82E 00 4.52E 00 1.84E 00 2.06E-01-3.16E-01-2.77E-01-1.32E-01-5.23E-02
 13 0.04211      0.00     0.00 2.75E 00 7.83E 00 7.72E 00 4.93E 00 1.91E 00 1.21E-01-4.29E-01-3.89E-01-2.22E-01-1.22E-01
 12 0.03906      0.00     0.00 6.14E 00 9.60E 00 8.78E 00 5.32E 00 1.89E 00-5.12E-02-6.33E-01-5.52E-01-3.36E-01-2.11E-01
 11 0.03578      0.00 1.26E 00 1.00E 01 1.16E 01 9.67E 00 5.48E 00 1.65E 00-4.29E-01-9.01E-01-6.87E-01-4.25E-01-2.88E-01
 10 0.03328      0.00 5.48E 00 1.18E 01 1.26E 01 9.99E 00 5.33E 00 1.22E 00-7.54E-01-1.03E 00-7.44E-01-4.73E-01-3.36E-01
  9 0.03125      0.00 1.08E 01 1.27E 01 1.31E 01 9.98E 00 5.01E 00 7.62E-01-9.73E-01-1.09E 00-7.67E-01-5.01E-01-3.67E-01
  8 0.02859      0.00 9.68E 00 1.30E 01 1.32E 01 9.74E 00 4.38E 00 1.43E-01-1.18E 00-1.11E 00-7.74E-01-5.28E-01-4.01E-01
  7 0.02437      0.00 8.74E 00 1.31E 01 1.31E 01 8.93E 00 2.67E 00-8.66E-01-1.24E 00-1.02E 00-7.39E-01-5.42E-01-4.30E-01
  6 0.01906      0.00 8.44E 00 1.30E 01 1.22E 01 6.80E 00-8.16E-01-1.08E 00-9.95E-01-8.21E-01-6.44E-01-5.07E-01-4.16E-01
  5 0.01344      0.00 8.39E 00 1.25E 01 9.81E 00 6.73E-02-7.04E-01-7.99E-01-6.77E-01-5.87E-01-4.99E-01-4.12E-01-3.42E-01
  4 0.00812      0.00 7.70E 00 1.11E 01 1.55E 00-6.12E-01-4.51E-01-4.73E-01-3.99E-01-3.57E-01-3.19E-01-2.72E-01-2.26E-01
  3 0.00359      0.00 5.30E 00 4.72E 00-6.03E-01-3.49E-01-2.06E-01-2.06E-01-1.74E-01-1.58E-01-1.44E-01-1.25E-01-1.03E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =     13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00      0.00
 20 0.06062  3.53E-02 2.82E-02 1.28E-02 3.14E-03-6.67E-04-1.54E-03-8.67E-04 5.37E-05 1.63E-03 5.25E-04      0.00
 19 0.05766  7.66E-02 4.91E-02 1.57E-02-1.44E-03-5.82E-03-4.88E-03-1.35E-03 1.94E-03 5.26E-03 1.13E-03      0.00
 18 0.05469  9.13E-02 4.28E-02 7.69E-04-1.61E-02-1.66E-02-1.16E-02-4.18E-03 1.82E-03 7.02E-03 1.57E-03      0.00
 17 0.05211  8.11E-02 2.20E-02-2.08E-02-3.35E-02-2.87E-02-1.93E-02-7.96E-03 5.59E-04 7.60E-03 1.88E-03      0.00
 16 0.04945  4.64E-02-1.28E-02-4.99E-02-5.51E-02-4.33E-02-2.86E-02-1.29E-02-1.72E-03 7.40E-03 2.15E-03      0.00
 15 0.04687 -4.37E-03-5.51E-02-8.24E-02-7.82E-02-5.87E-02-3.85E-02-1.85E-02-4.58E-03 6.63E-03 2.35E-03      0.00
 14 0.04445 -5.99E-02-9.87E-02-1.15E-01-1.01E-01-7.36E-02-4.80E-02-2.40E-02-7.63E-03 5.55E-03 2.49E-03      0.00
 13 0.04211 -1.16E-01-1.42E-01-1.46E-01-1.22E-01-8.77E-02-5.71E-02-2.94E-02-1.07E-02 4.26E-03 2.58E-03      0.00
 12 0.03906 -1.87E-01-1.96E-01-1.85E-01-1.48E-01-1.05E-01-6.85E-02-3.62E-02-1.48E-02 2.38E-03 2.66E-03      0.00
 11 0.03578 -2.52E-01-2.45E-01-2.19E-01-1.71E-01-1.20E-01-7.86E-02-4.24E-02-1.88E-02 2.64E-04 2.64E-03      0.00
 10 0.03328 -2.93E-01-2.75E-01-2.39E-01-1.85E-01-1.30E-01-8.46E-02-4.62E-02-2.14E-02-1.29E-03 2.57E-03      0.00
  9 0.03125 -3.20E-01-2.95E-01-2.53E-01-1.94E-01-1.35E-01-8.84E-02-4.87E-02-2.31E-02-2.48E-03 2.50E-03      0.00
  8 0.02859 -3.50E-01-3.16E-01-2.65E-01-2.02E-01-1.41E-01-9.21E-02-5.13E-02-2.50E-02-3.91E-03 2.37E-03      0.00
  7 0.02437 -3.74E-01-3.29E-01-2.72E-01-2.04E-01-1.42E-01-9.33E-02-5.26E-02-2.66E-02-5.62E-03 2.12E-03      0.00
  6 0.01906 -3.59E-01-3.10E-01-2.51E-01-1.87E-01-1.31E-01-8.59E-02-4.89E-02-2.54E-02-6.45E-03 1.73E-03      0.00
  5 0.01344 -2.92E-01-2.49E-01-2.00E-01-1.48E-01-1.03E-01-6.82E-02-3.91E-02-2.07E-02-5.78E-03 1.26E-03      0.00
  4 0.00812 -1.91E-01-1.62E-01-1.30E-01-9.57E-02-6.67E-02-4.41E-02-2.54E-02-1.36E-02-3.95E-03 7.80E-04      0.00
  3 0.00359 -8.73E-02-7.37E-02-5.93E-02-4.35E-02-3.03E-02-2.00E-02-1.16E-02-6.20E-03-1.83E-03 3.49E-04      0.00
```

```
  1 0.00000  9.11E-03      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                 DIMENSIONLESS U VELOCITY                    -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1         2         3         4         5         6         7         8         9        10        11        12
        X =  0.00000   0.00000   0.06295   0.12937   0.20308   0.28491   0.37574   0.47656   0.58847   0.71269   0.85058   1.00363
0 J     Y
 21 0.50500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.49500      0.00      0.00      0.00      0.00      0.00 6.98E-02 1.84E-01 2.40E-01 2.54E-01 2.51E-01 2.44E-01 2.42E-01
 19 0.47500      0.00      0.00      0.00      0.00      0.00 1.26E-01 2.17E-01 2.68E-01 2.83E-01 2.80E-01 2.76E-01 2.76E-01
 18 0.44750      0.00      0.00      0.00      0.00      0.00 1.78E-01 2.59E-01 3.01E-01 3.11E-01 3.07E-01 3.02E-01 3.04E-01
 17 0.42750      0.00      0.00      0.00      0.00 1.43E-01 2.14E-01 2.96E-01 3.32E-01 3.36E-01 3.29E-01 3.23E-01 3.24E-01
 16 0.40625      0.00      0.00      0.00      0.00 1.80E-01 2.64E-01 3.35E-01 3.64E-01 3.63E-01 3.52E-01 3.45E-01 3.42E-01
 15 0.38500      0.00      0.00      0.00      0.00 2.19E-01 3.12E-01 3.72E-01 3.92E-01 3.85E-01 3.72E-01 3.63E-01 3.51E-01
 14 0.36500      0.00      0.00      0.00 1.05E-01 2.60E-01 3.58E-01 4.04E-01 4.12E-01 3.99E-01 3.84E-01 3.68E-01 3.48E-01
 13 0.34625      0.00      0.00      0.00 2.01E-01 3.28E-01 4.03E-01 4.28E-01 4.21E-01 4.03E-01 3.82E-01 3.59E-01 3.37E-01
 12 0.32750      0.00      0.00      0.00 2.78E-01 3.91E-01 4.39E-01 4.40E-01 4.18E-01 3.91E-01 3.63E-01 3.39E-01 3.19E-01
 11 0.29750      0.00      0.00 9.64E-02 3.63E-01 4.67E-01 4.76E-01 4.39E-01 3.89E-01 3.38E-01 3.06E-01 2.92E-01 2.82E-01
 10 0.27500      0.00      0.00 4.17E-01 5.31E-01 5.47E-01 4.93E-01 4.11E-01 3.20E-01 2.68E-01 2.54E-01 2.53E-01 2.49E-01
  9 0.25750      0.00      0.00 6.24E-01 6.43E-01 5.82E-01 4.76E-01 3.56E-01 2.50E-01 2.12E-01 2.15E-01 2.22E-01 2.23E-01
  8 0.24250      0.00 1.00E 00 7.97E-01 7.01E-01 5.85E-01 4.41E-01 2.91E-01 1.87E-01 1.67E-01 1.82E-01 1.95E-01 1.99E-01
  7 0.21500      0.00 1.00E 00 8.51E-01 7.20E-01 5.60E-01 3.75E-01 1.72E-01 7.71E-02 9.19E-02 1.24E-01 1.45E-01 1.56E-01
  6 0.17500      0.00 1.00E 00 8.81E-01 7.11E-01 4.81E-01 2.21E-01-4.36E-02-4.18E-02 3.99E-03 4.52E-02 7.38E-02 9.33E-02
  5 0.13000      0.00 1.00E 00 8.62E-01 6.22E-01 2.81E-01-1.99E-01-1.74E-01-1.28E-01-7.80E-02-3.41E-02 9.26E-04 2.98E-02
  4 0.08500      0.00 1.00E 00 7.70E-01 3.95E-01-2.45E-01-2.80E-01-2.41E-01-1.91E-01-1.43E-01-9.81E-02-5.68E-02-1.98E-02
  3 0.04500      0.00 1.00E 00 5.70E-01-1.94E-01-3 65E-01-3.17E-01-2.75E-01-2.26E-01-1.80E-01-1.35E-01-9.02E-02-4.79E-02
  2 0.01250      0.00 1.00E 00 2.27E-01-5.00E-01-3.97E-01-3.31E-01-2.87E-01-2.39E-01-1.94E-01-1.48E-01-1.02E-01-5.81E-02
  1-0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0       I =     13        14        15        16        17        18        19        20        21        22        23
        X =  1.17352   1.36209   1.57141   1.80376   2.06166   2.34793   2.66569   3.00001   3.33434   3.66866   4.00299
0 J     Y
 21 0.50500      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.49500  2.48E-01 2.63E-01 2.76E-01 2.82E-01 2.84E-01 2.84E-01 2.83E-01 2.82E-01 2.82E-01 2.83E-01 2.84E-01
 19 0.47500  2.84E-01 2.94E-01 3.00E-01 3.01E-01 2.99E-01 2.97E-01 2.96E-01 2.95E-01 2.96E-01 2.98E-01 2.98E-01
 18 0.44750  3.11E-01 3.14E-01 3.11E-01 3.06E-01 3.01E-01 2.97E-01 2.94E-01 2.93E-01 2.93E-01 2.93E-01 2.94E-01
 17 0.42750  3.25E-01 3.21E-01 3.13E-01 3.05E-01 2.99E-01 2.93E-01 2.90E-01 2.88E-01 2.87E-01 2.87E-01 2.88E-01
 16 0.40625  3.34E-01 3.23E-01 3.11E-01 3.01E-01 2.94E-01 2.88E-01 2.84E-01 2.82E-01 2.80E-01 2.80E-01 2.80E-01
 15 0.38500  3.35E-01 3.19E-01 3.06E-01 2.95E-01 2.87E-01 2.81E-01 2.77E-01 2.74E-01 2.73E-01 2.72E-01 2.72E-01
 14 0.36500  3.29E-01 3.11E-01 2.97E-01 2.86E-01 2.79E-01 2.73E-01 2.69E-01 2.67E-01 2.65E-01 2.64E-01 2.64E-01
 13 0.34625  3.18E-01 3.00E-01 2.87E-01 2.77E-01 2.70E-01 2.65E-01 2.61E-01 2.59E-01 2.58E-01 2.57E-01 2.57E-01
 12 0.32750  3.02E-01 2.86E-01 2.74E-01 2.66E-01 2.60E-01 2.56E-01 2.53E-01 2.51E-01 2.50E-01 2.49E-01 2.49E-01
 11 0.29750  2.70E-01 2.59E-01 2.51E-01 2.46E-01 2.43E-01 2.41E-01 2.40E-01 2.38E-01 2.37E-01 2.36E-01 2.36E-01
 10 0.27500  2.42E-01 2.35E-01 2.31E-01 2.30E-01 2.29E-01 2.29E-01 2.29E-01 2.29E-01 2.28E-01 2.27E-01 2.27E-01
  9 0.25750  2.19E-01 2.16E-01 2.15E-01 2.17E-01 2.18E-01 2.20E-01 2.21E-01 2.21E-01 2.21E-01 2.20E-01 2.20E-01
  8 0.24250  1.99E-01 1.99E-01 2.02E-01 2.05E-01 2.09E-01 2.12E-01 2.14E-01 2.15E-01 2.15E-01 2.15E-01 2.15E-01
  7 0.21500  1.62E-01 1.68E-01 1.76E-01 1.85E-01 1.92E-01 1.98E-01 2.03E-01 2.05E-01 2.06E-01 2.05E-01 2.05E-01
  6 0.17500  1.09E-01 1.24E-01 1.40E-01 1.56E-01 1.69E-01 1.79E-01 1.86E-01 1.91E-01 1.93E-01 1.93E-01 1.92E-01
  5 0.13000  5.56E-02 8.07E-02 1.05E-01 1.27E-01 1.46E-01 1.60E-01 1.71E-01 1.77E-01 1.80E-01 1.81E-01 1.80E-01
  4 0.08500  1.44E-02 4.68E-02 7.78E-02 1.05E-01 1.28E-01 1.46E-01 1.59E-01 1.66E-01 1.71E-01 1.72E-01 1.71E-01
  3 0.04500 -8.93E-03 2.78E-02 6.23E-02 9.31E-02 1.18E-01 1.38E-01 1.52E-01 1.61E-01 1.65E-01 1.67E-01 1.66E-01
  2 0.01250 -1.74E-02 2.08E-02 5.66E-02 8.86E-02 1.15E-01 1.35E-01 1.49E-01 1.58E-01 1.63E-01 1.65E-01 1.64E-01
  1-0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                 DIMENSIONLESS V VELOCITY                    -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1         2         3         4         5         6         7         8         9        10        11        12
        X = -0.03148   0.03148   0.09443   0.16430   0.24187   0.32796   0.42352   0.52960   0.64735   0.77804   0.92311   1.08415
0 J     Y
```

3	9.443E-02	2.069E-03
4	1.643E-01	1.474E-03
5	2.419E-01	1.141E-03
6	3.280E-01	1.120E-03
7	4.235E-01	1.170E-03
8	5.296E-01	1.178E-03
9	6.473E-01	1.150E-03
10	7.780E-01	1.111E-03
11	9.231E-01	1.081E-03
12	1.084E 00	1.091E-03
13	1.263E 00	1.211E-03
14	1.461E 00	1.397E-03
15	1.682E 00	1.536E-03
16	1.926E 00	1.601E-03
17	2.197E 00	1.609E-03
18	2.499E 00	1.580E-03
19	2.833E 00	1.534E-03
20	3.167E 00	1.482E-03
21	3.502E 00	1.430E-03
22	3.836E 00	1.397E-03



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   156 0.2855E-01 0.9137E-02 0.2204E-01 0.3926E-02 0.3990E-02 0.1039E 08 0.6290E 01 0.4086E-02 0.1064E 02 0.1156E 04 0.9800E 03
   157 0.2751E-01 0.8920E-02 0.2200E-01 0.3868E-02 0.3920E-02 0.9944E 07 0.6298E 01 0.3902E-02 0.1064E 02 0.1156E 04 0.9793E 03
   158 0.2657E-01 0.8726E-02 0.2195E-01 0.3868E-02 0.3818E-02 0.8789E 07 0.6306E 01 0.3731E-02 0.1065E 02 0.1157E 04 0.9788E 03
   159 0.2551E-01 0.8549E-02 0.2191E-01 0.3918E-02 0.3808E-02 0.1100E 08 0.6313E 01 0.3543E-02 0.1066E 02 0.1157E 04 0.9783E 03
   160 0.2449E-01 0.8356E-02 0.2186E-01 0.3827E-02 0.3804E-02 0.1182E 08 0.6320E 01 0.3351E-02 0.1067E 02 0.1157E 04 0.9773E 03
   161 0.2366E-01 0.8182E-02 0.2177E-01 0.3793E-02 0.3680E-02 0.7937E 07 0.6327E 01 0.3183E-02 0.1067E 02 0.1157E 04 0.9766E 03
   162 0.2287E-01 0.8027E-02 0.2167E-01 0.3824E-02 0.3561E-02 0.6325E 07 0.6333E 01 0.3032E-02 0.1068E 02 0.1157E 04 0.9761E 03
   163 0.2199E-01 0.7889E-02 0.2159E-01 0.3863E-02 0.3531E-02 0.7883E 07 0.6340E 01 0.2866E-02 0.1069E 02 0.1157E 04 0.9755E 03
   164 0.2117E-01 0.7743E-02 0.2151E-01 0.3826E-02 0.3514E-02 0.8728E 07 0.6346E 01 0.2696E-02 0.1070E 02 0.1158E 04 0.9750E 03
   165 0.2037E-01 0.7634E-02 0.2141E-01 0.3745E-02 0.3488E-02 0.8828E 07 0.6351E 01 0.2527E-02 0.1071E 02 0.1158E 04 0.9743E 03
   166 0.1961E-01 0.7563E-02 0.2131E-01 0.3723E-02 0.3452E-02 0.8442E 07 0.6357E 01 0.2361E-02 0.1071E 02 0.1158E 04 0.9736E 03
   167 0.1890E-01 0.7511E-02 0.2119E-01 0.3722E-02 0.3409E-02 0.7937E 07 0.6362E 01 0.2203E-02 0.1072E 02 0.1158E 04 0.9729E 03
   168 0.1823E-01 0.7487E-02 0.2107E-01 0.3706E-02 0.3357E-02 0.7281E 07 0.6367E 01 0.2050E-02 0.1073E 02 0.1158E 04 0.9722E 03
   169 0.1760E-01 0.7467E-02 0.2093E-01 0.3694E-02 0.3301E-02 0.6526E 07 0.6372E 01 0.1905E-02 0.1074E 02 0.1159E 04 0.9715E 03
   170 0.1701E-01 0.7442E-02 0.2079E-01 0.3691E-02 0.3240E-02 0.6002E 07 0.6377E 01 0.1768E-02 0.1075E 02 0.1159E 04 0.9708E 03
   171 0.1646E-01 0.7427E-02 0.2064E-01 0.3670E-02 0.3176E-02 0.5771E 07 0.6381E 01 0.1638E-02 0.1076E 02 0.1159E 04 0.9700E 03
   172 0.1594E-01 0.7418E-02 0.2049E-01 0.3653E-02 0.3109E-02 0.5424E 07 0.6385E 01 0.1517E-02 0.1077E 02 0.1159E 04 0.9693E 03
   173 0.1546E-01 0.7414E-02 0.2033E-01 0.3670E-02 0.3041E-02 0.5443E 07 0.6389E 01 0.1403E-02 0.1077E 02 0.1159E 04 0.9686E 03
   174 0.1502E-01 0.7425E-02 0.2016E-01 0.3665E-02 0.2971E-02 0.5377E 07 0.6393E 01 0.1297E-02 0.1078E 02 0.1160E 04 0.9680E 03
   175 0.1460E-01 0.7435E-02 0.2000E-01 0.3685E-02 0.2902E-02 0.5478E 07 0.6396E 01 0.1198E-02 0.1079E 02 0.1160E 04 0.9673E 03
   176 0.1422E-01 0.7443E-02 0.1983E-01 0.3647E-02 0.2832E-02 0.5539E 07 0.6400E 01 0.1108E-02 0.1080E 02 0.1160E 04 0.9667E 03
   177 0.1386E-01 0.7454E-02 0.1965E-01 0.3678E-02 0.2762E-02 0.5609E 07 0.6403E 01 0.1024E-02 0.1081E 02 0.1160E 04 0.9661E 03
   178 0.1352E-01 0.7445E-02 0.1948E-01 0.3643E-02 0.2691E-02 0.5767E 07 0.6406E 01 0.9487E-03 0.1082E 02 0.1160E 04 0.9655E 03
   179 0.1321E-01 0.7444E-02 0.1930E-01 0.3639E-02 0.2622E-02 0.5865E 07 0.6409E 01 0.8795E-03 0.1083E 02 0.1161E 04 0.9650E 03
   180 0.1293E-01 0.7423E-02 0.1912E-01 0.3635E-02 0.2552E-02 0.6029E 07 0.6412E 01 0.8176E-03 0.1084E 02 0.1161E 04 0.9645E 03
   181 0.1266E-01 0.7412E-02 0.1894E-01 0.3666E-02 0.2483E-02 0.6238E 07 0.6415E 01 0.7621E-03 0.1085E 02 0.1161E 04 0.9640E 03
   182 0.1243E-01 0.7378E-02 0.1876E-01 0.3662E-02 0.2415E-02 0.6536E 07 0.6417E 01 0.7125E-03 0.1086E 02 0.1161E 04 0.9635E 03
   183 0.1221E-01 0.7349E-02 0.1857E-01 0.3642E-02 0.2348E-02 0.6882E 07 0.6420E 01 0.6691E-03 0.1087E 02 0.1161E 04 0.9631E 03
   184 0.1200E-01 0.7317E-02 0.1839E-01 0.3632E-02 0.2281E-02 0.7141E 07 0.6422E 01 0.6316E-03 0.1087E 02 0.1162E 04 0.9627E 03
   185 0.1182E-01 0.7271E-02 0.1820E-01 0.3681E-02 0.2215E-02 0.7299E 07 0.6425E 01 0.5990E-03 0.1088E 02 0.1162E 04 0.9623E 03
   186 0.1164E-01 0.7223E-02 0.1801E-01 0.3645E-02 0.2150E-02 0.7646E 07 0.6427E 01 0.5717E-03 0.1089E 02 0.1162E 04 0.9619E 03
   187 0.1149E-01 0.7167E-02 0.1782E-01 0.3612E-02 0.2086E-02 0.8058E 07 0.6429E 01 0.5486E-03 0.1090E 02 0.1162E 04 0.9616E 03
   188 0.1135E-01 0.7105E-02 0.1763E-01 0.3647E-02 0.2023E-02 0.8349E 07 0.6431E 01 0.5306E-03 0.1091E 02 0.1163E 04 0.9613E 03
   189 0.1122E-01 0.7045E-02 0.1744E-01 0.3608E-02 0.1961E-02 0.8645E 07 0.6433E 01 0.5157E-03 0.1092E 02 0.1163E 04 0.9610E 03
   190 0.1110E-01 0.6974E-02 0.1725E-01 0.3564E-02 0.1901E-02 0.8927E 07 0.6435E 01 0.5049E-03 0.1093E 02 0.1163E 04 0.9608E 03
   191 0.1098E-01 0.6911E-02 0.1706E-01 0.3618E-02 0.1842E-02 0.9175E 07 0.6437E 01 0.4970E-03 0.1094E 02 0.1163E 04 0.9606E 03
   192 0.1088E-01 0.6834E-02 0.1687E-01 0.3573E-02 0.1785E-02 0.9645E 07 0.6439E 01 0.4921E-03 0.1095E 02 0.1163E 04 0.9604E 03
   193 0.1078E-01 0.6758E-02 0.1669E-01 0.3592E-02 0.1729E-02 0.9855E 07 0.6440E 01 0.4898E-03 0.1096E 02 0.1164E 04 0.9602E 03
   194 0.1069E-01 0.6681E-02 0.1650E-01 0.3597E-02 0.1675E-02 0.1028E 08 0.6442E 01 0.4909E-03 0.1097E 02 0.1164E 04 0.9600E 03
   195 0.1060E-01 0.6601E-02 0.1632E-01 0.3551E-02 0.1622E-02 0.1043E 08 0.6444E 01 0.4928E-03 0.1097E 02 0.1164E 04 0.9598E 03
   196 0.1058E-01 0.6522E-02 0.1611E-01 0.3543E-02 0.1499E-02 0.6884E 07 0.6446E 01 0.5256E-03 0.1098E 02 0.1164E 04 0.9597E 03
   197 0.1054E-01 0.6416E-02 0.1592E-01 0.3603E-02 0.1392E-02 0.6376E 07 0.6447E 01 0.5655E-03 0.1099E 02 0.1165E 04 0.9597E 03
   198 0.1048E-01 0.6285E-02 0.1574E-01 0.3609E-02 0.1348E-02 0.9024E 07 0.6449E 01 0.5888E-03 0.1100E 02 0.1165E 04 0.9597E 03
   199 0.1042E-01 0.6171E-02 0.1556E-01 0.3647E-02 0.1317E-02 0.1103E 08 0.6451E 01 0.6012E-03 0.1101E 02 0.1165E 04 0.9597E 03
   200 0.1035E-01 0.6065E-02 0.1540E-01 0.3642E-02 0.1287E-02 0.1224E 08 0.6453E 01 0.6083E-03 0.1102E 02 0.1165E 04 0.9597E 03
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 SWIRL CASE WITH LFS  =  3
             AND NSBR =  0

 CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =      1.000
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6	0.02187	4.49E 05	8.12E 04	2.57E 04	2.01E 04	1.71E 04	5.75E 03	5.06E 03	4.99E 03	4.89E 03	4.61E 03	4.17E 03	3.58E 03
5	0.01625	4.49E 05	8.16E 04	3.34E 04	2.97E 04	7.63E 03	4.49E 03	4.22E 03	4.23E 03	4.21E 03	4.03E 03	3.68E 03	3.20E 03
4	0.01062	4.49E 05	8.30E 04	4.83E 04	1.83E 04	4.90E 03	3.72E 03	3.59E 03	3.63E 03	3.64E 03	3.52E 03	3.24E 03	2.86E 03
3	0.00562	4.49E 05	8.88E 04	6.44E 04	1.02E 04	3.98E 03	3.29E 03	3.22E 03	3.26E 03	3.28E 03	3.19E 03	2.97E 03	2.64E 03
2	0.00156	4.49E 05	1.11E 05	1.69E 04	6.89E 03	3.53E 03	3.08E 03	3.04E 03	3.09E 03	3.11E 03	3.03E 03	2.83E 03	2.53E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.2.019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		1.90E 03	2.04E 03	1.93E 03	1.73E 03	1.51E 03	1.33E 03	1.19E 03	1.08E 03	9.88E 02	9.60E 02	4.49E 05
19	0.05937		1.72E 03	1.79E 03	1.64E 03	1.41E 03	1.17E 03	9.58E 02	7.94E 02	6.73E 02	5.82E 02	5.91E 02	4.49E 05
18	0.05594		1.86E 03	1.80E 03	1.57E 03	1.29E 03	1.02E 03	7.97E 02	6.27E 02	5.04E 02	4.14E 02	4.41E 02	4.49E 05
17	0.05344		2.06E 03	1.89E 03	1.59E 03	1.27E 03	9.79E 02	7.45E 02	5.72E 02	4.49E 02	3.61E 02	3.97E 02	4.49E 05
16	0.05078		2.32E 03	2.02E 03	1.64E 03	1.28E 03	9.65E 02	7.21E 02	5.43E 02	4.20E 02	3.33E 02	3.75E 02	4.49E 05
15	0.04812		2.58E 03	2.16E 03	1.71E 03	1.30E 03	9.65E 02	7.10E 02	5.29E 02	4.05E 02	3.18E 02	3.64E 02	4.49E 05
14	0.04562		2.81E 03	2.28E 03	1.77E 03	1.32E 03	9.70E 02	7.07E 02	5.22E 02	3.97E 02	3.10E 02	3.58E 02	4.49E 05
13	0.04328		2.99E 03	2.38E 03	1.81E 03	1.34E 03	9.75E 02	7.05E 02	5.17E 02	3.92E 02	3.06E 02	3.52E 02	4.49E 05
12	0.04094		3.12E 03	2.45E 03	1.85E 03	1.36E 03	9.79E 02	7.04E 02	5.14E 02	3.88E 02	3.02E 02	3.46E 02	4.49E 05
11	0.03719		3.26E 03	2.53E 03	1.88E 03	1.37E 03	9.78E 02	6.99E 02	5.08E 02	3.82E 02	2.97E 02	3.35E 02	4.49E 05
10	0.03437		3.30E 03	2.54E 03	1.88E 03	1.36E 03	9.71E 02	6.92E 02	5.02E 02	3.77E 02	2.93E 02	3.26E 02	4.49E 05
9	0.03219		3.28E 03	2.52E 03	1.87E 03	1.35E 03	9.61E 02	6.84E 02	4.96E 02	3.72E 02	2.89E 02	3.17E 02	4.49E 05
8	0.03031		3.25E 03	2.50E 03	1.85E 03	1.33E 03	9.50E 02	6.76E 02	4.90E 02	3.67E 02	2.85E 02	3.09E 02	4.49E 05
7	0.02687		3.14E 03	2.42E 03	1.79E 03	1.29E 03	9.23E 02	6.58E 02	4.77E 02	3.57E 02	2.76E 02	2.92E 02	4.49E 05
6	0.02187		2.92E 03	2.26E 03	1.68E 03	1.22E 03	8.76E 02	6.26E 02	4.55E 02	3.41E 02	2.64E 02	2.68E 02	4.49E 05
5	0.01625		2.65E 03	2.07E 03	1.55E 03	1.13E 03	8.20E 02	5.90E 02	4.30E 02	3.23E 02	2.50E 02	2.43E 02	4.49E 05
4	0.01062		2.40E 03	1.90E 03	1.43E 03	1.06E 03	7.71E 02	5.59E 02	4.10E 02	3.09E 02	2.39E 02	2.24E 02	4.49E 05
3	0.00562		2.23E 03	1.79E 03	1.36E 03	1.01E 03	7.42E 02	5.41E 02	3.98E 02	3.01E 02	2.33E 02	2.13E 02	4.49E 05
2	0.00156		2.15E 03	1.74E 03	1.33E 03	9.90E 02	7.31E 02	5.36E 02	3.96E 02	3.00E 02	2.33E 02	2.10E 02	4.49E 05
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAM FUNCTION -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	0.00	9.84E-01	9.70E-01	9.67E-01	9.68E-01	9.70E-01	9.72E-01	9.73E-01
19	0.05937		0.00	0.00	0.00	0.00	0.00	8.97E-01	8.38E-01	8.23E-01	8.28E-01	8.38E-01	8.47E-01	8.55E-01
18	0.05594		0.00	0.00	0.00	0.00	0.00	7.56E-01	6.49E-01	6.24E-01	6.35E-01	6.56E-01	6.76E-01	6.96E-01
17	0.05344		0.00	0.00	0.00	0.00	9.36E-01	6.39E-01	5.11E-01	4.82E-01	5.00E-01	5.29E-01	5.59E-01	5.87E-01
16	0.05078		0.00	0.00	0.00	0.00	8.03E-01	5.11E-01	3.71E-01	3.43E-01	3.66E-01	4.05E-01	4.45E-01	4.82E-01
15	0.04812		0.00	0.00	0.00	0.00	6.87E-01	3.89E-01	2.44E-01	2.18E-01	2.50E-01	2.98E-01	3.45E-01	3.87E-01
14	0.04562		0.00	0.00	0.00	9.44E-01	5.80E-01	2.82E-01	1.38E-01	1.19E-01	1.58E-01	2.12E-01	2.64E-01	3.09E-01
13	0.04328		0.00	0.00	0.00	8.39E-01	4.82E-01	1.89E-01	5.27E-02	4.25E-02	8.83E-02	1.45E-01	1.98E-01	2.44E-01
12	0.04094		0.00	0.00	0.00	7.51E-01	3.90E-01	1.06E-01	-1.77E-02	-1.66E-02	3.38E-02	9.10E-02	1.43E-01	1.89E-01
11	0.03719		0.00	0.00	9.45E-01	6.17E-01	2.54E-01	-7.07E-03	-9.81E-02	-7.88E-02	-2.74E-02	2.53E-02	7.30E-02	1.16E-01
10	0.03437		0.00	0.00	8.51E-01	5.14E-01	1.61E-01	-7.30E-02	-1.32E-01	-1.03E-01	-5.57E-02	-8.62E-03	3.45E-02	7.47E-02
9	0.03219		0.00	0.00	7.69E-01	4.31E-01	9.57E-02	-1.09E-01	-1.44E-01	-1.12E-01	-6.95E-02	-2.74E-02	1.19E-02	4.91E-02
8	0.03031		0.00	9.41E-01	6.87E-01	3.60E-01	4.67E-02	-1.29E-01	-1.46E-01	-1.15E-01	-7.66E-02	-3.88E-02	-2.96E-03	3.15E-02
7	0.02687		0.00	7.40E-01	5.31E-01	2.39E-01	-2.49E-02	-1.43E-01	-1.37E-01	-1.10E-01	-8.05E-02	-5.04E-02	-2.10E-02	8.05E-03
6	0.02187		0.00	4.90E-01	3.28E-01	9.72E-02	-8.58E-02	-1.23E-01	-1.08E-01	-9.02E-02	-7.09E-02	-5.09E-02	-3.03E-02	-9.37E-03
5	0.01625		0.00	2.70E-01	1.52E-01	-5.53E-03	-8.42E-02	-7.82E-02	-6.83E-02	-5.86E-02	-4.83E-02	-3.72E-02	-2.53E-02	-1.29E-02
4	0.01062		0.00	1.16E-01	4.18E-02	-3.55E-02	-4.30E-02	-3.69E-02	-3.21E-02	-2.79E-02	-2.36E-02	-1.89E-02	-1.36E-02	-7.99E-03
3	0.00562		0.00	3.24E-02	1.63E-03	-1.66E-02	-1.32E-02	-1.10E-02	-9.50E-03	-8.29E-03	-7.10E-03	-5.77E-03	-4.26E-03	-2.64E-03
2	0.00156		0.00	2.50E-03	-1.03E-03	-1.29E-03	-1.05E-03	-8.69E-04	-7.51E-04	-6.57E-04	-5.65E-04	-4.63E-04	-3.45E-04	-2.19E-04

45	0.4090E 00	0.6431E-01	0.5000E-02	0.8085E-01	0.4330E-01	0.7444E 08	0.2342E 02	0.2648E 00	0.0000	-0.3070E 02	0.2075E 03
46	0.4005E 00	0.6418E-01	0.5000E-02	0.7514E-01	0.4566E-01	0.7323E 08	0.2359E 02	0.2469E 00	0.0000	-0.4102E 02	0.2243E 03
47	0.3946E 00	0.6550E-01	0.5000E-02	0.7198E-01	0.4808E-01	0.7439E 08	0.2361E 02	0.2185E 00	0.0000	-0.4973E 02	0.2383E 03
48	0.3887E 00	0.6530E-01	0.5000E-02	0.6847E-01	0.5050E-01	0.7821E 08	0.2352E 02	0.1767E 00	0.0000	-0.5591E 02	0.2487E 03
49	0.3865E 00	0.6476E-01	0.5000E-02	0.6686E-01	0.5289E-01	0.7660E 08	0.2336E 02	0.1245E 00	0.0000	-0.5910E 02	0.2547E 03
50	0.3880E 00	0.6367E-01	0.5000E-02	0.6508E-01	0.5528E-01	0.8164E 08	0.2313E 02	0.6845E-01	0.0000	-0.5873E 02	0.2561E 03
51	0.3932E 00	0.6127E-01	0.5000E-02	0.6294E-01	0.5763E-01	0.8368E 08	0.2284E 02	0.1274E-01	0.0000	-0.5485E 02	0.2532E 03
52	0.4003E 00	0.5931E-01	0.5000E-02	0.6117E-01	0.5999E-01	0.9366E 08	0.2251E 02	-0.3884E-01	0.0000	-0.4762E 02	0.2467E 03
53	0.4060E 00	0.5553E-01	0.5000E-02	0.5703E-01	0.6230E-01	0.1137E 09	0.2214E 02	-0.8367E-01	0.0000	-0.3770E 02	0.2375E 03
54	0.4125E 00	0.5382E-01	0.5000E-02	0.5338E-01	0.6454E-01	0.1368E 09	0.2175E 02	-0.1205E 00	0.0000	-0.2581E 02	0.2267E 03
55	0.4172E 00	0.5011E-01	0.5000E-02	0.4725E-01	0.6671E-01	0.1656E 09	0.2134E 02	-0.1488E 00	0.0000	-0.1286E 02	0.2155E 03
56	0.4203E 00	0.4920E-01	0.5000E-02	0.4330E-01	0.6878E-01	0.1866E 09	0.2093E 02	-0.1690E 00	0.0000	0.4313E 00	0.2047E 03
57	0.4217E 00	0.4644E-01	0.5000E-02	0.3836E-01	0.7074E-01	0.2043E 09	0.2052E 02	-0.1820E 00	0.0000	0.1333E 02	0.1950E 03
58	0.4219E 00	0.4665E-01	0.5000E-02	0.3578E-01	0.7252E-01	0.2156E 09	0.2011E 02	-0.1889E 00	0.0000	0.2543E 02	0.1870E 03
59	0.4215E 00	0.4524E-01	0.5000E-02	0.2972E-01	0.7410E-01	0.2213E 09	0.1971E 02	-0.1912E 00	0.0000	0.3641E 02	0.1808E 03
60	0.4213E 00	0.4732E-01	0.5000E-02	0.2750E-01	0.7555E-01	0.2176E 09	0.1932E 02	-0.1901E 00	0.0000	0.4627E 02	0.1766E 03
61	0.4215E 00	0.4625E-01	0.5000E-02	0.2318E-01	0.7689E-01	0.2126E 09	0.1894E 02	-0.1868E 00	0.0000	0.5509E 02	0.1744E 03
62	0.4219E 00	0.4792E-01	0.5000E-02	0.2248E-01	0.7810E-01	0.2124E 09	0.1857E 02	-0.1821E 00	0.0000	0.6310E 02	0.1739E 03
63	0.4229E 00	0.4641E-01	0.5000E-02	0.1945E-01	0.7917E-01	0.2245E 09	0.1823E 02	-0.1765E 00	0.0000	0.7052E 02	0.1750E 03
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66	0.4285E 00	0.4653E-01	0.5000E-02	0.1842E-01	0.8135E-01	0.2355E 09	0.1727E 02	-0.1571E 00	0.0000	0.9133E 02	0.1867E 03
67	0.4305E 00	0.4492E-01	0.5000E-02	0.1714E-01	0.8167E-01	0.2350E 09	0.1698E 02	-0.1506E 00	0.0000	0.9798E 02	0.1932E 03
68	0.4326E 00	0.4554E-01	0.5000E-02	0.1716E-01	0.8175E-01	0.2361E 09	0.1670E 02	-0.1442E 00	0.0000	0.1044E 03	0.2010E 03
69	0.4345E 00	0.4405E-01	0.5000E-02	0.1574E-01	0.8159E-01	0.2440E 09	0.1643E 02	-0.1381E 00	0.0000	0.1106E 03	0.2101E 03
70	0.4363E 00	0.4461E-01	0.5000E-02	0.1537E-01	0.8117E-01	0.2499E 09	0.1618E 02	-0.1324E 00	0.0000	0.1162E 03	0.2205E 03
71	0.4378E 00	0.4325E-01	0.5000E-02	0.1374E-01	0.8048E-01	0.2524E 09	0.1594E 02	-0.1270E 00	0.0000	0.1213E 03	0.2324E 03
72	0.4392E 00	0.4376E-01	0.5000E-02	0.1329E-01	0.7954E-01	0.2515E 09	0.1571E 02	-0.1220E 00	0.0000	0.1259E 03	0.2458E 03
73	0.4402E 00	0.4253E-01	0.5000E-02	0.1179E-01	0.7834E-01	0.2468E 09	0.1549E 02	-0.1173E 00	0.0000	0.1299E 03	0.2607E 03
74	0.4408E 00	0.4300E-01	0.5000E-02	0.1150E-01	0.7690E-01	0.2390E 09	0.1528E 02	-0.1128E 00	0.0000	0.1333E 03	0.2771E 03
75	0.4410E 00	0.4185E-01	0.5000E-02	0.1031E-01	0.7524E-01	0.2298E 09	0.1508E 02	-0.1087E 00	0.0000	0.1364E 03	0.2950E 03
76	0.4409E 00	0.4225E-01	0.5000E-02	0.1033E-01	0.7337E-01	0.2194E 09	0.1489E 02	-0.1049E 00	0.0000	0.1393E 03	0.3143E 03
77	0.4403E 00	0.4117E-01	0.5000E-02	0.9532E-02	0.7133E-01	0.2130E 09	0.1470E 02	-0.1012E 00	0.0000	0.1420E 03	0.3348E 03
78	0.4396E 00	0.4153E-01	0.5000E-02	0.9790E-02	0.6912E-01	0.2087E 09	0.1452E 02	-0.9783E-01	0.0000	0.1446E 03	0.3566E 03
79	0.4384E 00	0.4052E-01	0.5000E-02	0.9238E-02	0.6678E-01	0.2037E 09	0.1435E 02	-0.9463E-01	0.0000	0.1473E 03	0.3793E 03
80	0.4370E 00	0.4084E-01	0.5000E-02	0.9481E-02	0.6432E-01	0.1965E 09	0.1419E 02	-0.9162E-01	0.0000	0.1500E 03	0.4028E 03
81	0.4351E 00	0.3992E-01	0.5000E-02	0.8928E-02	0.6175E-01	0.1889E 09	0.1403E 02	-0.8877E-01	0.0000	0.1527E 03	0.4269E 03
82	0.4330E 00	0.4021E-01	0.5000E-02	0.9011E-02	0.5911E-01	0.1813E 09	0.1387E 02	-0.8608E-01	0.0000	0.1553E 03	0.4515E 03
83	0.4305E 00	0.3934E-01	0.5000E-02	0.8381E-02	0.5641E-01	0.1775E 09	0.1373E 02	-0.8352E-01	0.0000	0.1578E 03	0.4762E 03
84	0.4278E 00	0.3958E-01	0.5000E-02	0.8297E-02	0.5365E-01	0.1740E 09	0.1358E 02	-0.8107E-01	0.0000	0.1600E 03	0.5010E 03
85	0.4248E 00	0.3874E-01	0.5000E-02	0.7624E-02	0.5087E-01	0.1694E 09	0.1344E 02	-0.7875E-01	0.0000	0.1621E 03	0.5256E 03
86	0.4215E 00	0.3888E-01	0.5000E-02	0.7520E-02	0.4806E-01	0.1631E 09	0.1331E 02	-0.7653E-01	0.0000	0.1639E 03	0.5498E 03
87	0.4178E 00	0.3806E-01	0.5000E-02	0.6901E-02	0.4525E-01	0.1561E 09	0.1318E 02	-0.7442E-01	0.0000	0.1655E 03	0.5736E 03
88	0.4140E 00	0.3816E-01	0.5000E-02	0.6857E-02	0.4248E-01	0.1488E 09	0.1305E 02	-0.7241E-01	0.0000	0.1670E 03	0.5966E 03
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90	0.4054E 00	0.3740E-01	0.5000E-02	0.6419E-02	0.3718E-01	0.1326E 09	0.1281E 02	-0.6864E-01	0.0000	0.1697E 03	0.6404E 03
91	0.4008E 00	0.3661E-01	0.5000E-02	0.6039E-02	0.3475E-01	0.1273E 09	0.1270E 02	-0.6686E-01	0.0000	0.1710E 03	0.6610E 03
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93	0.3908E 00	0.3585E-01	0.5000E-02	0.5802E-02	0.3022E-01	0.1162E 09	0.1248E 02	-0.6349E-01	0.0000	0.1737E 03	0.6992E 03
94	0.3856E 00	0.3583E-01	0.5000E-02	0.5838E-02	0.2825E-01	0.1103E 09	0.1237E 02	-0.6189E-01	0.0000	0.1750E 03	0.7167E 03
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96	0.3744E 00	0.3501E-01	0.5000E-02	0.5503E-02	0.2487E-01	0.1010E 09	0.1217E 02	-0.5884E-01	0.0000	0.1776E 03	0.7486E 03
97	0.3686E 00	0.3427E-01	0.5000E-02	0.5147E-02	0.2343E-01	0.9682E 08	0.1207E 02	-0.5738E-01	0.0000	0.1788E 03	0.7630E 03
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       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
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 13 0.04328  1.72E-03 2.59E-03 1.73E-03 1.38E-03 1.07E-03-7.28E-05-7.38E-04-2.85E-03-3.84E-03-4.21E-03     0.00
 12 0.04094  1.80E-03 2.63E-03 1.60E-03 1.13E-03 6.61E-04-4.23E-04-1.17E-03-3.52E-03-4.32E-03-4.00E-03     0.00
 11 0.03719  1.92E-03 2.67E-03 1.45E-03 8.34E-04 2.01E-04-8.03E-04-1.65E-03-4.17E-03-4.75E-03-3.63E-03     0.00
 10 0.03437  2.05E-03 2.70E-03 1.30E-03 4.62E-04-2.94E-04-1.11E-03-2.16E-03-4.91E-03-5.24E-03-3.38E-03     0.00
  9 0.03219  2.15E-03 2.66E-03 1.16E-03-7.98E-05-8.59E-04-1.38E-03-2.76E-03-5.82E-03-5.88E-03-3.27E-03     0.00
  8 0.03031  2.17E-03 2.52E-03 1.10E-03-5.93E-04-1.39E-03-1.69E-03-3.35E-03-6.66E-03-6.53E-03-3.31E-03     0.00
  7 0.02687  2.16E-03 2.41E-03 1.14E-03-9.51E-04-1.92E-03-2.09E-03-3.97E-03-7.42E-03-7.08E-03-3.45E-03     0.00
  6 0.02187  2.21E-03 2.40E-03 1.09E-03-1.10E-03-2.47E-03-2.55E-03-4.55E-03-8.05E-03-7.56E-03-3.64E-03     0.00
  5 0.01625  2.24E-03 2.46E-03 1.05E-03-1.20E-03-2.90E-03-2.94E-03-5.00E-03-8.53E-03-7.95E-03-3.77E-03     0.00
  4 0.01062  2.28E-03 2.54E-03 1.05E-03-1.28E-03-3.17E-03-3.22E-03-5.30E-03-8.85E-03-8.23E-03-3.82E-03     0.00
  3 0.00562  2.30E-03 2.57E-03 1.04E-03-1.29E-03-3.35E-03-3.38E-03-5.47E-03-9.02E-03-8.44E-03-3.77E-03     0.00
  2 0.00156  2.28E-03 2.54E-03 1.07E-03-1.27E-03-3.51E-03-3.48E-03-5.51E-03-9.16E-03-8.64E-03-3.75E-03     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                     TURBULENCE  ENERGY            -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00 1.17E-01 3.56E-01 5.57E-01 7.78E-01 1.03E 00 1.32E 00 1.63E 00 1.94E 00
 19 0.05937      0.00     0.00     0.00     0.00 9.39E-01 2.55E 00 3.75E 00 5.19E 00 6.87E 00 8.77E 00 1.09E 01 1.29E 01
 18 0.05594      0.00     0.00     0.00     0.00 1.20E 00 3.68E 00 5.56E 00 7.82E 00 1.04E 01 1.34E 01 1.66E 01 1.96E 01
 17 0.05344      0.00     0.00     0.00 3.27E-01 1.76E 00 4.20E 00 6.54E 00 9.36E 00 1.26E 01 1.63E 01 2.02E 01 2.38E 01
 16 0.05078      0.00     0.00     0.00 8.74E-01 2.22E 00 4.67E 00 7.49E 00 1.09E 01 1.49E 01 1.92E 01 2.39E 01 2.81E 01
 15 0.04812      0.00     0.00     0.00 9.77E-01 2.57E 00 5.20E 00 8.57E 00 1.27E 01 1.73E 01 2.23E 01 2.76E 01 3.22E 01
 14 0.04562      0.00     0.00 3.33E-01 1.35E 00 3.06E 00 6.12E 00 1.00E 01 1.46E 01 1.97E 01 2.52E 01 3.10E 01 3.59E 01
```

2	0.10000	0.00	7.75E-02	7.76E-02	7.77E-02	7.78E-02	7.78E-02	7.79E-02	7.80E-02	7.83E-02	7.87E-02	7.93E-02	8.02E-02
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23

X = 1.17352 1.36209 1.57141 1.80376 2.06166 2.34793 2.66569 3.00001 3.33434 3.66866 4.00299

0 J	Y											
11	1.00000	3.11E-01	3.38E-01	3.82E-01	4.71E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	2.78E-01	2.97E-01	3.24E-01	3.60E-01	4.00E-01	4.30E-01	4.48E-01	4.57E-01	4.63E-01	4.66E-01	4.66E-01
9	0.80000	2.52E-01	2.67E-01	2.87E-01	3.14E-01	3.45E-01	3.76E-01	4.00E-01	4.16E-01	4.26E-01	4.31E-01	4.31E-01
8	0.70000	2.30E-01	2.41E-01	2.56E-01	2.77E-01	3.03E-01	3.31E-01	3.57E-01	3.76E-01	3.88E-01	3.96E-01	3.96E-01
7	0.60000	2.08E-01	2.17E-01	2.29E-01	2.46E-01	2.67E-01	2.92E-01	3.16E-01	3.36E-01	3.51E-01	3.59E-01	3.59E-01
6	0.50000	1.87E-01	1.94E-01	2.03E-01	2.17E-01	2.34E-01	2.55E-01	2.77E-01	2.97E-01	3.12E-01	3.22E-01	3.22E-01
5	0.40000	1.65E-01	1.71E-01	1.78E-01	1.88E-01	2.02E-01	2.19E-01	2.39E-01	2.57E-01	2.72E-01	2.82E-01	2.82E-01
4	0.30000	1.42E-01	1.45E-01	1.50E-01	1.58E-01	1.69E-01	1.83E-01	2.00E-01	2.16E-01	2.30E-01	2.39E-01	2.39E-01
3	0.20000	1.14E-01	1.17E-01	1.21E-01	1.27E-01	1.34E-01	1.45E-01	1.57E-01	1.71E-01	1.83E-01	1.91E-01	1.91E-01
2	0.10000	8.13E-02	8.29E-02	8.52E-02	8.77E-02	9.19E-02	9.82E-02	1.07E-01	1.16E-01	1.26E-01	1.33E-01	1.32E-01
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS PRESSURE -*

0 I = 1 2 3 4 5 6 7 8 9 10 11 12

X = -0.03148 0.03148 0.09443 0.16430 0.24187 0.32796 0.42352 0.52960 0.64735 0.77804 0.92311 1.08415

0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	3.31E 03	1.80E 03	1.16E 03	1.40E 03	2.78E 03	5.64E 03	1.04E 04	1.73E 04
19	0.47500	0.00	0.00	0.00	0.00	3.39E 03	2.00E 03	1.31E 03	1.52E 03	2.84E 03	5.63E 03	1.03E 04	1.71E 04
18	0.44750	0.00	0.00	0.00	0.00	3.00E 03	1.91E 03	1.32E 03	1.54E 03	2.85E 03	5.60E 03	1.02E 04	1.69E 04
17	0.42750	0.00	0.00	0.00	1.87E 03	2.30E 03	1.77E 03	1.27E 03	1.51E 03	2.83E 03	5.59E 03	1.02E 04	1.69E 04
16	0.40625	0.00	0.00	0.00	2.26E 03	2.13E 03	1.62E 03	1.20E 03	1.48E 03	2.82E 03	5.58E 03	1.02E 04	1.69E 04
15	0.38500	0.00	0.00	0.00	2.09E 03	1.99E 03	1.51E 03	1.14E 03	1.46E 03	2.83E 03	5.61E 03	1.02E 04	1.69E 04
14	0.36500	0.00	0.00	5.43E 02	1.52E 03	1.92E 03	1.46E 03	1.13E 03	1.49E 03	2.88E 03	5.68E 03	1.03E 04	1.70E 04
13	0.34625	0.00	0.00	9.87E 02	1.56E 03	1.96E 03	1.49E 03	1.19E 03	1.57E 03	2.97E 03	5.79E 03	1.04E 04	1.71E 04
12	0.32750	0.00	0.00	6.27E 02	1.54E 03	2.06E 03	1.60E 03	1.31E 03	1.70E 03	3.12E 03	5.96E 03	1.06E 04	1.73E 04
11	0.29750	0.00	-8.62E 03	-8.57E 02	1.62E 03	2.33E 03	1.88E 03	1.62E 03	2.04E 03	3.49E 03	6.38E 03	1.11E 04	1.78E 04
10	0.27500	0.00	-8.38E 03	-7.20E 02	1.98E 03	2.52E 03	2.11E 03	1.91E 03	2.37E 03	3.86E 03	6.81E 03	1.16E 04	1.83E 04
9	0.25750	0.00	-1.41E 04	1.06E 03	2.12E 03	2.61E 03	2.32E 03	2.17E 03	2.66E 03	4.20E 03	7.21E 03	1.20E 04	1.87E 04
8	0.24250	0.00	-3.88E 03	6.17E 02	2.16E 03	2.84E 03	2.62E 03	2.45E 03	2.91E 03	4.50E 03	7.59E 03	1.24E 04	1.90E 04
7	0.21500	0.00	-2.57E 03	3.54E 02	2.00E 03	2.78E 03	2.80E 03	2.85E 03	3.56E 03	5.31E 03	8.38E 03	1.31E 04	1.96E 04
6	0.17500	0.00	-1.41E 03	2.80E 02	1.67E 03	2.50E 03	2.78E 03	3.04E 03	3.86E 03	5.65E 03	8.78E 03	1.37E 04	2.03E 04
5	0.13000	0.00	-6.66E 02	3.63E 02	1.48E 03	2.30E 03	2.75E 03	3.17E 03	4.08E 03	5.90E 03	9.04E 03	1.39E 04	2.04E 04
4	0.08500	0.00	-2.57E 02	4.64E 02	1.39E 03	2.19E 03	2.73E 03	3.26E 03	4.23E 03	6.07E 03	9.21E 03	1.40E 04	2.05E 04
3	0.04500	0.00	-6.49E 01	5.26E 02	1.36E 03	2.13E 03	2.72E 03	3.31E 03	4.31E 03	6.16E 03	9.31E 03	1.41E 04	2.05E 04
2	0.01250	0.00	0.00	5.49E 02	1.35E 03	2.12E 03	2.72E 03	3.32E 03	4.33E 03	6.20E 03	9.34E 03	1.41E 04	2.05E 04
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23

X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	2.60E 04	3.57E 04	4.53E 04	5.40E 04	6.13E 04	6.69E 04	7.07E 04	7.29E 04	7.40E 04	7.47E 04	0.00
19	0.47500	2.57E 04	3.53E 04	4.49E 04	5.36E 04	6.10E 04	6.67E 04	7.06E 04	7.28E 04	7.40E 04	7.47E 04	0.00
18	0.44750	2.54E 04	3.50E 04	4.45E 04	5.33E 04	6.08E 04	6.65E 04	7.04E 04	7.27E 04	7.39E 04	7.47E 04	0.00
17	0.42750	2.54E 04	3.49E 04	4.44E 04	5.32E 04	6.07E 04	6.64E 04	7.04E 04	7.26E 04	7.39E 04	7.46E 04	0.00
16	0.40625	2.53E 04	3.48E 04	4.44E 04	5.31E 04	6.06E 04	6.63E 04	7.03E 04	7.26E 04	7.38E 04	7.46E 04	0.00
15	0.38500	2.54E 04	3.49E 04	4.44E 04	5.31E 04	6.05E 04	6.63E 04	7.03E 04	7.26E 04	7.38E 04	7.45E 04	0.00
14	0.36500	2.55E 04	3.49E 04	4.44E 04	5.31E 04	6.05E 04	6.62E 04	7.02E 04	7.26E 04	7.38E 04	7.45E 04	0.00
13	0.34625	2.56E 04	3.50E 04	4.44E 04	5.31E 04	6.05E 04	6.62E 04	7.02E 04	7.25E 04	7.38E 04	7.44E 04	0.00
12	0.32750	2.58E 04	3.52E 04	4.45E 04	5.32E 04	6.05E 04	6.62E 04	7.02E 04	7.25E 04	7.38E 04	7.43E 04	0.00

```
X  0.46  0                2        4        6        8                1     .  0.46
X  0.48  .                                                                 .  0.48
X  0.50  +                                                                 +  0.50
X  0.52  0                2        4        6        8                      1  0.52
X  0.54  .                                                                 .  0.54
X  0.56  .                                                                 .  0.56
X  0.58  0                2        4        6        8                      1  0.58
X  0.60  +                                                                 +  0.60
X  0.62  .                                                                 .  0.62
X  0.64  .                                                                 .  0.64
X  0.66  0                2        4        6        8                      1  0.66
X  0.68  .                                                                 .  0.68
X  0.70  +                                                                 +  0.70
X  0.72  .                                                                 .  0.72
X  0.74  0                2        4        6        8                      1  0.74
X  0.76  .                                                                 .  0.76
X  0.78  .                                                                 .  0.78
X  0.80  +                                                                 +  0.80
X  0.82  .                                                                 .  0.82
X  0.84  0                2        4        6        8                      1  0.84
X  0.86  .                                                                 .  0.86
X  0.88  .                                                                 .  0.88
X  0.90  +                                                                 +  0.90
X  0.92  0                2        4        6        8                      1  0.92
X  0.94  .                                                                 .  0.94
X  0.96  .                                                                 .  0.96
X  0.98  .                                                                 .  0.98
```

2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

W VELOCITY

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.15E 01	1.15E 01	1.15E 01	1.14E 01	1.13E 01	1.12E 01	1.11E 01	1.11E 01
19	0.05937	0.00	0.00	0.00	0.00	1.22E 01	1.20E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.19E 01	1.20E 01
18	0.05594	0.00	0.00	0.00	0.00	1.27E 01	1.23E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.20E 01	1.23E 01
17	0.05344	0.00	0.00	0.00	1.41E 01	1.33E 01	1.26E 01	1.22E 01	1.21E 01	1.21E 01	1.21E 01	1.22E 01	1.25E 01
16	0.05078	0.00	0.00	0.00	1.48E 01	1.37E 01	1.28E 01	1.24E 01	1.22E 01	1.22E 01	1.22E 01	1.24E 01	1.29E 01
15	0.04812	0.00	0.00	0.00	1.54E 01	1.40E 01	1.29E 01	1.24E 01	1.23E 01	1.23E 01	1.24E 01	1.28E 01	1.33E 01
14	0.04562	0.00	0.00	1.79E 01	1.61E 01	1.43E 01	1.30E 01	1.25E 01	1.24E 01	1.24E 01	1.27E 01	1.33E 01	1.36E 01
13	0.04328	0.00	0.00	1.88E 01	1.67E 01	1.45E 01	1.30E 01	1.24E 01	1.24E 01	1.25E 01	1.31E 01	1.37E 01	1.38E 01
12	0.04094	0.00	0.00	1.95E 01	1.72E 01	1.46E 01	1.30E 01	1.23E 01	1.23E 01	1.28E 01	1.36E 01	1.40E 01	1.39E 01
11	0.03719	0.00	2.37E 01	2.07E 01	1.77E 01	1.47E 01	1.28E 01	1.22E 01	1.25E 01	1.35E 01	1.43E 01	1.44E 01	1.39E 01
10	0.03437	0.00	2.46E 01	2.20E 01	1.82E 01	1.45E 01	1.24E 01	1.20E 01	1.29E 01	1.41E 01	1.46E 01	1.44E 01	1.37E 01
9	0.03219	0.00	2.57E 01	2.27E 01	1.81E 01	1.41E 01	1.20E 01	1.20E 01	1.34E 01	1.45E 01	1.47E 01	1.42E 01	1.34E 01
8	0.03031	3.00E 01	2.73E 01	2.30E 01	1.78E 01	1.36E 01	1.17E 01	1.22E 01	1.38E 01	1.47E 01	1.46E 01	1.40E 01	1.31E 01
7	0.02687	3.00E 01	2.73E 01	2.25E 01	1.69E 01	1.28E 01	1.15E 01	1.27E 01	1.43E 01	1.47E 01	1.42E 01	1.33E 01	1.23E 01
6	0.02187	3.00E 01	2.69E 01	2.13E 01	1.52E 01	1.16E 01	1.15E 01	1.34E 01	1.40E 01	1.37E 01	1.28E 01	1.18E 01	1.07E 01
5	0.01625	3.00E 01	2.59E 01	1.90E 01	1.27E 01	1.05E 01	1.16E 01	1.20E 01	1.19E 01	1.13E 01	1.03E 01	9.35E 00	8.45E 00
4	0.01062	3.00E 01	2.43E 01	1.53E 01	9.76E 00	8.53E 00	8.78E 00	8.75E 00	8.42E 00	7.85E 00	7.14E 00	6.41E 00	5.76E 00
3	0.00562	3.00E 01	2.10E 01	1.02E 01	4.36E 00	5.14E 00	5.00E 00	4.90E 00	4.66E 00	4.32E 00	3.92E 00	3.51E 00	3.14E 00
2	0.00156	3.00E 01	5.84E 00	2.82E 00	1.21E 00	1.43E 00	1.39E 00	1.36E 00	1.29E 00	1.20E 00	1.09E 00	9.73E-01	8.72E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.14E 01	1.21E 01	1.28E 01	1.33E 01	1.36E 01	1.37E 01	1.37E 01	1.35E 01	1.32E 01	1.29E 01	0.00
19	0.05937	1.24E 01	1.29E 01	1.35E 01	1.39E 01	1.42E 01	1.43E 01	1.42E 01	1.41E 01	1.39E 01	1.36E 01	0.00
18	0.05594	1.28E 01	1.33E 01	1.36E 01	1.39E 01	1.40E 01	1.41E 01	1.39E 01	1.37E 01	1.35E 01	1.31E 01	0.00
17	0.05344	1.30E 01	1.34E 01	1.36E 01	1.37E 01	1.38E 01	1.37E 01	1.35E 01	1.33E 01	1.30E 01	1.26E 01	0.00
16	0.05078	1.32E 01	1.34E 01	1.35E 01	1.35E 01	1.34E 01	1.33E 01	1.31E 01	1.28E 01	1.24E 01	1.20E 01	0.00
15	0.04812	1.34E 01	1.34E 01	1.33E 01	1.32E 01	1.30E 01	1.28E 01	1.25E 01	1.22E 01	1.18E 01	1.14E 01	0.00
14	0.04562	1.36E 01	1.33E 01	1.31E 01	1.29E 01	1.26E 01	1.23E 01	1.20E 01	1.16E 01	1.12E 01	1.08E 01	0.00
13	0.04328	1.36E 01	1.32E 01	1.29E 01	1.25E 01	1.22E 01	1.19E 01	1.15E 01	1.11E 01	1.07E 01	1.02E 01	0.00
12	0.04094	1.35E 01	1.31E 01	1.26E 01	1.22E 01	1.18E 01	1.14E 01	1.10E 01	1.05E 01	1.01E 01	9.66E 00	0.00
11	0.03719	1.33E 01	1.26E 01	1.20E 01	1.15E 01	1.10E 01	1.05E 01	1.01E 01	9.65E 00	9.21E 00	8.76E 00	0.00
10	0.03437	1.29E 01	1.22E 01	1.15E 01	1.09E 01	1.04E 01	9.88E 00	9.41E 00	8.96E 00	8.52E 00	8.08E 00	0.00
9	0.03219	1.26E 01	1.18E 01	1.10E 01	1.04E 01	9.86E 00	9.35E 00	8.87E 00	8.42E 00	7.98E 00	7.56E 00	0.00
8	0.03031	1.22E 01	1.14E 01	1.06E 01	9.97E 00	9.40E 00	8.89E 00	8.41E 00	7.97E 00	7.54E 00	7.13E 00	0.00
7	0.02687	1.14E 01	1.05E 01	9.76E 00	9.10E 00	8.53E 00	8.02E 00	7.55E 00	7.13E 00	6.73E 00	6.35E 00	0.00
6	0.02187	9.81E 00	9.00E 00	8.30E 00	7.69E 00	7.15E 00	6.68E 00	6.26E 00	5.89E 00	5.54E 00	5.22E 00	0.00
5	0.01625	7.67E 00	7.00E 00	6.42E 00	5.90E 00	5.46E 00	5.07E 00	4.73E 00	4.43E 00	4.16E 00	3.91E 00	0.00
4	0.01062	5.21E 00	4.74E 00	4.33E 00	3.96E 00	3.65E 00	3.38E 00	3.14E 00	2.94E 00	2.75E 00	2.58E 00	0.00
3	0.00562	2.84E 00	2.58E 00	2.35E 00	2.14E 00	1.97E 00	1.82E 00	1.69E 00	1.58E 00	1.47E 00	1.38E 00	0.00
2	0.00156	7.87E-01	7.15E-01	6.51E-01	5.95E-01	5.46E-01	5.04E-01	4.67E-01	4.36E-01	4.07E-01	3.81E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRESSURE

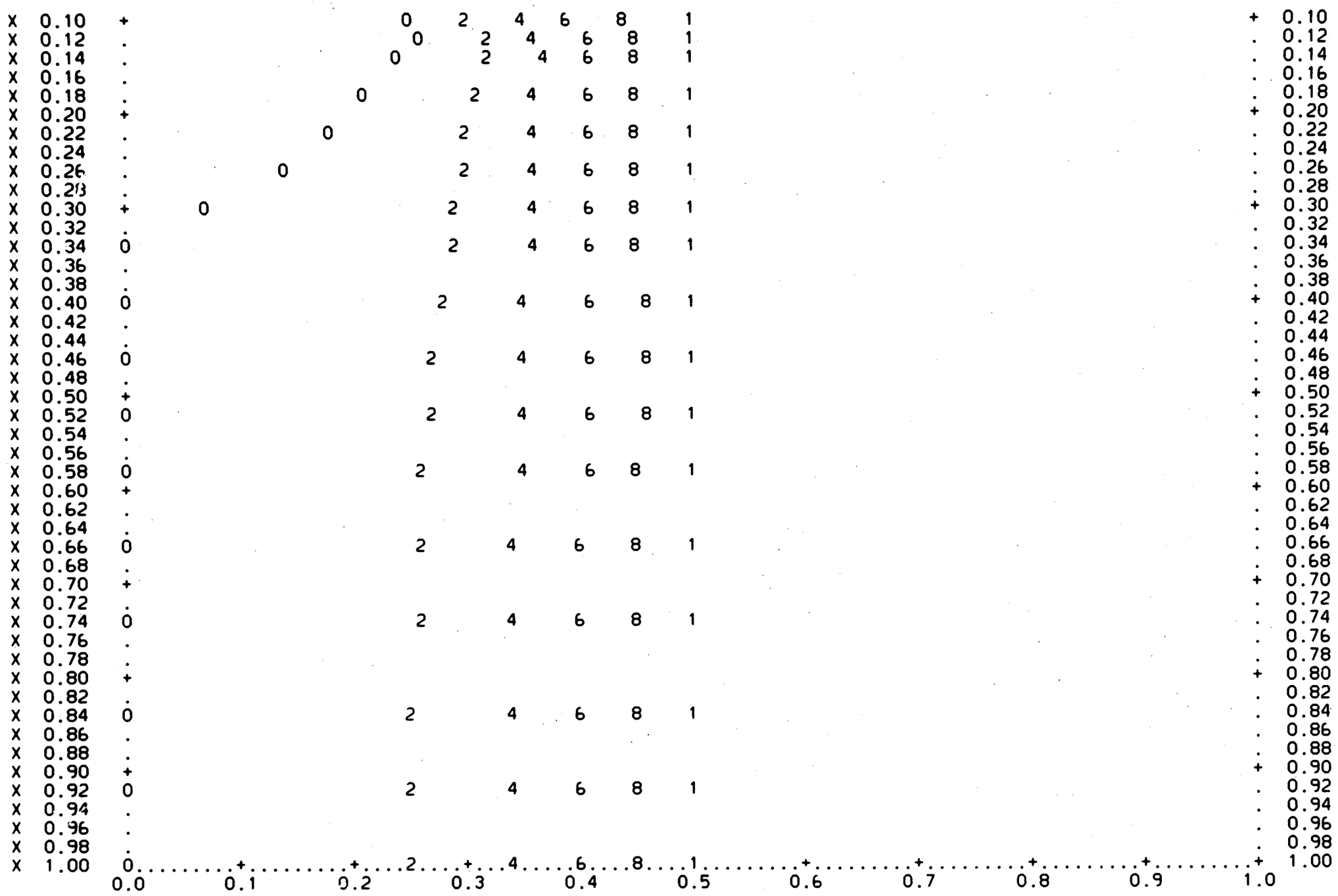
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552

21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	1.30E-02	1.92E-02	8.38E-03	2.01E-03	-4.69E-04	-7.18E-04	-2.24E-04	5.87E-04
19	0.46125	0.00	0.00	0.00	0.00	5.10E-02	4.47E-02	2.11E-02	5.33E-03	-9.14E-04	-1.52E-03	-1.77E-04	1.75E-03
18	0.43750	0.00	0.00	0.00	0.00	1.07E-01	6.88E-02	3.25E-02	7.83E-03	-1.76E-03	-2.42E-03	1.05E-04	2.82E-03
17	0.41687	0.00	0.00	0.00	4.10E-02	1.30E-01	9.13E-02	4.15E-02	9.04E-03	-3.13E-03	-3.45E-03	2.80E-04	3.13E-03
16	0.39562	0.00	0.00	0.00	9.65E-02	1.60E-01	1.13E-01	4.99E-02	9.34E-03	-5.17E-03	-4.80E-03	-1.50E-04	2.34E-03
15	0.37500	0.00	0.00	0.00	1.65E-01	1.93E-01	1.33E-01	5.68E-02	8.61E-03	-7.67E-03	-6.55E-03	-1.78E-03	5.16E-04
14	0.35562	0.00	0.00	3.15E-02	2.16E-01	2.27E-01	1.51E-01	6.14E-02	6.88E-03	-1.05E-02	-9.22E-03	-4.41E-03	-1.74E-03
13	0.33687	0.00	0.00	9.16E-02	2.61E-01	2.57E-01	1.64E-01	6.36E-02	4.05E-03	-1.43E-02	-1.30E-02	-7.42E-03	-4.07E-03
12	0.31250	0.00	0.00	2.05E-01	3.20E-01	2.93E-01	1.77E-01	6.30E-02	-1.71E-03	-2.11E-02	-1.84E-02	-1.12E-02	-7.02E-03
11	0.28625	0.00	4.20E-02	3.34E-01	3.88E-01	3.22E-01	1.83E-01	5.51E-02	-1.43E-02	-3.00E-02	-2.29E-02	-1.42E-02	-9.59E-03
10	0.26625	0.00	1.83E-01	3.95E-01	4.21E-01	3.33E-01	1.78E-01	4.06E-02	-2.51E-02	-3.45E-02	-2.48E-02	-1.58E-02	-1.12E-02
9	0.25000	0.00	3.61E-01	4.25E-01	4.35E-01	3.33E-01	1.67E-01	2.54E-02	-3.24E-02	-3.63E-02	-2.56E-02	-1.67E-02	-1.22E-02
8	0.22875	0.00	3.23E-01	4.32E-01	4.40E-01	3.25E-01	1.46E-01	4.76E-03	-3.94E-02	-3.70E-02	-2.58E-02	-1.76E-02	-1.34E-02
7	0.19500	0.00	2.91E-01	4.35E-01	4.37E-01	2.98E-01	8.91E-02	-2.89E-02	-4.14E-02	-3.40E-02	-2.46E-02	-1.81E-02	-1.43E-02
6	0.15250	0.00	2.81E-01	4.32E-01	4.08E-01	2.27E-01	-2.72E-02	-3.60E-02	-3.32E-02	-2.74E-02	-2.15E-02	-1.69E-02	-1.39E-02
5	0.10750	0.00	2.80E-01	4.17E-01	3.27E-01	2.24E-03	-2.35E-02	-2.66E-02	-2.26E-02	-1.96E-02	-1.66E-02	-1.37E-02	-1.14E-02
4	0.06500	0.00	2.57E-01	3.70E-01	5.17E-02	-2.04E-02	-1.50E-02	-1.58E-02	-1.33E-02	-1.19E-02	-1.06E-02	-9.06E-03	-7.52E-03
3	0.02875	0.00	1.77E-01	1.57E-01	-2.01E-02	-1.16E-02	-6.86E-03	-6.86E-03	-5.81E-03	-5.28E-03	-4.80E-03	-4.16E-03	-3.45E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	1.18E-03	9.39E-04	4.27E-04	1.05E-04	-2.22E-05	-5.15E-05	-2.89E-05	1.79E-06	5.42E-05	1.75E-05	0.00
19	0.46125	2.55E-03	1.64E-03	5.23E-04	-4.81E-05	-1.94E-04	-1.63E-04	-4.50E-05	6.47E-05	1.75E-04	3.75E-05	0.00
18	0.43750	3.04E-03	1.43E-03	2.56E-05	-5.35E-04	-5.53E-04	-3.88E-04	-1.39E-04	6.08E-05	2.34E-04	5.22E-05	0.00
17	0.41687	2.70E-03	7.33E-04	-6.93E-04	-1.12E-03	-9.57E-04	-6.43E-04	-2.65E-04	1.86E-05	2.53E-04	6.27E-05	0.00
16	0.39562	1.55E-03	-4.26E-04	-1.66E-03	-1.84E-03	-1.44E-03	-9.53E-04	-4.32E-04	-5.72E-05	2.47E-04	7.15E-05	0.00
15	0.37500	-1.46E-04	-1.84E-03	-2.75E-03	-2.61E-03	-1.96E-03	-1.28E-03	-6.16E-04	-1.53E-04	2.21E-04	7.82E-05	0.00
14	0.35562	-2.00E-03	-3.29E-03	-3.82E-03	-3.35E-03	-2.45E-03	-1.60E-03	-8.00E-04	-2.54E-04	1.85E-04	8.30E-05	0.00
13	0.33687	-3.86E-03	-4.72E-03	-4.86E-03	-4.06E-03	-2.92E-03	-1.90E-03	-9.79E-04	-3.58E-04	1.42E-04	8.61E-05	0.00
12	0.31250	-6.23E-03	-6.53E-03	-6.15E-03	-4.94E-03	-3.51E-03	-2.28E-03	-1.21E-03	-4.94E-04	7.92E-05	8.85E-05	0.00
11	0.28625	-8.39E-03	-8.16E-03	-7.29E-03	-5.71E-03	-4.02E-03	-2.62E-03	-1.41E-03	-6.25E-04	8.80E-06	8.79E-05	0.00
10	0.26625	-9.76E-03	-9.18E-03	-7.98E-03	-6.17E-03	-4.32E-03	-2.82E-03	-1.54E-03	-7.12E-04	-4.31E-05	8.58E-05	0.00
9	0.25000	-1.07E-02	-9.84E-03	-8.42E-03	-6.45E-03	-4.51E-03	-2.95E-03	-1.62E-03	-7.71E-04	-8.26E-05	8.32E-05	0.00
8	0.22875	-1.17E-02	-1.05E-02	-8.85E-03	-6.73E-03	-4.69E-03	-3.07E-03	-1.71E-03	-8.34E-04	-1.30E-04	7.91E-05	0.00
7	0.19500	-1.25E-02	-1.10E-02	-9.05E-03	-6.81E-03	-4.74E-03	-3.11E-03	-1.75E-03	-8.86E-04	-1.87E-04	7.07E-05	0.00
6	0.15250	-1.20E-02	-1.03E-02	-8.38E-03	-6.25E-03	-4.35E-03	-2.86E-03	-1.63E-03	-8.48E-04	-2.15E-04	5.77E-05	0.00
5	0.10750	-9.72E-03	-8.31E-03	-6.68E-03	-4.94E-03	-3.44E-03	-2.27E-03	-1.30E-03	-6.90E-04	-1.93E-04	4.21E-05	0.00
4	0.06500	-6.37E-03	-5.40E-03	-4.34E-03	-3.19E-03	-2.22E-03	-1.47E-03	-8.47E-04	-4.52E-04	-1.32E-04	2.60E-05	0.00
3	0.02875	-2.91E-03	-2.46E-03	-1.98E-03	-1.45E-03	-1.01E-03	-6.68E-04	-3.86E-04	-2.07E-04	-6.11E-05	1.16E-05	0.00
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS W VELOCITY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	3.83E-01	3.84E-01	3.82E-01	3.79E-01	3.76E-01	3.73E-01	3.69E-01	3.69E-01
19	0.47500	0.00	0.00	0.00	0.00	4.05E-01	4.00E-01	3.97E-01	3.96E-01	3.96E-01	3.96E-01	3.96E-01	3.99E-01
18	0.44750	0.00	0.00	0.00	0.00	4.22E-01	4.08E-01	4.01E-01	3.99E-01	4.00E-01	4.00E-01	4.01E-01	4.09E-01
17	0.42750	0.00	0.00	0.00	4.70E-01	4.42E-01	4.19E-01	4.08E-01	4.04E-01	4.03E-01	4.03E-01	4.05E-01	4.18E-01



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 55.000

COMPUTED INLET SWIRL NUMBER = 0.9537

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	7.27E 00	1.22E 01	1.34E 01	1.30E 01	1.23E 01	1.15E 01	1.10E 01
19	0.05937	0.00	0.00	0.00	0.00	0.00	9.43E 00	1.34E 01	1.44E 01	1.40E 01	1.33E 01	1.25E 01	1.18E 01
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.16E 01	1.46E 01	1.51E 01	1.45E 01	1.37E 01	1.27E 01	1.18E 01
17	0.05344	0.00	0.00	0.00	0.00	1.51E 01	1.36E 01	1.51E 01	1.52E 01	1.45E 01	1.35E 01	1.24E 01	1.14E 01
16	0.05078	0.00	0.00	0.00	0.00	1.30E 01	1.35E 01	1.45E 01	1.44E 01	1.37E 01	1.26E 01	1.17E 01	1.09E 01
15	0.04812	0.00	0.00	0.00	0.00	1.29E 01	1.35E 01	1.38E 01	1.32E 01	1.23E 01	1.14E 01	1.07E 01	1.02E 01
14	0.04562	0.00	0.00	0.00	1.61E 01	1.39E 01	1.34E 01	1.27E 01	1.16E 01	1.06E 01	9.99E 00	9.67E 00	9.42E 00
13	0.04328	0.00	0.00	0.00	1.34E 01	1.36E 01	1.27E 01	1.13E 01	9.75E 00	8.89E 00	8.70E 00	8.70E 00	8.66E 00
12	0.04094	0.00	0.00	0.00	1.29E 01	1.36E 01	1.19E 01	9.56E 00	7.73E 00	7.25E 00	7.45E 00	7.72E 00	7.87E 00
11	0.03719	0.00	0.00	1.26E 01	1.39E 01	1.36E 01	1.06E 01	6.36E 00	4.56E 00	4.87E 00	5.58E 00	6.15E 00	6.54E 00
10	0.03437	0.00	0.00	1.48E 01	1.61E 01	1.35E 01	8.49E 00	3.43E 00	2.49E 00	3.32E 00	4.26E 00	4.99E 00	5.53E 00
9	0.03219	0.00	0.00	1.84E 01	1.75E 01	1.28E 01	6.07E 00	1.26E 00	1.12E 00	2.20E 00	3.26E 00	4.09E 00	4.74E 00
8	0.03031	0.00	3.00E 01	2.25E 01	1.81E 01	1.17E 01	3.86E 00	-3.31E-01	8.85E-02	1.30E 00	2.42E 00	3.33E 00	4.07E 00
7	0.02687	0.00	3.00E 01	2.41E 01	1.78E 01	9.56E 00	-1.25E-01	-2.51E 00	-1.54E 00	-2.39E-01	9.47E-01	1.96E 00	2.84E 00
6	0.02187	0.00	3.00E 01	2.47E 01	1.62E 01	4.55E 00	-5.16E 00	-4.64E 00	-3.52E 00	-2.26E 00	-1.05E 00	8.75E-02	1.17E 00
5	0.01625	0.00	3.00E 01	2.32E 01	1.11E 01	-6.63E 00	-7.36E 00	-6.45E 00	-5.38E 00	-4.21E 00	-2.97E 00	-1.72E 00	-4.56E-01
4	0.01062	0.00	3.00E 01	1.85E 01	-2.32E 00	-1.01E 01	-8.99E 00	-7.87E 00	-6.80E 00	-5.68E 00	-4.44E 00	-3.09E 00	-1.69E 00
3	0.00562	0.00	3.00E 01	6.85E 00	-1.53E 01	-1.20E 01	-1.00E 01	-8.71E 00	-7.60E 00	-6.49E 00	-5.26E 00	-3.87E 00	-2.38E 00
2	0.00156	0.00	3.00E 01	-1.24E 01	-1.55E 01	-1.26E 01	-1.04E 01	-9.02E 00	-7.89E 00	-6.78E 00	-5.55E 00	-4.15E 00	-2.63E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.05E 01	9.95E 00	9.46E 00	9.08E 00	8.83E 00	8.66E 00	8.54E 00	8.46E 00	8.41E 00	8.40E 00	8.40E 00
19	0.05937	1.10E 01	1.03E 01	9.77E 00	9.39E 00	9.14E 00	9.00E 00	8.92E 00	8.90E 00	8.91E 00	8.95E 00	8.96E 00
18	0.05594	1.09E 01	1.02E 01	9.71E 00	9.34E 00	9.09E 00	8.93E 00	8.84E 00	8.81E 00	8.81E 00	8.83E 00	8.83E 00
17	0.05344	1.07E 01	1.00E 01	9.55E 00	9.20E 00	8.96E 00	8.80E 00	8.70E 00	8.65E 00	8.64E 00	8.65E 00	8.65E 00
16	0.05078	1.03E 01	9.73E 00	9.30E 00	8.99E 00	8.76E 00	8.61E 00	8.51E 00	8.45E 00	8.42E 00	8.42E 00	8.42E 00
15	0.04812	9.73E 00	9.33E 00	8.99E 00	8.72E 00	8.52E 00	8.38E 00	8.28E 00	8.22E 00	8.19E 00	8.18E 00	8.18E 00
14	0.04562	9.15E 00	8.88E 00	8.63E 00	8.42E 00	8.26E 00	8.14E 00	8.05E 00	7.99E 00	7.96E 00	7.94E 00	7.94E 00
13	0.04328	8.56E 00	8.41E 00	8.25E 00	8.11E 00	7.99E 00	7.89E 00	7.82E 00	7.77E 00	7.73E 00	7.71E 00	7.71E 00
12	0.04094	7.92E 00	7.90E 00	7.84E 00	7.77E 00	7.70E 00	7.63E 00	7.58E 00	7.53E 00	7.50E 00	7.48E 00	7.48E 00
11	0.03719	6.82E 00	7.00E 00	7.12E 00	7.17E 00	7.19E 00	7.18E 00	7.17E 00	7.15E 00	7.13E 00	7.11E 00	7.11E 00
10	0.03437	5.96E 00	6.30E 00	6.54E 00	6.70E 00	6.79E 00	6.84E 00	6.86E 00	6.86E 00	6.85E 00	6.83E 00	6.83E 00
9	0.03219	5.29E 00	5.74E 00	6.09E 00	6.33E 00	6.48E 00	6.57E 00	6.62E 00	6.64E 00	6.64E 00	6.62E 00	6.62E 00
8	0.03031	4.71E 00	5.27E 00	5.70E 00	6.01E 00	6.21E 00	6.34E 00	6.42E 00	6.46E 00	6.46E 00	6.45E 00	6.45E 00
7	0.02687	3.67E 00	4.40E 00	4.99E 00	5.43E 00	5.73E 00	5.93E 00	6.06E 00	6.13E 00	6.16E 00	6.15E 00	6.15E 00

1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23

0 J Y | X = 0.14669 | 0.17026 | 0.19643 | 0.22547 | 0.25771 | 0.29349 | 0.33321 | 0.37500 | 0.41679 | 0.45858 | 0.50037

21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	9.74E-01	9.75E-01	9.76E-01	9.77E-01	9.77E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	9.78E-01	
19	0.05937	8.63E-01	8.70E-01	8.77E-01	8.81E-01	8.84E-01	8.86E-01	8.88E-01	8.86E-01	8.89E-01	8.88E-01	8.88E-01	
18	0.05594	7.14E-01	7.31E-01	7.45E-01	7.55E-01	7.61E-01	7.65E-01	7.67E-01	7.69E-01	7.69E-01	7.68E-01	7.68E-01	
17	0.05344	6.13E-01	6.36E-01	6.55E-01	6.68E-01	6.77E-01	6.82E-01	6.86E-01	6.87E-01	6.87E-01	6.87E-01	6.86E-01	
16	0.05078	5.15E-01	5.43E-01	5.66E-01	5.82E-01	5.93E-01	6.00E-01	6.04E-01	6.06E-01	6.07E-01	6.06E-01	6.06E-01	
15	0.04812	4.25E-01	4.58E-01	4.84E-01	5.03E-01	5.16E-01	5.24E-01	5.29E-01	5.31E-01	5.32E-01	5.31E-01	5.31E-01	
14	0.04562	3.49E-01	3.85E-01	4.13E-01	4.34E-01	4.48E-01	4.58E-01	4.64E-01	4.67E-01	4.67E-01	4.67E-01	4.67E-01	
13	0.04328	2.86E-01	3.23E-01	3.53E-01	3.75E-01	3.91E-01	4.01E-01	4.07E-01	4.10E-01	4.12E-01	4.11E-01	4.11E-01	
12	0.04094	2.31E-01	2.68E-01	2.99E-01	3.22E-01	3.38E-01	3.48E-01	3.55E-01	3.59E-01	3.60E-01	3.60E-01	3.60E-01	
11	0.03719	1.57E-01	1.94E-01	2.24E-01	2.47E-01	2.63E-01	2.74E-01	2.81E-01	2.85E-01	2.87E-01	2.87E-01	2.87E-01	
10	0.03437	1.13E-01	1.48E-01	1.77E-01	1.99E-01	2.15E-01	2.26E-01	2.33E-01	2.37E-01	2.39E-01	2.39E-01	2.39E-01	
9	0.03219	8.49E-02	1.18E-01	1.45E-01	1.67E-01	1.82E-01	1.93E-01	2.00E-01	2.04E-01	2.05E-01	2.06E-01	2.06E-01	
8	0.03031	6.48E-02	9.57E-02	1.22E-01	1.42E-01	1.57E-01	1.67E-01	1.74E-01	1.77E-01	1.79E-01	1.80E-01	1.79E-01	
7	0.02687	3.65E-02	6.31E-02	8.59E-02	1.04E-01	1.16E-01	1.26E-01	1.32E-01	1.35E-01	1.37E-01	1.37E-01	1.37E-01	
6	0.02187	1.14E-02	3.10E-02	4.80E-02	6.15E-02	7.13E-02	7.82E-02	6.30E-02	8.58E-02	8.71E-02	8.75E-02	8.74E-02	
5	0.01625	-3.94E-04	1.14E-02	2.18E-02	3.01E-02	3.62E-02	4.06E-02	4.36E-02	4.54E-02	4.63E-02	4.65E-02	4.65E-02	
4	0.01062	-2.35E-03	3.04E-03	7.79E-03	1.16E-02	1.45E-02	1.65E-02	1.79E-02	1.88E-02	1.92E-02	1.93E-02	1.93E-02	
3	0.00562	-1.01E-03	5.49E-04	1.93E-03	3.06E-03	3.90E-03	4.49E-03	4.91E-03	5.16E-03	5.29E-03	5.32E-03	5.32E-03	
2	0.00156	-9.13E-05	3.11E-05	1.40E-04	2.28E-04	2.94E-04	3.42E-04	3.74E-04	3.94E-04	4.04E-04	4.07E-04	4.07E-04	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- RADIAL COORDINATE OF STREAMLINES -*

0 I = 1 2 3 4 5 6 7 8 9 10 11 12

0 J Y | X = 0.00000 | 0.00000 | 0.00787 | 0.01617 | 0.02539 | 0.03561 | 0.04697 | 0.05957 | 0.07356 | 0.08909 | 0.10632 | 0.12545

11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.58E-02	4.46E-02	5.27E-02	5.94E-02	6.05E-02	6.07E-02	6.07E-02	6.06E-02	6.04E-02	6.03E-02
9	0.80000	0.00	2.79E-02	3.30E-02	4.22E-02	5.07E-02	5.70E-02	5.87E-02	5.90E-02	5.89E-02	5.87E-02	5.84E-02	5.82E-02
8	0.70000	0.00	2.61E-02	3.06E-02	3.95E-02	4.84E-02	5.47E-02	5.69E-02	5.73E-02	5.71E-02	5.68E-02	5.64E-02	5.60E-02
7	0.60000	0.00	2.41E-02	2.84E-02	3.67E-02	4.61E-02	5.26E-02	5.51E-02	5.55E-02	5.53E-02	5.48E-02	5.43E-02	5.37E-02
6	0.50000	0.00	2.21E-02	2.61E-02	3.40E-02	4.37E-02	5.05E-02	5.32E-02	5.37E-02	5.34E-02	5.28E-02	5.21E-02	5.12E-02
5	0.40000	0.00	1.96E-02	2.36E-02	3.14E-02	4.12E-02	4.84E-02	5.13E-02	5.19E-02	5.15E-02	5.06E-02	4.96E-02	4.85E-02
4	0.30000	0.00	1.70E-02	2.10E-02	2.86E-02	3.84E-02	4.60E-02	4.93E-02	4.99E-02	4.93E-02	4.82E-02	4.67E-02	4.53E-02
3	0.20000	0.00	1.37E-02	1.78E-02	2.55E-02	3.56E-02	4.36E-02	4.71E-02	4.77E-02	4.68E-02	4.52E-02	4.33E-02	4.14E-02
2	0.10000	0.00	9.69E-03	1.36E-02	2.20E-02	3.23E-02	4.07E-02	4.46E-02	4.50E-02	4.37E-02	4.13E-02	3.86E-02	3.61E-02
1	0.00000	0.00	0.00	3.14E-03	1.66E-02	2.81E-02	3.74E-02	4.15E-02	4.16E-02	3.89E-02	3.51E-02	3.07E-02	2.46E-02

0 I = 13 14 15 16 17 18 19 20 21 22 23

0 J Y | X = 0.14669 | 0.17026 | 0.19643 | 0.22547 | 0.25771 | 0.29349 | 0.33321 | 0.37500 | 0.41679 | 0.45858 | 0.50037

11	1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	
10	0.90000	6.02E-02	6.01E-02	6.00E-02	5.99E-02	5.98E-02	5.97E-02	5.97E-02	5.97E-02	5.97E-02	5.97E-02	5.97E-02	
9	0.80000	5.79E-02	5.76E-02	5.74E-02	5.72E-02	5.70E-02	5.69E-02	5.69E-02	5.68E-02	5.68E-02	5.68E-02	5.68E-02	
8	0.70000	5.56E-02	5.51E-02	5.47E-02	5.44E-02	5.41E-02	5.40E-02	5.39E-02	5.38E-02	5.38E-02	5.39E-02	5.39E-02	
7	0.60000	5.31E-02	5.24E-02	5.18E-02	5.13E-02	5.10E-02	5.08E-02	5.06E-02	5.06E-02	5.05E-02	5.06E-02	5.06E-02	
6	0.50000	5.03E-02	4.94E-02	4.87E-02	4.80E-02	4.75E-02	4.72E-02	4.70E-02	4.69E-02	4.69E-02	4.69E-02	4.69E-02	
5	0.40000	4.73E-02	4.61E-02	4.51E-02	4.43E-02	4.37E-02	4.33E-02	4.30E-02	4.28E-02	4.27E-02	4.28E-02	4.28E-02	
4	0.30000	4.38E-02	4.23E-02	4.10E-02	3.98E-02	3.90E-02	3.85E-02	3.81E-02	3.79E-02	3.78E-02	3.79E-02	3.79E-02	
3	0.20000	3.94E-02	3.75E-02	3.58E-02	3.44E-02	3.34E-02	3.27E-02	3.22E-02	3.19E-02	3.18E-02	3.18E-02	3.18E-02	
2	0.10000	3.34E-02	3.07E-02	2.82E-02	2.64E-02	2.51E-02	2.42E-02	2.36E-02	2.33E-02	2.32E-02	2.31E-02	2.31E-02	
1	0.00000	1.64E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

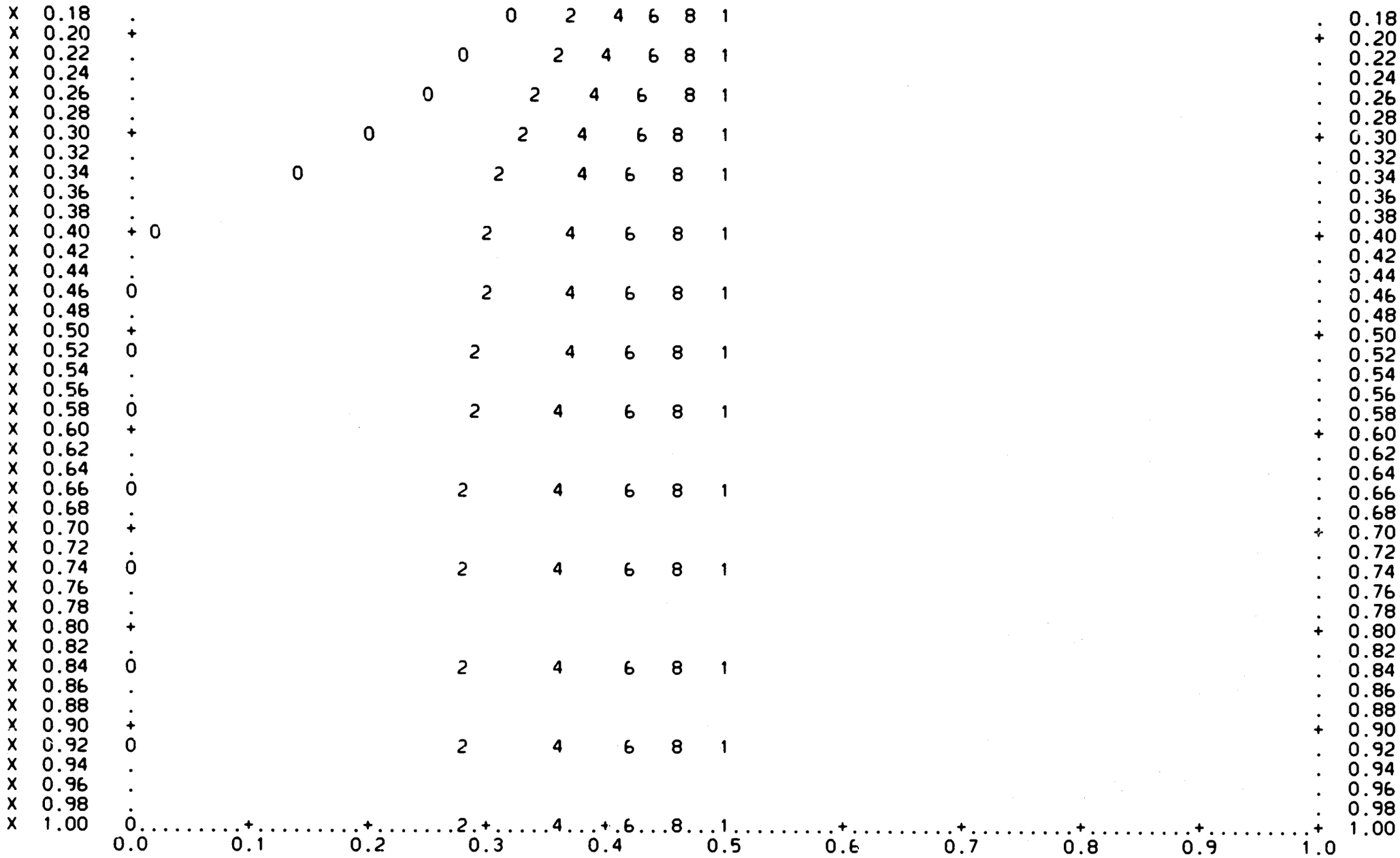
```
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
 0 J     Y
  21 0.06312     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187     0.00     0.00     0.00     0.00 2.18E 01 2.20E 01 2.22E 01 2.24E 01 2.29E 01 2.42E 01 2.61E 01 2.82E 01
  19 0.05937     0.00     0.00     0.00     0.00 2.26E 01 2.26E 01 2.29E 01 2.33E 01 2.40E 01 2.54E 01 2.73E 01 2.92E 01
  18 0.05594     0.00     0.00     0.00     0.00 2.33E 01 2.31E 01 2.33E 01 2.38E 01 2.49E 01 2.64E 01 2.80E 01 2.94E 01
  17 0.05344     0.00     0.00     0.00 2.56E 01 2.44E 01 2.39E 01 2.40E 01 2.46E 01 2.58E 01 2.71E 01 2.83E 01 2.94E 01
  16 0.05078     0.00     0.00     0.00 2.65E 01 2.49E 01 2.44E 01 2.48E 01 2.57E 01 2.69E 01 2.78E 01 2.86E 01 2.93E 01
  15 0.04812     0.00     0.00     0.00 2.75E 01 2.54E 01 2.49E 01 2.56E 01 2.68E 01 2.79E 01 2.85E 01 2.89E 01 2.91E 01
  14 0.04562     0.00     0.00 3.28E 01 2.89E 01 2.57E 01 2.53E 01 2.65E 01 2.78E 01 2.87E 01 2.90E 01 2.89E 01 2.88E 01
  13 0.04328     0.00     0.00 3.39E 01 2.88E 01 2.53E 01 2.55E 01 2.72E 01 2.87E 01 2.93E 01 2.92E 01 2.88E 01 2.84E 01
  12 0.04094     0.00     0.00 3.54E 01 2.87E 01 2.50E 01 2.58E 01 2.80E 01 2.93E 01 2.96E 01 2.93E 01 2.86E 01 2.79E 01
  11 0.03719     0.00 4.74E 01 3.79E 01 2.84E 01 2.46E 01 2.64E 01 2.88E 01 2.97E 01 2.96E 01 2.88E 01 2.78E 01 2.68E 01
  10 0.03437     0.00 4.99E 01 3.70E 01 2.67E 01 2.40E 01 2.66E 01 2.88E 01 2.95E 01 2.91E 01 2.81E 01 2.70E 01 2.58E 01
   9 0.03219     0.00 5.30E 01 3.67E 01 2.57E 01 2.38E 01 2.65E 01 2.84E 01 2.89E 01 2.84E 01 2.74E 01 2.61E 01 2.48E 01
   8 0.03031 7.43E 01 5.63E 01 3.60E 01 2.48E 01 2.36E 01 2.62E 01 2.79E 01 2.82E 01 2.76E 01 2.65E 01 2.52E 01 2.39E 01
   7 0.02687 7.43E 01 5.48E 01 3.40E 01 2.34E 01 2.31E 01 2.50E 01 2.62E 01 2.64E 01 2.58E 01 2.47E 01 2.34E 01 2.20E 01
   6 0.02187 7.43E 01 5.17E 01 3.03E 01 2.06E 01 2.13E 01 2.21E 01 2.26E 01 2.27E 01 2.22E 01 2.12E 01 2.00E 01 1.88E 01
   5 0.01625 7.43E 01 4.71E 01 2.45E 01 1.74E 01 1.74E 01 1.74E 01 1.75E 01 1.76E 01 1.72E 01 1.65E 01 1.56E 01 1.45E 01
   4 0.01062 7.43E 01 4.09E 01 1.55E 01 1.30E 01 1.22E 01 1.19E 01 1.18E 01 1.18E 01 1.16E 01 1.12E 01 1.05E 01 9.81E 00
   3 0.00562 7.43E 01 3.09E 01 7.64E 00 7.29E 00 6.76E 00 6.47E 00 6.38E 00 6.37E 00 6.28E 00 6.06E 00 5.72E 00 5.32E 00
   2 0.00156 7.43E 01 8.59E 00 2.12E 00 2.03E 00 1.88E 00 1.80E 00 1.77E 00 1.77E 00 1.74E 00 1.68E 00 1.59E 00 1.48E 00
   1-0.00156     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 0       I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
 0 J     Y
  21 0.06312     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187 2.99E 01 3.11E 01 3.17E 01 3.17E 01 3.14E 01 3.08E 01 2.99E 01 2.91E 01 2.82E 01 2.79E 01     0.00
  19 0.05937 3.08E 01 3.18E 01 3.24E 01 3.26E 01 3.25E 01 3.21E 01 3.17E 01 3.11E 01 3.06E 01 3.00E 01     0.00
  18 0.05594 3.06E 01 3.14E 01 3.17E 01 3.18E 01 3.17E 01 3.14E 01 3.10E 01 3.05E 01 3.00E 01 2.95E 01     0.00
  17 0.05344 3.03E 01 3.08E 01 3.10E 01 3.10E 01 3.08E 01 3.04E 01 3.00E 01 2.96E 01 2.91E 01 2.86E 01     0.00
  16 0.05078 2.98E 01 3.01E 01 3.01E 01 3.00E 01 2.97E 01 2.93E 01 2.89E 01 2.84E 01 2.79E 01 2.74E 01     0.00
  15 0.04812 2.93E 01 2.93E 01 2.91E 01 2.88E 01 2.85E 01 2.81E 01 2.76E 01 2.71E 01 2.67E 01 2.62E 01     0.00
  14 0.04562 2.87E 01 2.85E 01 2.81E 01 2.77E 01 2.73E 01 2.68E 01 2.63E 01 2.59E 01 2.54E 01 2.49E 01     0.00
  13 0.04328 2.80E 01 2.76E 01 2.71E 01 2.67E 01 2.62E 01 2.57E 01 2.51E 01 2.47E 01 2.42E 01 2.37E 01     0.00
  12 0.04094 2.73E 01 2.67E 01 2.61E 01 2.55E 01 2.50E 01 2.44E 01 2.39E 01 2.34E 01 2.30E 01 2.25E 01     0.00
  11 0.03719 2.59E 01 2.51E 01 2.43E 01 2.36E 01 2.30E 01 2.24E 01 2.19E 01 2.14E 01 2.09E 01 2.05E 01     0.00
  10 0.03437 2.47E 01 2.37E 01 2.29E 01 2.21E 01 2.15E 01 2.09E 01 2.03E 01 1.99E 01 1.94E 01 1.90E 01     0.00
   9 0.03219 2.37E 01 2.26E 01 2.17E 01 2.09E 01 2.03E 01 1.97E 01 1.91E 01 1.86E 01 1.82E 01 1.78E 01     0.00
   8 0.03031 2.27E 01 2.16E 01 2.07E 01 1.99E 01 1.92E 01 1.86E 01 1.81E 01 1.76E 01 1.72E 01 1.68E 01     0.00
   7 0.02687 2.08E 01 1.96E 01 1.87E 01 1.79E 01 1.72E 01 1.66E 01 1.61E 01 1.57E 01 1.53E 01 1.49E 01     0.00
   6 0.02187 1.76E 01 1.65E 01 1.56E 01 1.48E 01 1.42E 01 1.37E 01 1.32E 01 1.28E 01 1.25E 01 1.22E 01     0.00
   5 0.01625 1.35E 01 1.26E 01 1.18E 01 1.12E 01 1.07E 01 1.03E 01 9.89E 00 9.59E 00 9.31E 00 9.08E 00     0.00
   4 0.01062 9.09E 00 8.44E 00 7.89E 00 7.44E 00 7.08E 00 6.78E 00 6.53E 00 6.32E 00 6.13E 00 5.97E 00     0.00
   3 0.00562 4.92E 00 4.56E 00 4.25E 00 4.00E 00 3.80E 00 3.64E 00 3.50E 00 3.38E 00 3.28E 00 3.19E 00     0.00
   2 0.00156 1.37E 00 1.27E 00 1.18E 00 1.11E 00 1.06E 00 1.01E 00 9.71E-01 9.39E-01 9.11E-01 8.87E-01     0.00
   1-0.00156     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                            PRESSURE                -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
 0       I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
 0 J     Y
  21 0.06312     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  20 0.06187     0.00     0.00     0.00     0.00 1.85E 03 1.90E 03 1.85E 03 1.84E 03 1.87E 03 1.89E 03 1.91E 03 1.92E 03
  19 0.05937     0.00     0.00     0.00     0.00 1.80E 03 1.87E 03 1.82E 03 1.82E 03 1.84E 03 1.86E 03 1.87E 03 1.88E 03
```

17	0.41687	0.00	0.00	0.00	2.25E-01	3.45E-01	1.03E-01	-1.45E-02	-4.39E-02	-3.94E-02	-2.87E-02	-2.01E-02	-1.35E-02
16	0.39562	0.00	0.00	0.00	4.45E-01	3.60E-01	1.00E-01	-3.08E-02	-6.06E-02	-5.13E-02	-3.64E-02	-2.54E-02	-1.72E-02
15	0.37500	0.00	0.00	0.00	6.75E-01	3.67E-01	8.44E-02	-4.95E-02	-7.42E-02	-5.98E-02	-4.21E-02	-2.98E-02	-2.05E-02
14	0.35562	0.00	0.00	3.24E-01	6.33E-01	3.43E-01	5.79E-02	-6.59E-02	-8.24E-02	-6.46E-02	-4.60E-02	-3.31E-02	-2.33E-02
13	0.33687	0.00	0.00	5.77E-01	6.30E-01	3.14E-01	3.32E-02	-7.61E-02	-8.56E-02	-6.66E-02	-4.83E-02	-3.56E-02	-2.55E-02
12	0.31250	0.00	0.00	8.94E-01	6.33E-01	2.62E-01	-1.74E-04	-8.18E-02	-8.43E-02	-6.64E-02	-4.99E-02	-3.80E-02	-2.80E-02
11	0.28625	0.00	4.31E-01	8.65E-01	5.93E-01	1.71E-01	-2.41E-02	-7.51E-02	-7.64E-02	-6.27E-02	-4.94E-02	-3.92E-02	-2.96E-02
10	0.26625	0.00	6.94E-01	8.95E-01	5.45E-01	1.09E-01	-3.08E-02	-6.65E-02	-6.86E-02	-5.86E-02	-4.82E-02	-3.93E-02	-3.03E-02
9	0.25000	0.00	9.17E-01	9.15E-01	4.88E-01	6.89E-02	-3.20E-02	-5.85E-02	-6.18E-02	-5.48E-02	-4.66E-02	-3.89E-02	-3.05E-02
8	0.22875	0.00	9.03E-01	9.12E-01	4.03E-01	2.30E-02	-3.13E-02	-4.79E-02	-5.26E-02	-4.95E-02	-4.42E-02	-3.80E-02	-3.03E-02
7	0.19500	0.00	9.03E-01	8.63E-01	2.33E-01	-1.94E-02	-2.73E-02	-3.30E-02	-3.88E-02	-4.06E-02	-3.92E-02	-3.52E-02	-2.90E-02
6	0.15250	0.00	9.16E-01	7.07E-01	2.15E-02	-3.03E-02	-2.22E-02	-2.03E-02	-2.49E-02	-2.97E-02	-3.15E-02	-2.98E-02	-2.52E-02
5	0.10750	0.00	9.03E-01	3.75E-01	-6.05E-02	-3.27E-02	-1.75E-02	-1.21E-02	-1.45E-02	-1.94E-02	-2.23E-02	-2.22E-02	-1.92E-02
4	0.06500	0.00	7.62E-01	3.16E-02	-3.39E-02	-2.31E-02	-1.17E-02	-6.81E-03	-7.78E-03	-1.11E-02	-1.34E-02	-1.38E-02	-1.21E-02
3	0.02875	0.00	4.07E-01	-4.66E-02	-1.75E-02	-1.10E-02	-5.41E-03	-2.95E-03	-3.26E-03	-4.77E-03	-5.93E-03	-6.19E-03	-5.47E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	-1.10E-03	-4.84E-04	-1.33E-04	1.91E-05	6.14E-05	4.80E-05	5.32E-05	4.95E-05	9.33E-05	3.64E-07	0.00
19	0.46125	-3.29E-03	-1.55E-03	-5.44E-04	-5.20E-05	1.49E-04	1.95E-04	2.53E-04	2.69E-04	2.80E-04	-4.20E-07	0.00
18	0.43750	-5.84E-03	-2.98E-03	-1.28E-03	-3.94E-04	1.69E-05	1.75E-04	3.19E-04	3.80E-04	3.94E-04	-1.24E-06	0.00
17	0.41687	-8.20E-03	-4.39E-03	-2.08E-03	-8.36E-04	-2.18E-04	6.06E-05	2.96E-04	4.05E-04	4.48E-04	-1.61E-06	0.00
16	0.39562	-1.07E-02	-5.96E-03	-3.04E-03	-1.41E-03	-5.59E-04	-1.37E-04	2.04E-04	3.72E-04	4.64E-04	-1.61E-06	0.00
15	0.37500	-1.30E-02	-7.52E-03	-4.04E-03	-2.04E-03	-9.57E-04	-3.82E-04	6.96E-05	3.00E-04	4.50E-04	-1.31E-06	0.00
14	0.35562	-1.51E-02	-8.96E-03	-5.01E-03	-2.67E-03	-1.36E-03	-6.39E-04	-8.24E-05	2.10E-04	4.18E-04	-9.01E-07	0.00
13	0.33687	-1.69E-02	-1.03E-02	-5.93E-03	-3.29E-03	-1.77E-03	-9.00E-04	-2.42E-04	1.10E-04	3.74E-04	-5.33E-07	0.00
12	0.31250	-1.90E-02	-1.19E-02	-7.07E-03	-4.07E-03	-2.29E-03	-1.24E-03	-4.56E-04	-2.75E-05	3.05E-04	-2.53E-07	0.00
11	0.28625	-2.06E-02	-1.32E-02	-8.08E-03	-4.78E-03	-2.78E-03	-1.56E-03	-6.68E-04	-1.69E-04	2.24E-04	-5.00E-07	0.00
10	0.26625	-2.14E-02	-1.40E-02	-8.68E-03	-5.23E-03	-3.09E-03	-1.77E-03	-8.10E-04	-2.67E-04	1.63E-04	-1.03E-06	0.00
9	0.25000	-2.18E-02	-1.44E-02	-9.06E-03	-5.52E-03	-3.30E-03	-1.91E-03	-9.09E-04	-3.37E-04	1.16E-04	-1.63E-06	0.00
8	0.22875	-2.21E-02	-1.48E-02	-9.43E-03	-5.82E-03	-3.52E-03	-2.07E-03	-1.02E-03	-4.18E-04	5.80E-05	-2.45E-06	0.00
7	0.19500	-2.15E-02	-1.48E-02	-9.56E-03	-5.99E-03	-3.67E-03	-2.18E-03	-1.12E-03	-5.05E-04	-1.88E-05	-3.39E-06	0.00
6	0.15250	-1.92E-02	-1.34E-02	-8.82E-03	-5.61E-03	-3.47E-03	-2.08E-03	-1.11E-03	-5.28E-04	-7.76E-05	-3.62E-06	0.00
5	0.10750	-1.49E-02	-1.05E-02	-7.03E-03	-4.51E-03	-2.82E-03	-1.70E-03	-9.18E-04	-4.54E-04	-9.38E-05	-2.94E-06	0.00
4	0.06500	-9.49E-03	-6.79E-03	-4.56E-03	-2.94E-03	-1.85E-03	-1.11E-03	-6.08E-04	-3.06E-04	-7.27E-05	-1.81E-06	0.00
3	0.02875	-4.30E-03	-3.08E-03	-2.08E-03	-1.34E-03	-8.44E-04	-5.09E-04	-2.79E-04	-1.41E-04	-3.57E-05	-7.71E-07	0.00
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- DIMENSIONLESS W VELOCITY -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	7.27E-01	7.35E-01	7.40E-01	7.47E-01	7.64E-01	8.05E-01	8.71E-01	9.40E-01
19	0.47500	0.00	0.00	0.00	0.00	7.52E-01	7.54E-01	7.62E-01	7.75E-01	8.00E-01	8.48E-01	9.12E-01	9.75E-01
18	0.44750	0.00	0.00	0.00	0.00	7.76E-01	7.70E-01	7.76E-01	7.94E-01	8.29E-01	8.78E-01	9.32E-01	9.81E-01
17	0.42750	0.00	0.00	0.00	8.53E-01	8.13E-01	7.96E-01	8.00E-01	8.21E-01	8.59E-01	9.03E-01	9.44E-01	9.81E-01
16	0.40625	0.00	0.00	0.00	8.82E-01	8.30E-01	8.14E-01	8.27E-01	8.57E-01	8.95E-01	9.28E-01	9.55E-01	9.77E-01
15	0.38500	0.00	0.00	0.00	9.18E-01	8.46E-01	8.29E-01	8.54E-01	8.94E-01	9.29E-01	9.50E-01	9.62E-01	9.71E-01
14	0.36500	0.00	0.00	1.09E 00	9.64E-01	8.57E-01	8.42E-01	8.82E-01	9.28E-01	9.57E-01	9.66E-01	9.64E-01	9.61E-01
13	0.34625	0.00	0.00	1.13E 00	9.61E-01	8.45E-01	8.49E-01	9.08E-01	9.56E-01	9.76E-01	9.74E-01	9.62E-01	9.48E-01



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.381E 02	0.408E 02	0.430E 02	0.452E 02	0.475E 02	0.500E 02

RADIAL POSITION 2R/D

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	7.22E 00	1.37E 01	1.46E 01	1.37E 01	1.27E 01	1.19E 01	1.12E 01
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.22E 01	1.65E 01	1.66E 01	1.53E 01	1.40E 01	1.28E 01	1.19E 01
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.76E 01	1.97E 01	1.85E 01	1.65E 01	1.46E 01	1.31E 01	1.20E 01
17	0.05344	0.00	0.00	0.00	0.00	2.44E 01	2.19E 01	2.12E 01	1.89E 01	1.64E 01	1.44E 01	1.29E 01	1.19E 01
16	0.05078	0.00	0.00	0.00	0.00	2.21E 01	2.17E 01	2.02E 01	1.77E 01	1.53E 01	1.36E 01	1.24E 01	1.16E 01
15	0.04812	0.00	0.00	0.00	0.00	2.29E 01	2.12E 01	1.79E 01	1.52E 01	1.35E 01	1.25E 01	1.17E 01	1.10E 01
14	0.04562	0.00	0.00	0.00	3.51E 01	2.54E 01	1.91E 01	1.44E 01	1.23E 01	1.15E 01	1.12E 01	1.08E 01	1.03E 01
13	0.04328	0.00	0.00	0.00	2.64E 01	2.13E 01	1.44E 01	1.03E 01	9.32E 00	9.58E 00	9.83E 00	9.79E 00	9.54E 00
12	0.04094	0.00	0.00	0.00	2.32E 01	1.82E 01	1.00E 01	6.30E 00	6.54E 00	7.67E 00	8.42E 00	8.69E 00	8.66E 00
11	0.03719	0.00	0.00	3.37E 01	2.35E 01	1.35E 01	2.62E 00	8.70E-01	2.75E 00	4.76E 00	6.07E 00	6.75E 00	7.06E 00
10	0.03437	0.00	0.00	2.26E 01	1.79E 01	5.62E 00	-2.13E 00	-2.05E 00	3.86E-01	2.70E 00	4.26E 00	5.20E 00	5.76E 00
9	0.03219	0.00	0.00	2.04E 01	1.49E 01	1.31E 00	-4.55E 00	-3.80E 00	-1.24E 00	1.16E 00	2.86E 00	3.97E 00	4.71E 00
8	0.03031	0.00	3.00E 01	2.15E 01	1.25E 01	-1.39E 00	-6.01E 00	-5.02E 00	-2.50E 00	-1.03E-01	1.67E 00	2.91E 00	3.80E 00
7	0.02687	0.00	3.00E 01	2.15E 01	8.81E 00	-5.61E 00	-7.73E 00	-6.71E 00	-4.53E 00	-2.29E 00	-4.65E-01	9.75E-01	2.13E 00
6	0.02187	0.00	3.00E 01	1.96E 01	1.09E 00	-8.95E 00	-9.26E 00	-8.47E 00	-6.96E 00	-5.13E 00	-3.35E 00	-1.71E 00	-2.32E-01
5	0.01625	0.00	3.00E 01	1.43E 01	-1.01E 01	-1.11E 01	-1.06E 01	-9.99E 00	-9.07E 00	-7.74E 00	-6.10E 00	-4.32E 00	-2.57E 00
4	0.01062	0.00	3.00E 01	1.69E 00	-1.45E 01	-1.29E 01	-1.18E 01	-1.12E 01	-1.06E 01	-9.59E 00	-8.14E 00	-6.32E 00	-4.36E 00
3	0.00562	0.00	3.00E 01	-1.49E 01	-1.63E 01	-1.40E 01	-1.26E 01	-1.18E 01	-1.14E 01	-1.06E 01	-9.25E 00	-7.43E 00	-5.38E 00
2	0.00156	0.00	3.00E 01	-2.45E 01	-1.75E 01	-1.45E 01	-1.29E 01	-1.21E 01	-1.16E 01	-1.09E 01	-9.65E 00	-7.83E 00	-5.75E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.07E 01	1.04E 01	1.03E 01	1.03E 01	1.04E 01	1.05E 01	1.05E 01	1.06E 01	1.06E 01	1.07E 01	1.07E 01
19	0.05937	1.12E 01	1.08E 01	1.06E 01	1.06E 01	1.06E 01	1.07E 01	1.07E 01	1.08E 01	1.09E 01	1.10E 01	1.10E 01
18	0.05594	1.13E 01	1.08E 01	1.05E 01	1.04E 01	1.03E 01	1.02E 01	1.02E 01	1.03E 01	1.03E 01	1.04E 01	1.04E 01
17	0.05344	1.12E 01	1.06E 01	1.03E 01	1.01E 01	9.94E 00	9.85E 00	9.80E 00	9.79E 00	9.80E 00	9.82E 00	9.82E 00
16	0.05078	1.09E 01	1.03E 01	9.97E 00	9.71E 00	9.52E 00	9.39E 00	9.31E 00	9.26E 00	9.24E 00	9.24E 00	9.24E 00
15	0.04812	1.04E 01	9.92E 00	9.54E 00	9.26E 00	9.06E 00	8.90E 00	8.80E 00	8.73E 00	8.68E 00	8.67E 00	8.67E 00
14	0.04562	9.84E 00	9.42E 00	9.07E 00	8.79E 00	8.58E 00	8.42E 00	8.30E 00	8.22E 00	8.16E 00	8.14E 00	8.14E 00
13	0.04328	9.21E 00	8.87E 00	8.56E 00	8.30E 00	8.10E 00	7.95E 00	7.83E 00	7.74E 00	7.68E 00	7.65E 00	7.65E 00
12	0.04094	8.48E 00	8.24E 00	8.00E 00	7.78E 00	7.60E 00	7.46E 00	7.35E 00	7.27E 00	7.21E 00	7.17E 00	7.17E 00
11	0.03719	7.15E 00	7.11E 00	7.01E 00	6.88E 00	6.77E 00	6.67E 00	6.58E 00	6.52E 00	6.46E 00	6.42E 00	6.42E 00
10	0.03437	6.07E 00	6.20E 00	6.22E 00	6.18E 00	6.13E 00	6.07E 00	6.02E 00	5.96E 00	5.92E 00	5.88E 00	5.88E 00
9	0.03219	5.19E 00	5.46E 00	5.58E 00	5.63E 00	5.63E 00	5.61E 00	5.58E 00	5.55E 00	5.51E 00	5.47E 00	5.47E 00
8	0.03031	4.43E 00	4.82E 00	5.04E 00	5.15E 00	5.20E 00	5.22E 00	5.22E 00	5.20E 00	5.17E 00	5.14E 00	5.14E 00
7	0.02687	3.01E 00	3.63E 00	4.04E 00	4.29E 00	4.44E 00	4.53E 00	4.58E 00	4.59E 00	4.58E 00	4.55E 00	4.55E 00
6	0.02187	1.01E 00	1.96E 00	2.63E 00	3.10E 00	3.41E 00	3.61E 00	3.73E 00	3.79E 00	3.80E 00	3.79E 00	3.79E 00
5	0.01625	-9.93E-01	2.86E-01	1.25E 00	1.93E 00	2.40E 00	2.72E 00	2.93E 00	3.03E 00	3.08E 00	3.08E 00	3.08E 00
4	0.01062	-2.54E 00	-1.00E 00	1.79E-01	1.04E 00	1.64E 00	2.06E 00	2.33E 00	2.47E 00	2.54E 00	2.55E 00	2.56E 00
3	0.00562	-3.41E 00	-1.73E 00	-4.24E-01	5.38E-01	1.22E 00	1.68E 00	1.99E 00	2.17E 00	2.25E 00	2.27E 00	2.27E 00

21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.73E-01	9.73E-01	9.73E-01	9.73E-01	9.73E-01	9.73E-01
19	0.05937	8.61E-01	8.64E-01	8.66E-01	8.66E-01	8.65E-01	8.64E-01	8.63E-01	8.62E-01	8.61E-01	8.60E-01	8.60E-01
18	0.05594	7.08E-01	7.18E-01	7.23E-01	7.24E-01	7.24E-01	7.22E-01	7.21E-01	7.19E-01	7.17E-01	7.15E-01	7.15E-01
17	0.05344	6.04E-01	6.18E-01	6.25E-01	6.29E-01	6.29E-01	6.29E-01	6.27E-01	6.25E-01	6.23E-01	6.21E-01	6.21E-01
16	0.05078	4.99E-01	5.19E-01	5.30E-01	5.35E-01	5.37E-01	5.38E-01	5.37E-01	5.35E-01	5.33E-01	5.31E-01	5.31E-01
15	0.04812	4.04E-01	4.28E-01	4.42E-01	4.50E-01	4.54E-01	4.56E-01	4.56E-01	4.54E-01	4.53E-01	4.50E-01	4.50E-01
14	0.04562	3.23E-01	3.50E-01	3.68E-01	3.78E-01	3.83E-01	3.86E-01	3.87E-01	3.87E-01	3.85E-01	3.83E-01	3.83E-01
13	0.04328	2.55E-01	2.85E-01	3.05E-01	3.17E-01	3.24E-01	3.28E-01	3.30E-01	3.30E-01	3.29E-01	3.27E-01	3.27E-01
12	0.04094	1.95E-01	2.28E-01	2.49E-01	2.63E-01	2.71E-01	2.76E-01	2.79E-01	2.79E-01	2.79E-01	2.77E-01	2.77E-01
11	0.03719	1.17E-01	1.51E-01	1.74E-01	1.89E-01	1.99E-01	2.05E-01	2.09E-01	2.10E-01	2.10E-01	2.09E-01	2.09E-01
10	0.03437	7.14E-02	1.05E-01	1.28E-01	1.44E-01	1.55E-01	1.61E-01	1.65E-01	1.67E-01	1.67E-01	1.67E-01	1.67E-01
9	0.03219	4.33E-02	7.57E-02	9.89E-02	1.15E-01	1.25E-01	1.32E-01	1.37E-01	1.38E-01	1.39E-01	1.38E-01	1.38E-01
8	0.03031	2.40E-02	5.51E-02	7.76E-02	9.32E-02	1.04E-01	1.11E-01	1.15E-01	1.17E-01	1.18E-01	1.17E-01	1.17E-01
7	0.02687	-1.22E-03	2.65E-02	4.70E-02	6.13E-02	7.12E-02	7.77E-02	8.19E-02	8.40E-02	8.48E-02	8.46E-02	8.46E-02
6	0.02187	-1.88E-02	2.52E-03	1.86E-02	3.01E-02	3.81E-02	4.34E-02	4.69E-02	4.88E-02	4.96E-02	4.96E-02	4.96E-02
5	0.01625	-1.99E-02	-6.59E-03	3.65E-03	1.11E-02	1.63E-02	1.98E-02	2.21E-02	2.34E-02	2.40E-02	2.40E-02	2.40E-02
4	0.01062	-1.16E-02	-5.43E-03	-6.06E-04	2.93E-03	5.41E-03	7.12E-03	8.25E-03	8.87E-03	9.17E-03	9.23E-03	9.23E-03
3	0.00562	-3.78E-03	-1.95E-03	-5.23E-04	5.27E-04	1.27E-03	1.78E-03	2.12E-03	2.31E-03	2.40E-03	2.42E-03	2.42E-03
2	0.00156	-3.10E-04	-1.67E-04	-5.36E-05	2.96E-05	8.86E-05	1.29E-04	1.56E-04	1.71E-04	1.79E-04	1.80E-04	1.80E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- RADIAL COORDINATE OF STREAMLINES -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J	Y												
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.91E-02	4.69E-02	5.47E-02	5.98E-02	6.08E-02	6.09E-02	6.08E-02	6.06E-02	6.05E-02	6.03E-02
9	0.80000	0.00	2.79E-02	3.65E-02	4.49E-02	5.23E-02	5.79E-02	5.92E-02	5.93E-02	5.91E-02	5.88E-02	5.85E-02	5.82E-02
8	0.70000	0.00	2.61E-02	3.51E-02	4.38E-02	5.11E-02	5.62E-02	5.78E-02	5.79E-02	5.75E-02	5.70E-02	5.66E-02	5.61E-02
7	0.60000	0.00	2.41E-02	3.33E-02	4.26E-02	4.98E-02	5.48E-02	5.64E-02	5.64E-02	5.59E-02	5.52E-02	5.45E-02	5.39E-02
6	0.50000	0.00	2.21E-02	3.12E-02	4.12E-02	4.85E-02	5.34E-02	5.51E-02	5.50E-02	5.43E-02	5.34E-02	5.24E-02	5.15E-02
5	0.40000	0.00	1.96E-02	2.89E-02	3.96E-02	4.72E-02	5.22E-02	5.38E-02	5.36E-02	5.26E-02	5.14E-02	5.01E-02	4.90E-02
4	0.30000	0.00	1.70E-02	2.64E-02	3.80E-02	4.59E-02	5.09E-02	5.24E-02	5.20E-02	5.08E-02	4.92E-02	4.76E-02	4.61E-02
3	0.20000	0.00	1.37E-02	2.35E-02	3.62E-02	4.45E-02	4.95E-02	5.10E-02	5.05E-02	4.88E-02	4.67E-02	4.47E-02	4.28E-02
2	0.10000	0.00	9.69E-03	1.99E-02	3.42E-02	4.31E-02	4.81E-02	4.95E-02	4.87E-02	4.64E-02	4.38E-02	4.12E-02	3.85E-02
1	0.00000	0.00	0.00	1.42E-02	3.14E-02	4.13E-02	4.66E-02	4.79E-02	4.65E-02	4.35E-02	3.98E-02	3.61E-02	3.20E-02

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J	Y											
11	1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.02E-02	6.03E-02	6.03E-02
9	0.80000	5.80E-02	5.79E-02	5.78E-02	5.78E-02	5.78E-02	5.78E-02	5.79E-02	5.79E-02	5.79E-02	5.79E-02	5.79E-02
8	0.70000	5.57E-02	5.55E-02	5.54E-02	5.53E-02	5.53E-02	5.53E-02	5.54E-02	5.54E-02	5.55E-02	5.55E-02	5.55E-02
7	0.60000	5.33E-02	5.30E-02	5.27E-02	5.26E-02	5.26E-02	5.26E-02	5.26E-02	5.27E-02	5.28E-02	5.28E-02	5.28E-02
6	0.50000	5.08E-02	5.02E-02	4.99E-02	4.97E-02	4.96E-02	4.96E-02	4.96E-02	4.96E-02	4.97E-02	4.98E-02	4.98E-02
5	0.40000	4.80E-02	4.72E-02	4.67E-02	4.64E-02	4.62E-02	4.61E-02	4.61E-02	4.61E-02	4.62E-02	4.62E-02	4.62E-02
4	0.30000	4.48E-02	4.38E-02	4.31E-02	4.26E-02	4.22E-02	4.20E-02	4.19E-02	4.19E-02	4.19E-02	4.20E-02	4.20E-02
3	0.20000	4.11E-02	3.96E-02	3.85E-02	3.77E-02	3.72E-02	3.69E-02	3.66E-02	3.65E-02	3.65E-02	3.66E-02	3.66E-02
2	0.10000	3.61E-02	3.40E-02	3.23E-02	3.09E-02	2.99E-02	2.92E-02	2.88E-02	2.85E-02	2.85E-02	2.85E-02	2.85E-02
1	0.00000	2.70E-02	2.03E-02	1.14E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS U VELOCITY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0 J	Y												

18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.40E 02	5.27E 02	5.11E 02	5.43E 02	7.31E 02	1.07E 03	1.32E 03	1.38E 03
17	0.42750	1.00E 00	1.00E 00	1.00E 00	8.03E 01	3.63E 02	4.62E 02	5.28E 02	6.55E 02	9.51E 02	1.34E 03	1.64E 03	1.74E 03
16	0.40625	1.00E 00	1.00E 00	1.00E 00	5.36E 02	5.30E 02	5.57E 02	6.40E 02	8.55E 02	1.22E 03	1.62E 03	1.92E 03	2.04E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	5.57E 02	5.32E 02	6.27E 02	8.11E 02	1.11E 03	1.49E 03	1.87E 03	2.17E 03	2.29E 03
14	0.36500	1.00E 00	1.00E 00	1.03E 02	3.32E 02	5.18E 02	7.51E 02	1.03E 03	1.37E 03	1.73E 03	2.09E 03	2.37E 03	2.50E 03
13	0.34625	1.00E 00	1.00E 00	5.37E 02	4.68E 02	6.59E 02	9.46E 02	1.26E 03	1.60E 03	1.94E 03	2.28E 03	2.55E 03	2.67E 03
12	0.32750	1.00E 00	1.00E 00	4.59E 02	4.33E 02	7.62E 02	1.14E 03	1.48E 03	1.80E 03	2.13E 03	2.46E 03	2.72E 03	2.83E 03
11	0.29750	1.00E 00	1.80E 02	1.95E 02	4.21E 02	9.88E 02	1.48E 03	1.78E 03	2.08E 03	2.41E 03	2.72E 03	2.96E 03	3.05E 03
10	0.27500	1.00E 00	5.11E 02	1.98E 02	5.36E 02	1.23E 03	1.66E 03	1.94E 03	2.25E 03	2.58E 03	2.89E 03	3.12E 03	3.20E 03
9	0.25750	1.00E 00	3.71E 02	1.33E 02	6.33E 02	1.39E 03	1.78E 03	2.05E 03	2.37E 03	2.70E 03	3.01E 03	3.23E 03	3.30E 03
8	0.24250	1.00E 00	7.47E 00	1.18E 02	7.47E 02	1.52E 03	1.87E 03	2.14E 03	2.46E 03	2.80E 03	3.10E 03	3.31E 03	3.39E 03
7	0.21500	1.00E 00	7.83E 00	1.71E 02	9.67E 02	1.74E 03	2.03E 03	2.30E 03	2.62E 03	2.96E 03	3.26E 03	3.46E 03	3.51E 03
6	0.17500	1.00E 00	8.97E 00	3.02E 02	1.44E 03	2.01E 03	2.27E 03	2.52E 03	2.84E 03	3.17E 03	3.45E 03	3.63E 03	3.66E 03
5	0.13000	1.00E 00	1.28E 01	6.09E 02	1.66E 03	2.31E 03	2.52E 03	2.76E 03	3.06E 03	3.37E 03	3.62E 03	3.77E 03	3.79E 03
4	0.08500	1.00E 00	2.63E 01	1.43E 03	2.04E 03	2.56E 03	2.75E 03	2.98E 03	3.26E 03	3.54E 03	3.77E 03	3.89E 03	3.88E 03
3	0.04500	1.00E 00	7.83E 01	1.50E 03	2.38E 03	2.74E 03	2.92E 03	3.15E 03	3.41E 03	3.68E 03	3.89E 03	3.99E 03	3.97E 03
2	0.01250	1.00E 00	1.25E 02	1.90E 03	2.62E 03	2.87E 03	3.04E 03	3.28E 03	3.56E 03	3.83E 03	4.03E 03	4.12E 03	4.08E 03
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.197	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	2.31E 01	2.22E 01	2.13E 01	2.03E 01	1.95E 01	1.88E 01	1.82E 01	1.78E 01	1.73E 01	1.74E 01	1.00E 00	
19	0.47500	6.41E 02	5.46E 02	4.44E 02	3.50E 02	2.71E 02	2.10E 02	1.67E 02	1.39E 02	1.21E 02	1.54E 02	1.00E 00	
18	0.44750	1.30E 03	1.15E 03	9.68E 02	7.92E 02	6.37E 02	5.09E 02	4.14E 02	3.47E 02	2.99E 02	3.87E 02	1.00E 00	
17	0.42750	1.67E 03	1.50E 03	1.29E 03	1.08E 03	8.89E 02	7.30E 02	6.08E 02	5.19E 02	4.55E 02	5.77E 02	1.00E 00	
16	0.40625	1.98E 03	1.81E 03	1.58E 03	1.35E 03	1.13E 03	9.46E 02	8.03E 02	6.98E 02	6.21E 02	7.69E 02	1.00E 00	
15	0.38500	2.24E 03	2.06E 03	1.83E 03	1.57E 03	1.34E 03	1.14E 03	9.79E 02	8.61E 02	7.75E 02	9.40E 02	1.00E 00	
14	0.36500	2.45E 03	2.27E 03	2.02E 03	1.76E 03	1.51E 03	1.30E 03	1.13E 03	9.99E 02	9.05E 02	1.08E 03	1.00E 00	
13	0.34625	2.62E 03	2.43E 03	2.18E 03	1.91E 03	1.65E 03	1.43E 03	1.25E 03	1.11E 03	1.01E 03	1.19E 03	1.00E 00	
12	0.32750	2.77E 03	2.58E 03	2.32E 03	2.04E 03	1.78E 03	1.54E 03	1.35E 03	1.21E 03	1.11E 03	1.29E 03	1.00E 00	
11	0.29750	2.98E 03	2.78E 03	2.51E 03	2.22E 03	1.94E 03	1.70E 03	1.50E 03	1.35E 03	1.24E 03	1.43E 03	1.00E 00	
10	0.27500	3.12E 03	2.91E 03	2.63E 03	2.33E 03	2.04E 03	1.79E 03	1.59E 03	1.44E 03	1.32E 03	1.51E 03	1.00E 00	
9	0.25750	3.21E 03	3.00E 03	2.71E 03	2.41E 03	2.11E 03	1.86E 03	1.65E 03	1.49E 03	1.38E 03	1.56E 03	1.00E 00	
8	0.24250	3.29E 03	3.06E 03	2.77E 03	2.46E 03	2.17E 03	1.91E 03	1.69E 03	1.54E 03	1.42E 03	1.60E 03	1.00E 00	
7	0.21500	3.41E 03	3.17E 03	2.88E 03	2.55E 03	2.25E 03	1.98E 03	1.77E 03	1.60E 03	1.48E 03	1.66E 03	1.00E 00	
6	0.17500	3.54E 03	3.30E 03	3.00E 03	2.66E 03	2.35E 03	2.07E 03	1.85E 03	1.68E 03	1.55E 03	1.72E 03	1.00E 00	
5	0.13000	3.65E 03	3.40E 03	3.09E 03	2.75E 03	2.43E 03	2.14E 03	1.91E 03	1.74E 03	1.61E 03	1.77E 03	1.00E 00	
4	0.08500	3.74E 03	3.48E 03	3.16E 03	2.82E 03	2.49E 03	2.19E 03	1.96E 03	1.78E 03	1.65E 03	1.81E 03	1.00E 00	
3	0.04500	3.81E 03	3.54E 03	3.21E 03	2.87E 03	2.53E 03	2.23E 03	1.99E 03	1.81E 03	1.68E 03	1.84E 03	1.00E 00	
2	0.01250	3.90E 03	3.62E 03	3.27E 03	2.91E 03	2.57E 03	2.26E 03	2.01E 03	1.83E 03	1.69E 03	1.87E 03	1.00E 00	
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	2.035E-02
3	9.443E-02	1.345E-02
4	1.643E-01	8.365E-03
5	2.419E-01	4.516E-03

18	0.05594	0.00	0.00	0.00	0.00	1.71E 03	1.82E 03	1.77E 03	1.78E 03	1.80E 03	1.81E 03	1.82E 03	1.82E 03	
17	0.05344	0.00	0.00	0.00	1.79E 03	1.69E 03	1.75E 03	1.72E 03	1.74E 03	1.76E 03	1.78E 03	1.78E 03	1.77E 03	
16	0.05078	0.00	0.00	0.00	1.66E 03	1.67E 03	1.67E 03	1.67E 03	1.70E 03	1.72E 03	1.73E 03	1.73E 03	1.72E 03	
15	0.04812	0.00	0.00	0.00	1.47E 03	1.61E 03	1.59E 03	1.61E 03	1.65E 03	1.67E 03	1.68E 03	1.68E 03	1.67E 03	
14	0.04562	0.00	0.00	1.96E 03	1.46E 03	1.52E 03	1.51E 03	1.55E 03	1.60E 03	1.62E 03	1.63E 03	1.62E 03	1.61E 03	
13	0.04328	0.00	0.00	1.74E 03	1.49E 03	1.43E 03	1.43E 03	1.49E 03	1.54E 03	1.57E 03	1.57E 03	1.57E 03	1.56E 03	
12	0.04094	0.00	0.00	1.43E 03	1.45E 03	1.36E 03	1.37E 03	1.43E 03	1.48E 03	1.51E 03	1.51E 03	1.51E 03	1.51E 03	
11	0.03719	0.00	1.80E 03	1.32E 03	1.29E 03	1.23E 03	1.26E 03	1.33E 03	1.38E 03	1.40E 03	1.42E 03	1.42E 03	1.42E 03	
10	0.03437	0.00	1.40E 03	1.29E 03	1.19E 03	1.14E 03	1.19E 03	1.25E 03	1.29E 03	1.32E 03	1.34E 03	1.35E 03	1.35E 03	
9	0.03219	0.00	1.00E 03	1.21E 03	1.11E 03	1.09E 03	1.13E 03	1.18E 03	1.22E 03	1.25E 03	1.28E 03	1.29E 03	1.30E 03	
8	0.03031	0.00	8.17E 02	1.11E 03	1.06E 03	1.04E 03	1.08E 03	1.12E 03	1.16E 03	1.20E 03	1.22E 03	1.24E 03	1.26E 03	
7	0.02687	0.00	7.97E 02	9.79E 02	9.60E 02	9.57E 02	9.82E 02	1.02E 03	1.05E 03	1.09E 03	1.13E 03	1.16E 03	1.18E 03	
6	0.02187	0.00	7.06E 02	8.19E 02	8.11E 02	8.26E 02	8.44E 02	8.69E 02	9.05E 02	9.48E 02	9.94E 02	1.04E 03	1.08E 03	
5	0.01625	0.00	5.58E 02	6.47E 02	6.75E 02	6.86E 02	7.04E 02	7.27E 02	7.62E 02	8.10E 02	8.66E 02	9.24E 02	9.78E 02	
4	0.01062	0.00	3.73E 02	4.81E 02	5.22E 02	5.66E 02	5.93E 02	6.18E 02	6.54E 02	7.05E 02	7.69E 02	8.37E 02	9.03E 02	
3	0.00562	0.00	1.30E 02	4.00E 02	4.42E 02	4.94E 02	5.28E 02	5.57E 02	5.93E 02	6.46E 02	7.13E 02	7.87E 02	8.59E 02	
2	0.00156	0.00	0.00	3.09E 02	4.06E 02	4.66E 02	5.04E 02	5.34E 02	5.71E 02	6.24E 02	6.93E 02	7.69E 02	8.43E 02	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		1.93E 03	1.94E 03	1.93E 03	1.93E 03	1.91E 03	1.90E 03	1.89E 03	1.87E 03	1.86E 03	1.85E 03	0.00
19	0.05937		1.89E 03	1.89E 03	1.88E 03	1.87E 03	1.86E 03	1.85E 03	1.84E 03	1.83E 03	1.82E 03	1.80E 03	0.00
18	0.05594		1.82E 03	1.81E 03	1.81E 03	1.80E 03	1.79E 03	1.78E 03	1.77E 03	1.76E 03	1.75E 03	1.74E 03	0.00
17	0.05344		1.77E 03	1.76E 03	1.75E 03	1.74E 03	1.74E 03	1.73E 03	1.72E 03	1.71E 03	1.70E 03	1.69E 03	0.00
16	0.05078		1.71E 03	1.70E 03	1.70E 03	1.69E 03	1.68E 03	1.67E 03	1.66E 03	1.66E 03	1.65E 03	1.64E 03	0.00
15	0.04812		1.66E 03	1.65E 03	1.64E 03	1.63E 03	1.62E 03	1.62E 03	1.61E 03	1.61E 03	1.60E 03	1.60E 03	0.00
14	0.04562		1.60E 03	1.59E 03	1.59E 03	1.58E 03	1.57E 03	1.57E 03	1.57E 03	1.56E 03	1.56E 03	1.56E 03	0.00
13	0.04328		1.55E 03	1.54E 03	1.54E 03	1.53E 03	1.53E 03	1.53E 03	1.52E 03	1.52E 03	1.52E 03	1.52E 03	0.00
12	0.04094		1.50E 03	1.50E 03	1.49E 03	1.49E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	1.48E 03	0.00
11	0.03719		1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.42E 03	1.43E 03	1.43E 03	0.00
10	0.03437		1.36E 03	1.36E 03	1.36E 03	1.37E 03	1.37E 03	1.38E 03	1.38E 03	1.38E 03	1.39E 03	1.39E 03	0.00
9	0.03219		1.31E 03	1.32E 03	1.32E 03	1.33E 03	1.34E 03	1.34E 03	1.35E 03	1.35E 03	1.36E 03	1.36E 03	0.00
8	0.03031		1.27E 03	1.28E 03	1.29E 03	1.30E 03	1.31E 03	1.32E 03	1.32E 03	1.33E 03	1.34E 03	1.34E 03	0.00
7	0.02687		1.20E 03	1.22E 03	1.24E 03	1.25E 03	1.26E 03	1.27E 03	1.28E 03	1.29E 03	1.30E 03	1.31E 03	0.00
6	0.02187		1.11E 03	1.14E 03	1.16E 03	1.18E 03	1.20E 03	1.21E 03	1.23E 03	1.24E 03	1.25E 03	1.26E 03	0.00
5	0.01625		1.03E 03	1.06E 03	1.10E 03	1.12E 03	1.14E 03	1.16E 03	1.18E 03	1.19E 03	1.21E 03	1.22E 03	0.00
4	0.01062		9.60E 02	1.01E 03	1.05E 03	1.08E 03	1.10E 03	1.13E 03	1.15E 03	1.16E 03	1.18E 03	1.19E 03	0.00
3	0.00562		9.23E 02	9.76E 02	1.02E 03	1.05E 03	1.08E 03	1.11E 03	1.13E 03	1.15E 03	1.16E 03	1.18E 03	0.00
2	0.00156		9.09E 02	9.64E 02	1.01E 03	1.04E 03	1.07E 03	1.10E 03	1.12E 03	1.14E 03	1.16E 03	1.17E 03	0.00
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- PRESSURE -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	6.52E-02	5.45E-02	9.12E-02	9.98E-02	9.74E-02	9.71E-02	1.02E-01	1.09E-01
19	0.05937		0.00	0.00	0.00	0.00	7.20E-02	5.54E-02	8.96E-02	9.64E-02	9.28E-02	9.03E-02	9.16E-02	9.43E-02
18	0.05594		0.00	0.00	0.00	0.00	9.12E-02	6.02E-02	8.93E-02	9.24E-02	8.62E-02	8.02E-02	7.64E-02	7.39E-02
17	0.05344		0.00	0.00	0.00	9.33E-03	8.24E-02	7.07E-02	9.01E-02	8.88E-02	8.02E-02	7.18E-02	6.44E-02	5.88E-02
16	0.05078		0.00	0.00	0.00	3.35E-02	6.79E-02	7.95E-02	8.99E-02	8.42E-02	7.26E-02	6.17E-02	5.10E-02	4.24E-02
15	0.04812		0.00	0.00	0.00	6.16E-02	6.35E-02	8.34E-02	8.72E-02	7.72E-02	6.28E-02	4.99E-02	3.65E-02	2.57E-02
14	0.04562		0.00	0.00	-8.75E-02	4.57E-02	6.17E-02	8.19E-02	8.08E-02	6.79E-02	5.12E-02	3.68E-02	2.21E-02	9.93E-03

12	0.32750	0.00	0.00	1.18E 00	9.56E-01	8.34E-01	8.58E-01	9.32E-01	9.77E-01	9.87E-01	9.75E-01	9.53E-01	9.31E-01
11	0.29750	0.00	1.58E 00	1.26E 00	9.45E-01	8.19E-01	8.80E-01	9.59E-01	9.91E-01	9.87E-01	9.61E-01	9.28E-01	8.95E-01
10	0.27500	0.00	1.66E 00	1.23E 00	8.91E-01	8.00E-01	8.87E-01	9.59E-01	9.83E-01	9.70E-01	9.38E-01	8.99E-01	8.60E-01
9	0.25750	0.00	1.77E 00	1.22E 00	8.56E-01	7.92E-01	8.83E-01	9.48E-01	9.64E-01	9.47E-01	9.12E-01	8.70E-01	8.28E-01
8	0.24250	2.48E 00	1.88E 00	1.20E 00	8.26E-01	7.87E-01	8.73E-01	9.28E-01	9.41E-01	9.21E-01	8.84E-01	8.41E-01	7.97E-01
7	0.21500	2.48E 00	1.83E 00	1.13E 00	7.81E-01	7.71E-01	8.34E-01	8.73E-01	8.80E-01	8.59E-01	8.22E-01	7.79E-01	7.34E-01
6	0.17500	2.48E 00	1.72E 00	1.01E 00	6.86E-01	7.09E-01	7.36E-01	7.54E-01	7.57E-01	7.39E-01	7.07E-01	6.68E-01	6.26E-01
5	0.13000	2.48E 00	1.57E 00	8.15E-01	5.81E-01	5.81E-01	5.81E-01	5.85E-01	5.85E-01	5.73E-01	5.50E-01	5.19E-01	4.84E-01
4	0.08500	2.48E 00	1.36E 00	5.16E-01	4.32E-01	4.08E-01	3.96E-01	3.93E-01	3.93E-01	3.86E-01	3.72E-01	3.51E-01	3.27E-01
3	0.04500	2.48E 00	1.03E 00	2.55E-01	2.43E-01	2.25E-01	2.16E-01	2.13E-01	2.12E-01	2.09E-01	2.02E-01	1.91E-01	1.77E-01
2	0.01250	2.48E 00	2.86E-01	7.07E-02	6.75E-02	6.26E-02	5.99E-02	5.91E-02	5.89E-02	5.81E-02	5.61E-02	5.29E-02	4.92E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	9.98E-01	1.04E 00	1.06E 00	1.06E 00	1.05E 00	1.03E 00	9.98E-01	9.69E-01	9.41E-01	9.28E-01	0.00
19	0.47500	1.03E 00	1.06E 00	1.08E 00	1.09E 00	1.08E 00	1.07E 00	1.06E 00	1.04E 00	1.02E 00	1.00E 00	0.00
18	0.44750	1.02E 00	1.05E 00	1.06E 00	1.06E 00	1.06E 00	1.05E 00	1.03E 00	1.02E 00	1.00E 00	9.84E-01	0.00
17	0.42750	1.01E 00	1.03E 00	1.03E 00	1.03E 00	1.03E 00	1.01E 00	1.00E 00	9.86E-01	9.71E-01	9.53E-01	0.00
16	0.40625	9.94E-01	1.00E 00	1.00E 00	9.98E-01	9.89E-01	9.76E-01	9.62E-01	9.47E-01	9.32E-01	9.15E-01	0.00
15	0.38500	9.76E-01	9.76E-01	9.71E-01	9.62E-01	9.49E-01	9.35E-01	9.20E-01	9.04E-01	8.89E-01	8.72E-01	0.00
14	0.36500	9.56E-01	9.48E-01	9.38E-01	9.25E-01	9.10E-01	8.95E-01	8.78E-01	8.62E-01	8.47E-01	8.31E-01	0.00
13	0.34625	9.35E-01	9.20E-01	9.05E-01	8.89E-01	8.72E-01	8.55E-01	8.38E-01	8.22E-01	8.06E-01	7.91E-01	0.00
12	0.32750	9.10E-01	8.90E-01	8.70E-01	8.51E-01	8.33E-01	8.15E-01	7.97E-01	7.81E-01	7.65E-01	7.50E-01	0.00
11	0.29750	8.64E-01	8.36E-01	8.11E-01	7.88E-01	7.67E-01	7.48E-01	7.30E-01	7.13E-01	6.98E-01	6.84E-01	0.00
10	0.27500	8.24E-01	7.91E-01	7.63E-01	7.38E-01	7.16E-01	6.96E-01	6.78E-01	6.62E-01	6.47E-01	6.33E-01	0.00
9	0.25750	7.89E-01	7.54E-01	7.24E-01	6.98E-01	6.75E-01	6.56E-01	6.37E-01	6.21E-01	6.07E-01	5.94E-01	0.00
8	0.24250	7.56E-01	7.20E-01	6.89E-01	6.63E-01	6.40E-01	6.20E-01	6.02E-01	5.87E-01	5.72E-01	5.60E-01	0.00
7	0.21500	6.92E-01	6.54E-01	6.22E-01	5.96E-01	5.73E-01	5.54E-01	5.37E-01	5.22E-01	5.09E-01	4.97E-01	0.00
6	0.17500	5.86E-01	5.49E-01	5.19E-01	4.94E-01	4.73E-01	4.56E-01	4.41E-01	4.28E-01	4.16E-01	4.06E-01	0.00
5	0.13000	4.51E-01	4.20E-01	3.94E-01	3.73E-01	3.56E-01	3.42E-01	3.30E-01	3.20E-01	3.10E-01	3.03E-01	0.00
4	0.08500	3.03E-01	2.81E-01	2.63E-01	2.48E-01	2.36E-01	2.26E-01	2.18E-01	2.11E-01	2.04E-01	1.99E-01	0.00
3	0.04500	1.64E-01	1.52E-01	1.42E-01	1.33E-01	1.27E-01	1.21E-01	1.17E-01	1.13E-01	1.09E-01	1.06E-01	0.00
2	0.01250	4.55E-02	4.22E-02	3.94E-02	3.71E-02	3.52E-02	3.37E-02	3.24E-02	3.13E-02	3.04E-02	2.96E-02	0.00
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAMLINE COORDS -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0 J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	0.00	2.37E-01	3.12E-01	3.75E-01	4.37E-01	4.79E-01	4.87E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01
9	0.80000	0.00	2.23E-01	2.89E-01	3.58E-01	4.18E-01	4.64E-01	4.74E-01	4.75E-01	4.73E-01	4.71E-01	4.69E-01	4.66E-01
8	0.70000	0.00	2.09E-01	2.76E-01	3.48E-01	4.08E-01	4.50E-01	4.63E-01	4.63E-01	4.61E-01	4.57E-01	4.53E-01	4.49E-01
7	0.60000	0.00	1.93E-01	2.59E-01	3.37E-01	3.97E-01	4.38E-01	4.51E-01	4.52E-01	4.48E-01	4.43E-01	4.37E-01	4.31E-01
6	0.50000	0.00	1.77E-01	2.41E-01	3.24E-01	3.86E-01	4.27E-01	4.41E-01	4.40E-01	4.35E-01	4.28E-01	4.20E-01	4.12E-01
5	0.40000	0.00	1.57E-01	2.23E-01	3.10E-01	3.75E-01	4.16E-01	4.30E-01	4.29E-01	4.21E-01	4.12E-01	4.01E-01	3.91E-01
4	0.30000	0.00	1.36E-01	2.02E-01	2.96E-01	3.63E-01	4.05E-01	4.19E-01	4.16E-01	4.07E-01	3.94E-01	3.81E-01	3.68E-01
3	0.20000	0.00	1.10E-01	1.79E-01	2.79E-01	3.51E-01	3.94E-01	4.08E-01	4.04E-01	3.91E-01	3.74E-01	3.57E-01	3.41E-01
2	0.10000	0.00	7.75E-02	1.48E-01	2.59E-01	3.38E-01	3.81E-01	3.95E-01	3.89E-01	3.71E-01	3.50E-01	3.28E-01	3.05E-01
1	0.00000	0.00	0.00	9.81E-02	2.32E-01	3.21E-01	3.68E-01	3.81E-01	3.71E-01	3.47E-01	3.15E-01	2.84E-01	2.48E-01

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0 J	Y											

```
0          0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
  X  0.00  0.........+.........+.2.......+4.......6+....8....1.........+.........+.........+.........+.........  0.00
  X  0.02  .                   0                 2         4         6     8   1                                 .  0.02
  X  0.04  .                                               0           2     4     6     8   1                   .  0.04
  X  0.06  .                                                           0     2     4     6     8   1           .  0.06
  X  0.08  .                                                                 0     2     4     6     8     1  0.08
  X  0.10  +                                                                       0     2     4     6     8  1  0.10
  X  0.12  .                                                                 0           2     4     6     8  1  0.12
  X  0.14  .                                                                       0           2     4     6  8  1  0.14
  X  0.16  .                                                                                                    .  0.16
  X  0.18  .                                                                       0           2           4     6  8  1  0.18
  X  0.20  +                                                                                                    +  0.20
  X  0.22  .                                                                             0           2           4     6  8  1  0.22
  X  0.24  .                                                                                                    .  0.24
  X  0.26  .                                                         0                       2           4     6  8  1  0.26
  X  0.28  .                                                                                                    .  0.28
  X  0.30  +                                         0                             2           4     6  8  1     0.30
  X  0.32  .                                                                                                    .  0.32
  X  0.34  .                               0                               2           4     6  8  1           0.34
  X  0.36  .                                                                                                    .  0.36
  X  0.38  .                                                                                                    .  0.38
  X  0.40  +          0                                          2           4     6  8  1                 0.40
  X  0.42  .                                                                                                    .  0.42
  X  0.44  .                                                                                                    .  0.44
  X  0.46  0                                                   2           4     6  8  1                       0.46
  X  0.48  .                                                                                                    .  0.48
  X  0.50  +                                                                                                    +  0.50
```

```
  2 0.00156 -3.73E 00-2.00E 00-6.43E-01 3.56E-01 1.06E 00 1.55E 00 1.87E 00 2.06E 00 2.14E 00 2.17E 00 2.17E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                        V   VELOCITY              -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 1.34E 00 1.09E 00 1.23E-01-1.20E-01-1.19E-01-9.00E-02-6.94E-02-4.58E-02
 19 0.05766      0.00     0.00     0.00     0.00 5.05E 00 2.30E 00 1.58E-01-4.02E-01-3.95E-01-3.03E-01-2.21E-01-1.42E-01
 18 0.05469      0.00     0.00     0.00     0.00 1.06E 01 2.98E 00-1.11E-01-8.67E-01-7.92E-01-5.78E-01-4.01E-01-2.56E-01
 17 0.05211      0.00     0.00     0.00 6.99E 00 1.04E 01 2.97E 00-5.85E-01-1.39E 00-1.18E 00-8.26E-01-5.62E-01-3.61E-01
 16 0.04945      0.00     0.00     0.00 1.39E 01 1.09E 01 2.77E 00-1.16E 00-1.92E 00-1.54E 00-1.06E 00-7.19E-01-4.69E-01
 15 0.04687      0.00     0.00     0.00 2.13E 01 1.10E 01 2.17E 00-1.78E 00-2.35E 00-1.80E 00-1.24E 00-8.53E-01-5.69E-01
 14 0.04445      0.00     0.00 1.05E 01 1.98E 01 1.01E 01 1.27E 00-2.31E 00-2.61E 00-1.96E 00-1.36E 00-9.60E-01-6.55E-01
 13 0.04211      0.00     0.00 1.88E 01 1.96E 01 9.01E 00 4.56E-01-2.62E 00-2.71E 00-2.03E 00-1.44E 00-1.05E 00-7.29E-01
 12 0.03906      0.00     0.00 2.91E 01 1.94E 01 7.19E 00-5.49E-01-2.77E 00-2.67E 00-2.03E 00-1.50E 00-1.13E 00-8.13E-01
 11 0.03578      0.00 1.47E 01 2.76E 01 1.74E 01 4.19E 00-1.13E 00-2.51E 00-2.42E 00-1.93E 00-1.51E 00-1.18E 00-8.72E-01
 10 0.03328      0.00 2.32E 01 2.82E 01 1.53E 01 2.54E 00-1.19E 00-2.20E 00-2.17E 00-1.82E 00-1.48E 00-1.19E 00-9.00E-01
  9 0.03125      0.00 3.02E 01 2.86E 01 1.32E 01 1.50E 00-1.13E 00-1.91E 00-1.95E 00-1.70E 00-1.44E 00-1.19E 00-9.12E-01
  8 0.02859      0.00 3.00E 01 2.83E 01 1.02E 01 3.85E-01-9.95E-01-1.53E 00-1.66E 00-1.55E 00-1.37E 00-1.17E 00-9.15E-01
  7 0.02437      0.00 3.02E 01 2.62E 01 4.82E 00-4.96E-01-7.57E-01-1.00E 00-1.21E 00-1.27E 00-1.23E 00-1.09E 00-8.83E-01
  6 0.01906      0.00 3.07E 01 1.99E 01-4.38E-01-8.14E-01-5.47E-01-5.61E-01-7.59E-01-9.35E-01-9.95E-01-9.33E-01-7.76E-01
  5 0.01344      0.00 2.99E 01 8.25E 00-1.38E 00-8.16E-01-4.01E-01-2.96E-01-4.28E-01-6.09E-01-7.10E-01-7.00E-01-5.96E-01
  4 0.00812      0.00 2.41E 01-8.87E-02-1.08E 00-5.96E-01-2.62E-01-1.52E-01-2.21E-01-3.47E-01-4.29E-01-4.37E-01-3.79E-01
  3 0.00359      0.00 1.24E 01-1.51E 00-5.92E-01-2.89E-01-1.21E-01-6.29E-02-9.09E-02-1.49E-01-1.89E-01-1.96E-01-1.71E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062 -2.23E-02-6.42E-03 1.30E-03 3.88E-03 3.98E-03 2.83E-03 2.62E-03 2.21E-03 3.36E-03 1.03E-05     0.00
 19 0.05766 -7.36E-02-2.81E-02-4.25E-03 6.08E-03 9.52E-03 9.26E-03 1.01E-02 9.83E-03 9.28E-03-5.58E-06     0.00
 18 0.05469 -1.40E-01-6.39E-02-2.17E-02-1.41E-03 7.35E-03 9.89E-03 1.30E-02 1.38E-02 1.30E-02-2.47E-05     0.00
 17 0.05211 -2.06E-01-1.02E-01-4.31E-02-1.30E-02 1.36E-03 7.20E-03 1.29E-02 1.50E-02 1.50E-02-3.44E-05     0.00
 16 0.04945 -2.77E-01-1.47E-01-7.01E-02-2.93E-02-8.27E-03 1.73E-03 1.05E-02 1.42E-02 1.58E-02-3.57E-05     0.00
 15 0.04687 -3.47E-01-1.93E-01-9.97E-02-4.79E-02-1.99E-02-5.37E-03 6.65E-03 1.22E-02 1.55E-02-2.98E-05     0.00
 14 0.04445 -4.10E-01-2.37E-01-1.29E-01-6.68E-02-3.21E-02-1.30E-02 2.17E-03 9.54E-03 1.47E-02-2.05E-05     0.00
 13 0.04211 -4.68E-01-2.78E-01-1.57E-01-8.56E-02-4.44E-02-2.09E-02-2.61E-03 6.57E-03 1.34E-02-1.13E-05     0.00
 12 0.03906 -5.37E-01-3.29E-01-1.93E-01-1.10E-01-6.04E-02-3.12E-02-9.09E-03 2.42E-03 1.14E-02-3.43E-06     0.00
 11 0.03578 -5.92E-01-3.74E-01-2.25E-01-1.32E-01-7.56E-02-4.11E-02-1.56E-02-1.92E-03 8.84E-03-6.02E-06     0.00
 10 0.03328 -6.22E-01-4.00E-01-2.45E-01-1.47E-01-8.54E-02-4.76E-02-2.00E-02-4.95E-03 6.91E-03-1.49E-05     0.00
  9 0.03125 -6.39E-01-4.16E-01-2.58E-01-1.56E-01-9.21E-02-5.21E-02-2.31E-02-7.14E-03 5.39E-03-2.59E-05     0.00
  8 0.02859 -6.52E-01-4.31E-01-2.71E-01-1.66E-01-9.92E-02-5.69E-02-2.66E-02-9.70E-03 3.47E-03-4.14E-05     0.00
  7 0.02437 -6.44E-01-4.35E-01-2.79E-01-1.73E-01-1.05E-01-6.11E-02-3.02E-02-1.26E-02 8.71E-04-5.89E-05     0.00
  6 0.01906 -5.79E-01-3.99E-01-2.60E-01-1.63E-01-1.00E-01-5.90E-02-3.03E-02-1.38E-02-1.28E-03-6.39E-05     0.00
  5 0.01344 -4.53E-01-3.16E-01-2.08E-01-1.32E-01-8.15E-02-4.84E-02-2.54E-02-1.21E-02-2.14E-03-5.21E-05     0.00
  4 0.00812 -2.90E-01-2.05E-01-1.36E-01-8.63E-02-5.35E-02-3.19E-02-1.69E-02-8.22E-03-1.80E-03-3.23E-05     0.00
  3 0.00359 -1.32E-01-9.30E-02-6.18E-02-3.94E-02-2.45E-02-1.46E-02-7.80E-03-3.82E-03-9.11E-04-1.38E-05     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                          W VELOCITY              -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
```

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 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00     0.00 2.41E-01 4.58E-01 4.85E-01 4.56E-01 4.24E-01 3.97E-01 3.73E-01
 19 0.47500      0.00     0.00     0.00     0.00     0.00 4.07E-01 5.50E-01 5.53E-01 5.11E-01 4.65E-01 4.26E-01 3.95E-01
 18 0.44750      0.00     0.00     0.00     0.00     0.00 5.86E-01 6.55E-01 6.17E-01 5.49E-01 4.85E-01 4.37E-01 4.01E-01
 17 0.42750      0.00     0.00     0.00     0.00 8.13E-01 7.29E-01 7.06E-01 6.31E-01 5.47E-01 4.79E-01 4.31E-01 3.97E-01
 16 0.40625      0.00     0.00     0.00     0.00 7.38E-01 7.22E-01 6.72E-01 5.89E-01 5.11E-01 4.54E-01 4.15E-01 3.85E-01
 15 0.38500      0.00     0.00     0.00     0.00 7.63E-01 7.05E-01 5.97E-01 5.06E-01 4.51E-01 4.16E-01 3.90E-01 3.67E-01
 14 0.36500      0.00     0.00     0.00 1.17E 00 8.47E-01 6.37E-01 4.81E-01 4.09E-01 3.84E-01 3.72E-01 3.59E-01 3.44E-01
 13 0.34625      0.00     0.00     0.00 8.81E-01 7.11E-01 4.81E-01 3.43E-01 3.11E-01 3.19E-01 3.28E-01 3.26E-01 3.18E-01
 12 0.32750      0.00     0.00     0.00 7.73E-01 6.06E-01 3.34E-01 2.10E-01 2.18E-01 2.56E-01 2.81E-01 2.90E-01 2.89E-01
 11 0.29750      0.00     0.00 1.12E 00 7.85E-01 4.51E-01 8.72E-02 2.90E-02 9.17E-02 1.59E-01 2.02E-01 2.25E-01 2.35E-01
 10 0.27500      0.00     0.00 7.52E-01 5.95E-01 1.87E-01-7.11E-02-6.84E-02 1.29E-02 9.00E-02 1.42E-01 1.73E-01 1.92E-01
  9 0.25750      0.00     0.00 6.81E-01 4.97E-01 4.35E-02-1.52E-01-1.27E-01-4.12E-02 3.88E-02 9.54E-02 1.32E-01 1.57E-01
  8 0.24250      0.00 1.00E 00 7.17E-01 4.18E-01-4.63E-02-2.00E-01-1.67E-01-8.32E-02-3.43E-03 5.56E-02 9.70E-02 1.27E-01
  7 0.21500      0.00 1.00E 00 7.16E-01 2.94E-01-1.87E-01-2.58E-01-2.24E-01-1.51E-01-7.64E-02-1.55E-02 3.25E-02 7.09E-02
  6 0.17500      0.00 1.00E 00 6.55E-01 3.65E-02-2.98E-01-3.09E-01-2.82E-01-2.32E-01-1.71E-01-1.12E-01-5.69E-02-7.75E-03
  5 0.13000      0.00 1.00E 00 4.77E-01-3.37E-01-3.71E-01-3.54E-01-3.33E-01-3.02E-01-2.58E-01-2.03E-01-1.44E-01-8.56E-02
  4 0.08500      0.00 1.00E 00 5.64E-02-4.83E-01-4.30E-01-3.94E-01-3.72E-01-3.52E-01-3.20E-01-2.71E-01-2.11E-01-1.45E-01
  3 0.04500      0.00 1.00E 00-4.95E-01-5.44E-01-4.68E-01-4.19E-01-3.95E-01-3.79E-01-3.53E-01-3.08E-01-2.48E-01-1.79E-01
  2 0.01250      0.00 1.00E 00-8.17E-01-5.84E-01-4.83E-01-4.28E-01-4.03E-01-3.88E-01-3.65E-01-3.22E-01-2.61E-01-1.92E-01
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  1.17352  1.36209  1.57141  1.80376  2.06166  2.34793  2.66569  3.00001  3.33434  3.66866  4.00299
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500  3.56E-01 3.47E-01 3.44E-01 3.45E-01 3.47E-01 3.49E-01 3.51E-01 3.53E-01 3.55E-01 3.57E-01 3.57E-01
 19 0.47500  3.74E-01 3.61E-01 3.54E-01 3.53E-01 3.53E-01 3.55E-01 3.58E-01 3.62E-01 3.65E-01 3.68E-01 3.68E-01
 18 0.44750  3.77E-01 3.61E-01 3.51E-01 3.45E-01 3.43E-01 3.41E-01 3.42E-01 3.43E-01 3.44E-01 3.46E-01 3.46E-01
 17 0.42750  3.72E-01 3.55E-01 3.43E-01 3.36E-01 3.31E-01 3.28E-01 3.27E-01 3.26E-01 3.27E-01 3.27E-01 3.27E-01
 16 0.40625  3.62E-01 3.45E-01 3.32E-01 3.24E-01 3.17E-01 3.13E-01 3.10E-01 3.09E-01 3.08E-01 3.08E-01 3.08E-01
 15 0.38500  3.47E-01 3.31E-01 3.18E-01 3.09E-01 3.02E-01 2.97E-01 2.93E-01 2.91E-01 2.89E-01 2.89E-01 2.89E-01
 14 0.36500  3.28E-01 3.14E-01 3.02E-01 2.93E-01 2.86E-01 2.81E-01 2.77E-01 2.74E-01 2.72E-01 2.71E-01 2.71E-01
 13 0.34625  3.07E-01 2.96E-01 2.85E-01 2.77E-01 2.70E-01 2.65E-01 2.61E-01 2.58E-01 2.56E-01 2.55E-01 2.55E-01
 12 0.32750  2.83E-01 2.75E-01 2.67E-01 2.59E-01 2.53E-01 2.49E-01 2.45E-01 2.42E-01 2.40E-01 2.39E-01 2.39E-01
 11 0.29750  2.38E-01 2.37E-01 2.34E-01 2.29E-01 2.26E-01 2.22E-01 2.19E-01 2.17E-01 2.15E-01 2.14E-01 2.14E-01
 10 0.27500  2.02E-01 2.07E-01 2.07E-01 2.06E-01 2.04E-01 2.02E-01 2.01E-01 1.99E-01 1.97E-01 1.96E-01 1.96E-01
  9 0.25750  1.73E-01 1.82E-01 1.86E-01 1.88E-01 1.88E-01 1.87E-01 1.86E-01 1.85E-01 1.84E-01 1.82E-01 1.82E-01
  8 0.24250  1.48E-01 1.61E-01 1.68E-01 1.72E-01 1.73E-01 1.74E-01 1.74E-01 1.73E-01 1.72E-01 1.71E-01 1.71E-01
  7 0.21500  1.00E-01 1.21E-01 1.35E-01 1.43E-01 1.48E-01 1.51E-01 1.53E-01 1.53E-01 1.53E-01 1.52E-01 1.52E-01
  6 0.17500  3.35E-02 6.52E-02 8.78E-02 1.03E-01 1.14E-01 1.20E-01 1.24E-01 1.26E-01 1.27E-01 1.26E-01 1.26E-01
  5 0.13000 -3.31E-02 9.53E-03 4.15E-02 6.43E-02 8.01E-02 9.07E-02 9.75E-02 1.01E-01 1.03E-01 1.03E-01 1.03E-01
  4 0.08500 -8.45E-02-3.34E-02 5.95E-03 3.46E-02 5.47E-02 6.85E-02 7.75E-02 8.25E-02 8.48E-02 8.52E-02 8.52E-02
  3 0.04500 -1.14E-01-5.77E-02-1.41E-02 1.79E-02 4.06E-02 5.62E-02 6.65E-02 7.22E-02 7.50E-02 7.56E-02 7.56E-02
  2 0.01250 -1.24E-01-6.66E-02-2.14E-02 1.19E-02 3.54E-02 5.17E-02 6.25E-02 6.85E-02 7.15E-02 7.22E-02 7.22E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS V VELOCITY                -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J    Y
 21 0.50000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.48500      0.00     0.00     0.00     0.00 4.48E-02 3.65E-02 4.11E-03-4.00E-03-3.97E-03-3.00E-03-2.31E-03-1.53E-03
 19 0.46125      0.00     0.00     0.00     0.00 1.68E-01 7.67E-02 5.25E-03-1.34E-02-1.32E-02-1.01E-02-7.35E-03-4.73E-03
 18 0.43750      0.00     0.00     0.00     0.00 3.52E-01 9.94E-02-3.69E-03-2.89E-02-2.64E-02-1.93E-02-1.34E-02-8.53E-03
 17 0.41687      0.00     0.00     0.00 2.33E-01 3.48E-01 9.89E-02-1.95E-02-4.62E-02-3.93E-02-2.75E-02-1.87E-02-1.20E-02
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         6  3.280E-01  4.936E-03

         7  4.235E-01  4.870E-03

         8  5.296E-01  4.633E-03

         9  6.473E-01  4.670E-03

        10  7.780E-01  5.194E-03

        11  9.231E-01  5.865E-03

        12  1.084E 00  6.335E-03

        13  1.263E 00  6.524E-03

        14  1.461E 00  6.484E-03

        15  1.682E 00  6.304E-03

        16  1.926E 00  6.053E-03

        17  2.197E 00  5.773E-03

        18  2.499E 00  5.481E-03

        19  2.833E 00  5.199E-03

        20  3.167E 00  4.945E-03

        21  3.502E 00  4.720E-03

        22  3.836E 00  4.682E-03
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1X-AXIS IS XI
 Y-AXES ARE             00         02         04         06         08         10
 SYMBOL                  0          2          4          6          8          1
 MAXIMUM VALUES  0.384E 00  0.408E 00  0.430E 00  0.451E 00  0.475E 00  0.500E 00


                                                 RADIAL POSITION R/D

0         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X 0.00    0.........+2....4..6+.8..1....+.........+.........+.........+.........+.........+.........+.......... 0.00
 X 0.02    .          0       2   4   6 8 1                                                                    . 0.02
 X 0.04    .                        0   2  4 6 81                                                              . 0.04
 X 0.06    .                                0  2 4 6 8 1                                                       . 0.06
 X 0.08    .                                    0  2 4 6 8   1                                                 . 0.08
 X 0.10    +                                     0  2 4 6 8  1                                                 + 0.10
 X 0.12    .                                    0  2  4 6 8  1                                                 . 0.12
 X 0.14    .                                  0   2  4  6 8  1                                                 . 0.14
 X 0.16    .                                                                                                   . 0.16
 X 0.18    .                               0    2   4  6  8  1                                                 . 0.18
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13	0.04328	0.00	0.00	-6.61E-02	1.72E-02	5.72E-02	7.53E-02	7.09E-02	5.60E-02	3.80E-02	2.26E-02	7.67E-03	-5.82E-03
12	0.04094	0.00	0.00	-3.71E-02	2.07E-03	4.65E-02	6.32E-02	5.70E-02	4.09E-02	2.26E-02	7.22E-03	-7.41E-03	-2.18E-02
11	0.03719	0.00	-1.38E-01	-5.34E-02	-1.56E-02	2.05E-02	3.33E-02	2.64E-02	1.11E-02	-5.71E-03	-2.00E-02	-3.31E-02	-4.74E-02
10	0.03437	0.00	-1.26E-01	-7.56E-02	-3.24E-02	-6.32E-03	5.56E-03	-1.31E-03	-1.49E-02	-2.97E-02	-4.23E-02	-5.40E-02	-6.72E-02
9	0.03219	0.00	-1.20E-01	-8.99E-02	-4.86E-02	-3.24E-02	-2.00E-02	-2.49E-02	-3.68E-02	-5.02E-02	-6.10E-02	-7.10E-02	-8.28E-02
8	0.03031	0.00	-1.22E-01	-1.02E-01	-7.13E-02	-5.23E-02	-4.24E-02	-4.65E-02	-5.68E-02	-6.82E-02	-7.74E-02	-8.60E-02	-9.66E-02
7	0.02687	0.00	-1.45E-01	-1.33E-01	-1.07E-01	-9.40E-02	-8.70E-02	-8.90E-02	-9.49E-02	-1.01E-01	-1.07E-01	-1.12E-01	-1.20E-01
6	0.02187	0.00	-1.92E-01	-1.90E-01	-1.75E-01	-1.60E-01	-1.53E-01	-1.51E-01	-1.50E-01	-1.48E-01	-1.47E-01	-1.48E-01	-1.51E-01
5	0.01625	0.00	-2.41E-01	-2.50E-01	-2.34E-01	-2.31E-01	-2.22E-01	-2.14E-01	-2.04E-01	-1.95E-01	-1.87E-01	-1.81E-01	-1.80E-01
4	0.01062	0.00	-2.92E-01	-3.03E-01	-3.01E-01	-2.91E-01	-2.78E-01	-2.63E-01	-2.47E-01	-2.31E-01	-2.17E-01	-2.07E-01	-2.02E-01
3	0.00562	0.00	-3.37E-01	-3.41E-01	-3.41E-01	-3.29E-01	-3.11E-01	-2.91E-01	-2.71E-01	-2.52E-01	-2.35E-01	-2.21E-01	-2.14E-01
2	0.00156	0.00	-3.55E-01	-3.62E-01	-3.57E-01	-3.43E-01	-3.23E-01	-3.01E-01	-2.81E-01	-2.60E-01	-2.41E-01	-2.27E-01	-2.19E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.14E-01	1.17E-01	1.21E-01	1.28E-01	1.37E-01	1.46E-01	1.53E-01	1.55E-01	1.54E-01	1.54E-01	0.00
19	0.05937	9.70E-02	9.98E-02	1.03E-01	1.10E-01	1.20E-01	1.29E-01	1.36E-01	1.39E-01	1.38E-01	1.38E-01	0.00
18	0.05594	7.33E-02	7.43E-02	7.75E-02	8.35E-02	9.19E-02	1.00E-01	1.06E-01	1.08E-01	1.08E-01	1.06E-01	0.00
17	0.05344	5.60E-02	5.58E-02	5.80E-02	6.32E-02	7.03E-02	7.72E-02	8.16E-02	8.32E-02	8.24E-02	8.01E-02	0.00
16	0.05078	3.78E-02	3.60E-02	3.75E-02	4.14E-02	4.68E-02	5.21E-02	5.50E-02	5.56E-02	5.43E-02	5.15E-02	0.00
15	0.04812	1.93E-02	1.62E-02	1.69E-02	1.95E-02	2.33E-02	2.65E-02	2.75E-02	2.72E-02	2.57E-02	2.24E-02	0.00
14	0.04562	1.75E-03	-2.17E-03	-2.26E-03	-9.08E-04	1.11E-03	2.33E-03	1.61E-03	3.46E-04	-1.51E-03	-4.69E-03	0.00
13	0.04328	-1.47E-02	-1.93E-02	-2.00E-02	-1.99E-02	-1.96E-02	-2.04E-02	-2.25E-02	-2.45E-02	-2.69E-02	-2.95E-02	0.00
12	0.04094	-3.11E-02	-3.60E-02	-3.74E-02	-3.87E-02	-4.02E-02	-4.28E-02	-4.66E-02	-4.94E-02	-5.18E-02	-5.38E-02	0.00
11	0.03719	-5.66E-02	-6.23E-02	-6.47E-02	-6.80E-02	-7.26E-02	-7.86E-02	-8.43E-02	-8.80E-02	-9.02E-02	-9.11E-02	0.00
10	0.03437	-7.56E-02	-8.13E-02	-8.47E-02	-8.93E-02	-9.63E-02	-1.04E-01	-1.12E-01	-1.16E-01	-1.17E-01	-1.17E-01	0.00
9	0.03219	-9.05E-02	-9.60E-02	-1.00E-01	-1.05E-01	-1.14E-01	-1.23E-01	-1.32E-01	-1.36E-01	-1.38E-01	-1.37E-01	0.00
8	0.03031	-1.03E-01	-1.08E-01	-1.13E-01	-1.19E-01	-1.29E-01	-1.39E-01	-1.49E-01	-1.53E-01	-1.54E-01	-1.53E-01	0.00
7	0.02687	-1.25E-01	-1.30E-01	-1.35E-01	-1.42E-01	-1.54E-01	-1.67E-01	-1.77E-01	-1.82E-01	-1.82E-01	-1.79E-01	0.00
6	0.02187	-1.54E-01	-1.57E-01	-1.63E-01	-1.73E-01	-1.88E-01	-2.03E-01	-2.14E-01	-2.18E-01	-2.17E-01	-2.13E-01	0.00
5	0.01625	-1.81E-01	-1.83E-01	-1.90E-01	-2.01E-01	-2.19E-01	-2.35E-01	-2.46E-01	-2.50E-01	-2.48E-01	-2.44E-01	0.00
4	0.01062	-2.01E-01	-2.03E-01	-2.09E-01	-2.22E-01	-2.41E-01	-2.58E-01	-2.69E-01	-2.73E-01	-2.70E-01	-2.66E-01	0.00
3	0.00562	-2.12E-01	-2.14E-01	-2.21E-01	-2.34E-01	-2.53E-01	-2.71E-01	-2.82E-01	-2.85E-01	-2.82E-01	-2.78E-01	0.00
2	0.00156	-2.16E-01	-2.18E-01	-2.25E-01	-2.38E-01	-2.58E-01	-2.75E-01	-2.86E-01	-2.89E-01	-2.87E-01	-2.82E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- TURBULENCE ENERGY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	4.92E 00	4.78E 00	3.87E 00	3.30E 00	3.19E 00	3.71E 00	4.41E 00	4.73E 00
19	0.05937	0.00	0.00	0.00	0.00	2.73E 01	3.21E 01	2.55E 01	2.02E 01	1.84E 01	2.12E 01	2.49E 01	2.58E 01
18	0.05594	0.00	0.00	0.00	0.00	4.64E 01	3.93E 01	3.15E 01	2.69E 01	2.78E 01	3.36E 01	3.81E 01	3.80E 01
17	0.05344	0.00	0.00	0.00	1.52E 01	3.45E 01	3.36E 01	3.12E 01	3.12E 01	3.62E 01	4.28E 01	4.62E 01	4.48E 01
16	0.05078	0.00	0.00	0.00	5.50E 01	4.38E 01	3.76E 01	3.59E 01	3.98E 01	4.71E 01	5.29E 01	5.43E 01	5.11E 01
15	0.04812	0.00	0.00	0.00	5.60E 01	4.32E 01	4.06E 01	4.40E 01	5.17E 01	5.88E 01	6.23E 01	6.16E 01	5.67E 01
14	0.04562	0.00	0.00	2.37E 01	3.75E 01	4.11E 01	4.66E 01	5.52E 01	6.37E 01	6.88E 01	7.01E 01	6.75E 01	6.12E 01
13	0.04328	0.00	0.00	6.54E 01	4.39E 01	4.72E 01	5.57E 01	6.60E 01	7.34E 01	7.65E 01	7.61E 01	7.21E 01	6.48E 01
12	0.04094	0.00	0.00	4.54E 01	3.77E 01	5.19E 01	6.39E 01	7.45E 01	8.06E 01	8.23E 01	8.07E 01	7.59E 01	6.77E 01
11	0.03719	0.00	3.19E 01	2.70E 01	3.80E 01	6.48E 01	7.50E 01	8.31E 01	8.77E 01	8.83E 01	8.59E 01	8.02E 01	7.12E 01
10	0.03437	0.00	6.27E 01	2.69E 01	4.64E 01	7.36E 01	7.67E 01	8.43E 01	8.91E 01	9.01E 01	8.78E 01	8.20E 01	7.28E 01
9	0.03219	0.00	3.63E 01	2.00E 01	5.46E 01	7.46E 01	7.55E 01	8.32E 01	8.85E 01	9.01E 01	8.83E 01	8.27E 01	7.35E 01

```
 11 1.00000  5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01
 10 0.90000  4.82E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01 4.81E-01
  9 0.80000  4.64E-01 4.62E-01 4.61E-01 4.61E-01 4.61E-01 4.61E-01 4.61E-01 4.61E-01 4.62E-01 4.62E-01 4.62E-01
  8 0.70000  4.46E-01 4.43E-01 4.41E-01 4.41E-01 4.40E-01 4.40E-01 4.41E-01 4.41E-01 4.41E-01 4.42E-01 4.42E-01
  7 0.60000  4.26E-01 4.22E-01 4.20E-01 4.18E-01 4.18E-01 4.18E-01 4.18E-01 4.18E-01 4.18E-01 4.19E-01 4.19E-01
  6 0.50000  4.06E-01 4.00E-01 3.96E-01 3.94E-01 3.93E-01 3.93E-01 3.92E-01 3.93E-01 3.93E-01 3.94E-01 3.94E-01
  5 0.40000  3.83E-01 3.76E-01 3.71E-01 3.67E-01 3.65E-01 3.64E-01 3.64E-01 3.64E-01 3.64E-01 3.64E-01 3.64E-01
  4 0.30000  3.57E-01 3.48E-01 3.40E-01 3.35E-01 3.32E-01 3.30E-01 3.29E-01 3.29E-01 3.29E-01 3.29E-01 3.29E-01
  3 0.20000  3.26E-01 3.13E-01 3.03E-01 2.96E-01 2.91E-01 2.87E-01 2.85E-01 2.84E-01 2.84E-01 2.84E-01 2.84E-01
  2 0.10000  2.85E-01 2.66E-01 2.51E-01 2.39E-01 2.30E-01 2.24E-01 2.21E-01 2.19E-01 2.18E-01 2.18E-01 2.18E-01
  1 0.00000  2.00E-01 1.40E-01 2.29E-02     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS PRESSURE            -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J     Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00 6.86E 05 7.08E 05 6.86E 05 6.85E 05 6.94E 05 7.02E 05 7.09E 05 7.15E 05
 19 0.47500      0.00     0.00     0.00     0.00 6.70E 05 6.95E 05 6.76E 05 6.75E 05 6.84E 05 6.92E 05 6.97E 05 7.00E 05
 18 0.44750      0.00     0.00     0.00     0.00 6.36E 05 6.75E 05 6.57E 05 6.60E 05 6.68E 05 6.74E 05 6.77E 05 6.77E 05
 17 0.42750      0.00     0.00     0.00 6.67E 05 6.29E 05 6.50E 05 6.40E 05 6.47E 05 6.55E 05 6.60E 05 6.61E 05 6.60E 05
 16 0.40625      0.00     0.00     0.00 6.15E 05 6.22E 05 6.21E 05 6.20E 05 6.31E 05 6.40E 05 6.43E 05 6.42E 05 6.40E 05
 15 0.38500      0.00     0.00     0.00 5.47E 05 5.99E 05 5.90E 05 5.98E 05 6.12E 05 6.21E 05 6.24E 05 6.23E 05 6.20E 05
 14 0.36500      0.00     0.00 7.29E 05 5.44E 05 5.64E 05 5.60E 05 5.75E 05 5.93E 05 6.02E 05 6.04E 05 6.03E 05 6.00E 05
 13 0.34625      0.00     0.00 6.48E 05 5.55E 05 5.33E 05 5.33E 05 5.54E 05 5.73E 05 5.82E 05 5.84E 05 5.83E 05 5.80E 05
 12 0.32750      0.00     0.00 5.33E 05 5.38E 05 5.04E 05 5.08E 05 5.31E 05 5.50E 05 5.60E 05 5.63E 05 5.62E 05 5.60E 05
 11 0.29750      0.00 6.68E 05 4.90E 05 4.81E 05 4.57E 05 4.69E 05 4.93E 05 5.12E 05 5.21E 05 5.26E 05 5.28E 05 5.28E 05
 10 0.27500      0.00 5.19E 05 4.81E 05 4.41E 05 4.25E 05 4.41E 05 4.63E 05 4.80E 05 4.91E 05 4.97E 05 5.01E 05 5.03E 05
  9 0.25750      0.00 3.73E 05 4.48E 05 4.13E 05 4.04E 05 4.19E 05 4.38E 05 4.55E 05 4.66E 05 4.74E 05 4.80E 05 4.84E 05
  8 0.24250      0.00 3.04E 05 4.13E 05 3.94E 05 3.87E 05 4.00E 05 4.17E 05 4.32E 05 4.45E 05 4.54E 05 4.62E 05 4.68E 05
  7 0.21500      0.00 2.96E 05 3.64E 05 3.57E 05 3.56E 05 3.65E 05 3.78E 05 3.92E 05 4.06E 05 4.18E 05 4.30E 05 4.39E 05
  6 0.17500      0.00 2.63E 05 3.04E 05 3.01E 05 3.07E 05 3.14E 05 3.23E 05 3.36E 05 3.52E 05 3.69E 05 3.86E 05 4.01E 05
  5 0.13000      0.00 2.07E 05 2.41E 05 2.51E 05 2.55E 05 2.61E 05 2.70E 05 2.83E 05 3.01E 05 3.22E 05 3.43E 05 3.64E 05
  4 0.08500      0.00 1.39E 05 1.79E 05 1.94E 05 2.10E 05 2.20E 05 2.30E 05 2.43E 05 2.62E 05 2.86E 05 3.11E 05 3.35E 05
  3 0.04500      0.00 4.84E 04 1.49E 05 1.64E 05 1.84E 05 1.96E 05 2.07E 05 2.20E 05 2.40E 05 2.65E 05 2.93E 05 3.19E 05
  2 0.01250      0.00     0.00 1.15E 05 1.51E 05 1.73E 05 1.87E 05 1.98E 05 2.12E 05 2.32E 05 2.57E 05 2.86E 05 3.13E 05
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =     13       14       15       16       17       18       19       20       21       22       23
        X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J     Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500  7.18E 05 7.19E 05 7.18E 05 7.15E 05 7.11E 05 7.07E 05 7.01E 05 6.96E 05 6.91E 05 6.86E 05     0.00
 19 0.47500  7.01E 05 7.01E 05 6.99E 05 6.96E 05 6.93E 05 6.88E 05 6.84E 05 6.79E 05 6.75E 05 6.70E 05     0.00
 18 0.44750  6.76E 05 6.74E 05 6.72E 05 6.69E 05 6.65E 05 6.61E 05 6.57E 05 6.54E 05 6.50E 05 6.46E 05     0.00
 17 0.42750  6.57E 05 6.55E 05 6.52E 05 6.48E 05 6.45E 05 6.42E 05 6.38E 05 6.35E 05 6.32E 05 6.29E 05     0.00
 16 0.40625  6.37E 05 6.34E 05 6.30E 05 6.27E 05 6.24E 05 6.21E 05 6.18E 05 6.16E 05 6.14E 05 6.11E 05     0.00
 15 0.38500  6.16E 05 6.12E 05 6.09E 05 6.06E 05 6.04E 05 6.01E 05 5.99E 05 5.97E 05 5.95E 05 5.94E 05     0.00
 14 0.36500  5.96E 05 5.93E 05 5.90E 05 5.87E 05 5.85E 05 5.83E 05 5.82E 05 5.80E 05 5.79E 05 5.78E 05     0.00
 13 0.34625  5.77E 05 5.74E 05 5.72E 05 5.70E 05 5.68E 05 5.67E 05 5.66E 05 5.65E 05 5.65E 05 5.64E 05     0.00
 12 0.32750  5.58E 05 5.56E 05 5.54E 05 5.53E 05 5.52E 05 5.51E 05 5.51E 05 5.51E 05 5.51E 05 5.51E 05     0.00
 11 0.29750  5.27E 05 5.27E 05 5.26E 05 5.27E 05 5.27E 05 5.28E 05 5.28E 05 5.29E 05 5.30E 05 5.31E 05     0.00
 10 0.27500  5.05E 05 5.06E 05 5.07E 05 5.08E 05 5.09E 05 5.11E 05 5.13E 05 5.14E 05 5.16E 05 5.17E 05     0.00
  9 0.25750  4.87E 05 4.90E 05 4.92E 05 4.94E 05 4.97E 05 4.99E 05 5.01E 05 5.03E 05 5.05E 05 5.07E 05     0.00
  8 0.24250  4.73E 05 4.77E 05 4.80E 05 4.83E 05 4.86E 05 4.89E 05 4.92E 05 4.94E 05 4.97E 05 4.99E 05     0.00
  7 0.21500  4.47E 05 4.54E 05 4.59E 05 4.64E 05 4.68E 05 4.72E 05 4.76E 05 4.79E 05 4.82E 05 4.86E 05     0.00
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```
X  0.52   0                                                                    2                4                6                8                1  0.52
X  0.54   .                                                                                                                                     .  0.54
X  0.56   .                                                                                                                                     .  0.56
X  0.58   0                                                                    2                4                6                8                1  0.58
X  0.60   +                                                                                                                                     +  0.60
X  0.62   .                                                                                                                                     .  0.62
X  0.64   .                                                                                                                                     .  0.64
X  0.66   0                                                                    2                4                6                8                1  0.66
X  0.68   .                                                                                                                                     .  0.68
X  0.70   +                                                                                                                                     +  0.70
X  0.72   .                                                                                                                                     .  0.72
X  0.74   0                                                                    2                4                6                8                1  0.74
X  0.76   .                                                                                                                                     .  0.76
X  0.78   .                                                                                                                                     .  0.78
X  0.80   +                                                                                                                                     +  0.80
X  0.82   .                                                                                                                                     .  0.82
X  0.84   0                                                                    2                4                6                8                1  0.84
X  0.86   .                                                                                                                                     .  0.86
X  0.88   .                                                                                                                                     .  0.88
X  0.90   +                                                                                                                                     +  0.90
X  0.92   0                                                                    2                4                6                8                1  0.92
X  0.94   .                                                                                                                                     .  0.94
X  0.96   .                                                                                                                                     .  0.96
X  0.98   .                                                                                                                                     .  0.98
X  1.00   0.....+.....+.....+.....+.....+.....2..+.....+..4.....+...6.....+.8.....1  1.00
          0.0      0.1      0.2      0.3      0.4      0.5      0.6      0.7      0.8      0.9      1.0
```

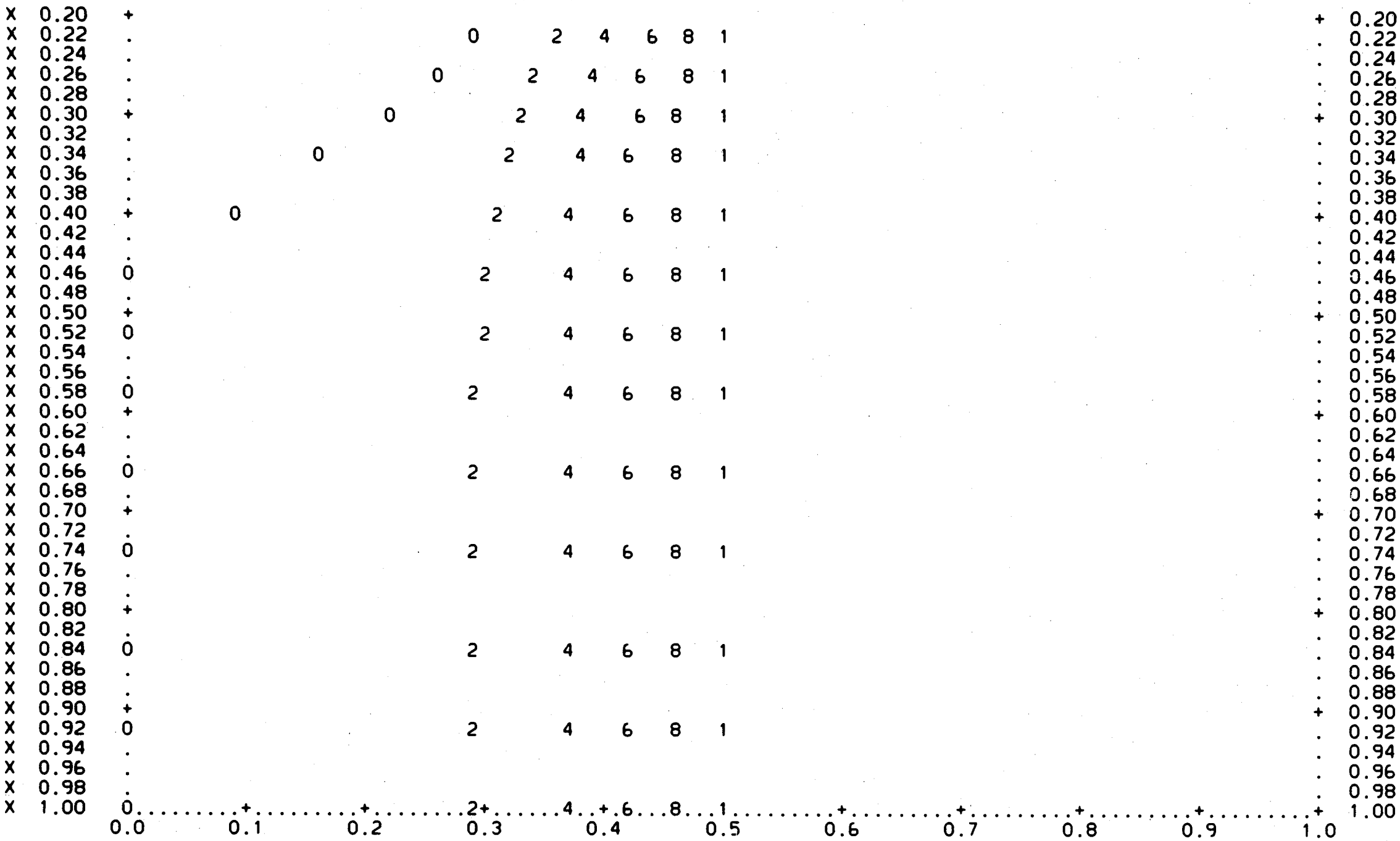
```
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187       0.00     0.00     0.00     0.00 2.38E 01 2.41E 01 2.43E 01 2.46E 01 2.54E 01 2.70E 01 2.93E 01 3.15E 01
 19 0.05937       0.00     0.00     0.00     0.00 2.46E 01 2.47E 01 2.50E 01 2.56E 01 2.66E 01 2.83E 01 3.05E 01 3.25E 01
 18 0.05594       0.00     0.00     0.00     0.00 2.54E 01 2.52E 01 2.55E 01 2.62E 01 2.75E 01 2.92E 01 3.10E 01 3.26E 01
 17 0.05344       0.00     0.00     0.00 2.77E 01 2.65E 01 2.61E 01 2.63E 01 2.71E 01 2.84E 01 2.99E 01 3.13E 01 3.24E 01
 16 0.05078       0.00     0.00     0.00 2.87E 01 2.72E 01 2.68E 01 2.73E 01 2.83E 01 2.96E 01 3.06E 01 3.15E 01 3.22E 01
 15 0.04812       0.00     0.00     0.00 2.98E 01 2.78E 01 2.74E 01 2.83E 01 2.95E 01 3.06E 01 3.12E 01 3.16E 01 3.19E 01
 14 0.04562       0.00     0.00 3.52E 01 3.13E 01 2.82E 01 2.79E 01 2.92E 01 3.06E 01 3.14E 01 3.17E 01 3.16E 01 3.15E 01
 13 0.04328       0.00     0.00 3.65E 01 3.12E 01 2.79E 01 2.82E 01 3.01E 01 3.15E 01 3.20E 01 3.19E 01 3.14E 01 3.10E 01
 12 0.04094       0.00     0.00 3.81E 01 3.11E 01 2.76E 01 2.86E 01 3.09E 01 3.22E 01 3.23E 01 3.18E 01 3.11E 01 3.03E 01
 11 0.03719       0.00 5.11E 01 4.07E 01 3.07E 01 2.70E 01 2.93E 01 3.17E 01 3.26E 01 3.22E 01 3.13E 01 3.02E 01 2.91E 01
 10 0.03437       0.00 5.37E 01 3.94E 01 2.87E 01 2.65E 01 2.95E 01 3.17E 01 3.22E 01 3.16E 01 3.05E 01 2.91E 01 2.79E 01
  9 0.03219       0.00 5.71E 01 3.88E 01 2.75E 01 2.62E 01 2.93E 01 3.12E 01 3.16E 01 3.08E 01 2.96E 01 2.82E 01 2.68E 01
  8 0.03031   8.24E 01 6.07E 01 3.80E 01 2.64E 01 2.60E 01 2.88E 01 3.05E 01 3.07E 01 3.00E 01 2.87E 01 2.72E 01 2.58E 01
  7 0.02687   8.24E 01 5.88E 01 3.58E 01 2.49E 01 2.53E 01 2.73E 01 2.86E 01 2.87E 01 2.79E 01 2.66E 01 2.51E 01 2.37E 01
  6 0.02187   8.24E 01 5.53E 01 3.17E 01 2.17E 01 2.29E 01 2.38E 01 2.45E 01 2.46E 01 2.39E 01 2.28E 01 2.15E 01 2.01E 01
  5 0.01625   8.24E 01 5.02E 01 2.51E 01 1.85E 01 1.85E 01 1.86E 01 1.89E 01 1.89E 01 1.85E 01 1.77E 01 1.67E 01 1.55E 01
  4 0.01062   8.24E 01 4.36E 01 1.31E 01 1.35E 01 1.29E 01 1.26E 01 1.26E 01 1.27E 01 1.25E 01 1.20E 01 1.13E 01 1.05E 01
  3 0.00562   8.24E 01 3.27E 01 7.62E 00 7.59E 00 7.07E 00 6.84E 00 6.81E 00 6.83E 00 6.74E 00 6.49E 00 6.12E 00 5.68E 00
  2 0.00156   8.24E 01 9.09E 00 2.12E 00 2.11E 00 1.96E 00 1.90E 00 1.89E 00 1.90E 00 1.87E 00 1.80E 00 1.70E 00 1.58E 00
  1-0.00156       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0        I =      13       14       15       16       17       18       19       20       21       22       23
         X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187   3.32E 01 3.43E 01 3.48E 01 3.47E 01 3.42E 01 3.35E 01 3.26E 01 3.16E 01 3.07E 01 3.03E 01     0.00
 19 0.05937   3.41E 01 3.51E 01 3.56E 01 3.56E 01 3.54E 01 3.50E 01 3.45E 01 3.39E 01 3.32E 01 3.26E 01     0.00
 18 0.05594   3.37E 01 3.45E 01 3.48E 01 3.48E 01 3.45E 01 3.42E 01 3.37E 01 3.32E 01 3.27E 01 3.20E 01     0.00
 17 0.05344   3.33E 01 3.38E 01 3.39E 01 3.38E 01 3.35E 01 3.31E 01 3.27E 01 3.22E 01 3.17E 01 3.11E 01     0.00
 16 0.05078   3.27E 01 3.29E 01 3.29E 01 3.27E 01 3.23E 01 3.19E 01 3.14E 01 3.09E 01 3.04E 01 2.98E 01     0.00
 15 0.04812   3.20E 01 3.20E 01 3.17E 01 3.14E 01 3.10E 01 3.05E 01 3.00E 01 2.95E 01 2.90E 01 2.84E 01     0.00
 14 0.04562   3.13E 01 3.10E 01 3.06E 01 3.02E 01 2.97E 01 2.92E 01 2.86E 01 2.81E 01 2.76E 01 2.71E 01     0.00
 13 0.04328   3.05E 01 3.00E 01 2.95E 01 2.90E 01 2.84E 01 2.79E 01 2.73E 01 2.68E 01 2.63E 01 2.57E 01     0.00
 12 0.04094   2.96E 01 2.90E 01 2.83E 01 2.77E 01 2.71E 01 2.65E 01 2.59E 01 2.54E 01 2.49E 01 2.44E 01     0.00
 11 0.03719   2.81E 01 2.71E 01 2.63E 01 2.56E 01 2.49E 01 2.43E 01 2.37E 01 2.32E 01 2.27E 01 2.23E 01     0.00
 10 0.03437   2.67E 01 2.56E 01 2.47E 01 2.39E 01 2.33E 01 2.26E 01 2.20E 01 2.15E 01 2.10E 01 2.06E 01     0.00
  9 0.03219   2.55E 01 2.44E 01 2.34E 01 2.26E 01 2.19E 01 2.13E 01 2.07E 01 2.02E 01 1.97E 01 1.93E 01     0.00
  8 0.03031   2.44E 01 2.33E 01 2.23E 01 2.15E 01 2.08E 01 2.01E 01 1.96E 01 1.91E 01 1.86E 01 1.82E 01     0.00
  7 0.02687   2.23E 01 2.11E 01 2.01E 01 1.93E 01 1.86E 01 1.80E 01 1.74E 01 1.70E 01 1.65E 01 1.62E 01     0.00
  6 0.02187   1.88E 01 1.77E 01 1.67E 01 1.59E 01 1.53E 01 1.48E 01 1.43E 01 1.39E 01 1.35E 01 1.32E 01     0.00
  5 0.01625   1.45E 01 1.35E 01 1.27E 01 1.20E 01 1.15E 01 1.11E 01 1.07E 01 1.04E 01 1.01E 01 9.83E 00     0.00
  4 0.01062   9.70E 00 9.02E 00 8.45E 00 7.99E 00 7.62E 00 7.31E 00 7.04E 00 6.82E 00 6.63E 00 6.46E 00     0.00
  3 0.00562   5.25E 00 4.87E 00 4.55E 00 4.30E 00 4.09E 00 3.92E 00 3.77E 00 3.65E 00 3.55E 00 3.46E 00     0.00
  2 0.00156   1.46E 00 1.35E 00 1.26E 00 1.19E 00 1.14E 00 1.09E 00 1.05E 00 1.01E 00 9.85E-01 9.60E-01     0.00
  1-0.00156       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                             PRESSURE                -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =       1        2        3        4        5        6        7        8        9       10       11       12
         X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187       0.00     0.00     0.00     0.00 2.08E 03 2.15E 03 2.10E 03 2.10E 03 2.12E 03 2.15E 03 2.17E 03 2.18E 03
 19 0.05937       0.00     0.00     0.00     0.00 2.03E 03 2.11E 03 2.06E 03 2.07E 03 2.09E 03 2.11E 03 2.12E 03 2.13E 03
 18 0.05594       0.00     0.00     0.00     0.00 1.93E 03 2.05E 03 2.00E 03 2.01E 03 2.04E 03 2.05E 03 2.06E 03 2.06E 03
```

16	0.39562	0.00	0.00	0.00	4.64E-01	3.62E-01	9.23E-02	-3.85E-02	-6.41E-02	-5.13E-02	-3.52E-02	-2.40E-02	-1.56E-02
15	0.37500	0.00	0.00	0.00	7.09E-01	3.67E-01	7.23E-02	-5.94E-02	-7.84E-02	-6.01E-02	-4.12E-02	-2.84E-02	-1.90E-02
14	0.35562	0.00	0.00	3.50E-01	6.60E-01	3.36E-01	4.22E-02	-7.70E-02	-8.70E-02	-6.53E-02	-4.53E-02	-3.20E-02	-2.18E-02
13	0.33687	0.00	0.00	6.26E-01	6.53E-01	3.00E-01	1.52E-02	-8.75E-02	-9.04E-02	-6.76E-02	-4.81E-02	-3.48E-02	-2.43E-02
12	0.31250	0.00	0.00	9.69E-01	6.46E-01	2.40E-01	-1.83E-02	-9.23E-02	-8.89E-02	-6.78E-02	-5.02E-02	-3.77E-02	-2.71E-02
11	0.28625	0.00	4.90E-01	9.19E-01	5.81E-01	1.40E-01	-3.76E-02	-8.36E-02	-8.06E-02	-6.44E-02	-5.02E-02	-3.93E-02	-2.91E-02
10	0.26625	0.00	7.74E-01	9.39E-01	5.10E-01	8.46E-02	-3.98E-02	-7.32E-02	-7.24E-02	-6.05E-02	-4.93E-02	-3.97E-02	-3.00E-02
9	0.25000	0.00	1.01E 00	9.53E-01	4.40E-01	5.01E-02	-3.78E-02	-6.37E-02	-6.51E-02	-5.68E-02	-4.80E-02	-3.96E-02	-3.04E-02
8	0.22875	0.00	1.00E 00	9.42E-01	3.41E-01	1.28E-02	-3.32E-02	-5.11E-02	-5.53E-02	-5.15E-02	-4.58E-02	-3.90E-02	-3.05E-02
7	0.19500	0.00	1.01E 00	8.72E-01	1.61E-01	-1.65E-02	-2.52E-02	-3.35E-02	-4.04E-02	-4.25E-02	-4.10E-02	-3.65E-02	-2.94E-02
6	0.15250	0.00	1.02E 00	6.64E-01	-1.46E-02	-2.71E-02	-1.82E-02	-1.87E-02	-2.53E-02	-3.12E-02	-3.32E-02	-3.11E-02	-2.59E-02
5	0.10750	0.00	9.98E-01	2.75E-01	-4.61E-02	-2.72E-02	-1.34E-02	-9.88E-03	-1.43E-02	-2.03E-02	-2.37E-02	-2.33E-02	-1.99E-02
4	0.06500	0.00	8.05E-01	-2.96E-03	-3.60E-02	-1.99E-02	-8.73E-03	-5.06E-03	-7.37E-03	-1.16E-02	-1.43E-02	-1.46E-02	-1.26E-02
3	0.02875	0.00	4.15E-01	-5.03E-02	-1.97E-02	-9.64E-03	-4.04E-03	-2.10E-03	-3.03E-03	-4.98E-03	-6.31E-03	-6.52E-03	-5.70E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

O		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
O	J	Y											
21	0.50000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500		-7.44E-04	-2.14E-04	4.33E-05	1.29E-04	1.33E-04	9.44E-05	8.72E-05	7.35E-05	1.12E-04	3.42E-07	0.00
19	0.46125		-2.45E-03	-9.38E-04	-1.42E-04	2.03E-04	3.17E-04	3.09E-04	3.37E-04	3.28E-04	3.09E-04	-1.86E-07	0.00
18	0.43750		-4.68E-03	-2.13E-03	-7.24E-04	-4.70E-05	2.45E-04	3.30E-04	4.35E-04	4.61E-04	4.35E-04	-8.23E-07	0.00
17	0.41687		-6.85E-03	-3.40E-03	-1.44E-03	-4.34E-04	4.52E-05	2.40E-04	4.30E-04	4.99E-04	5.00E-04	-1.15E-06	0.00
16	0.39562		-9.23E-03	-4.88E-03	-2.34E-03	-9.76E-04	-2.76E-04	5.78E-05	3.50E-04	4.74E-04	5.25E-04	-1.19E-06	0.00
15	0.37500		-1.16E-02	-6.42E-03	-3.32E-03	-1.60E-03	-6.65E-04	-1.79E-04	2.22E-04	4.06E-04	5.18E-04	-9.95E-07	0.00
14	0.35562		-1.37E-02	-7.89E-03	-4.29E-03	-2.23E-03	-1.07E-03	-4.34E-04	7.23E-05	3.18E-04	4.90E-04	-6.84E-07	0.00
13	0.33687		-1.56E-02	-9.27E-03	-5.24E-03	-2.85E-03	-1.48E-03	-6.95E-04	-8.71E-05	2.19E-04	4.47E-04	-3.77E-07	0.00
12	0.31250		-1.79E-02	-1.10E-02	-6.43E-03	-3.66E-03	-2.01E-03	-1.04E-03	-3.03E-04	8.06E-05	3.79E-04	-1.14E-07	0.00
11	0.28625		-1.97E-02	-1.25E-02	-7.51E-03	-4.41E-03	-2.52E-03	-1.37E-03	-5.20E-04	-6.41E-05	2.95E-04	-2.01E-07	0.00
10	0.26625		-2.07E-02	-1.33E-02	-8.17E-03	-4.88E-03	-2.85E-03	-1.59E-03	-6.67E-04	-1.65E-04	2.30E-04	-4.98E-07	0.00
9	0.25000		-2.13E-02	-1.39E-02	-8.60E-03	-5.20E-03	-3.07E-03	-1.74E-03	-7.70E-04	-2.38E-04	1.80E-04	-8.62E-07	0.00
8	0.22875		-2.17E-02	-1.44E-02	-9.04E-03	-5.53E-03	-3.31E-03	-1.90E-03	-8.87E-04	-3.23E-04	1.16E-04	-1.38E-06	0.00
7	0.19500		-2.15E-02	-1.45E-02	-9.28E-03	-5.76E-03	-3.49E-03	-2.04E-03	-1.01E-03	-4.20E-04	2.90E-05	-1.96E-06	0.00
6	0.15250		-1.93E-02	-1.33E-02	-8.65E-03	-5.44E-03	-3.34E-03	-1.97E-03	-1.01E-03	-4.59E-04	-4.27E-05	-2.13E-06	0.00
5	0.10750		-1.51E-02	-1.05E-02	-6.94E-03	-4.40E-03	-2.72E-03	-1.61E-03	-8.47E-04	-4.02E-04	-7.13E-05	-1.74E-06	0.00
4	0.06500		-9.68E-03	-6.82E-03	-4.52E-03	-2.88E-03	-1.78E-03	-1.06E-03	-5.65E-04	-2.74E-04	-6.01E-05	-1.08E-06	0.00
3	0.02875		-4.39E-03	-3.10E-03	-2.06E-03	-1.31E-03	-8.16E-04	-4.88E-04	-2.60E-04	-1.27E-04	-3.04E-05	-4.60E-07	0.00
2	0.00000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

O*- DIMENSIONLESS W VELOCITY -*

O		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
O	J	Y												
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		0.00	0.00	0.00	0.00	7.93E-01	8.03E-01	8.11E-01	8.21E-01	8.46E-01	9.00E-01	9.75E-01	1.05E 00
19	0.47500		0.00	0.00	0.00	0.00	8.19E-01	8.24E-01	8.35E-01	8.52E-01	8.85E-01	9.44E-01	1.02E 00	1.08E 00
18	0.44750		0.00	0.00	0.00	0.00	8.46E-01	8.41E-01	8.51E-01	8.74E-01	9.16E-01	9.73E-01	1.03E 00	1.09E 00
17	0.42750		0.00	0.00	0.00	9.24E-01	8.85E-01	8.70E-01	8.78E-01	9.04E-01	9.48E-01	9.96E-01	1.04E 00	1.08E 00
16	0.40625		0.00	0.00	0.00	9.56E-01	9.06E-01	8.94E-01	9.09E-01	9.44E-01	9.85E-01	1.02E 00	1.05E 00	1.07E 00
15	0.38500		0.00	0.00	0.00	9.94E-01	9.25E-01	9.13E-01	9.42E-01	9.85E-01	1.02E 00	1.04E 00	1.05E 00	1.06E 00
14	0.36500		0.00	0.00	1.17E 00	1.04E 00	9.40E-01	9.30E-01	9.75E-01	1.02E 00	1.05E 00	1.06E 00	1.05E 00	1.05E 00
13	0.34625		0.00	0.00	1.22E 00	1.04E 00	9.29E-01	9.41E-01	1.00E 00	1.05E 00	1.07E 00	1.06E 00	1.05E 00	1.03E 00
12	0.32750		0.00	0.00	1.27E 00	1.04E 00	9.19E-01	9.53E-01	1.03E 00	1.07E 00	1.08E 00	1.06E 00	1.04E 00	1.01E 00



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI
Y-AXES ARE 00 02 04 06 08 10
SYMBOL 0 2 4 6 8 1
MAXIMUM VALUES 0.384E 02 0.408E 02 0.430E 02 0.451E 02 0.475E 02 0.500E 02

RADIAL POSITION 2R/D

8	0.03031	2.70E 01	9.18E 00	1.91E 01	6.36E 01	7.39E 01	7.37E 01	8.13E 01	8.72E 01	8.95E 01	8.82E 01	8.29E 01	7.37E 01		
7	0.02687	2.70E 01	9.31E 00	2.55E 01	7.74E 01	6.98E 01	7.04E 01	7.75E 01	8.41E 01	8.75E 01	8.71E 01	8.23E 01	7.34E 01		
6	0.02187	2.70E 01	9.77E 00	4.00E 01	9.41E 01	6.40E 01	6.63E 01	7.24E 01	7.93E 01	8.37E 01	8.41E 01	7.99E 01	7.17E 01		
5	0.01625	2.70E 01	1.12E 01	7.06E 01	7.08E 01	6.10E 01	6.31E 01	6.81E 01	7.42E 01	7.88E 01	7.97E 01	7.61E 01	6.87E 01		
4	0.01062	2.70E 01	1.59E 01	1.12E 02	6.28E 01	5.95E 01	6.09E 01	6.52E 01	7.04E 01	7.45E 01	7.55E 01	7.24E 01	6.55E 01		
3	0.00562	2.70E 01	3.17E 01	8.10E 01	5.98E 01	5.85E 01	5.98E 01	6.36E 01	6.83E 01	7.19E 01	7.29E 01	7.00E 01	6.35E 01		
2	0.00156	2.70E 01	4.76E 01	8.25E 01	5.91E 01	5.83E 01	5.96E 01	6.34E 01	6.79E 01	7.13E 01	7.22E 01	6.93E 01	6.30E 01		
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	4.63E 00	4.30E 00	3.92E 00	3.56E 00	3.26E 00	3.02E 00	2.82E 00	2.66E 00	2.53E 00	2.53E 00	2.70E 01
19	0.05937	2.39E 01	2.05E 01	1.68E 01	1.35E 01	1.07E 01	8.56E 00	6.98E 00	5.90E 00	5.18E 00	6.09E 00	2.70E 01
18	0.05594	3.44E 01	2.91E 01	2.36E 01	1.88E 01	1.48E 01	1.17E 01	9.44E 00	7.83E 00	6.70E 00	8.43E 00	2.70E 01
17	0.05344	3.98E 01	3.34E 01	2.70E 01	2.14E 01	1.69E 01	1.33E 01	1.07E 01	8.91E 00	7.61E 00	9.85E 00	2.70E 01
16	0.05078	4.48E 01	3.72E 01	2.99E 01	2.37E 01	1.87E 01	1.47E 01	1.19E 01	9.89E 00	8.47E 00	1.11E 01	2.70E 01
15	0.04812	4.90E 01	4.05E 01	3.24E 01	2.56E 01	2.01E 01	1.59E 01	1.28E 01	1.07E 01	9.20E 00	1.22E 01	2.70E 01
14	0.04562	5.25E 01	4.30E 01	3.44E 01	2.71E 01	2.13E 01	1.68E 01	1.36E 01	1.14E 01	9.78E 00	1.30E 01	2.70E 01
13	0.04328	5.52E 01	4.51E 01	3.59E 01	2.82E 01	2.22E 01	1.75E 01	1.42E 01	1.19E 01	1.02E 01	1.35E 01	2.70E 01
12	0.04094	5.75E 01	4.68E 01	3.72E 01	2.92E 01	2.29E 01	1.81E 01	1.47E 01	1.23E 01	1.06E 01	1.40E 01	2.70E 01
11	0.03719	6.02E 01	4.89E 01	3.87E 01	3.04E 01	2.38E 01	1.88E 01	1.52E 01	1.28E 01	1.10E 01	1.44E 01	2.70E 01
10	0.03437	6.15E 01	4.99E 01	3.95E 01	3.09E 01	2.42E 01	1.92E 01	1.55E 01	1.30E 01	1.12E 01	1.45E 01	2.70E 01
9	0.03219	6.21E 01	5.03E 01	3.98E 01	3.12E 01	2.44E 01	1.93E 01	1.56E 01	1.31E 01	1.13E 01	1.45E 01	2.70E 01
8	0.03031	6.23E 01	5.05E 01	4.00E 01	3.13E 01	2.45E 01	1.94E 01	1.57E 01	1.31E 01	1.13E 01	1.44E 01	2.70E 01
7	0.02687	6.22E 01	5.05E 01	4.00E 01	3.13E 01	2.45E 01	1.94E 01	1.57E 01	1.31E 01	1.13E 01	1.42E 01	2.70E 01
6	0.02187	6.10E 01	4.97E 01	3.94E 01	3.09E 01	2.42E 01	1.91E 01	1.55E 01	1.29E 01	1.11E 01	1.36E 01	2.70E 01
5	0.01625	5.87E 01	4.81E 01	3.83E 01	3.00E 01	2.35E 01	1.86E 01	1.51E 01	1.26E 01	1.08E 01	1.29E 01	2.70E 01
4	0.01062	5.63E 01	4.64E 01	3.71E 01	2.92E 01	2.29E 01	1.81E 01	1.47E 01	1.23E 01	1.06E 01	1.23E 01	2.70E 01
3	0.00562	5.48E 01	4.53E 01	3.63E 01	2.87E 01	2.25E 01	1.79E 01	1.45E 01	1.21E 01	1.04E 01	1.19E 01	2.70E 01
2	0.00156	5.44E 01	4.50E 01	3.62E 01	2.86E 01	2.25E 01	1.79E 01	1.45E 01	1.21E 01	1.04E 01	1.19E 01	2.70E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- TURBULENCE DISSIPATION -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	6.85E 03	6.56E 03	4.79E 03	3.77E 03	3.58E 03	4.48E 03	5.82E 03	6.46E 03
19	0.05937	0.00	0.00	0.00	0.00	1.16E 04	1.36E 04	9.66E 03	6.75E 03	5.28E 03	5.32E 03	5.98E 03	6.16E 03
18	0.05594	0.00	0.00	0.00	0.00	2.56E 04	1.96E 04	1.33E 04	9.39E 03	7.65E 03	7.40E 03	7.35E 03	6.80E 03
17	0.05344	0.00	0.00	0.00	1.86E 04	2.28E 04	1.72E 04	1.31E 04	1.07E 04	9.76E 03	9.37E 03	8.67E 03	7.50E 03
16	0.05078	0.00	0.00	0.00	3.66E 04	2.52E 04	1.80E 04	1.44E 04	1.31E 04	1.26E 04	1.17E 04	1.02E 04	8.34E 03
15	0.04812	0.00	0.00	0.00	3.77E 04	2.54E 04	1.91E 04	1.70E 04	1.66E 04	1.57E 04	1.39E 04	1.16E 04	9.13E 03
14	0.04562	0.00	0.00	3.62E 04	3.18E 04	2.46E 04	2.11E 04	2.05E 04	2.00E 04	1.82E 04	1.56E 04	1.26E 04	9.78E 03
13	0.04328	0.00	0.00	5.27E 04	3.15E 04	2.58E 04	2.35E 04	2.35E 04	2.26E 04	2.00E 04	1.67E 04	1.34E 04	1.02E 04
12	0.04094	0.00	0.00	3.05E 04	2.70E 04	2.71E 04	2.51E 04	2.52E 04	2.39E 04	2.10E 04	1.75E 04	1.39E 04	1.06E 04
11	0.03719	0.00	3.77E 04	3.06E 04	3.05E 04	3.25E 04	2.58E 04	2.57E 04	2.43E 04	2.13E 04	1.78E 04	1.43E 04	1.08E 04
10	0.03437	0.00	4.96E 04	3.31E 04	3.67E 04	3.17E 04	2.35E 04	2.40E 04	2.31E 04	2.07E 04	1.75E 04	1.42E 04	1.08E 04
9	0.03219	0.00	2.18E 04	3.42E 04	4.26E 04	2.80E 04	2.11E 04	2.20E 04	2.17E 04	1.98E 04	1.71E 04	1.39E 04	1.07E 04
8	0.03031	4.49E 05	8.25E 04	4.40E 04	4.77E 04	2.47E 04	1.89E 04	2.02E 04	2.03E 04	1.89E 04	1.65E 04	1.36E 04	1.05E 04
7	0.02687	4.49E 05	8.32E 04	5.15E 04	5.23E 04	1.86E 04	1.58E 04	1.70E 04	1.77E 04	1.70E 04	1.53E 04	1.28E 04	1.00E 04
6	0.02187	4.49E 05	8.57E 04	6.61E 04	4.89E 04	1.34E 04	1.26E 04	1.36E 04	1.45E 04	1.45E 04	1.35E 04	1.16E 04	9.16E 03
5	0.01625	4.49E 05	9.30E 04	8.89E 04	2.13E 04	1.05E 04	1.02E 04	1.10E 04	1.18E 04	1.21E 04	1.15E 04	1.01E 04	8.12E 03
4	0.01062	4.49E 05	1.13E 05	9.91E 04	1.32E 04	8.93E 03	8.75E 03	9.31E 03	9.98E 03	1.03E 04	9.94E 03	8.82E 03	7.19E 03

DIMENSIONLESS TURBULENCE ENERGY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.46E-03	5.31E-03	4.31E-03	3.67E-03	3.54E-03	4.12E-03	4.90E-03	5.26E-03
19	0.47500	0.00	0.00	0.00	0.00	3.03E-02	3.56E-02	2.83E-02	2.25E-02	2.04E-02	2.36E-02	2.77E-02	2.87E-02
18	0.44750	0.00	0.00	0.00	0.00	5.16E-02	4.36E-02	3.51E-02	2.99E-02	3.09E-02	3.73E-02	4.23E-02	4.23E-02
17	0.42750	0.00	0.00	0.00	1.69E-02	3.83E-02	3.73E-02	3.47E-02	3.47E-02	4.02E-02	4.76E-02	5.14E-02	4.98E-02
16	0.40625	0.00	0.00	0.00	6.11E-02	4.86E-02	4.18E-02	3.99E-02	4.43E-02	5.23E-02	5.87E-02	6.03E-02	5.68E-02
15	0.38500	0.00	0.00	0.00	6.22E-02	4.80E-02	4.52E-02	4.89E-02	5.75E-02	6.53E-02	6.93E-02	6.84E-02	6.30E-02
14	0.36500	0.00	0.00	2.63E-02	4.17E-02	4.56E-02	5.18E-02	6.13E-02	7.08E-02	7.65E-02	7.79E-02	7.50E-02	6.80E-02
13	0.34625	0.00	0.00	7.26E-02	4.88E-02	5.24E-02	6.19E-02	7.33E-02	8.16E-02	8.50E-02	8.45E-02	8.02E-02	7.20E-02
12	0.32750	0.00	0.00	5.05E-02	4.19E-02	5.76E-02	7.10E-02	8.27E-02	8.96E-02	9.15E-02	8.97E-02	8.43E-02	7.53E-02
11	0.29750	0.00	3.54E-02	3.00E-02	4.23E-02	7.20E-02	8.34E-02	9.24E-02	9.75E-02	9.82E-02	9.54E-02	8.91E-02	7.91E-02
10	0.27500	0.00	6.97E-02	2.99E-02	5.16E-02	8.18E-02	8.52E-02	9.37E-02	9.90E-02	1.00E-01	9.76E-02	9.12E-02	8.09E-02
9	0.25750	0.00	4.03E-02	2.22E-02	6.06E-02	8.29E-02	8.39E-02	9.24E-02	9.83E-02	1.00E-01	9.81E-02	9.19E-02	8.17E-02
8	0.24250	3.00E-02	1.02E-02	2.12E-02	7.07E-02	8.21E-02	8.19E-02	9.03E-02	9.68E-02	9.95E-02	9.80E-02	9.21E-02	8.19E-02
7	0.21500	3.00E-02	1.03E-02	2.83E-02	8.60E-02	7.76E-02	7.82E-02	8.61E-02	9.34E-02	9.73E-02	9.68E-02	9.14E-02	8.16E-02
6	0.17500	3.00E-02	1.09E-02	4.45E-02	1.05E-01	7.12E-02	7.37E-02	8.05E-02	8.81E-02	9.30E-02	9.34E-02	8.88E-02	7.97E-02
5	0.13000	3.00E-02	1.25E-02	7.84E-02	7.87E-02	6.77E-02	7.01E-02	7.57E-02	8.25E-02	8.75E-02	8.85E-02	8.46E-02	7.63E-02
4	0.08500	3.00E-02	1.77E-02	1.25E-01	6.98E-02	6.61E-02	6.77E-02	7.24E-02	7.82E-02	8.27E-02	8.39E-02	8.04E-02	7.28E-02
3	0.04500	3.00E-02	3.52E-02	9.00E-02	6.65E-02	6.50E-02	6.64E-02	7.07E-02	7.59E-02	7.99E-02	8.10E-02	7.78E-02	7.06E-02
2	0.01250	3.00E-02	5.29E-02	9.17E-02	6.57E-02	6.48E-02	6.62E-02	7.04E-02	7.54E-02	7.93E-02	8.02E-02	7.70E-02	6.99E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	5.14E-03	4.78E-03	4.35E-03	3.96E-03	3.63E-03	3.35E-03	3.13E-03	2.95E-03	2.81E-03	2.81E-03	3.00E-02
19	0.47500	2.65E-02	2.28E-02	1.87E-02	1.50E-02	1.19E-02	9.51E-03	7.76E-03	6.56E-03	5.75E-03	6.76E-03	3.00E-02
18	0.44750	3.82E-02	3.23E-02	2.63E-02	2.09E-02	1.65E-02	1.30E-02	1.05E-02	8.70E-03	7.44E-03	9.37E-03	3.00E-02
17	0.42750	4.43E-02	3.71E-02	3.00E-02	2.38E-02	1.88E-02	1.48E-02	1.19E-02	9.90E-03	8.46E-03	1.09E-02	3.00E-02
16	0.40625	4.97E-02	4.14E-02	3.33E-02	2.63E-02	2.07E-02	1.64E-02	1.32E-02	1.10E-02	9.42E-03	1.24E-02	3.00E-02
15	0.38500	5.45E-02	4.49E-02	3.60E-02	2.84E-02	2.24E-02	1.77E-02	1.43E-02	1.19E-02	1.02E-02	1.35E-02	3.00E-02
14	0.36500	5.83E-02	4.78E-02	3.82E-02	3.01E-02	2.36E-02	1.87E-02	1.51E-02	1.26E-02	1.09E-02	1.44E-02	3.00E-02
13	0.34625	6.13E-02	5.01E-02	3.99E-02	3.14E-02	2.46E-02	1.95E-02	1.58E-02	1.32E-02	1.14E-02	1.50E-02	3.00E-02
12	0.32750	6.38E-02	5.20E-02	4.13E-02	3.25E-02	2.55E-02	2.01E-02	1.63E-02	1.36E-02	1.18E-02	1.55E-02	3.00E-02
11	0.29750	6.69E-02	5.43E-02	4.30E-02	3.37E-02	2.65E-02	2.09E-02	1.69E-02	1.42E-02	1.22E-02	1.60E-02	3.00E-02
10	0.27500	6.83E-02	5.54E-02	4.39E-02	3.44E-02	2.69E-02	2.13E-02	1.72E-02	1.44E-02	1.25E-02	1.61E-02	3.00E-02
9	0.25750	6.89E-02	5.59E-02	4.42E-02	3.47E-02	2.72E-02	2.15E-02	1.74E-02	1.45E-02	1.26E-02	1.61E-02	3.00E-02
8	0.24250	6.92E-02	5.61E-02	4.44E-02	3.48E-02	2.73E-02	2.15E-02	1.74E-02	1.46E-02	1.26E-02	1.60E-02	3.00E-02
7	0.21500	6.91E-02	5.61E-02	4.44E-02	3.48E-02	2.72E-02	2.15E-02	1.74E-02	1.46E-02	1.26E-02	1.58E-02	3.00E-02
6	0.17500	6.78E-02	5.52E-02	4.38E-02	3.43E-02	2.69E-02	2.12E-02	1.72E-02	1.44E-02	1.24E-02	1.52E-02	3.00E-02
5	0.13000	6.53E-02	5.34E-02	4.25E-02	3.34E-02	2.62E-02	2.07E-02	1.68E-02	1.40E-02	1.21E-02	1.44E-02	3.00E-02
4	0.08500	6.26E-02	5.15E-02	4.12E-02	3.25E-02	2.54E-02	2.01E-02	1.63E-02	1.36E-02	1.17E-02	1.37E-02	3.00E-02
3	0.04500	6.09E-02	5.03E-02	4.04E-02	3.19E-02	2.50E-02	1.98E-02	1.61E-02	1.35E-02	1.16E-02	1.33E-02	3.00E-02
2	0.01250	6.04E-02	5.00E-02	4.02E-02	3.18E-02	2.50E-02	1.98E-02	1.61E-02	1.35E-02	1.16E-02	1.32E-02	3.00E-02

DIMENSIONLESS STREAMLINE PLOT

OITER NO	I--- ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	---I I--- FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D ---I
1	0.1361E-01	0.1504E-01	0.1109E 00	0.5761E-02	0.8213E-02	0.4205E 10	0.5428E 01	-0.7725E-04	0.1679E 02	0.1846E 04	0.2520E 04
2	0.1331E-01	0.1510E 00	0.9421E-01	0.1617E-01	0.1296E-01	0.7477E 10	0.5428E 01	-0.8536E-04	0.1680E 02	0.1992E 04	0.2521E 04
3	0.7704E-01	0.2185E 00	0.8527E-01	0.2252E-01	0.1643E-01	0.9623E 10	0.5428E 01	-0.5627E-04	0.1680E 02	0.2123E 04	0.2521E 04
4	0.1946E 00	0.1972E 00	0.7951E-01	0.1533E-01	0.1788E-01	0.9424E 10	0.5428E 01	-0.5914E-04	0.1680E 02	0.2092E 04	0.2521E 04
5	0.2034E 00	0.2130E 00	0.7622E-01	0.1543E-01	0.1846E-01	0.8019E 10	0.5428E 01	-0.6751E-04	0.1681E 02	0.2062E 04	0.2521E 04
6	0.2225E 00	0.2150E 00	0.7466E-01	0.1682E-01	0.1982E-01	0.7025E 10	0.5428E 01	-0.7727E-04	0.1681E 02	0.2028E 04	0.2522E 04
7	0.2300E 00	0.2189E 00	0.7386E-01	0.1708E-01	0.2053E-01	0.6611E 10	0.5428E 01	-0.8796E-04	0.1682E 02	0.2000E 04	0.2522E 04
8	0.2324E 00	0.2221E 00	0.7321E-01	0.1744E-01	0.2101E-01	0.6114E 10	0.5428E 01	-0.9816E-04	0.1682E 02	0.1977E 04	0.2522E 04
9	0.2349E 00	0.2234E 00	0.7238E-01	0.1866E-01	0.2151E-01	0.5778E 10	0.5428E 01	-0.1067E-03	0.1683E 02	0.1959E 04	0.2522E 04
10	0.2371E 00	0.2228E 00	0.7147E-01	0.1946E-01	0.2210E-01	0.5212E 10	0.5428E 01	-0.1154E-03	0.1683E 02	0.1946E 04	0.2523E 04
11	0.2386E 00	0.2220E 00	0.7112E-01	0.2007E-01	0.2279E-01	0.4972E 10	0.5428E 01	-0.1229E-03	0.1684E 02	0.1938E 04	0.2523E 04
12	0.2401E 00	0.2205E 00	0.7097E-01	0.2078E-01	0.2371E-01	0.4831E 10	0.5428E 01	-0.1306E-03	0.1684E 02	0.1932E 04	0.2523E 04
13	0.2431E 00	0.2175E 00	0.7068E-01	0.2149E-01	0.2474E-01	0.4751E 10	0.5428E 01	-0.1371E-03	0.1684E 02	0.1928E 04	0.2524E 04
14	0.2450E 00	0.2133E 00	0.7052E-01	0.2218E-01	0.2578E-01	0.4701E 10	0.5428E 01	-0.1430E-03	0.1685E 02	0.1926E 04	0.2524E 04
15	0.2457E 00	0.2081E 00	0.7027E-01	0.2283E-01	0.2689E-01	0.4660E 10	0.5428E 01	-0.1489E-03	0.1685E 02	0.1925E 04	0.2524E 04
16	0.2456E 00	0.2025E 00	0.7005E-01	0.2325E-01	0.2799E-01	0.4617E 10	0.5428E 01	-0.1531E-03	0.1686E 02	0.1926E 04	0.2525E 04
17	0.2459E 00	0.1953E 00	0.6995E-01	0.2345E-01	0.2913E-01	0.4562E 10	0.5428E 01	-0.1570E-03	0.1686E 02	0.1927E 04	0.2525E 04
18	0.2462E 00	0.1886E 00	0.6977E-01	0.2348E-01	0.2997E-01	0.4496E 10	0.5428E 01	-0.1606E-03	0.1687E 02	0.1930E 04	0.2525E 04
19	0.2453E 00	0.1818E 00	0.6960E-01	0.2327E-01	0.3044E-01	0.4417E 10	0.5428E 01	-0.1638E-03	0.1687E 02	0.1933E 04	0.2526E 04
20	0.2437E 00	0.1754E 00	0.6931E-01	0.2290E-01	0.3090E-01	0.4325E 10	0.5428E 01	-0.1662E-03	0.1688E 02	0.1936E 04	0.2526E 04
21	0.2417E 00	0.1702E 00	0.6900E-01	0.2247E-01	0.3113E-01	0.4220E 10	0.5427E 01	-0.1684E-03	0.1688E 02	0.1940E 04	0.2527E 04
22	0.2389E 00	0.1674E 00	0.6870E-01	0.2192E-01	0.3112E-01	0.4102E 10	0.5427E 01	-0.1694E-03	0.1689E 02	0.1943E 04	0.2527E 04
23	0.2369E 00	0.1649E 00	0.6837E-01	0.2142E-01	0.3109E-01	0.3968E 10	0.5427E 01	-0.1702E-03	0.1689E 02	0.1946E 04	0.2528E 04
24	0.2349E 00	0.1626E 00	0.6799E-01	0.2097E-01	0.3095E-01	0.3819E 10	0.5427E 01	-0.1704E-03	0.1690E 02	0.1950E 04	0.2528E 04
25	0.2331E 00	0.1604E 00	0.6758E-01	0.2066E-01	0.3068E-01	0.3665E 10	0.5427E 01	-0.1696E-03	0.1690E 02	0.1953E 04	0.2528E 04
26	0.2309E 00	0.1584E 00	0.6705E-01	0.2039E-01	0.3045E-01	0.3500E 10	0.5427E 01	-0.1692E-03	0.1691E 02	0.1956E 04	0.2529E 04
27	0.2282E 00	0.1572E 00	0.6648E-01	0.2015E-01	0.3022E-01	0.3321E 10	0.5427E 01	-0.1676E-03	0.1691E 02	0.1959E 04	0.2529E 04
28	0.2248E 00	0.1555E 00	0.6597E-01	0.1999E-01	0.2991E-01	0.3129E 10	0.5427E 01	-0.1651E-03	0.1692E 02	0.1962E 04	0.2530E 04
29	0.2211E 00	0.1537E 00	0.6542E-01	0.1986E-01	0.2969E-01	0.2927E 10	0.5427E 01	-0.1624E-03	0.1692E 02	0.1964E 04	0.2530E 04
30	0.2176E 00	0.1513E 00	0.6482E-01	0.1979E-01	0.2955E-01	0.2716E 10	0.5427E 01	-0.1596E-03	0.1693E 02	0.1967E 04	0.2531E 04
31	0.2148E 00	0.1492E 00	0.6427E-01	0.1982E-01	0.2951E-01	0.2505E 10	0.5426E 01	-0.1565E-03	0.1693E 02	0.1969E 04	0.2532E 04
32	0.2120E 00	0.1470E 00	0.6370E-01	0.1995E-01	0.2953E-01	0.2309E 10	0.5426E 01	-0.1542E-03	0.1694E 02	0.1971E 04	0.2532E 04
33	0.2089E 00	0.1445E 00	0.6315E-01	0.2009E-01	0.2958E-01	0.2120E 10	0.5426E 01	-0.1522E-03	0.1694E 02	0.1972E 04	0.2533E 04
34	0.2054E 00	0.1420E 00	0.6258E-01	0.2040E-01	0.2985E-01	0.1928E 10	0.5426E 01	-0.1512E-03	0.1695E 02	0.1974E 04	0.2533E 04
35	0.2021E 00	0.1400E 00	0.6200E-01	0.2075E-01	0.3025E-01	0.1736E 10	0.5426E 01	-0.1517E-03	0.1695E 02	0.1975E 04	0.2534E 04
36	0.1988E 00	0.1381E 00	0.6143E-01	0.2116E-01	0.3079E-01	0.1601E 10	0.5426E 01	-0.1543E-03	0.1696E 02	0.1976E 04	0.2535E 04
37	0.1953E 00	0.1363E 00	0.6095E-01	0.2158E-01	0.3146E-01	0.1491E 10	0.5426E 01	-0.1598E-03	0.1696E 02	0.1977E 04	0.2536E 04
38	0.1916E 00	0.1343E 00	0.6059E-01	0.2207E-01	0.3207E-01	0.1371E 10	0.5426E 01	-0.1681E-03	0.1697E 02	0.1978E 04	0.2536E 04
39	0.1880E 00	0.1323E 00	0.6027E-01	0.2264E-01	0.3267E-01	0.1256E 10	0.5426E 01	-0.1795E-03	0.1697E 02	0.1979E 04	0.2537E 04
40	0.1843E 00	0.1302E 00	0.6001E-01	0.2328E-01	0.3334E-01	0.1146E 10	0.5425E 01	-0.1945E-03	0.1698E 02	0.1980E 04	0.2538E 04
41	0.1802E 00	0.1279E 00	0.5984E-01	0.2379E-01	0.3382E-01	0.1026E 10	0.5425E 01	-0.2109E-03	0.1698E 02	0.1981E 04	0.2539E 04
42	0.1762E 00	0.1245E 00	0.5967E-01	0.2401E-01	0.3426E-01	0.9496E 09	0.5425E 01	-0.2295E-03	0.1699E 02	0.1981E 04	0.2540E 04
43	0.1724E 00	0.1220E 00	0.5953E-01	0.2437E-01	0.3464E-01	0.8783E 09	0.5425E 01	-0.2521E-03	0.1700E 02	0.1982E 04	0.2541E 04
44	0.1690E 00	0.1193E 00	0.5937E-01	0.2478E-01	0.3500E-01	0.8012E 09	0.5425E 01	-0.2792E-03	0.1700E 02	0.1983E 04	0.2542E 04
45	0.1662E 00	0.1166E 00	0.5922E-01	0.2525E-01	0.3533E-01	0.7763E 09	0.5424E 01	-0.3115E-03	0.1701E 02	0.1983E 04	0.2543E 04
46	0.1636E 00	0.1139E 00	0.5914E-01	0.2577E-01	0.3558E-01	0.7764E 09	0.5424E 01	-0.3482E-03	0.1701E 02	0.1983E 04	0.2544E 04
47	0.1613E 00	0.1112E 00	0.5901E-01	0.2630E-01	0.3573E-01	0.7639E 09	0.5424E 01	-0.3902E-03	0.1702E 02	0.1984E 04	0.2545E 04
48	0.1590E 00	0.1088E 00	0.5883E-01	0.2684E-01	0.3582E-01	0.7410E 09	0.5423E 01	-0.4371E-03	0.1702E 02	0.1984E 04	0.2547E 04
49	0.1565E 00	0.1067E 00	0.5867E-01	0.2754E-01	0.3579E-01	0.7095E 09	0.5423E 01	-0.4896E-03	0.1703E 02	0.1984E 04	0.2548E 04
50	0.1540E 00	0.1045E 00	0.5846E-01	0.2817E-01	0.3565E-01	0.6718E 09	0.5422E 01	-0.5482E-03	0.1703E 02	0.1984E 04	0.2550E 04

```
 17 0.05344      0.00     0.00     0.00 2.00E 03 1.91E 03 1.97E 03 1.95E 03 1.97E 03 2.00E 03 2.01E 03 2.01E 03 2.00E 03
 16 0.05078      0.00     0.00     0.00 1.85E 03 1.88E 03 1.88E 03 1.89E 03 1.92E 03 1.94E 03 1.95E 03 1.95E 03 1.94E 03
 15 0.04812      0.00     0.00     0.00 1.64E 03 1.81E 03 1.79E 03 1.82E 03 1.86E 03 1.89E 03 1.89E 03 1.88E 03 1.87E 03
 14 0.04562      0.00     0.00 2.20E 03 1.63E 03 1.70E 03 1.70E 03 1.75E 03 1.80E 03 1.82E 03 1.83E 03 1.82E 03 1.81E 03
 13 0.04328      0.00     0.00 1.95E 03 1.66E 03 1.60E 03 1.61E 03 1.68E 03 1.74E 03 1.76E 03 1.76E 03 1.75E 03 1.74E 03
 12 0.04094      0.00     0.00 1.58E 03 1.61E 03 1.50E 03 1.53E 03 1.61E 03 1.66E 03 1.69E 03 1.69E 03 1.69E 03 1.68E 03
 11 0.03719      0.00 2.13E 03 1.47E 03 1.42E 03 1.36E 03 1.41E 03 1.49E 03 1.54E 03 1.57E 03 1.58E 03 1.58E 03 1.58E 03
 10 0.03437      0.00 1.66E 03 1.44E 03 1.30E 03 1.26E 03 1.32E 03 1.39E 03 1.44E 03 1.47E 03 1.48E 03 1.49E 03 1.50E 03
  9 0.03219      0.00 1.20E 03 1.34E 03 1.21E 03 1.19E 03 1.25E 03 1.31E 03 1.36E 03 1.39E 03 1.41E 03 1.43E 03 1.44E 03
  8 0.03031      0.00 9.78E 02 1.24E 03 1.15E 03 1.14E 03 1.18E 03 1.24E 03 1.29E 03 1.32E 03 1.35E 03 1.37E 03 1.39E 03
  7 0.02687      0.00 9.26E 02 1.08E 03 1.03E 03 1.04E 03 1.07E 03 1.11E 03 1.16E 03 1.20E 03 1.24E 03 1.27E 03 1.30E 03
  6 0.02187      0.00 7.99E 02 8.91E 02 8.81E 02 8.90E 02 9.08E 02 9.38E 02 9.81E 02 1.03E 03 1.08E 03 1.14E 03 1.18E 03
  5 0.01625      0.00 6.21E 02 6.93E 02 7.12E 02 7.31E 02 7.47E 02 7.72E 02 8.14E 02 8.70E 02 9.36E 02 1.00E 03 1.07E 03
  4 0.01062      0.00 4.19E 02 5.27E 02 5.64E 02 5.99E 02 6.22E 02 6.48E 02 6.89E 02 7.49E 02 8.24E 02 9.04E 02 9.80E 02
  3 0.00562      0.00 1.65E 02 4.06E 02 4.71E 02 5.20E 02 5.50E 02 5.78E 02 6.19E 02 6.81E 02 7.60E 02 8.47E 02 9.31E 02
  2 0.00156      0.00     0.00 3.07E 02 4.31E 02 4.89E 02 5.23E 02 5.52E 02 5.93E 02 6.55E 02 7.37E 02 8.26E 02 9.12E 02
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =     13       14       15       16       17       18       19       20       21       22       23
        X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  2.19E 03 2.19E 03 2.19E 03 2.18E 03 2.16E 03 2.15E 03 2.13E 03 2.11E 03 2.10E 03 2.08E 03     0.00
 19 0.05937  2.14E 03 2.13E 03 2.13E 03 2.12E 03 2.10E 03 2.09E 03 2.07E 03 2.06E 03 2.05E 03 2.03E 03     0.00
 18 0.05594  2.05E 03 2.05E 03 2.04E 03 2.03E 03 2.01E 03 2.00E 03 1.99E 03 1.98E 03 1.97E 03 1.96E 03     0.00
 17 0.05344  1.99E 03 1.98E 03 1.97E 03 1.96E 03 1.95E 03 1.94E 03 1.93E 03 1.92E 03 1.91E 03 1.90E 03     0.00
 16 0.05078  1.93E 03 1.91E 03 1.90E 03 1.89E 03 1.88E 03 1.88E 03 1.87E 03 1.86E 03 1.85E 03 1.84E 03     0.00
 15 0.04812  1.86E 03 1.85E 03 1.84E 03 1.83E 03 1.82E 03 1.81E 03 1.81E 03 1.80E 03 1.79E 03 1.79E 03     0.00
 14 0.04562  1.79E 03 1.78E 03 1.77E 03 1.77E 03 1.76E 03 1.75E 03 1.75E 03 1.75E 03 1.74E 03 1.74E 03     0.00
 13 0.04328  1.73E 03 1.72E 03 1.72E 03 1.71E 03 1.71E 03 1.70E 03 1.70E 03 1.70E 03 1.70E 03 1.69E 03     0.00
 12 0.04094  1.67E 03 1.67E 03 1.66E 03 1.66E 03 1.65E 03 1.65E 03 1.65E 03 1.65E 03 1.65E 03 1.65E 03     0.00
 11 0.03719  1.58E 03 1.57E 03 1.57E 03 1.57E 03 1.58E 03 1.58E 03 1.58E 03 1.58E 03 1.59E 03 1.59E 03     0.00
 10 0.03437  1.50E 03 1.51E 03 1.51E 03 1.52E 03 1.52E 03 1.53E 03 1.53E 03 1.54E 03 1.54E 03 1.55E 03     0.00
  9 0.03219  1.45E 03 1.46E 03 1.47E 03 1.47E 03 1.48E 03 1.49E 03 1.49E 03 1.50E 03 1.51E 03 1.51E 03     0.00
  8 0.03031  1.40E 03 1.42E 03 1.43E 03 1.44E 03 1.45E 03 1.46E 03 1.47E 03 1.47E 03 1.48E 03 1.49E 03     0.00
  7 0.02687  1.33E 03 1.35E 03 1.36E 03 1.38E 03 1.39E 03 1.40E 03 1.42E 03 1.43E 03 1.44E 03 1.45E 03     0.00
  6 0.02187  1.22E 03 1.25E 03 1.28E 03 1.30E 03 1.32E 03 1.34E 03 1.35E 03 1.37E 03 1.38E 03 1.39E 03     0.00
  5 0.01625  1.12E 03 1.16E 03 1.20E 03 1.23E 03 1.26E 03 1.28E 03 1.30E 03 1.31E 03 1.33E 03 1.35E 03     0.00
  4 0.01062  1.05E 03 1.10E 03 1.14E 03 1.18E 03 1.21E 03 1.23E 03 1.26E 03 1.28E 03 1.29E 03 1.31E 03     0.00
  3 0.00562  1.00E 03 1.06E 03 1.11E 03 1.15E 03 1.18E 03 1.21E 03 1.24E 03 1.26E 03 1.28E 03 1.29E 03     0.00
  2 0.00156  9.88E 02 1.05E 03 1.10E 03 1.14E 03 1.17E 03 1.20E 03 1.23E 03 1.25E 03 1.27E 03 1.29E 03     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                            PRESSURE                   -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00     0.00 5.83E-02 4.84E-02 7.73E-02 8.34E-02 8.16E-02 8.37E-02 9.05E-02 9.82E-02
 19 0.05937      0.00     0.00     0.00     0.00 6.33E-02 4.87E-02 7.58E-02 8.04E-02 7.73E-02 7.66E-02 7.99E-02 8.46E-02
 18 0.05594      0.00     0.00     0.00     0.00 7.78E-02 5.15E-02 7.46E-02 7.58E-02 7.02E-02 6.63E-02 6.47E-02 6.55E-02
 17 0.05344      0.00     0.00     0.00 1.20E-02 7.00E-02 5.94E-02 7.46E-02 7.24E-02 6.46E-02 5.78E-02 5.35E-02 5.13E-02
 16 0.05078      0.00     0.00     0.00 3.14E-02 5.78E-02 6.58E-02 7.41E-02 6.76E-02 5.75E-02 4.81E-02 4.12E-02 3.62E-02
 15 0.04812      0.00     0.00     0.00 5.41E-02 5.33E-02 6.80E-02 7.07E-02 6.15E-02 4.83E-02 3.72E-02 2.82E-02 2.11E-02
 14 0.04562      0.00     0.00-6.77E-02 4.11E-02 5.15E-02 6.58E-02 6.46E-02 5.31E-02 3.79E-02 2.56E-02 1.51E-02 6.54E-03
 13 0.04328      0.00     0.00-4.99E-02 1.58E-02 4.67E-02 5.91E-02 5.52E-02 4.25E-02 2.66E-02 1.35E-02 2.32E-03-7.21E-03
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11	0.29750	0.00	1.70E 00	1.36E 00	1.02E 00	9.02E-01	9.77E-01	1.06E 00	1.09E 00	1.07E 00	1.04E 00	1.01E 00	9.69E-01
10	0.27500	0.00	1.79E 00	1.31E 00	9.57E-01	8.82E-01	9.82E-01	1.06E 00	1.07E 00	1.05E 00	1.02E 00	9.71E-01	9.28E-01
9	0.25750	0.00	1.90E 00	1.29E 00	9.15E-01	8.74E-01	9.75E-01	1.04E 00	1.05E 00	1.03E 00	9.86E-01	9.39E-01	8.93E-01
8	0.24250	2.75E 00	2.02E 00	1.27E 00	8.81E-01	8.67E-01	9.60E-01	1.02E 00	1.02E 00	9.98E-01	9.55E-01	9.07E-01	8.59E-01
7	0.21500	2.75E 00	1.96E 00	1.19E 00	8.29E-01	8.43E-01	9.11E-01	9.52E-01	9.55E-01	9.29E-01	8.86E-01	8.38E-01	7.89E-01
6	0.17500	2.75E 00	1.84E 00	1.06E 00	7.22E-01	7.64E-01	7.95E-01	8.17E-01	8.18E-01	7.97E-01	7.61E-01	7.17E-01	6.71E-01
5	0.13000	2.75E 00	1.67E 00	8.37E-01	6.16E-01	6.18E-01	6.21E-01	6.29E-01	6.30E-01	6.17E-01	5.90E-01	5.56E-01	5.18E-01
4	0.08500	2.75E 00	1.45E 00	4.36E-01	4.49E-01	4.28E-01	4.20E-01	4.21E-01	4.22E-01	4.15E-01	3.99E-01	3.76E-01	3.49E-01
3	0.04500	2.75E 00	1.09E 00	2.54E-01	2.53E-01	2.36E-01	2.28E-01	2.27E-01	2.28E-01	2.25E-01	2.16E-01	2.04E-01	1.89E-01
2	0.01250	2.75E 00	3.03E-01	7.06E-02	7.02E-02	6.54E-02	6.33E-02	6.31E-02	6.32E-02	6.24E-02	6.01E-02	5.66E-02	5.26E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

O		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
O	J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	1.11E 00	1.14E 00	1.16E 00	1.16E 00	1.14E 00	1.12E 00	1.09E 00	1.05E 00	1.02E 00	1.01E 00	0.00	
19	0.47500	1.14E 00	1.17E 00	1.19E 00	1.19E 00	1.18E 00	1.17E 00	1.15E 00	1.13E 00	1.11E 00	1.09E 00	0.00	
18	0.44750	1.12E 00	1.15E 00	1.16E 00	1.16E 00	1.15E 00	1.14E 00	1.12E 00	1.11E 00	1.09E 00	1.07E 00	0.00	
17	0.42750	1.11E 00	1.13E 00	1.13E 00	1.13E 00	1.12E 00	1.10E 00	1.09E 00	1.07E 00	1.06E 00	1.04E 00	0.00	
16	0.40625	1.09E 00	1.10E 00	1.10E 00	1.09E 00	1.08E 00	1.06E 00	1.05E 00	1.03E 00	1.01E 00	9.93E-01	0.00	
15	0.38500	1.07E 00	1.07E 00	1.06E 00	1.05E 00	1.03E 00	1.02E 00	9.99E-01	9.82E-01	9.66E-01	9.47E-01	0.00	
14	0.36500	1.04E 00	1.03E 00	1.02E 00	1.01E 00	9.89E-01	9.72E-01	9.54E-01	9.37E-01	9.20E-01	9.02E-01	0.00	
13	0.34625	1.02E 00	1.00E 00	9.83E-01	9.65E-01	9.47E-01	9.29E-01	9.10E-01	8.92E-01	8.75E-01	8.58E-01	0.00	
12	0.32750	9.88E-01	9.66E-01	9.44E-01	9.23E-01	9.03E-01	8.84E-01	8.65E-01	8.47E-01	8.31E-01	8.14E-01	0.00	
11	0.29750	9.35E-01	9.05E-01	8.78E-01	8.53E-01	8.31E-01	8.11E-01	7.91E-01	7.74E-01	7.57E-01	7.42E-01	0.00	
10	0.27500	8.89E-01	8.55E-01	8.24E-01	7.98E-01	7.75E-01	7.54E-01	7.35E-01	7.18E-01	7.02E-01	6.87E-01	0.00	
9	0.25750	8.50E-01	8.13E-01	7.81E-01	7.54E-01	7.31E-01	7.10E-01	6.90E-01	6.74E-01	6.58E-01	6.44E-01	0.00	
8	0.24250	8.15E-01	7.76E-01	7.43E-01	7.15E-01	6.92E-01	6.71E-01	6.52E-01	6.36E-01	6.20E-01	6.07E-01	0.00	
7	0.21500	7.43E-01	7.04E-01	6.70E-01	6.42E-01	6.19E-01	5.99E-01	5.81E-01	5.66E-01	5.51E-01	5.39E-01	0.00	
6	0.17500	6.28E-01	5.89E-01	5.58E-01	5.32E-01	5.10E-01	4.92E-01	4.76E-01	4.63E-01	4.50E-01	4.40E-01	0.00	
5	0.13000	4.82E-01	4.50E-01	4.23E-01	4.01E-01	3.84E-01	3.69E-01	3.56E-01	3.45E-01	3.36E-01	3.28E-01	0.00	
4	0.08500	3.23E-01	3.01E-01	2.82E-01	2.66E-01	2.54E-01	2.44E-01	2.35E-01	2.27E-01	2.21E-01	2.15E-01	0.00	
3	0.04500	1.75E-01	1.62E-01	1.52E-01	1.43E-01	1.36E-01	1.31E-01	1.26E-01	1.22E-01	1.18E-01	1.15E-01	0.00	
2	0.01250	4.86E-02	4.51E-02	4.21E-02	3.98E-02	3.79E-02	3.63E-02	3.49E-02	3.38E-02	3.28E-02	3.20E-02	0.00	
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

O*- DIMENSIONLESS STREAMLINE COORDS -*

O		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
O	J	Y												
11	1.00000	0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	
10	0.90000	0.00	2.37E-01	3.12E-01	3.75E-01	4.37E-01	4.78E-01	4.87E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01	
9	0.80000	0.00	2.23E-01	2.92E-01	3.59E-01	4.19E-01	4.64E-01	4.74E-01	4.75E-01	4.73E-01	4.71E-01	4.68E-01	4.66E-01	
8	0.70000	0.00	2.09E-01	2.81E-01	3.51E-01	4.09E-01	4.50E-01	4.63E-01	4.63E-01	4.60E-01	4.56E-01	4.52E-01	4.49E-01	
7	0.60000	0.00	1.93E-01	2.67E-01	3.41E-01	3.99E-01	4.38E-01	4.51E-01	4.51E-01	4.47E-01	4.42E-01	4.36E-01	4.31E-01	
6	0.50000	0.00	1.77E-01	2.49E-01	3.29E-01	3.88E-01	4.28E-01	4.41E-01	4.40E-01	4.34E-01	4.27E-01	4.19E-01	4.12E-01	
5	0.40000	0.00	1.57E-01	2.31E-01	3.17E-01	3.78E-01	4.17E-01	4.30E-01	4.28E-01	4.21E-01	4.11E-01	4.01E-01	3.92E-01	
4	0.30000	0.00	1.36E-01	2.11E-01	3.04E-01	3.67E-01	4.07E-01	4.19E-01	4.16E-01	4.06E-01	3.93E-01	3.81E-01	3.69E-01	
3	0.20000	0.00	1.10E-01	1.88E-01	2.90E-01	3.56E-01	3.96E-01	4.08E-01	4.04E-01	3.90E-01	3.74E-01	3.58E-01	3.43E-01	
2	0.10000	0.00	7.75E-02	1.59E-01	2.74E-01	3.45E-01	3.85E-01	3.96E-01	3.89E-01	3.71E-01	3.50E-01	3.29E-01	3.08E-01	
1	0.00000	0.00	0.00	1.13E-01	2.51E-01	3.31E-01	3.72E-01	3.84E-01	3.72E-01	3.48E-01	3.18E-01	2.89E-01	2.56E-01	

O		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
O	J	Y											
11	1.00000	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	

```
0         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00  0.........+.........+.2.......+4.......6+....8....1.........+.........+.........+.........+.........  0.00
 X  0.02  .                   0                   2       4       6    8  1                                   .  0.02
 X  0.04  .                                                 0       2    4    6    8  1                        .  0.04
 X  0.06  .                                                              0    2    4    6    8  1             .  0.06
 X  0.08  .                                                                   0    2    4    6    8       1  0.08
 X  0.10  +                                                                        0    2    4    6    8  1  0.10
 X  0.12  .                                                                   0         2    4    6    8  1  0.12
 X  0.14  .                                                                        0         2    4    6    8  1  0.14
 X  0.16  .                                                                                                   .  0.16
 X  0.18  .                                                                             0         2    4    6    8  1  0.18
 X  0.20  +                                                                                                   +  0.20
 X  0.22  .                                                                             0              2    4    6    8  1  0.22
 X  0.24  .                                                                                                   .  0.24
 X  0.26  .                                                       0                        2         4    6    8  1  0.26
 X  0.28  .                                                                                                   .  0.28
 X  0.30  +                                            0                        2         4    6    8       1  0.30
 X  0.32  .                                                                                                   .  0.32
 X  0.34  .                                  0                        2              4    6    8       1  0.34
 X  0.36  .                                                                                                   .  0.36
 X  0.38  .                                                                                                   .  0.38
 X  0.40  +                        0                        2              4    6    8       1  0.40
 X  0.42  .                                                                                                   .  0.42
 X  0.44  .                                                                                                   .  0.44
 X  0.46  0                                          2              4         6    8       1  0.46
 X  0.48  .                                                                                                   .  0.48
 X  0.50  +                                                                                                   +  0.50
```

3	0.00562	4.49E 05	1.55E 05	3.68E 04	1.01E 04	8.06E 03	7.96E 03	8.43E 03	8.98E 03	9.25E 03	8.97E 03	8.04E 03	6.61E 03			
2	0.00156	4.49E 05	1.87E 05	2.68E 04	8.77E 03	7.63E 03	7.59E 03	8.03E 03	8.52E 03	8.76E 03	8.50E 03	7.64E 03	6.32E 03			
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	6.25E 03	5.60E 03	4.87E 03	4.22E 03	3.70E 03	3.29E 03	2.97E 03	2.72E 03	2.52E 03	2.52E 03	4.49E 05	
19	0.05937	5.66E 03	4.82E 03	3.95E 03	3.21E 03	2.62E 03	2.16E 03	1.83E 03	1.59E 03	1.42E 03	1.61E 03	4.49E 05	
18	0.05594	5.79E 03	4.65E 03	3.62E 03	2.78E 03	2.15E 03	1.68E 03	1.34E 03	1.11E 03	9.53E 02	1.21E 03	4.49E 05	
17	0.05344	6.09E 03	4.72E 03	3.56E 03	2.66E 03	2.00E 03	1.52E 03	1.19E 03	9.63E 02	8.09E 02	1.10E 03	4.49E 05	
16	0.05078	6.50E 03	4.88E 03	3.59E 03	2.62E 03	1.93E 03	1.44E 03	1.11E 03	8.84E 02	7.34E 02	1.05E 03	4.49E 05	
15	0.04812	6.91E 03	5.06E 03	3.65E 03	2.62E 03	1.90E 03	1.40E 03	1.06E 03	8.41E 02	6.93E 02	1.03E 03	4.49E 05	
14	0.04562	7.25E 03	5.23E 03	3.71E 03	2.63E 03	1.89E 03	1.37E 03	1.03E 03	8.15E 02	6.69E 02	1.01E 03	4.49E 05	
13	0.04328	7.52E 03	5.35E 03	3.76E 03	2.64E 03	1.88E 03	1.36E 03	1.02E 03	7.98E 02	6.53E 02	9.94E 02	4.49E 05	
12	0.04094	7.71E 03	5.45E 03	3.80E 03	2.65E 03	1.87E 03	1.34E 03	1.00E 03	7.83E 02	6.39E 02	9.75E 02	4.49E 05	
11	0.03719	7.86E 03	5.52E 03	3.81E 03	2.64E 03	1.85E 03	1.32E 03	9.77E 02	7.60E 02	6.19E 02	9.36E 02	4.49E 05	
10	0.03437	7.84E 03	5.49E 03	3.79E 03	2.61E 03	1.82E 03	1.29E 03	9.55E 02	7.41E 02	6.01E 02	9.00E 02	4.49E 05	
9	0.03219	7.75E 03	5.43E 03	3.74E 03	2.57E 03	1.79E 03	1.27E 03	9.34E 02	7.23E 02	5.86E 02	8.68E 02	4.49E 05	
8	0.03031	7.64E 03	5.35E 03	3.68E 03	2.53E 03	1.76E 03	1.24E 03	9.15E 02	7.07E 02	5.72E 02	8.38E 02	4.49E 05	
7	0.02687	7.35E 03	5.16E 03	3.55E 03	2.44E 03	1.69E 03	1.19E 03	8.76E 02	6.76E 02	5.45E 02	7.81E 02	4.49E 05	
6	0.02187	6.80E 03	4.81E 03	3.31E 03	2.28E 03	1.58E 03	1.11E 03	8.15E 02	6.27E 02	5.05E 02	6.96E 02	4.49E 05	
5	0.01625	6.11E 03	4.37E 03	3.03E 03	2.08E 03	1.45E 03	1.02E 03	7.48E 02	5.74E 02	4.61E 02	6.08E 02	4.49E 05	
4	0.01062	5.48E 03	3.97E 03	2.78E 03	1.92E 03	1.34E 03	9.46E 02	6.93E 02	5.32E 02	4.26E 02	5.38E 02	4.49E 05	
3	0.00562	5.09E 03	3.71E 03	2.62E 03	1.83E 03	1.27E 03	9.02E 02	6.63E 02	5.09E 02	4.08E 02	4.99E 02	4.49E 05	
2	0.00156	4.89E 03	3.60E 03	2.56E 03	1.79E 03	1.25E 03	8.91E 02	6.57E 02	5.06E 02	4.06E 02	4.86E 02	4.49E 05	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- DIMENSIONLESS STREAM FUNCTION -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545

0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	9.82E-01	9.65E-01	9.63E-01	9.66E-01	9.69E-01	9.71E-01	9.72E-01
19	0.05937	0.00	0.00	0.00	0.00	0.00	8.80E-01	8.07E-01	8.00E-01	8.13E-01	8.28E-01	8.41E-01	8.52E-01
18	0.05594	0.00	0.00	0.00	0.00	0.00	6.83E-01	5.65E-01	5.62E-01	5.96E-01	6.34E-01	6.65E-01	6.91E-01
17	0.05344	0.00	0.00	0.00	0.00	8.96E-01	5.05E-01	3.78E-01	3.89E-01	4.43E-01	4.98E-01	5.44E-01	5.79E-01
16	0.05078	0.00	0.00	0.00	0.00	6.84E-01	3.09E-01	1.88E-01	2.18E-01	2.94E-01	3.67E-01	4.25E-01	4.70E-01
15	0.04812	0.00	0.00	0.00	0.00	4.94E-01	1.27E-01	2.33E-02	7.34E-02	1.67E-01	2.52E-01	3.18E-01	3.70E-01
14	0.04562	0.00	0.00	0.00	8.80E-01	3.14E-01	-2.59E-02	-1.02E-01	-3.35E-02	6.91E-02	1.59E-01	2.30E-01	2.86E-01
13	0.04328	0.00	0.00	0.00	6.78E-01	1.59E-01	-1.40E-01	-1.87E-01	-1.07E-01	-3.11E-03	8.72E-02	1.59E-01	2.17E-01
12	0.04094	0.00	0.00	0.00	5.23E-01	3.24E-02	-2.21E-01	-2.41E-01	-1.58E-01	-5.85E-02	2.81E-02	9.86E-02	1.57E-01
11	0.03719	0.00	0.00	8.65E-01	3.08E-01	-1.24E-01	-2.90E-01	-2.78E-01	-2.03E-01	-1.18E-01	-4.15E-02	2.35E-02	7.95E-02
10	0.03437	0.00	0.00	6.90E-01	1.73E-01	-1.98E-01	-2.98E-01	-2.76E-01	-2.13E-01	-1.42E-01	-7.55E-02	-1.65E-02	3.61E-02
9	0.03219	0.00	0.00	5.89E-01	9.10E-02	-2.26E-01	-2.86E-01	-2.63E-01	-2.11E-01	-1.50E-01	-9.25E-02	-3.88E-02	1.03E-02
8	0.03031	0.00	9.41E-01	5.06E-01	3.26E-02	-2.34E-01	-2.69E-01	-2.47E-01	-2.04E-01	-1.52E-01	-1.01E-01	-5.24E-02	-6.78E-03
7	0.02687	0.00	7.40E-01	3.60E-01	-4.99E-02	-2.25E-01	-2.30E-01	-2.11E-01	-1.82E-01	-1.45E-01	-1.06E-01	-6.60E-02	-2.74E-02
6	0.02187	0.00	4.90E-01	1.82E-01	-1.16E-01	-1.77E-01	-1.67E-01	-1.54E-01	-1.38E-01	-1.18E-01	-9.30E-02	-6.56E-02	-3.78E-02
5	0.01625	0.00	2.70E-01	4.40E-02	-1.13E-01	-1.10E-01	-9.96E-02	-9.22E-02	-8.53E-02	-7.59E-02	-6.31E-02	-4.77E-02	-3.12E-02
4	0.01062	0.00	1.16E-01	-1.80E-02	-6.07E-02	-5.13E-02	-4.53E-02	-4.18E-02	-3.92E-02	-3.58E-02	-3.07E-02	-2.41E-02	-1.67E-02
3	0.00562	0.00	3.24E-02	-1.65E-02	-1.76E-02	-1.51E-02	-1.32E-02	-1.21E-02	-1.14E-02	-1.06E-02	-9.21E-03	-7.36E-03	-5.25E-03
2	0.00156	0.00	2.50E-03	-1.95E-03	-1.42E-03	-1.19E-03	-1.04E-03	-9.51E-04	-8.99E-04	-8.35E-04	-7.32E-04	-5.90E-04	-4.26E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037

```
  1-0.01250      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                DIMENSIONLESS LENGTH SCALE              -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =      2         3         4         5         6         7         8         9        10        11        12        13
         X =  0.00393   0.01180   0.02054   0.03023   0.04099   0.05294   0.06620   0.08092   0.09726   0.11539   0.13552   0.15786
0 J      Y
 21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.06187      0.00      0.00      0.00 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02
 19 0.05937      0.00      0.00      0.00 1.98E-01 2.14E-01 2.13E-01 2.15E-01 2.39E-01 2.94E-01 3.33E-01 3.41E-01 3.30E-01
 18 0.05594      0.00      0.00      0.00 1.98E-01 2.01E-01 2.13E-01 2.37E-01 3.07E-01 4.21E-01 5.11E-01 5.52E-01 5.57E-01
 17 0.05344      0.00      0.00 5.10E-02 1.42E-01 1.80E-01 2.13E-01 2.61E-01 3.56E-01 4.79E-01 5.80E-01 6.39E-01 6.60E-01
 16 0.05078      0.00      0.00 1.78E-01 1.84E-01 2.05E-01 2.39E-01 3.07E-01 4.11E-01 5.27E-01 6.30E-01 7.02E-01 7.38E-01
 15 0.04812      0.00      0.00 1.78E-01 1.79E-01 2.17E-01 2.75E-01 3.59E-01 4.60E-01 5.68E-01 6.69E-01 7.48E-01 7.95E-01
 14 0.04562      0.00 5.10E-02 1.16E-01 1.71E-01 2.42E-01 3.20E-01 4.06E-01 5.01E-01 6.03E-01 7.02E-01 7.84E-01 8.38E-01
 13 0.04328      0.00 1.60E-01 1.47E-01 2.01E-01 2.84E-01 3.65E-01 4.46E-01 5.36E-01 6.34E-01 7.31E-01 8.14E-01 8.73E-01
 12 0.04094      0.00 1.60E-01 1.38E-01 2.20E-01 3.26E-01 4.07E-01 4.84E-01 5.70E-01 6.65E-01 7.60E-01 8.43E-01 9.04E-01
 11 0.03719  7.64E-02 7.35E-02 1.23E-01 2.57E-01 4.03E-01 4.71E-01 5.41E-01 6.23E-01 7.14E-01 8.06E-01 8.88E-01 9.51E-01
 10 0.03437  1.60E-01 6.76E-02 1.38E-01 3.19E-01 4.57E-01 5.16E-01 5.81E-01 6.62E-01 7.50E-01 8.40E-01 9.20E-01 9.84E-01
  9 0.03219  1.60E-01 4.18E-02 1.51E-01 3.69E-01 4.99E-01 5.50E-01 6.14E-01 6.92E-01 7.78E-01 8.66E-01 9.45E-01 1.01E 00
  8 0.03031  5.39E-03 3.04E-02 1.70E-01 4.12E-01 5.34E-01 5.82E-01 6.43E-01 7.19E-01 8.03E-01 8.88E-01 9.67E-01 1.03E 00
  7 0.02687  5.46E-03 4.01E-02 2.08E-01 5.01E-01 5.98E-01 6.41E-01 6.97E-01 7.69E-01 8.49E-01 9.29E-01 1.01E 00 1.07E 00
  6 0.02187  5.70E-03 6.14E-02 2.99E-01 6.12E-01 6.88E-01 7.26E-01 7.78E-01 8.43E-01 9.15E-01 9.89E-01 1.06E 00 1.12E 00
  5 0.01625  6.47E-03 1.07E-01 4.47E-01 7.26E-01 7.84E-01 8.20E-01 8.66E-01 9.23E-01 9.88E-01 1.06E 00 1.12E 00 1.18E 00
  4 0.01062  9.04E-03 1.92E-01 6.04E-01 8.22E-01 8.69E-01 9.04E-01 9.47E-01 9.98E-01 1.06E 00 1.12E 00 1.18E 00 1.23E 00
  3 0.00562  1.84E-02 3.18E-01 7.34E-01 8.89E-01 9.28E-01 9.64E-01 1.01E 00 1.05E 00 1.11E 00 1.17E 00 1.22E 00 1.28E 00
  2 0.00156  2.81E-02 4.47E-01 8.30E-01 9.34E-01 9.70E-01 1.01E 00 1.05E 00 1.10E 00 1.15E 00 1.21E 00 1.26E 00 1.31E 00
0        I =     14        15        16        17        18        19        20        21        22        23
         X =  0.18266   0.21019   0.24075   0.27467   0.31232   0.35411   0.39590   0.43769   0.47948   0.52127
0 J      Y
 21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.06187  2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 5.00E-03
 19 0.05937  3.08E-01 2.79E-01 2.47E-01 2.15E-01 1.85E-01 1.61E-01 1.44E-01 1.32E-01 1.50E-01 5.00E-03
 18 0.05594  5.40E-01 5.09E-01 4.69E-01 4.26E-01 3.83E-01 3.45E-01 3.15E-01 2.91E-01 3.23E-01 5.00E-03
 17 0.05344  6.55E-01 6.31E-01 5.96E-01 5.55E-01 5.12E-01 4.73E-01 4.42E-01 4.16E-01 4.49E-01 5.00E-03
 16 0.05078  7.45E-01 7.31E-01 7.04E-01 6.68E-01 6.29E-01 5.93E-01 5.63E-01 5.38E-01 5.65E-01 5.00E-03
 15 0.04812  8.13E-01 8.09E-01 7.90E-01 7.60E-01 7.26E-01 6.94E-01 6.67E-01 6.44E-01 6.63E-01 5.00E-03
 14 0.04562  8.65E-01 8.68E-01 8.56E-01 8.32E-01 8.03E-01 7.75E-01 7.51E-01 7.31E-01 7.40E-01 5.00E-03
 13 0.04328  9.05E-01 9.15E-01 9.08E-01 8.90E-01 8.65E-01 8.40E-01 8.19E-01 8.01E-01 8.02E-01 5.00E-03
 12 0.04094  9.41E-01 9.55E-01 9.53E-01 9.39E-01 9.18E-01 8.97E-01 8.78E-01 8.62E-01 8.57E-01 5.00E-03
 11 0.03719  9.91E-01 1.01E 00 1.01E 00 1.01E 00 9.91E-01 9.74E-01 9.58E-01 9.45E-01 9.32E-01 5.00E-03
 10 0.03437  1.03E 00 1.05E 00 1.05E 00 1.05E 00 1.04E 00 1.02E 00 1.01E 00 9.99E-01 9.82E-01 5.00E-03
  9 0.03219  1.05E 00 1.08E 00 1.08E 00 1.08E 00 1.07E 00 1.06E 00 1.05E 00 1.04E 00 1.02E 00 5.00E-03
  8 0.03031  1.07E 00 1.10E 00 1.11E 00 1.11E 00 1.10E 00 1.09E 00 1.08E 00 1.07E 00 1.05E 00 5.00E-03
  7 0.02687  1.11E 00 1.14E 00 1.15E 00 1.15E 00 1.14E 00 1.13E 00 1.12E 00 1.12E 00 1.09E 00 5.00E-03
  6 0.02187  1.17E 00 1.19E 00 1.20E 00 1.21E 00 1.20E 00 1.19E 00 1.19E 00 1.18E 00 1.16E 00 5.00E-03
  5 0.01625  1.22E 00 1.25E 00 1.26E 00 1.26E 00 1.26E 00 1.25E 00 1.25E 00 1.24E 00 1.23E 00 5.00E-03
  4 0.01062  1.27E 00 1.30E 00 1.31E 00 1.31E 00 1.31E 00 1.30E 00 1.29E 00 1.29E 00 1.28E 00 5.00E-03
  3 0.00562  1.31E 00 1.34E 00 1.35E 00 1.35E 00 1.34E 00 1.33E 00 1.32E 00 1.32E 00 1.32E 00 5.00E-03
  2 0.00156  1.34E 00 1.36E 00 1.37E 00 1.37E 00 1.36E 00 1.34E 00 1.34E 00 1.33E 00 1.35E 00 5.00E-03
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-               DIMENSIONLESS EFF. VISCOSITY             -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0        I =      1         2         3         4         5         6         7         8         9        10        11        12
         X = -0.03148   0.03148   0.09443   0.16430   0.24187   0.32796   0.42352   0.52960   0.64735   0.77804   0.92311   1.08415
0 J      Y
 21 0.50500  1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00 1.00E 00
 20 0.49500  1.00E 00 1.00E 00 1.00E 00 1.00E 00 2.24E 01 2.21E 01 2.00E 01 1.85E 01 1.82E 01 1.96E 01 2.13E 01 2.20E 01
```

51	0.1516E 00	0.1027E 00	0.5831E-01	0.2881E-01	0.3543E-01	0.6465E 09	0.5422E 01	-0.6124E-03	0.1704E 02	0.1984E 04	0.2551E 04
52	0.1497E 00	0.1012E 00	0.5815E-01	0.2949E-01	0.3514E-01	0.6165E 09	0.5421E 01	-0.6824E-03	0.1704E 02	0.1984E 04	0.2553E 04
53	0.1477E 00	0.1000E 00	0.5792E-01	0.3019E-01	0.3478E-01	0.5809E 09	0.5420E 01	-0.7587E-03	0.1705E 02	0.1984E 04	0.2555E 04
54	0.1458E 00	0.9891E-01	0.5761E-01	0.3093E-01	0.3439E-01	0.5420E 09	0.5419E 01	-0.8406E-03	0.1705E 02	0.1984E 04	0.2557E 04
55	0.1439E 00	0.9796E-01	0.5734E-01	0.3161E-01	0.3394E-01	0.5007E 09	0.5418E 01	-0.9289E-03	0.1706E 02	0.1984E 04	0.2559E 04
56	0.1422E 00	0.9753E-01	0.5705E-01	0.3235E-01	0.3345E-01	0.4580E 09	0.5417E 01	-0.1023E-02	0.1706E 02	0.1984E 04	0.2561E 04
57	0.1404E 00	0.9699E-01	0.5686E-01	0.3312E-01	0.3293E-01	0.4154E 09	0.5416E 01	-0.1122E-02	0.1707E 02	0.1984E 04	0.2563E 04
58	0.1392E 00	0.9644E-01	0.5670E-01	0.3381E-01	0.3239E-01	0.3754E 09	0.5414E 01	-0.1228E-02	0.1708E 02	0.1984E 04	0.2565E 04
59	0.1382E 00	0.9604E-01	0.5647E-01	0.3449E-01	0.3187E-01	0.3516E 09	0.5413E 01	-0.1339E-02	0.1708E 02	0.1984E 04	0.2568E 04
60	0.1371E 00	0.9563E-01	0.5617E-01	0.3520E-01	0.3134E-01	0.3342E 09	0.5411E 01	-0.1455E-02	0.1709E 02	0.1984E 04	0.2571E 04
61	0.1359E 00	0.9526E-01	0.5578E-01	0.3589E-01	0.3079E-01	0.3192E 09	0.5409E 01	-0.1578E-02	0.1709E 02	0.1984E 04	0.2573E 04
62	0.1347E 00	0.9501E-01	0.5534E-01	0.3654E-01	0.3022E-01	0.3037E 09	0.5407E 01	-0.1705E-02	0.1710E 02	0.1985E 04	0.2576E 04
63	0.1333E 00	0.9492E-01	0.5490E-01	0.3725E-01	0.2962E-01	0.2864E 09	0.5405E 01	-0.1836E-02	0.1711E 02	0.1985E 04	0.2579E 04
64	0.1321E 00	0.9505E-01	0.5451E-01	0.3790E-01	0.2900E-01	0.2691E 09	0.5403E 01	-0.1972E-02	0.1711E 02	0.1985E 04	0.2583E 04
65	0.1312E 00	0.9485E-01	0.5424E-01	0.3852E-01	0.2837E-01	0.2515E 09	0.5400E 01	-0.2111E-02	0.1712E 02	0.1985E 04	0.2586E 04
66	0.1303E 00	0.9462E-01	0.5392E-01	0.3909E-01	0.2773E-01	0.2357E 09	0.5398E 01	-0.2255E-02	0.1712E 02	0.1985E 04	0.2590E 04
67	0.1293E 00	0.9446E-01	0.5353E-01	0.3970E-01	0.2708E-01	0.2280E 09	0.5395E 01	-0.2402E-02	0.1713E 02	0.1986E 04	0.2594E 04
68	0.1280E 00	0.9423E-01	0.5306E-01	0.4023E-01	0.2642E-01	0.2192E 09	0.5391E 01	-0.2552E-02	0.1714E 02	0.1986E 04	0.2598E 04
69	0.1268E 00	0.9385E-01	0.5255E-01	0.4072E-01	0.2576E-01	0.2144E 09	0.5388E 01	-0.2705E-02	0.1715E 02	0.1986E 04	0.2602E 04
70	0.1255E 00	0.9351E-01	0.5199E-01	0.4115E-01	0.2511E-01	0.2137E 09	0.5384E 01	-0.2859E-02	0.1715E 02	0.1987E 04	0.2606E 04
71	0.1244E 00	0.9325E-01	0.5135E-01	0.4155E-01	0.2445E-01	0.2122E 09	0.5381E 01	-0.3015E-02	0.1716E 02	0.1987E 04	0.2611E 04
72	0.1234E 00	0.9351E-01	0.5072E-01	0.4190E-01	0.2378E-01	0.2101E 09	0.5376E 01	-0.3173E-02	0.1717E 02	0.1988E 04	0.2616E 04
73	0.1226E 00	0.9367E-01	0.5019E-01	0.4223E-01	0.2310E-01	0.2077E 09	0.5372E 01	-0.3330E-02	0.1718E 02	0.1988E 04	0.2621E 04
74	0.1216E 00	0.9356E-01	0.4970E-01	0.4250E-01	0.2243E-01	0.2038E 09	0.5368E 01	-0.3486E-02	0.1718E 02	0.1989E 04	0.2626E 04
75	0.1206E 00	0.9326E-01	0.4913E-01	0.4274E-01	0.2177E-01	0.1985E 09	0.5363E 01	-0.3642E-02	0.1719E 02	0.1989E 04	0.2631E 04
76	0.1194E 00	0.9279E-01	0.4850E-01	0.4289E-01	0.2110E-01	0.1934E 09	0.5358E 01	-0.3796E-02	0.1720E 02	0.1990E 04	0.2637E 04
77	0.1181E 00	0.9218E-01	0.4783E-01	0.4300E-01	0.2044E-01	0.1860E 09	0.5352E 01	-0.3948E-02	0.1721E 02	0.1990E 04	0.2643E 04
78	0.1168E 00	0.9134E-01	0.4716E-01	0.4302E-01	0.1978E-01	0.1795E 09	0.5347E 01	-0.4096E-02	0.1722E 02	0.1991E 04	0.2649E 04
79	0.1159E 00	0.9043E-01	0.4645E-01	0.4304E-01	0.1914E-01	0.1716E 09	0.5341E 01	-0.4241E-02	0.1723E 02	0.1992E 04	0.2655E 04
80	0.1149E 00	0.8946E-01	0.4568E-01	0.4297E-01	0.1850E-01	0.1643E 09	0.5335E 01	-0.4381E-02	0.1724E 02	0.1992E 04	0.2661E 04
81	0.1138E 00	0.8866E-01	0.4489E-01	0.4282E-01	0.1788E-01	0.1574E 09	0.5329E 01	-0.4515E-02	0.1725E 02	0.1993E 04	0.2668E 04
82	0.1128E 00	0.8826E-01	0.4409E-01	0.4269E-01	0.1728E-01	0.1499E 09	0.5323E 01	-0.4644E-02	0.1726E 02	0.1994E 04	0.2674E 04
83	0.1117E 00	0.8772E-01	0.4339E-01	0.4247E-01	0.1671E-01	0.1431E 09	0.5316E 01	-0.4766E-02	0.1727E 02	0.1994E 04	0.2681E 04
84	0.1105E 00	0.8704E-01	0.4265E-01	0.4218E-01	0.1614E-01	0.1366E 09	0.5309E 01	-0.4881E-02	0.1728E 02	0.1995E 04	0.2688E 04
85	0.1092E 00	0.8617E-01	0.4190E-01	0.4188E-01	0.1565E-01	0.1301E 09	0.5302E 01	-0.4987E-02	0.1729E 02	0.1996E 04	0.2695E 04
86	0.1079E 00	0.8517E-01	0.4113E-01	0.4151E-01	0.1518E-01	0.1236E 09	0.5295E 01	-0.5086E-02	0.1730E 02	0.1997E 04	0.2703E 04
87	0.1069E 00	0.8399E-01	0.4034E-01	0.4104E-01	0.1473E-01	0.1188E 09	0.5287E 01	-0.5174E-02	0.1731E 02	0.1997E 04	0.2710E 04
88	0.1058E 00	0.8264E-01	0.3951E-01	0.4059E-01	0.1428E-01	0.1139E 09	0.5279E 01	-0.5253E-02	0.1732E 02	0.1998E 04	0.2718E 04
89	0.1047E 00	0.8116E-01	0.3864E-01	0.4010E-01	0.1385E-01	0.1092E 09	0.5272E 01	-0.5322E-02	0.1733E 02	0.1999E 04	0.2725E 04
90	0.1035E 00	0.7961E-01	0.3776E-01	0.3957E-01	0.1350E-01	0.1053E 09	0.5264E 01	-0.5379E-02	0.1734E 02	0.2000E 04	0.2733E 04
91	0.1023E 00	0.7800E-01	0.3690E-01	0.3891E-01	0.1318E-01	0.1023E 09	0.5256E 01	-0.5426E-02	0.1736E 02	0.2001E 04	0.2741E 04
92	0.1010E 00	0.7663E-01	0.3607E-01	0.3832E-01	0.1287E-01	0.1011E 09	0.5247E 01	-0.5460E-02	0.1737E 02	0.2002E 04	0.2749E 04
93	0.9974E-01	0.7542E-01	0.3527E-01	0.3763E-01	0.1258E-01	0.9976E 08	0.5239E 01	-0.5483E-02	0.1738E 02	0.2002E 04	0.2757E 04
94	0.9840E-01	0.7420E-01	0.3448E-01	0.3715E-01	0.1229E-01	0.1021E 09	0.5229E 01	-0.6280E-02	0.1739E 02	0.2003E 04	0.2765E 04
95	0.9421E-01	0.8104E-01	0.3365E-01	0.3652E-01	0.1200E-01	0.1053E 09	0.5219E 01	-0.6507E-02	0.1741E 02	0.2004E 04	0.2773E 04
96	0.9381E-01	0.7819E-01	0.3279E-01	0.3556E-01	0.1175E-01	0.1050E 09	0.5210E 01	-0.5773E-02	0.1742E 02	0.2005E 04	0.2781E 04
97	0.9462E-01	0.6982E-01	0.3194E-01	0.3484E-01	0.1158E-01	0.1045E 09	0.5199E 01	-0.6281E-02	0.1743E 02	0.2006E 04	0.2789E 04
98	0.8954E-01	0.7566E-01	0.3107E-01	0.3417E-01	0.1142E-01	0.1035E 09	0.5189E 01	-0.6342E-02	0.1744E 02	0.2007E 04	0.2798E 04
99	0.8949E-01	0.7191E-01	0.3019E-01	0.3314E-01	0.1125E-01	0.1050E 09	0.5178E 01	-0.6329E-02	0.1746E 02	0.2008E 04	0.2806E 04
100	0.8720E-01	0.7032E-01	0.2935E-01	0.3232E-01	0.1106E-01	0.1069E 09	0.5168E 01	-0.6213E-02	0.1747E 02	0.2009E 04	0.2814E 04
101	0.8572E-01	0.6801E-01	0.2855E-01	0.3140E-01	0.1083E-01	0.1086E 09	0.5157E 01	-0.6082E-02	0.1748E 02	0.2010E 04	0.2823E 04
102	0.8407E-01	0.6552E-01	0.2775E-01	0.3056E-01	0.1060E-01	0.1101E 09	0.5147E 01	-0.5922E-02	0.1750E 02	0.2011E 04	0.2831E 04
103	0.8255E-01	0.6322E-01	0.2696E-01	0.2962E-01	0.1041E-01	0.1120E 09	0.5137E 01	-0.5752E-02	0.1751E 02	0.2012E 04	0.2839E 04
104	0.8092E-01	0.6113E-01	0.2620E-01	0.2874E-01	0.1029E-01	0.1136E 09	0.5127E 01	-0.5568E-02	0.1752E 02	0.2013E 04	0.2847E 04

12	0.04094	0.00	0.00	-2.38E-02	2.02E-03	3.72E-02	4.81E-02	4.22E-02	2.91E-02	1.32E-02	1.68E-04	-1.13E-02	-2.12E-02
11	0.03719	0.00	-1.15E-01	-3.83E-02	-1.46E-02	1.32E-02	2.04E-02	1.61E-02	2.95E-03	-1.08E-02	-2.29E-02	-3.36E-02	-4.35E-02
10	0.03437	0.00	-1.07E-01	-6.40E-02	-3.18E-02	-8.54E-03	-4.46E-03	-7.80E-03	-1.98E-02	-3.16E-02	-4.19E-02	-5.16E-02	-6.06E-02
9	0.03219	0.00	-1.02E-01	-7.41E-02	-4.60E-02	-3.22E-02	-2.61E-02	-2.85E-02	-3.93E-02	-4.90E-02	-5.81E-02	-6.66E-02	-7.40E-02
8	0.03031	0.00	-1.05E-01	-9.12E-02	-6.51E-02	-5.11E-02	-4.50E-02	-4.74E-02	-5.64E-02	-6.44E-02	-7.22E-02	-7.93E-02	-8.57E-02
7	0.02687	0.00	-1.26E-01	-1.21E-01	-9.67E-02	-8.73E-02	-8.23E-02	-8.37E-02	-8.85E-02	-9.37E-02	-9.74E-02	-1.01E-01	-1.06E-01
6	0.02187	0.00	-1.69E-01	-1.65E-01	-1.55E-01	-1.41E-01	-1.36E-01	-1.35E-01	-1.35E-01	-1.33E-01	-1.32E-01	-1.31E-01	-1.33E-01
5	0.01625	0.00	-2.10E-01	-2.20E-01	-2.03E-01	-1.98E-01	-1.92E-01	-1.86E-01	-1.80E-01	-1.73E-01	-1.66E-01	-1.60E-01	-1.59E-01
4	0.01062	0.00	-2.52E-01	-2.63E-01	-2.55E-01	-2.46E-01	-2.36E-01	-2.24E-01	-2.15E-01	-2.03E-01	-1.92E-01	-1.82E-01	-1.78E-01
3	0.00562	0.00	-2.83E-01	-2.90E-01	-2.87E-01	-2.76E-01	-2.61E-01	-2.47E-01	-2.34E-01	-2.21E-01	-2.07E-01	-1.95E-01	-1.89E-01
2	0.00156	0.00	-3.02E-01	-3.01E-01	-2.99E-01	-2.87E-01	-2.70E-01	-2.55E-01	-2.41E-01	-2.27E-01	-2.13E-01	-2.00E-01	-1.93E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

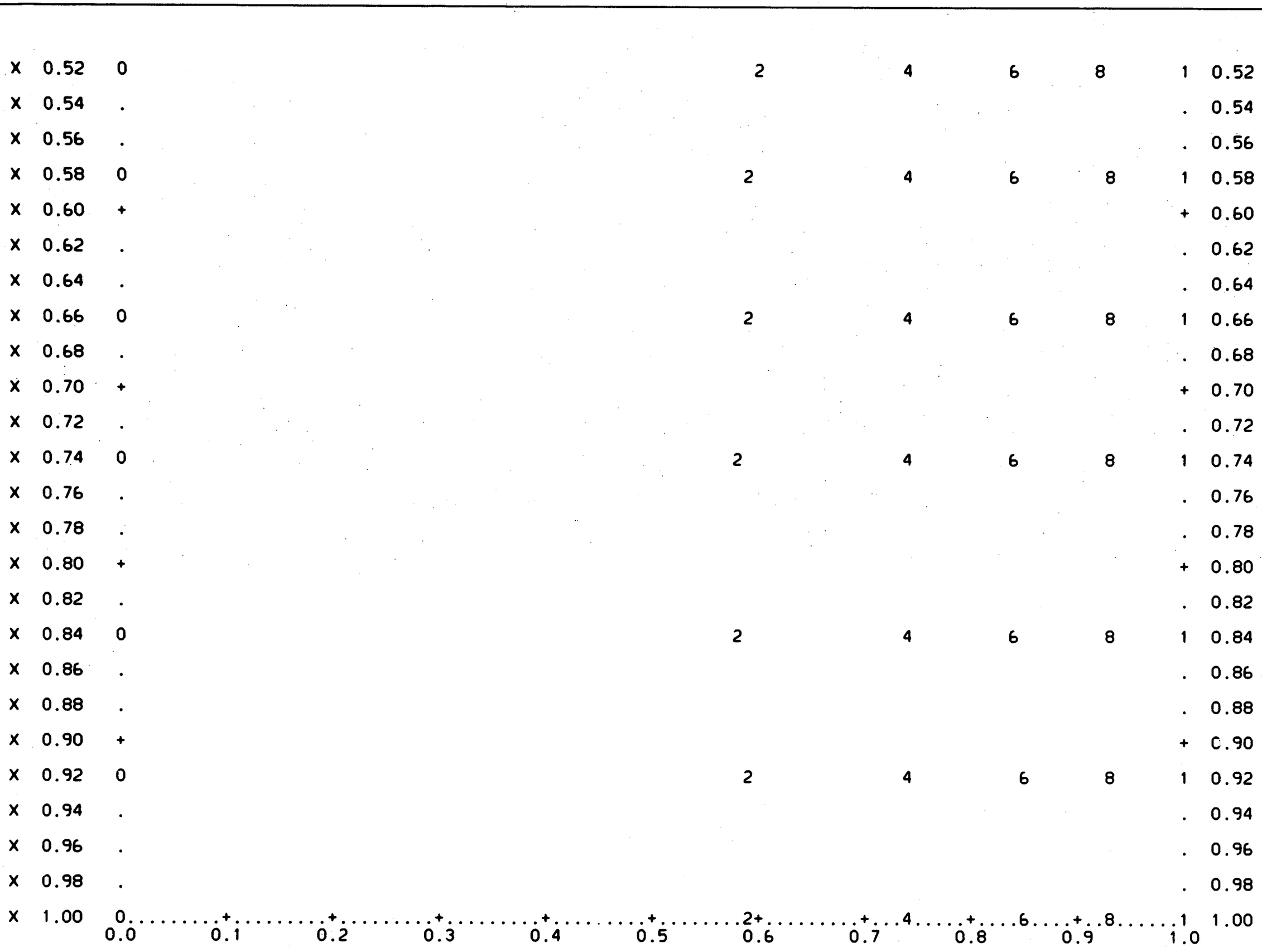
0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		1.03E-01	1.08E-01	1.14E-01	1.23E-01	1.32E-01	1.40E-01	1.44E-01	1.45E-01	1.45E-01	1.44E-01	0.00
19	0.05937		8.79E-02	9.16E-02	9.76E-02	1.06E-01	1.16E-01	1.23E-01	1.28E-01	1.30E-01	1.30E-01	1.28E-01	0.00
18	0.05594		6.58E-02	6.82E-02	7.29E-02	8.11E-02	8.92E-02	9.55E-02	9.98E-02	1.01E-01	1.01E-01	9.86E-02	0.00
17	0.05344		4.96E-02	5.10E-02	5.48E-02	6.20E-02	6.86E-02	7.38E-02	7.71E-02	7.76E-02	7.71E-02	7.41E-02	0.00
16	0.05078		3.26E-02	3.28E-02	3.57E-02	4.13E-02	4.65E-02	5.00E-02	5.20E-02	5.18E-02	5.05E-02	4.70E-02	0.00
15	0.04812		1.54E-02	1.50E-02	1.67E-02	2.07E-02	2.40E-02	2.58E-02	2.61E-02	2.54E-02	2.35E-02	1.96E-02	0.00
14	0.04562		-3.54E-04	-2.09E-03	-1.26E-03	1.02E-03	2.91E-03	2.91E-03	1.77E-03	5.98E-04	-1.89E-03	-5.96E-03	0.00
13	0.04328		-1.51E-02	-1.77E-02	-1.78E-02	-1.69E-02	-1.68E-02	-1.84E-02	-2.08E-02	-2.26E-02	-2.54E-02	-2.95E-02	0.00
12	0.04094		-2.97E-02	-3.30E-02	-3.41E-02	-3.47E-02	-3.63E-02	-3.97E-02	-4.31E-02	-4.56E-02	-4.85E-02	-5.23E-02	0.00
11	0.03719		-5.24E-02	-5.65E-02	-5.89E-02	-6.22E-02	-6.68E-02	-7.31E-02	-7.83E-02	-8.13E-02	-8.40E-02	-8.75E-02	0.00
10	0.03437		-6.91E-02	-7.37E-02	-7.72E-02	-8.21E-02	-8.87E-02	-9.71E-02	-1.03E-01	-1.07E-01	-1.09E-01	-1.12E-01	0.00
9	0.03219		-8.17E-02	-8.69E-02	-9.10E-02	-9.72E-02	-1.05E-01	-1.15E-01	-1.22E-01	-1.26E-01	-1.28E-01	-1.30E-01	0.00
8	0.03031		-9.25E-02	-9.77E-02	-1.03E-01	-1.10E-01	-1.19E-01	-1.29E-01	-1.37E-01	-1.41E-01	-1.43E-01	-1.45E-01	0.00
7	0.02687		-1.11E-01	-1.16E-01	-1.23E-01	-1.32E-01	-1.43E-01	-1.55E-01	-1.63E-01	-1.67E-01	-1.69E-01	-1.70E-01	0.00
6	0.02187		-1.37E-01	-1.41E-01	-1.49E-01	-1.60E-01	-1.73E-01	-1.87E-01	-1.96E-01	-2.00E-01	-2.01E-01	-2.01E-01	0.00
5	0.01625		-1.61E-01	-1 65E-01	-1.73E-01	-1.86E-01	-2.01E-01	-2.15E-01	-2.24E-01	-2.28E-01	-2.29E-01	-2.29E-01	0.00
4	0.01062		-1.79E-01	-1.83E-01	-1.92E-01	-2.05E-01	-2.21E-01	-2.35E-01	-2.44E-01	-2.48E-01	-2.49E-01	-2.49E-01	0.00
3	0.00562		-1.89E-01	-1.94E-01	-2.02E-01	-2.16E-01	-2.32E-01	-2.46E-01	-2.55E-01	-2.58E-01	-2.60E-01	-2.60E-01	0.00
2	0.00156		-1.93E-01	-1.97E-01	-2.06E-01	-2.20E-01	-2.36E-01	-2.50E-01	-2.59E-01	-2.62E-01	-2.64E-01	-2.64E-01	0.00
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- TURBULENCE ENERGY -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	5.32E 00	5.35E 00	4.38E 00	3.79E 00	3.80E 00	4.49E 00	5.22E 00	5.46E 00
19	0.05937		0.00	0.00	0.00	0.00	2.90E 01	3.62E 01	2.92E 01	2.36E 01	2.24E 01	2.60E 01	2.95E 01	2.96E 01
18	0.05594		0.00	0.00	0.00	0.00	5.19E 01	4.57E 01	3.73E 01	3.25E 01	3.43E 01	4.07E 01	4.45E 01	4.33E 01
17	0.05344		0.00	0.00	0.00	1.69E 01	4.17E 01	4.15E 01	3.86E 01	3.87E 01	4.43E 01	5.11E 01	5.35E 01	5.07E 01
16	0.05078		0.00	0.00	0.00	6.31E 01	5.38E 01	4.72E 01	4.51E 01	4.92E 01	5.67E 01	6.21E 01	6.24E 01	5.76E 01
15	0.04812		0.00	0.00	0.00	6.81E 01	5.55E 01	5.24E 01	5.55E 01	6.29E 01	6.95E 01	7.24E 01	7.03E 01	6.37E 01
14	0.04562		0.00	0.00	2.77E 01	4.89E 01	5.44E 01	6.06E 01	6.86E 01	7.63E 01	8.06E 01	8.09E 01	7.68E 01	6.87E 01
13	0.04328		0.00	0.00	7.79E 01	5.85E 01	6.33E 01	7.17E 01	8.09E 01	8.71E 01	8.90E 01	8.74E 01	8.19E 01	7.27E 01
12	0.04094		0.00	0.00	5.69E 01	5.29E 01	6.97E 01	8.10E 01	9.02E 01	9.49E 01	9.54E 01	9.26E 01	8.61E 01	7.59E 01
11	0.03719		0.00	3.84E 01	3.72E 01	5.57E 01	8.59E 01	9.18E 01	9.91E 01	1.03E 02	1.02E 02	9.84E 01	9.10E 01	7.99E 01
10	0.03437		0.00	7.07E 01	3.89E 01	6.85E 01	8.96E 01	9.21E 01	9.97E 01	1.04E 02	1.04E 02	1.01E 02	9.31E 01	8.17E 01
9	0.03219		0.00	3.71E 01	3.28E 01	7.84E 01	8.72E 01	8.95E 01	9.79E 01	1.03E 02	1.04E 02	1.01E 02	9.40E 01	8.25E 01
8	0.03031		2.70E 01	9.48E 00	3.47E 01	8.82E 01	8.43E 01	8.66E 01	9.54E 01	1.01E 02	1.03E 02	1.01E 02	9.42E 01	8.29E 01

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		DIMENSIONLESS PRESSURE											
		X = -0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
10	0.90000	4.82E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01	4.82E-01	
9	0.80000	4.64E-01	4.63E-01	4.62E-01	4.62E-01	4.62E-01	4.63E-01	4.63E-01	4.63E-01	4.63E-01	4.64E-01	4.64E-01	
8	0.70000	4.46E-01	4.44E-01	4.43E-01	4.42E-01	4.42E-01	4.43E-01	4.43E-01	4.43E-01	4.44E-01	4.44E-01	4.44E-01	
7	0.60000	4.27E-01	4.24E-01	4.22E-01	4.21E-01	4.21E-01	4.21E-01	4.21E-01	4.22E-01	4.22E-01	4.23E-01	4.23E-01	
6	0.50000	4.06E-01	4.02E-01	3.99E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.97E-01	3.98E-01	3.98E-01	3.98E-01	
5	0.40000	3.84E-01	3.78E-01	3.74E-01	3.71E-01	3.70E-01	3.69E-01	3.69E-01	3.69E-01	3.69E-01	3.70E-01	3.70E-01	
4	0.30000	3.59E-01	3.50E-01	3.45E-01	3.40E-01	3.38E-01	3.36E-01	3.35E-01	3.35E-01	3.36E-01	3.36E-01	3.36E-01	
3	0.20000	3.29E-01	3.17E-01	3.08E-01	3.02E-01	2.98E-01	2.95E-01	2.93E-01	2.92E-01	2.92E-01	2.93E-01	2.93E-01	
2	0.10000	2.89E-01	2.72E-01	2.58E-01	2.47E-01	2.39E-01	2.34E-01	2.30E-01	2.28E-01	2.28E-01	2.28E-01	2.28E-01	
1	0.00000	2.16E-01	1.63E-01	9.14E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	8.15E 05	8.15E 05	8.13E 05	8.09E 05	8.04E 05	7.98E 05	7.92E 05	7.85E 05	7.79E 05	7.73E 05	0.00
19	0.47500	7.94E 05	7.93E 05	7.90E 05	7.86E 05	7.82E 05	7.76E 05	7.71E 05	7.65E 05	7.60E 05	7.55E 05	0.00
18	0.44750	7.63E 05	7.60E 05	7.57E 05	7.53E 05	7.49E 05	7.44E 05	7.40E 05	7.35E 05	7.31E 05	7.27E 05	0.00
17	0.42750	7.40E 05	7.37E 05	7.33E 05	7.29E 05	7.25E 05	7.21E 05	7.17E 05	7.13E 05	7.10E 05	7.06E 05	0.00
16	0.40625	7.15E 05	7.11E 05	7.07E 05	7.04E 05	7.00E 05	6.97E 05	6.94E 05	6.91E 05	6.88E 05	6.85E 05	0.00
15	0.38500	6.90E 05	6.86E 05	6.82E 05	6.79E 05	6.76E 05	6.73E 05	6.71E 05	6.69E 05	6.67E 05	6.65E 05	0.00
14	0.36500	6.66E 05	6.62E 05	6.59E 05	6.56E 05	6.54E 05	6.52E 05	6.50E 05	6.49E 05	6.47E 05	6.46E 05	0.00
13	0.34625	6.44E 05	6.40E 05	6.38E 05	6.36E 05	6.34E 05	6.33E 05	6.32E 05	6.31E 05	6.30E 05	6.30E 05	0.00
12	0.32750	6.21E 05	6.19E 05	6.17E 05	6.15E 05	6.15E 05	6.14E 05	6.14E 05	6.14E 05	6.14E 05	6.14E 05	0.00
11	0.29750	5.86E 05	5.85E 05	5.85E 05	5.85E 05	5.86E 05	5.86E 05	5.87E 05	5.88E 05	5.89E 05	5.91E 05	0.00
10	0.27500	5.59E 05	5.60E 05	5.62E 05	5.63E 05	5.65E 05	5.67E 05	5.69E 05	5.71E 05	5.72E 05	5.74E 05	0.00
9	0.25750	5.39E 05	5.42E 05	5.44E 05	5.47E 05	5.50E 05	5.53E 05	5.55E 05	5.58E 05	5.60E 05	5.63E 05	0.00
8	0.24250	5.22E 05	5.26E 05	5.30E 05	5.34E 05	5.38E 05	5.41E 05	5.44E 05	5.47E 05	5.50E 05	5.53E 05	0.00
7	0.21500	4.92E 05	5.00E 05	5.06E 05	5.12E 05	5.17E 05	5.22E 05	5.26E 05	5.30E 05	5.33E 05	5.37E 05	0.00
6	0.17500	4.53E 05	4.65E 05	4.75E 05	4.83E 05	4.90E 05	4.97E 05	5.03E 05	5.08E 05	5.13E 05	5.17E 05	0.00
5	0.13000	0.00	2.31E 05	2.58E 05	2.65E 05	2.71E 05	2.78E 05	2.87E 05	3.02E 05	3.23E 05	3.48E 05	3.73E 05	3.96E 05
4	0.08500	0.00	1.56E 05	1.96E 05	2.10E 05	2.22E 05	2.31E 05	2.41E 05	2.56E 05	2.78E 05	3.06E 05	3.36E 05	3.64E 05
3	0.04500	0.00	6.13E 04	1.51E 05	1.75E 05	1.93E 05	2.04E 05	2.15E 05	2.30E 05	2.53E 05	2.83E 05	3.15E 05	3.46E 05
2	0.01250	0.00	0.00	1.14E 05	1.60E 05	1.82E 05	1.94E 05	2.05E 05	2.20E 05	2.44E 05	2.74E 05	3.07E 05	3.39E 05
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



DIMENSIONLESS STREAMLINE PLOT

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	9.74E-01	9.75E-01	9.75E-01	9.75E-01	9.75E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01
19	0.05937	8.61E-01	8.66E-01	8.69E-01	8.70E-01	8.70E-01	8.69E-01	8.69E-01	8.68E-01	8.67E-01	8.66E-01	8.66E-01
18	0.05594	7.10E-01	7.22E-01	7.29E-01	7.32E-01	7.33E-01	7.32E-01	7.32E-01	7.30E-01	7.29E-01	7.27E-01	7.27E-01
17	0.05344	6.06E-01	6.24E-01	6.34E-01	6.39E-01	6.41E-01	6.41E-01	6.41E-01	6.39E-01	6.37E-01	6.35E-01	6.35E-01
16	0.05078	5.03E-01	5.26E-01	5.40E-01	5.47E-01	5.51E-01	5.52E-01	5.52E-01	5.51E-01	5.49E-01	5.47E-01	5.47E-01
15	0.04812	4.09E-01	4.36E-01	4.53E-01	4.63E-01	4.69E-01	4.71E-01	4.72E-01	4.72E-01	4.70E-01	4.68E-01	4.68E-01
14	0.04562	3.29E-01	3.60E-01	3.80E-01	3.92E-01	3.99E-01	4.03E-01	4.04E-01	4.04E-01	4.03E-01	4.02E-01	4.02E-01
13	0.04328	2.62E-01	2.95E-01	3.17E-01	3.31E-01	3.40E-01	3.44E-01	3.47E-01	3.48E-01	3.47E-01	3.46E-01	3.46E-01
12	0.04094	2.04E-01	2.38E-01	2.62E-01	2.77E-01	2.87E-01	2.92E-01	2.96E-01	2.97E-01	2.97E-01	2.95E-01	2.95E-01
11	0.03719	1.26E-01	1.61E-01	1.86E-01	2.03E-01	2.14E-01	2.21E-01	2.25E-01	2.27E-01	2.27E-01	2.26E-01	2.26E-01
10	0.03437	8.07E-02	1.15E-01	1.40E-01	1.57E-01	1.68E-01	1.76E-01	1.80E-01	1.83E-01	1.83E-01	1.83E-01	1.83E-01
9	0.03219	5.25E-02	8.59E-02	1.10E-01	1.27E-01	1.38E-01	1.46E-01	1.50E-01	1.53E-01	1.54E-01	1.53E-01	1.53E-01
8	0.03031	3.31E-02	6.48E-02	8.82E-02	1.05E-01	1.16E-01	1.23E-01	1.28E-01	1.30E-01	1.31E-01	1.31E-01	1.31E-01
7	0.02687	7.06E-03	3.51E-02	5.61E-02	7.10E-02	8.13E-02	8.82E-02	9.28E-02	9.52E-02	9.62E-02	9.61E-02	9.61E-02
6	0.02187	-1.22E-02	9.07E-03	2.54E-02	3.72E-02	4.54E-02	5.11E-02	5.48E-02	5.68E-02	5.78E-02	5.78E-02	5.79E-02
5	0.01625	-1.57E-02	-2.52E-03	7.76E-03	1.53E-02	2.07E-02	2.43E-02	2.68E-02	2.82E-02	2.88E-02	2.89E-02	2.90E-02
4	0.01062	-9.66E-03	-3.55E-03	1.27E-03	4.85E-03	7.39E-03	9.17E-03	1.03E-02	1.10E-02	1.14E-02	1.14E-02	1.14E-02
3	0.00562	-3.19E-03	-1.40E-03	2.29E-05	1.08E-03	1.84E-03	2.37E-03	2.72E-03	2.93E-03	3.03E-03	3.05E-03	3.05E-03
2	0.00156	-2.64E-04	-1.23E-04	-1.07E-05	7.31E-05	1.33E-04	1.75E-04	2.03E-04	2.20E-04	2.28E-04	2.30E-04	2.30E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RADIAL COORDINATE OF STREAMLINES

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J	Y												
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.91E-02	4.69E-02	5.47E-02	5.99E-02	6.08E-02	6.09E-02	6.08E-02	6.07E-02	6.05E-02	6.04E-02
9	0.80000	0.00	2.79E-02	3.61E-02	4.47E-02	5.22E-02	5.80E-02	5.93E-02	5.94E-02	5.92E-02	5.89E-02	5.86E-02	5.83E-02
8	0.70000	0.00	2.61E-02	3.45E-02	4.35E-02	5.10E-02	5.62E-02	5.79E-02	5.79E-02	5.76E-02	5.71E-02	5.66E-02	5.61E-02
7	0.60000	0.00	2.41E-02	3.24E-02	4.21E-02	4.96E-02	5.48E-02	5.64E-02	5.65E-02	5.60E-02	5.53E-02	5.46E-02	5.39E-02
6	0.50000	0.00	2.21E-02	3.02E-02	4.05E-02	4.82E-02	5.34E-02	5.51E-02	5.50E-02	5.44E-02	5.35E-02	5.25E-02	5.15E-02
5	0.40000	0.00	1.96E-02	2.78E-02	3.88E-02	4.68E-02	5.20E-02	5.37E-02	5.36E-02	5.27E-02	5.15E-02	5.02E-02	4.89E-02
4	0.30000	0.00	1.70E-02	2.52E-02	3.70E-02	4.54E-02	5.07E-02	5.23E-02	5.21E-02	5.09E-02	4.92E-02	4.76E-02	4.60E-02
3	0.20000	0.00	1.37E-02	2.24E-02	3.49E-02	4.39E-02	4.92E-02	5.09E-02	5.05E-02	4.88E-02	4.67E-02	4.46E-02	4.26E-02
2	0.10000	0.00	9.69E-03	1.85E-02	3.24E-02	4.22E-02	4.77E-02	4.94E-02	4.86E-02	4.64E-02	4.37E-02	4.10E-02	3.82E-02
1	0.00000	0.00	0.00	1.23E-02	2.90E-02	4.02E-02	4.60E-02	4.77E-02	4.64E-02	4.34E-02	3.94E-02	3.55E-02	3.11E-02

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J	Y											
11	1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	6.02E-02	6.02E-02	6.01E-02	6.01E-02	6.01E-02	6.01E-02	6.01E-02	6.01E-02	6.01E-02	6.02E-02	6.02E-02
9	0.80000	5.80E-02	5.78E-02	5.77E-02	5.76E-02	5.76E-02	5.76E-02	5.77E-02	5.77E-02	5.77E-02	5.77E-02	5.77E-02
8	0.70000	5.57E-02	5.54E-02	5.52E-02	5.51E-02	5.50E-02	5.50E-02	5.51E-02	5.51E-02	5.52E-02	5.52E-02	5.52E-02
7	0.60000	5.33E-02	5.28E-02	5.25E-02	5.23E-02	5.22E-02	5.22E-02	5.22E-02	5.23E-02	5.23E-02	5.24E-02	5.24E-02
6	0.50000	5.07E-02	5.00E-02	4.96E-02	4.93E-02	4.91E-02	4.91E-02	4.90E-02	4.91E-02	4.91E-02	4.92E-02	4.92E-02
5	0.40000	4.78E-02	4.69E-02	4.63E-02	4.59E-02	4.57E-02	4.55E-02	4.54E-02	4.54E-02	4.55E-02	4.56E-02	4.56E-02
4	0.30000	4.46E-02	4.34E-02	4.25E-02	4.19E-02	4.15E-02	4.13E-02	4.11E-02	4.11E-02	4.11E-02	4.12E-02	4.12E-02
3	0.20000	4.08E-02	3.91E-02	3.79E-02	3.70E-02	3.63E-02	3.59E-02	3.56E-02	3.55E-02	3.55E-02	3.55E-02	3.55E-02
2	0.10000	3.56E-02	3.32E-02	3.13E-02	2.98E-02	2.87E-02	2.80E-02	2.76E-02	2.73E-02	2.73E-02	2.73E-02	2.73E-02
1	0.00000	2.50E-02	1.75E-02	2.86E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS U VELOCITY

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363

19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.92E 02	4.59E 02	4.08E 02	3.67E 02	3.89E 02	5.13E 02	6.30E 02	6.56E 02					
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	5.11E 02	4.78E 02	4.53E 02	4.67E 02	6.13E 02	9.24E 02	1.20E 03	1.29E 03					
17	0.42750	1.00E 00	1.00E 00	1.00E 00	7.62E 01	3.17E 02	3.97E 02	4.51E 02	5.54E 02	8.12E 02	1.19E 03	1.49E 03	1.62E 03					
16	0.40625	1.00E 00	1.00E 00	1.00E 00	5.01E 02	4.62E 02	4.76E 02	5.43E 02	7.33E 02	1.07E 03	1.45E 03	1.76E 03	1.90E 03					
15	0.38500	1.00E 00	1.00E 00	1.00E 00	5.05E 02	4.47E 02	5.24E 02	6.93E 02	9.78E 02	1.34E 03	1.70E 03	1.99E 03	2.13E 03					
14	0.36500	1.00E 00	1.00E 00	9.49E 01	2.69E 02	4.17E 02	6.25E 02	9.01E 02	1.23E 03	1.57E 03	1.91E 03	2.18E 03	2.32E 03					
13	0.34625	1.00E 00	1.00E 00	4.92E 02	3.71E 02	5.23E 02	8.02E 02	1.12E 03	1.45E 03	1.78E 03	2.09E 03	2.35E 03	2.48E 03					
12	0.32750	1.00E 00	1.00E 00	4.10E 02	3.21E 02	6.01E 02	9.88E 02	1.33E 03	1.65E 03	1.96E 03	2.26E 03	2.51E 03	2.63E 03					
11	0.29750	1.00E 00	1.64E 02	1.45E 02	2.88E 02	7.83E 02	1.32E 03	1.63E 03	1.92E 03	2.22E 03	2.51E 03	2.73E 03	2.84E 03					
10	0.27500	1.00E 00	4.82E 02	1.34E 02	3.57E 02	1.04E 03	1.52E 03	1.79E 03	2.08E 03	2.38E 03	2.66E 03	2.88E 03	2.97E 03					
9	0.25750	1.00E 00	3.67E 02	7.18E 01	4.24E 02	1.21E 03	1.64E 03	1.90E 03	2.19E 03	2.49E 03	2.77E 03	2.98E 03	3.07E 03					
8	0.24250	1.00E 00	7.18E 00	5.14E 01	5.14E 02	1.34E 03	1.74E 03	1.99E 03	2.27E 03	2.57E 03	2.85E 03	3.06E 03	3.14E 03					
7	0.21500	1.00E 00	7.31E 00	7.76E 01	6.94E 02	1.59E 03	1.90E 03	2.13E 03	2.42E 03	2.72E 03	3.00E 03	3.19E 03	3.26E 03					
6	0.17500	1.00E 00	7.74E 00	1.48E 02	1.10E 03	1.86E 03	2.12E 03	2.34E 03	2.62E 03	2.92E 03	3.18E 03	3.35E 03	3.40E 03					
5	0.13000	1.00E 00	9.21E 00	3.40E 02	1.42E 03	2.15E 03	2.36E 03	2.56E 03	2.82E 03	3.10E 03	3.34E 03	3.49E 03	3.52E 03					
4	0.08500	1.00E 00	1.47E 01	7.72E 02	1.81E 03	2.40E 03	2.57E 03	2.76E 03	3.01E 03	3.26E 03	3.47E 03	3.60E 03	3.61E 03					
3	0.04500	1.00E 00	4.03E 01	1.08E 03	2.15E 03	2.57E 03	2.72E 03	2.91E 03	3.15E 03	3.39E 03	3.58E 03	3.69E 03	3.69E 03					
2	0.01250	1.00E 00	7.44E 01	1.54E 03	2.41E 03	2.70E 03	2.83E 03	3.03E 03	3.28E 03	3.52E 03	3.71E 03	3.81E 03	3.80E 03					
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00					

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500		2.17E 01	2.10E 01	2.01E 01	1.92E 01	1.84E 01	1.78E 01	1.72E 01	1.67E 01	1.63E 01	1.63E 01	1.00E 00
19	0.47500		6.11E 02	5.28E 02	4.34E 02	3.44E 02	2.67E 02	2.06E 02	1.62E 02	1.34E 02	1.15E 02	1.41E 02	1.00E 00
18	0.44750		1.24E 03	1.10E 03	9.37E 02	7.71E 02	6.22E 02	4.97E 02	4.02E 02	3.35E 02	2.86E 02	3.56E 02	1.00E 00
17	0.42750		1.58E 03	1.43E 03	1.24E 03	1.04E 03	8.64E 02	7.09E 02	5.88E 02	5.00E 02	4.35E 02	5.34E 02	1.00E 00
16	0.40625		1.87E 03	1.72E 03	1.52E 03	1.30E 03	1.09E 03	9.15E 02	7.75E 02	6.71E 02	5.94E 02	7.15E 02	1.00E 00
15	0.38500		2.11E 03	1.96E 03	1.74E 03	1.51E 03	1.29E 03	1.10E 03	9.43E 02	8.27E 02	7.41E 02	8.77E 02	1.00E 00
14	0.36500		2.30E 03	2.15E 03	1.93E 03	1.69E 03	1.45E 03	1.25E 03	1.08E 03	9.59E 02	8.66E 02	1.01E 03	1.00E 00
13	0.34625		2.46E 03	2.30E 03	2.08E 03	1.83E 03	1.59E 03	1.37E 03	1.20E 03	1.07E 03	9.70E 02	1.12E 03	1.00E 00
12	0.32750		2.60E 03	2.44E 03	2.21E 03	1.95E 03	1.70E 03	1.48E 03	1.30E 03	1.16E 03	1.06E 03	1.21E 03	1.00E 00
11	0.29750		2.79E 03	2.62E 03	2.38E 03	2.12E 03	1.86E 03	1.63E 03	1.43E 03	1.30E 03	1.19E 03	1.34E 03	1.00E 00
10	0.27500		2.92E 03	2.74E 03	2.49E 03	2.22E 03	1.96E 03	1.72E 03	1.53E 03	1.38E 03	1.27E 03	1.42E 03	1.00E 00
9	0.25750		3.01E 03	2.82E 03	2.57E 03	2.29E 03	2.02E 03	1.78E 03	1.59E 03	1.43E 03	1.32E 03	1.47E 03	1.00E 00
8	0.24250		3.08E 03	2.89E 03	2.63E 03	2.35E 03	2.07E 03	1.83E 03	1.63E 03	1.48E 03	1.36E 03	1.51E 03	1.00E 00
7	0.21500		3.19E 03	2.99E 03	2.72E 03	2.43E 03	2.15E 03	1.90E 03	1.70E 03	1.54E 03	1.42E 03	1.56E 03	1.00E 00
6	0.17500		3.32E 03	3.11E 03	2.83E 03	2.53E 03	2.24E 03	1.99E 03	1.78E 03	1.61E 03	1.49E 03	1.62E 03	1.00E 00
5	0.13000		3.42E 03	3.21E 03	2.93E 03	2.62E 03	2.32E 03	2.06E 03	1.84E 03	1.68E 03	1.55E 03	1.67E 03	1.00E 00
4	0.08500		3.50E 03	3.28E 03	3.00E 03	2.69E 03	2.38E 03	2.11E 03	1.89E 03	1.72E 03	1.59E 03	1.70E 03	1.00E 00
3	0.04500		3.57E 03	3.34E 03	3.05E 03	2.73E 03	2.42E 03	2.14E 03	1.92E 03	1.75E 03	1.61E 03	1.73E 03	1.00E 00
2	0.01250		3.66E 03	3.41E 03	3.10E 03	2.78E 03	2.46E 03	2.17E 03	1.94E 03	1.76E 03	1.63E 03	1.76E 03	1.00E 00
1	-0.01250		1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	1.734E-02
3	9.443E-02	1.167E-02
4	1.643E-01	7.430E-03

105	0.7925E-01	0.5914E-01	0.2543E-01	0.2783E-01	0.1016E-01	0.1145E 09	0.5117E 01	-0.5374E-02	0.1754E 02	0.2014E 04	0.2855E 04
106	0.7763E-01	0.5720E-01	0.2470E-01	0.2707E-01	0.1003E-01	0.1215E 09	0.5106E 01	-0.5806E-02	0.1755E 02	0.2015E 04	0.2863E 04
107	0.7382E-01	0.6101E-01	0.2394E-01	0.2628E-01	0.9890E-02	0.1280E 09	0.5094E 01	-0.5737E-02	0.1756E 02	0.2016E 04	0.2871E 04
108	0.7272E-01	0.5833E-01	0.2320E-01	0.2519E-01	0.9697E-02	0.1282E 09	0.5085E 01	-0.4982E-02	0.1758E 02	0.2017E 04	0.2879E 04
109	0.7252E-01	0.5132E-01	0.2256E-01	0.2434E-01	0.9367E-02	0.1225E 09	0.5075E 01	-0.5139E-02	0.1759E 02	0.2018E 04	0.2887E 04
110	0.6872E-01	0.5420E-01	0.2190E-01	0.2342E-01	0.9061E-02	0.1210E 09	0.5064E 01	-0.4934E-02	0.1760E 02	0.2018E 04	0.2894E 04
111	0.6817E-01	0.5076E-01	0.2127E-01	0.2229E-01	0.8829E-02	0.1231E 09	0.5054E 01	-0.4738E-02	0.1762E 02	0.2020E 04	0.2901E 04
112	0.6583E-01	0.4909E-01	0.2067E-01	0.2146E-01	0.8656E-02	0.1260E 09	0.5045E 01	-0.4433E-02	0.1763E 02	0.2021E 04	0.2908E 04
113	0.6431E-01	0.4670E-01	0.2008E-01	0.2059E-01	0.8482E-02	0.1283E 09	0.5036E 01	-0.4135E-02	0.1764E 02	0.2022E 04	0.2915E 04
114	0.6254E-01	0.4454E-01	0.1950E-01	0.1985E-01	0.8300E-02	0.1295E 09	0.5027E 01	-0.3805E-02	0.1765E 02	0.2023E 04	0.2921E 04
115	0.6087E-01	0.4249E-01	0.1895E-01	0.1902E-01	0.8113E-02	0.1300E 09	0.5019E 01	-0.3477E-02	0.1767E 02	0.2023E 04	0.2928E 04
116	0.5929E-01	0.4048E-01	0.1841E-01	0.1831E-01	0.7922E-02	0.1306E 09	0.5012E 01	-0.3138E-02	0.1768E 02	0.2024E 04	0.2934E 04
117	0.5775E-01	0.3856E-01	0.1794E-01	0.1760E-01	0.7738E-02	0.1312E 09	0.5004E 01	-0.2801E-02	0.1769E 02	0.2025E 04	0.2940E 04
118	0.5612E-01	0.3667E-01	0.1750E-01	0.1689E-01	0.7563E-02	0.1317E 09	0.4990E 01	-0.2461E-02	0.1770E 02	0.2026E 04	0.2945E 04
119	0.5453E-01	0.3481E-01	0.1706E-01	0.1620E-01	0.7406E-02	0.1324E 09	0.4992E 01	-0.2123E-02	0.1771E 02	0.2027E 04	0.2951E 04
120	0.5301E-01	0.3296E-01	0.1665E-01	0.1552E-01	0.7268E-02	0.1329E 09	0.4986E 01	-0.1788E-02	0.1772E 02	0.2028E 04	0.2956E 04
121	0.5154E-01	0.3128E-01	0.1626E-01	0.1494E-01	0.7131E-02	0.1334E 09	0.4981E 01	-0.1456E-02	0.1774E 02	0.2029E 04	0.2961E 04
122	0.5017E-01	0.2970E-01	0.1589E-01	0.1433E-01	0.6981E-02	0.1338E 09	0.4976E 01	-0.1129E-02	0.1775E 02	0.2030E 04	0.2966E 04
123	0.4888E-01	0.2839E-01	0.1555E-01	0.1375E-01	0.6819E-02	0.1346E 09	0.4972E 01	-0.8099E-03	0.1776E 02	0.2031E 04	0.2970E 04
124	0.4764E-01	0.2712E-01	0.1524E-01	0.1320E-01	0.6654E-02	0.1337E 09	0.4969E 01	-0.4974E-03	0.1777E 02	0.2032E 04	0.2975E 04
125	0.4650E-01	0.2585E-01	0.1497E-01	0.1266E-01	0.6488E-02	0.1346E 09	0.4966E 01	-0.1946E-03	0.1778E 02	0.2033E 04	0.2979E 04
126	0.4544E-01	0.2463E-01	0.1471E-01	0.1216E-01	0.6320E-02	0.1348E 09	0.4963E 01	0.9858E-04	0.1779E 02	0.2034E 04	0.2983E 04
127	0.4445E-01	0.2348E-01	0.1448E-01	0.1168E-01	0.6159E-02	0.1350E 09	0.4961E 01	0.3818E-03	0.1780E 02	0.2035E 04	0.2987E 04
128	0.4360E-01	0.2242E-01	0.1426E-01	0.1123E-01	0.6003E-02	0.1350E 09	0.4960E 01	0.6537E-03	0.1780E 02	0.2036E 04	0.2991E 04
129	0.4279E-01	0.2149E-01	0.1405E-01	0.1084E-01	0.5849E-02	0.1355E 09	0.4959E 01	0.9132E-03	0.1781E 02	0.2037E 04	0.2995E 04
130	0.4203E-01	0.2066E-01	0.1387E-01	0.1041E-01	0.5703E-02	0.1351E 09	0.4958E 01	0.1161E-02	0.1782E 02	0.2037E 04	0.2998E 04
131	0.4132E-01	0.1989E-01	0.1371E-01	0.1006E-01	0.5554E-02	0.1355E 09	0.4958E 01	0.1395E-02	0.1783E 02	0.2038E 04	0.3001E 04
132	0.4070E-01	0.1916E-01	0.1358E-01	0.9687E-02	0.5403E-02	0.1358E 09	0.4958E 01	0.1615E-02	0.1784E 02	0.2039E 04	0.3004E 04
133	0.4015E-01	0.1848E-01	0.1345E-01	0.9395E-02	0.5253E-02	0.1350E 09	0.4959E 01	0.1821E-02	0.1785E 02	0.2040E 04	0.3007E 04
134	0.3966E-01	0.1785E-01	0.1333E-01	0.9080E-02	0.5106E-02	0.1351E 09	0.4960E 01	0.2013E-02	0.1785E 02	0.2041E 04	0.3010E 04
135	0.3916E-01	0.1733E-01	0.1324E-01	0.8821E-02	0.4961E-02	0.1349E 09	0.4962E 01	0.2190E-02	0.1786E 02	0.2042E 04	0.3013E 04
136	0.3867E-01	0.1687E-01	0.1316E-01	0.8544E-02	0.4824E-02	0.1344E 09	0.4963E 01	0.2353E-02	0.1787E 02	0.2043E 04	0.3015E 04
137	0.3814E-01	0.1651E-01	0.1310E-01	0.8333E-02	0.4693E-02	0.1347E 09	0.4966E 01	0.2501E-02	0.1788E 02	0.2043E 04	0.3018E 04
138	0.3761E-01	0.1618E-01	0.1305E-01	0.8114E-02	0.4561E-02	0.1341E 09	0.4968E 01	0.2635E-02	0.1788E 02	0.2044E 04	0.3020E 04
139	0.3707E-01	0.1597E-01	0.1302E-01	0.7934E-02	0.4437E-02	0.1338E 09	0.4971E 01	0.2755E-02	0.1789E 02	0.2045E 04	0.3022E 04
140	0.3653E-01	0.1587E-01	0.1300E-01	0.7780E-02	0.4315E-02	0.1334E 09	0.4974E 01	0.2860E-02	0.1790E 02	0.2046E 04	0.3024E 04
141	0.3597E-01	0.1583E-01	0.1302E-01	0.7609E-02	0.4197E-02	0.1327E 09	0.4977E 01	0.2951E-02	0.1790E 02	0.2047E 04	0.3026E 04
142	0.3541E-01	0.1584E-01	0.1305E-01	0.7513E-02	0.4081E-02	0.1325E 09	0.4980E 01	0.3029E-02	0.1791E 02	0.2047E 04	0.3028E 04
143	0.3484E-01	0.1590E-01	0.1310E-01	0.7407E-02	0.3967E-02	0.1319E 09	0.4984E 01	0.3092E-02	0.1791E 02	0.2048E 04	0.3030E 04
144	0.3428E-01	0.1597E-01	0.1315E-01	0.7351E-02	0.3860E-02	0.1314E 09	0.4988E 01	0.3143E-02	0.1792E 02	0.2049E 04	0.3031E 04
145	0.3374E-01	0.1606E-01	0.1319E-01	0.7247E-02	0.3704E-02	0.1203E 09	0.4992E 01	0.3183E-02	0.1793E 02	0.2050E 04	0.3033E 04
146	0.3320E-01	0.1616E-01	0.1325E-01	0.7224E-02	0.3579E-02	0.1179E 09	0.4996E 01	0.3211E-02	0.1793E 02	0.2050E 04	0.3034E 04
147	0.3265E-01	0.1622E-01	0.1331E-01	0.7173E-02	0.3477E-02	0.1183E 09	0.5000E 01	0.3228E-02	0.1794E 02	0.2051E 04	0.3036E 04
148	0.3209E-01	0.1626E-01	0.1337E-01	0.7181E-02	0.3386E-02	0.1187E 09	0.5004E 01	0.3234E-02	0.1794E 02	0.2052E 04	0.3037E 04
149	0.3153E-01	0.1628E-01	0.1342E-01	0.7173E-02	0.3307E-02	0.1187E 09	0.5009E 01	0.3231E-02	0.1795E 02	0.2053E 04	0.3038E 04
150	0.3095E-01	0.1628E-01	0.1348E-01	0.7165E-02	0.3236E-02	0.1185E 09	0.5013E 01	0.3219E-02	0.1795E 02	0.2053E 04	0.3040E 04
151	0.3036E-01	0.1629E-01	0.1355E-01	0.7158E-02	0.3173E-02	0.1184E 09	0.5018E 01	0.3196E-02	0.1796E 02	0.2054E 04	0.3041E 04
152	0.2976E-01	0.1626E-01	0.1360E-01	0.7172E-02	0.3122E-02	0.1175E 09	0.5023E 01	0.3166E-02	0.1796E 02	0.2055E 04	0.3042E 04
153	0.2916E-01	0.1625E-01	0.1366E-01	0.7204E-02	0.3077E-02	0.1173E 09	0.5027E 01	0.3128E-02	0.1797E 02	0.2055E 04	0.3043E 04
154	0.2855E-01	0.1622E-01	0.1372E-01	0.7195E-02	0.3040E-02	0.1163E 09	0.5032E 01	0.3080E-02	0.1797E 02	0.2056E 04	0.3044E 04
155	0.2796E-01	0.1618E-01	0.1377E-01	0.7232E-02	0.3008E-02	0.1155E 09	0.5036E 01	0.3026E-02	0.1798E 02	0.2057E 04	0.3045E 04
156	0.2736E-01	0.1611E-01	0.1382E-01	0.7263E-02	0.2980E-02	0.1146E 09	0.5041E 01	0.2965E-02	0.1798E 02	0.2057E 04	0.3046E 04
157	0.2677E-01	0.1602E-01	0.1386E-01	0.7279E-02	0.2951E-02	0.1144E 09	0.5045E 01	0.2898E-02	0.1799E 02	0.2058E 04	0.3047E 04
158	0.2619E-01	0.1591E-01	0.1391E-01	0.7312E-02	0.2920E-02	0.1131E 09	0.5050E 01	0.2824E-02	0.1799E 02	0.2059E 04	0.3048E 04

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  7 0.02687   2.70E 01 9.86E 00 4.56E 01 1.01E 02 7.81E 01 8.16E 01 9.03E 01 9.77E 01 1.01E 02 1.00E 02 9.36E 01 8.26E 01
  6 0.02187   2.70E 01 1.10E 01 6.93E 01 1.03E 02 7.21E 01 7.62E 01 8.40E 01 9.20E 01 9.69E 01 9.67E 01 9.11E 01 8.07E 01
  5 0.01625   2.70E 01 1.44E 01 1.13E 02 7.56E 01 6.85E 01 7.21E 01 7.88E 01 8.61E 01 9.12E 01 9.17E 01 8.68E 01 7.73E 01
  4 0.01062   2.70E 01 2.44E 01 1.62E 02 6.75E 01 6.65E 01 6.96E 01 7.53E 01 8.16E 01 8.62E 01 8.69E 01 8.24E 01 7.37E 01
  3 0.00562   2.70E 01 5.08E 01 1.09E 02 6.63E 01 6.56E 01 6.83E 01 7.35E 01 7.91E 01 8.32E 01 8.38E 01 7.97E 01 7.14E 01
  2 0.00156   2.70E 01 6.98E 01 1.07E 02 6.59E 01 6.54E 01 6.82E 01 7.33E 01 7.87E 01 8.25E 01 8.30E 01 7.89E 01 7.08E 01
  1-0.00156       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =      13       14       15       16       17       18       19       20       21       22       23
        X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187   5.26E 00 4.85E 00 4.41E 00 4.02E 00 3.69E 00 3.42E 00 3.20E 00 3.02E 00 2.87E 00 2.89E 00 2.70E 01
 19 0.05937   2.68E 01 2.26E 01 1.85E 01 1.48E 01 1.17E 01 9.40E 00 7.73E 00 6.60E 00 5.85E 00 7.09E 00 2.70E 01
 18 0.05594   3.84E 01 3.21E 01 2.59E 01 2.06E 01 1.62E 01 1.29E 01 1.04E 01 8.72E 00 7.53E 00 9.85E 00 2.70E 01
 17 0.05344   4.44E 01 3.68E 01 2.96E 01 2.34E 01 1.85E 01 1.46E 01 1.18E 01 9.92E 00 8.56E 00 1.15E 01 2.70E 01
 16 0.05078   4.98E 01 4.10E 01 3.28E 01 2.59E 01 2.04E 01 1.62E 01 1.31E 01 1.10E 01 9.53E 00 1.30E 01 2.70E 01
 15 0.04812   5.44E 01 4.45E 01 3.54E 01 2.79E 01 2.20E 01 1.75E 01 1.42E 01 1.19E 01 1.03E 01 1.42E 01 2.70E 01
 14 0.04562   5.82E 01 4.73E 01 3.76E 01 2.95E 01 2.32E 01 1.85E 01 1.50E 01 1.26E 01 1.10E 01 1.51E 01 2.70E 01
 13 0.04328   6.12E 01 4.96E 01 3.93E 01 3.08E 01 2.42E 01 1.92E 01 1.57E 01 1.32E 01 1.15E 01 1.58E 01 2.70E 01
 12 0.04094   6.37E 01 5.15E 01 4.07E 01 3.19E 01 2.50E 01 1.99E 01 1.62E 01 1.36E 01 1.19E 01 1.63E 01 2.70E 01
 11 0.03719   6.67E 01 5.37E 01 4.24E 01 3.31E 01 2.60E 01 2.06E 01 1.68E 01 1.41E 01 1.23E 01 1.68E 01 2.70E 01
 10 0.03437   6.82E 01 5.48E 01 4.32E 01 3.37E 01 2.64E 01 2.10E 01 1.71E 01 1.44E 01 1.25E 01 1.69E 01 2.70E 01
  9 0.03219   6.89E 01 5.54E 01 4.36E 01 3.40E 01 2.66E 01 2.11E 01 1.72E 01 1.45E 01 1.26E 01 1.69E 01 2.70E 01
  8 0.03031   6.92E 01 5.56E 01 4.37E 01 3.41E 01 2.67E 01 2.12E 01 1.72E 01 1.45E 01 1.26E 01 1.68E 01 2.70E 01
  7 0.02687   6.91E 01 5.56E 01 4.37E 01 3.41E 01 2.67E 01 2.11E 01 1.72E 01 1.44E 01 1.26E 01 1.65E 01 2.70E 01
  6 0.02187   6.78E 01 5.47E 01 4.31E 01 3.36E 01 2.62E 01 2.08E 01 1.69E 01 1.42E 01 1.23E 01 1.59E 01 2.70E 01
  5 0.01625   6.53E 01 5.29E 01 4.18E 01 3.26E 01 2.55E 01 2.02E 01 1.64E 01 1.38E 01 1.20E 01 1.50E 01 2.70E 01
  4 0.01062   6.25E 01 5.09E 01 4.04E 01 3.17E 01 2.48E 01 1.96E 01 1.59E 01 1.34E 01 1.16E 01 1.42E 01 2.70E 01
  3 0.00562   6.08E 01 4.97E 01 3.96E 01 3.11E 01 2.44E 01 1.92E 01 1.56E 01 1.31E 01 1.14E 01 1.38E 01 2.70E 01
  2 0.00156   6.03E 01 4.94E 01 3.94E 01 3.10E 01 2.43E 01 1.93E 01 1.57E 01 1.32E 01 1.14E 01 1.38E 01 2.70E 01
  1-0.00156       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                     TURBULENCE  DISSIPATION        -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =       1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187       0.00     0.00     0.00     0.00 7.71E 03 7.77E 03 5.75E 03 4.63E 03 4.65E 03 5.97E 03 7.48E 03 8.00E 03
 19 0.05937       0.00     0.00     0.00     0.00 1.26E 04 1.61E 04 1.16E 04 8.19E 03 6.67E 03 6.91E 03 7.60E 03 7.56E 03
 18 0.05594       0.00     0.00     0.00     0.00 3.03E 04 2.40E 04 1.65E 04 1.18E 04 9.77E 03 9.43E 03 9.12E 03 8.20E 03
 17 0.05344       0.00     0.00     0.00 2.18E 04 2.91E 04 2.26E 04 1.71E 04 1.39E 04 1.25E 04 1.17E 04 1.06E 04 8.95E 03
 16 0.05078       0.00     0.00     0.00 4.50E 04 3.31E 04 2.42E 04 1.93E 04 1.72E 04 1.60E 04 1.44E 04 1.23E 04 9.86E 03
 15 0.04812       0.00     0.00     0.00 5.05E 04 3.52E 04 2.66E 04 2.30E 04 2.15E 04 1.97E 04 1.70E 04 1.38E 04 1.07E 04
 14 0.04562       0.00     0.00 4.59E 04 4.37E 04 3.47E 04 2.96E 04 2.76E 04 2.58E 04 2.27E 04 1.89E 04 1.51E 04 1.14E 04
 13 0.04328       0.00     0.00 6.85E 04 4.43E 04 3.69E 04 3.29E 04 3.14E 04 2.88E 04 2.47E 04 2.03E 04 1.59E 04 1.20E 04
 12 0.04094       0.00     0.00 4.28E 04 3.92E 04 3.87E 04 3.48E 04 3.34E 04 3.03E 04 2.58E 04 2.11E 04 1.65E 04 1.24E 04
 11 0.03719       0.00 4.98E 04 4.31E 04 4.48E 04 4.53E 04 3.46E 04 3.35E 04 3.06E 04 2.62E 04 2.15E 04 1.69E 04 1.27E 04
 10 0.03437       0.00 5.93E 04 4.67E 04 5.32E 04 3.96E 04 3.09E 04 3.10E 04 2.90E 04 2.54E 04 2.12E 04 1.68E 04 1.26E 04
  9 0.03219       0.00 2.25E 04 4.93E 04 5.89E 04 3.32E 04 2.73E 04 2.83E 04 2.71E 04 2.43E 04 2.06E 04 1.66E 04 1.25E 04
  8 0.03031   4.49E 05 8.42E 04 6.25E 04 6.31E 04 2.83E 04 2.43E 04 2.57E 04 2.53E 04 2.32E 04 2.00E 04 1.62E 04 1.23E 04
  7 0.02687   4.49E 05 8.61E 04 7.41E 04 6.41E 04 2.13E 04 1.98E 04 2.15E 04 2.20E 04 2.10E 04 1.86E 04 1.54E 04 1.18E 04
  6 0.02187   4.49E 05 9.18E 04 9.66E 04 4.51E 04 1.56E 04 1.55E 04 1.70E 04 1.81E 04 1.79E 04 1.64E 04 1.39E 04 1.08E 04
  5 0.01625   4.49E 05 1.07E 05 1.27E 05 2.09E 04 1.23E 04 1.25E 04 1.36E 04 1.47E 04 1.50E 04 1.41E 04 1.21E 04 9.56E 03
  4 0.01062   4.49E 05 1.42E 05 1.11E 05 1.35E 04 1.05E 04 1.07E 04 1.15E 04 1.24E 04 1.27E 04 1.21E 04 1.06E 04 8.48E 03
  3 0.00562   4.49E 05 2.03E 05 4.83E 04 1.12E 04 9.50E 03 9.70E 03 1.04E 04 1.11E 04 1.14E 04 1.09E 04 9.65E 03 7.79E 03
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DIMENSIONLESS TURBULENCE ENERGY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.92E-03	5.94E-03	4.86E-03	4.21E-03	4.22E-03	4.99E-03	5.80E-03	6.06E-03
19	0.47500	0.00	0.00	0.00	0.00	3.22E-02	4.03E-02	3.25E-02	2.62E-02	2.49E-02	2.89E-02	3.28E-02	3.29E-02
18	0.44750	0.00	0.00	0.00	0.00	5.77E-02	5.08E-02	4.14E-02	3.61E-02	3.81E-02	4.52E-02	4.95E-02	4.81E-02
17	0.42750	0.00	0.00	0.00	1.88E-02	4.63E-02	4.61E-02	4.29E-02	4.30E-02	4.92E-02	5.67E-02	5.95E-02	5.63E-02
16	0.40625	0.00	0.00	0.00	7.01E-02	5.97E-02	5.24E-02	5.01E-02	5.47E-02	6.30E-02	6.90E-02	6.93E-02	6.41E-02
15	0.38500	0.00	0.00	0.00	7.56E-02	6.17E-02	5.83E-02	6.16E-02	6.99E-02	7.73E-02	8.04E-02	7.81E-02	7.08E-02
14	0.36500	0.00	0.00	3.08E-02	5.43E-02	6.05E-02	6.73E-02	7.63E-02	8.48E-02	8.95E-02	8.98E-02	8.53E-02	7.63E-02
13	0.34625	0.00	0.00	8.65E-02	6.50E-02	7.04E-02	7.97E-02	8.99E-02	9.67E-02	9.89E-02	9.71E-02	9.10E-02	8.07E-02
12	0.32750	0.00	0.00	6.32E-02	5.88E-02	7.75E-02	9.00E-02	1.00E-01	1.05E-01	1.06E-01	1.03E-01	9.56E-02	8.44E-02
11	0.29750	0.00	4.26E-02	4.13E-02	6.19E-02	9.55E-02	1.02E-01	1.10E-01	1.14E-01	1.13E-01	1.09E-01	1.01E-01	8.88E-02
10	0.27500	0.00	7.86E-02	4.33E-02	7.61E-02	9.95E-02	1.02E-01	1.11E-01	1.15E-01	1.15E-01	1.12E-01	1.03E-01	9.08E-02
9	0.25750	0.00	4.12E-02	3.65E-02	8.71E-02	9.69E-02	9.95E-02	1.09E-01	1.14E-01	1.16E-01	1.12E-01	1.04E-01	9.17E-02
8	0.24250	3.00E-02	1.05E-02	3.86E-02	9.80E-02	9.37E-02	9.62E-02	1.06E-01	1.13E-01	1.15E-01	1.12E-01	1.05E-01	9.21E-02
7	0.21500	3.00E-02	1.10E-02	5.07E-02	1.12E-01	8.68E-02	9.07E-02	1.00E-01	1.09E-01	1.12E-01	1.11E-01	1.04E-01	9.18E-02
6	0.17500	3.00E-02	1.22E-02	7.71E-02	1.15E-01	8.01E-02	8.46E-02	9.33E-02	1.02E-01	1.08E-01	1.07E-01	1.01E-01	8.97E-02
5	0.13000	3.00E-02	1.60E-02	1.25E-01	8.40E-02	7.61E-02	8.01E-02	8.75E-02	9.57E-02	1.01E-01	1.02E-01	9.64E-02	8.59E-02
4	0.08500	3.00E-02	2.71E-02	1.80E-01	7.51E-02	7.39E-02	7.73E-02	8.36E-02	9.07E-02	9.58E-02	9.65E-02	9.16E-02	8.19E-02
3	0.04500	3.00E-02	5.65E-02	1.21E-01	7.36E-02	7.29E-02	7.59E-02	8.17E-02	8.79E-02	9.25E-02	9.31E-02	8.86E-02	7.94E-02
2	0.01250	3.00E-02	7.75E-02	1.19E-01	7.32E-02	7.26E-02	7.57E-02	8.14E-02	8.74E-02	9.17E-02	9.22E-02	8.77E-02	7.87E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	5.84E-03	5.39E-03	4.90E-03	4.46E-03	4.10E-03	3.80E-03	3.55E-03	3.36E-03	3.19E-03	3.21E-03	3.00E-02
19	0.47500	2.97E-02	2.52E-02	2.05E-02	1.64E-02	1.30E-02	1.04E-02	8.59E-03	7.34E-03	6.50E-03	7.88E-03	3.00E-02
18	0.44750	4.26E-02	3.56E-02	2.88E-02	2.28E-02	1.80E-02	1.43E-02	1.16E-02	9.69E-03	8.37E-03	1.09E-02	3.00E-02
17	0.42750	4.93E-02	4.09E-02	3.29E-02	2.60E-02	2.05E-02	1.63E-02	1.32E-02	1.10E-02	9.51E-03	1.28E-02	3.00E-02
16	0.40625	5.53E-02	4.55E-02	3.64E-02	2.87E-02	2.27E-02	1.80E-02	1.46E-02	1.22E-02	1.06E-02	1.45E-02	3.00E-02
15	0.38500	6.05E-02	4.94E-02	3.94E-02	3.10E-02	2.44E-02	1.94E-02	1.58E-02	1.32E-02	1.15E-02	1.58E-02	3.00E-02
14	0.36500	6.46E-02	5.26E-02	4.18E-02	3.28E-02	2.58E-02	2.05E-02	1.67E-02	1.40E-02	1.22E-02	1.68E-02	3.00E-02
13	0.34625	6.80E-02	5.51E-02	4.36E-02	3.43E-02	2.69E-02	2.14E-02	1.74E-02	1.47E-02	1.27E-02	1.76E-02	3.00E-02
12	0.32750	7.08E-02	5.72E-02	4.52E-02	3.54E-02	2.78E-02	2.21E-02	1.80E-02	1.51E-02	1.32E-02	1.81E-02	3.00E-02
11	0.29750	7.42E-02	5.97E-02	4.71E-02	3.68E-02	2.89E-02	2.29E-02	1.86E-02	1.57E-02	1.37E-02	1.86E-02	3.00E-02
10	0.27500	7.58E-02	6.09E-02	4.80E-02	3.75E-02	2.94E-02	2.33E-02	1.89E-02	1.60E-02	1.39E-02	1.88E-02	3.00E-02
9	0.25750	7.65E-02	6.15E-02	4.84E-02	3.78E-02	2.96E-02	2.34E-02	1.91E-02	1.61E-02	1.40E-02	1.88E-02	3.00E-02
8	0.24250	7.69E-02	6.18E-02	4.86E-02	3.79E-02	2.97E-02	2.35E-02	1.91E-02	1.61E-02	1.40E-02	1.87E-02	3.00E-02
7	0.21500	7.68E-02	6.17E-02	4.86E-02	3.79E-02	2.96E-02	2.34E-02	1.91E-02	1.60E-02	1.40E-02	1.83E-02	3.00E-02
6	0.17500	7.53E-02	6.07E-02	4.78E-02	3.73E-02	2.92E-02	2.31E-02	1.87E-02	1.58E-02	1.37E-02	1.76E-02	3.00E-02
5	0.13000	7.25E-02	5.87E-02	4.64E-02	3.63E-02	2.83E-02	2.24E-02	1.82E-02	1.53E-02	1.33E-02	1.67E-02	3.00E-02
4	0.08500	6.95E-02	5.66E-02	4.49E-02	3.52E-02	2.75E-02	2.17E-02	1.77E-02	1.48E-02	1.29E-02	1.58E-02	3.00E-02
3	0.04500	6.76E-02	5.52E-02	4.40E-02	3.45E-02	2.71E-02	2.14E-02	1.74E-02	1.46E-02	1.27E-02	1.54E-02	3.00E-02
2	0.01250	6.70E-02	5.49E-02	4.38E-02	3.45E-02	2.70E-02	2.14E-02	1.74E-02	1.46E-02	1.27E-02	1.53E-02	3.00E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	2.55E-01	4.68E-01	4.95E-01	4.65E-01	4.32E-01	4.03E-01	3.77E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	4.07E-01	5.52E-01	5.59E-01	5.18E-01	4.72E-01	4.31E-01	3.97E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	5.70E-01	6.46E-01	6.15E-01	5.52E-01	4.89E-01	4.38E-01	4.00E-01
17	0.42750	0.00	0.00	0.00	0.00	7.86E-01	6.99E-01	6.89E-01	6.25E-01	5.46E-01	4.78E-01	4.29E-01	3.94E-01
16	0.40625	0.00	0.00	0.00	0.00	7.01E-01	6.85E-01	6.50E-01	5.78E-01	5.04E-01	4.49E-01	4.10E-01	3.80E-01
15	0.38500	0.00	0.00	0.00	0.00	7.15E-01	6.67E-01	5.75E-01	4.94E-01	4.40E-01	4.06E-01	3.82E-01	3.61E-01
14	0.36500	0.00	0.00	0.00	1.08E 00	7.86E-01	6.05E-01	4.63E-01	3.94E-01	3.71E-01	3.61E-01	3.50E-01	3.37E-01
13	0.34625	0.00	0.00	0.00	8.13E-01	6.68E-01	4.63E-01	3.31E-01	2.97E-01	3.05E-01	3.15E-01	3.16E-01	3.11E-01
12	0.32750	0.00	0.00	0.00	7.13E-01	5.80E-01	3.34E-01	2.05E-01	2.06E-01	2.42E-01	2.68E-01	2.80E-01	2.82E-01
11	0.29750	0.00	0.00	9.89E-01	7.20E-01	4.56E-01	1.12E-01	3.24E-02	8.44E-02	1.48E-01	1.92E-01	2.17E-01	2.31E-01
10	0.27500	0.00	0.00	6.99E-01	5.85E-01	2.56E-01	-3.85E-02	-5.95E-02	9.87E-03	8.28E-02	1.35E-01	1.68E-01	1.89E-01
9	0.25750	0.00	0.00	6.65E-01	5.15E-01	1.10E-01	-1.18E-01	-1.14E-01	-4.05E-02	3.49E-02	9.12E-02	1.29E-01	1.56E-01
8	0.24250	0.00	1.00E 00	7.20E-01	4.56E-01	2.54E-02	-1.67E-01	-1.52E-01	-7.93E-02	-4.19E-03	5.41E-02	9.61E-02	1.27E-01
7	0.21500	0.00	1.00E 00	7.32E-01	3.58E-01	-1.24E-01	-2.28E-01	-2.05E-01	-1.41E-01	-7.11E-02	-1.18E-02	3.58E-02	7.47E-02
6	0.17500	0.00	1.00E 00	6.90E-01	1.46E-01	-2.75E-01	-2.84E-01	-2.60E-01	-2.15E-01	-1.57E-01	-1.00E-01	-4.73E-02	1.03E-03
5	0.13000	0.00	1.00E 00	5.42E-01	-2.25E-01	-3.49E-01	-3.33E-01	-3.10E-01	-2.79E-01	-2.36E-01	-1.85E-01	-1.28E-01	-7.16E-02
4	0.08500	0.00	1.00E 00	1.85E-01	-5.08E-01	-4.22E-01	-3.77E-01	-3.49E-01	-3.25E-01	-2.93E-01	-2.47E-01	-1.89E-01	-1.27E-01
3	0.04500	0.00	1.00E 00	-4.02E-01	-5.35E-01	-4.61E-01	-4.04E-01	-3.72E-01	-3.51E-01	-3.23E-01	-2.81E-01	-2.24E-01	-1.59E-01
2	0.01250	0.00	1.00E 00	-7.82E-01	-5.67E-01	-4.77E-01	-4.14E-01	-3.80E-01	-3.60E-01	-3.34E-01	-2.93E-01	-2.36E-01	-1.70E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

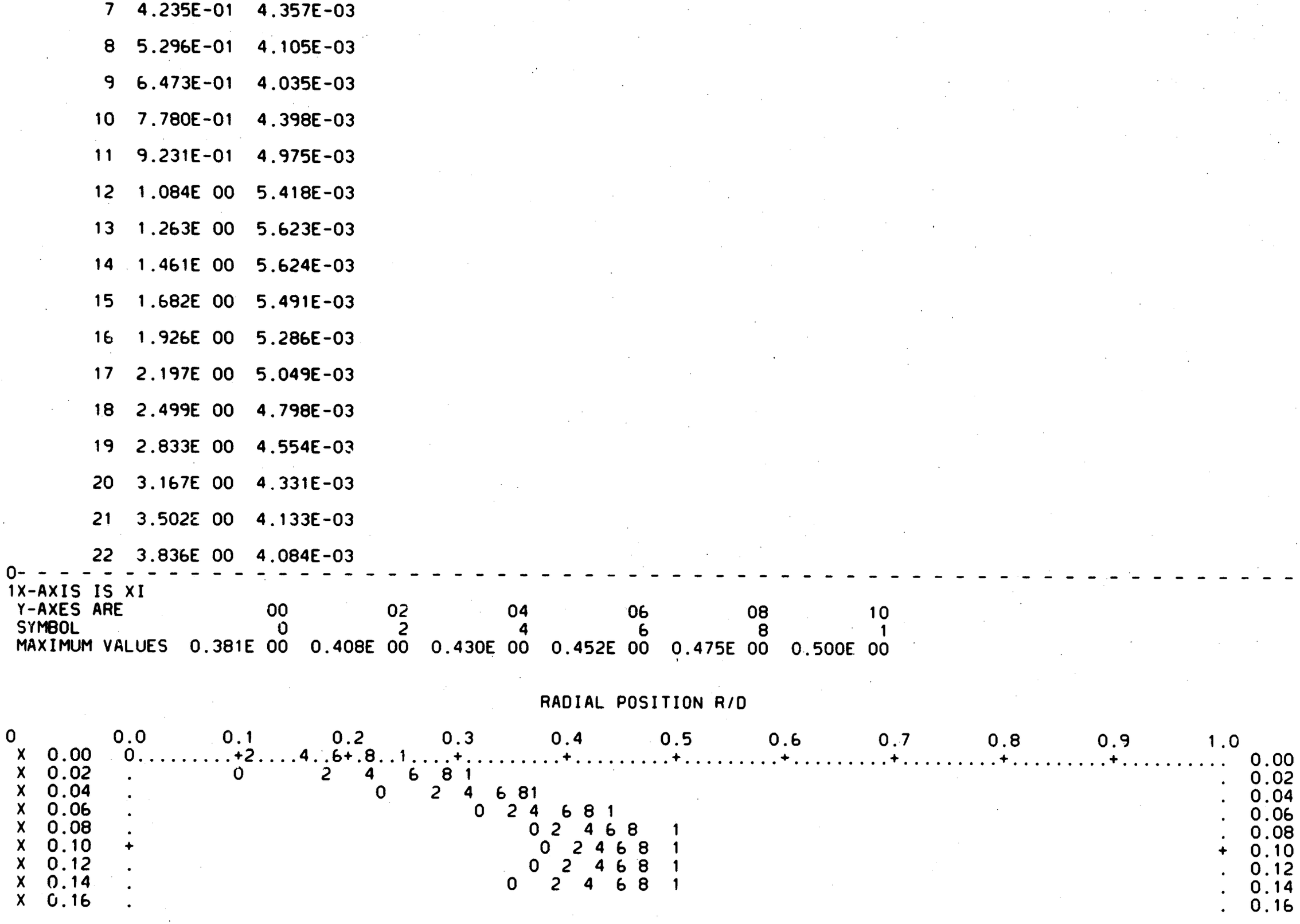
0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.56E-01	3.42E-01	3.35E-01	3.33E-01	3.34E-01	3.35E-01	3.36E-01	3.37E-01	3.38E-01	3.40E-01	3.40E-01
19	0.47500	3.72E-01	3.55E-01	3.46E-01	3.42E-01	3.41E-01	3.42E-01	3.44E-01	3.47E-01	3.50E-01	3.52E-01	3.52E-01
18	0.44750	3.73E-01	3.55E-01	3.43E-01	3.37E-01	3.33E-01	3.31E-01	3.31E-01	3.32E-01	3.33E-01	3.34E-01	3.34E-01
17	0.42750	3.68E-01	3.50E-01	3.37E-01	3.29E-01	3.24E-01	3.21E-01	3.19E-01	3.18E-01	3.18E-01	3.19E-01	3.19E-01
16	0.40625	3.57E-01	3.40E-01	3.27E-01	3.18E-01	3.12E-01	3.07E-01	3.05E-01	3.03E-01	3.02E-01	3.02E-01	3.02E-01
15	0.38500	3.42E-01	3.26E-01	3.14E-01	3.05E-01	2.98E-01	2.93E-01	2.90E-01	2.87E-01	2.86E-01	2.85E-01	2.85E-01
14	0.36500	3.23E-01	3.10E-01	2.99E-01	2.91E-01	2.84E-01	2.79E-01	2.75E-01	2.73E-01	2.71E-01	2.70E-01	2.70E-01
13	0.34625	3.02E-01	2.93E-01	2.84E-01	2.76E-01	2.70E-01	2.65E-01	2.61E-01	2.59E-01	2.57E-01	2.55E-01	2.55E-01
12	0.32750	2.79E-01	2.73E-01	2.66E-01	2.60E-01	2.55E-01	2.50E-01	2.47E-01	2.44E-01	2.43E-01	2.41E-01	2.41E-01
11	0.29750	2.36E-01	2.37E-01	2.36E-01	2.33E-01	2.29E-01	2.27E-01	2.24E-01	2.22E-01	2.20E-01	2.19E-01	2.19E-01
10	0.27500	2.02E-01	2.09E-01	2.11E-01	2.11E-01	2.10E-01	2.08E-01	2.07E-01	2.06E-01	2.04E-01	2.03E-01	2.03E-01
9	0.25750	1.74E-01	1.85E-01	1.91E-01	1.94E-01	1.95E-01	1.94E-01	1.94E-01	1.93E-01	1.92E-01	1.91E-01	1.91E-01
8	0.24250	1.50E-01	1.65E-01	1.74E-01	1.79E-01	1.82E-01	1.83E-01	1.83E-01	1.83E-01	1.82E-01	1.81E-01	1.81E-01
7	0.21500	1.06E-01	1.28E-01	1.43E-01	1.52E-01	1.58E-01	1.62E-01	1.64E-01	1.64E-01	1.64E-01	1.64E-01	1.64E-01
6	0.17500	4.26E-02	7.52E-02	9.88E-02	1.15E-01	1.26E-01	1.33E-01	1.38E-01	1.40E-01	1.41E-01	1.41E-01	1.41E-01
5	0.13000	-2.00E-02	2.26E-02	5.52E-02	7.86E-02	9.50E-02	1.06E-01	1.13E-01	1.17E-01	1.19E-01	1.19E-01	1.19E-01
4	0.08500	-6.83E-02	-1.79E-02	2.16E-02	5.07E-02	7.13E-02	8.56E-02	9.52E-02	1.01E-01	1.03E-01	1.04E-01	1.04E-01
3	0.04500	-9.56E-02	-4.08E-02	2.63E-03	3.50E-02	5.81E-02	7.43E-02	8.50E-02	9.12E-02	9.43E-02	9.51E-02	9.51E-02
2	0.01250	-1.06E-01	-4.92E-02	-4.29E-03	2.93E-02	5.33E-02	7.01E-02	8.14E-02	8.79E-02	9.11E-02	9.20E-02	9.20E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS V VELOCITY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415

0 J	Y												
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	4.75E-02	3.56E-02	4.18E-03	-4.05E-03	-4.14E-03	-3.18E-03	-2.59E-03	-1.90E-03
19	0.46125	0.00	0.00	0.00	0.00	1.71E-01	7.63E-02	6.06E-03	-1.31E-02	-1.34E-02	-1.06E-02	-8.14E-03	-5.65E-03
18	0.43750	0.00	0.00	0.00	0.00	3.50E-01	1.01E-01	-1.06E-03	-2.76E-02	-2.66E-02	-2.02E-02	-1.46E-02	-9.83E-03

5	2.419E-01	4.023E-03
6	3.280E-01	4.400E-03
7	4.235E-01	4.357E-03
8	5.296E-01	4.105E-03
9	6.473E-01	4.035E-03
10	7.780E-01	4.398E-03
11	9.231E-01	4.975E-03
12	1.084E 00	5.418E-03
13	1.263E 00	5.623E-03
14	1.461E 00	5.624E-03
15	1.682E 00	5.491E-03
16	1.926E 00	5.286E-03
17	2.197E 00	5.049E-03
18	2.499E 00	4.798E-03
19	2.833E 00	4.554E-03
20	3.167E 00	4.331E-03
21	3.502E 00	4.133E-03
22	3.836E 00	4.084E-03



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   160 0.2504E-01 0.1572E-01 0.1398E-01 0.7374E-02 0.2859E-02 0.1116E 09 0.5059E 01 0.2664E-02 0.1800E 02 0.2060E 04 0.3049E 04
   161 0.2448E-01 0.1562E-01 0.1400E-01 0.7424E-02 0.2830E-02 0.1110E 09 0.5063E 01 0.2577E-02 0.1801E 02 0.2060E 04 0.3050E 04
   162 0.2392E-01 0.1553E-01 0.1403E-01 0.7410E-02 0.2796E-02 0.1100E 09 0.5067E 01 0.2487E-02 0.1801E 02 0.2061E 04 0.3051E 04
   163 0.2337E-01 0.1540E-01 0.1405E-01 0.7460E-02 0.2767E-02 0.1092E 09 0.5071E 01 0.2393E-02 0.1802E 02 0.2062E 04 0.3052E 04
   164 0.2283E-01 0.1531E-01 0.1407E-01 0.7463E-02 0.2735E-02 0.1079E 09 0.5075E 01 0.2298E-02 0.1802E 02 0.2062E 04 0.3053E 04
   165 0.2231E-01 0.1519E-01 0.1407E-01 0.7533E-02 0.2706E-02 0.1074E 09 0.5079E 01 0.2199E-02 0.1803E 02 0.2063E 04 0.3054E 04
   166 0.2180E-01 0.1509E-01 0.1408E-01 0.7560E-02 0.2674E-02 0.1065E 09 0.5082E 01 0.2100E-02 0.1803E 02 0.2063E 04 0.3054E 04
   167 0.2131E-01 0.1500E-01 0.1408E-01 0.7558E-02 0.2645E-02 0.1057E 09 0.5086E 01 0.2000E-02 0.1804E 02 0.2064E 04 0.3055E 04
   168 0.2081E-01 0.1489E-01 0.1407E-01 0.7567E-02 0.2618E-02 0.1042E 09 0.5090E 01 0.1899E-02 0.1804E 02 0.2065E 04 0.3056E 04
   169 0.2035E-01 0.1480E-01 0.1406E-01 0.7568E-02 0.2596E-02 0.1036E 09 0.5093E 01 0.1798E-02 0.1805E 02 0.2065E 04 0.3057E 04
   170 0.1988E-01 0.1472E-01 0.1404E-01 0.7619E-02 0.2577E-02 0.1023E 09 0.5096E 01 0.1698E-02 0.1805E 02 0.2066E 04 0.3058E 04
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   172 0.1902E-01 0.1456E-01 0.1398E-01 0.7638E-02 0.2543E-02 0.1010E 09 0.5102E 01 0.1500E-02 0.1806E 02 0.2067E 04 0.3059E 04
   173 0.1860E-01 0.1451E-01 0.1395E-01 0.7660E-02 0.2525E-02 0.9972E 08 0.5105E 01 0.1402E-02 0.1807E 02 0.2067E 04 0.3060E 04
   174 0.1820E-01 0.1446E-01 0.1392E-01 0.7619E-02 0.2507E-02 0.9896E 08 0.5107E 01 0.1307E-02 0.1807E 02 0.2068E 04 0.3061E 04
   175 0.1781E-01 0.1444E-01 0.1387E-01 0.7675E-02 0.2487E-02 0.9783E 08 0.5110E 01 0.1213E-02 0.1808E 02 0.2068E 04 0.3062E 04
   176 0.1744E-01 0.1441E-01 0.1382E-01 0.7612E-02 0.2468E-02 0.9732E 08 0.5112E 01 0.1122E-02 0.1808E 02 0.2069E 04 0.3062E 04
   177 0.1708E-01 0.1438E-01 0.1377E-01 0.7610E-02 0.2450E-02 0.9602E 08 0.5114E 01 0.1034E-02 0.1809E 02 0.2069E 04 0.3063E 04
   178 0.1674E-01 0.1436E-01 0.1371E-01 0.7640E-02 0.2429E-02 0.9512E 08 0.5116E 01 0.9483E-03 0.1809E 02 0.2070E 04 0.3064E 04
   179 0.1641E-01 0.1432E-01 0.1365E-01 0.7589E-02 0.2410E-02 0.9437E 08 0.5118E 01 0.8656E-03 0.1810E 02 0.2071E 04 0.3065E 04
   180 0.1610E-01 0.1430E-01 0.1358E-01 0.7599E-02 0.2387E-02 0.9313E 08 0.5120E 01 0.7859E-03 0.1810E 02 0.2071E 04 0.3066E 04
   181 0.1580E-01 0.1428E-01 0.1351E-01 0.7539E-02 0.2366E-02 0.9249E 08 0.5122E 01 0.7102E-03 0.1811E 02 0.2072E 04 0.3067E 04
   182 0.1552E-01 0.1428E-01 0.1344E-01 0.7553E-02 0.2344E-02 0.9185E 08 0.5124E 01 0.6381E-03 0.1811E 02 0.2072E 04 0.3067E 04
   183 0.1524E-01 0.1426E-01 0.1336E-01 0.7513E-02 0.2321E-02 0.9092E 08 0.5125E 01 0.5698E-03 0.1812E 02 0.2073E 04 0.3068E 04
   184 0.1498E-01 0.1425E-01 0.1328E-01 0.7475E-02 0.2298E-02 0.9013E 08 0.5126E 01 0.5048E-03 0.1812E 02 0.2073E 04 0.3069E 04
   185 0.1473E-01 0.1422E-01 0.1320E-01 0.7469E-02 0.2277E-02 0.8893E 08 0.5128E 01 0.4437E-03 0.1813E 02 0.2074E 04 0.3070E 04
   186 0.1450E-01 0.1419E-01 0.1311E-01 0.7419E-02 0.2255E-02 0.8800E 08 0.5129E 01 0.3862E-03 0.1813E 02 0.2074E 04 0.3071E 04
   187 0.1428E-01 0.1414E-01 0.1303E-01 0.7359E-02 0.2231E-02 0.8747E 08 0.5130E 01 0.3329E-03 0.1814E 02 0.2075E 04 0.3071E 04
   188 0.1407E-01 0.1410E-01 0.1293E-01 0.7328E-02 0.2209E-02 0.8630E 08 0.5131E 01 0.2830E-03 0.1814E 02 0.2075E 04 0.3072E 04
   189 0.1387E-01 0.1405E-01 0.1284E-01 0.7298E-02 0.2187E-02 0.8597E 08 0.5131E 01 0.2370E-03 0.1815E 02 0.2076E 04 0.3073E 04
   190 0.1369E-01 0.1397E-01 0.1274E-01 0.7252E-02 0.2163E-02 0.8494E 08 0.5132E 01 0.1951E-03 0.1815E 02 0.2076E 04 0.3074E 04
   191 0.1351E-01 0.1391E-01 0.1265E-01 0.7203E-02 0.2140E-02 0.8426E 08 0.5133E 01 0.1566E-03 0.1816E 02 0.2077E 04 0.3075E 04
   192 0.1334E-01 0.1383E-01 0.1255E-01 0.7190E-02 0.2118E-02 0.8358E 08 0.5133E 01 0.1215E-03 0.1816E 02 0.2077E 04 0.3075E 04
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   197 0.1266E-01 0.1338E-01 0.1205E-01 0.6899E-02 0.2008E-02 0.7992E 08 0.5136E 01-0.2396E-05 0.1819E 02 0.2079E 04 0.3079E 04
   198 0.1254E-01 0.1328E-01 0.1195E-01 0.6890E-02 0.1986E-02 0.7900E 08 0.5136E 01-0.1786E-04 0.1820E 02 0.2080E 04 0.3080E 04
   199 0.1244E-01 0.1317E-01 0.1184E-01 0.6801E-02 0.1963E-02 0.7784E 08 0.5136E 01-0.3125E-04 0.1820E 02 0.2080E 04 0.3081E 04
   200 0.1234E-01 0.1305E-01 0.1175E-01 0.6763E-02 0.1943E-02 0.7794E 08 0.5136E 01-0.4139E-04 0.1821E 02 0.2081E 04 0.3081E 04
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 SWIRL CASE WITH LFS  =  7
             AND NSBR =  0

 CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =      2.000

 OR IF NSBR = 0 TO SWIRL VANE ANGLE =     70.000

  COMPUTED INLET SWIRL NUMBER =    1.8347
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2	0.00156	4.49E 05	2.38E 05	3.63E 04	1.00E 04	9.01E 03	9.26E 03	9.92E 03	1.05E 04	1.08E 04	1.04E 04	9.17E 03	7.45E 03
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	7.57E 03	6.71E 03	5.82E 03	5.06E 03	4.45E 03	3.97E 03	3.59E 03	3.30E 03	3.06E 03	3.08E 03	4.49E 05
19	0.05937	6.77E 03	5.69E 03	4.65E 03	3.78E 03	3.09E 03	2.57E 03	2.19E 03	1.92E 03	1.73E 03	1.99E 03	4.49E 05
18	0.05594	6.84E 03	5.43E 03	4.20E 03	3.24E 03	2.51E 03	1.97E 03	1.59E 03	1.33E 03	1.15E 03	1.52E 03	4.49E 05
17	0.05344	7.14E 03	5.47E 03	4.11E 03	3.08E 03	2.32E 03	1.78E 03	1.40E 03	1.15E 03	9.78E 02	1.39E 03	4.49E 05
16	0.05078	7.56E 03	5.62E 03	4.11E 03	3.01E 03	2.23E 03	1.68E 03	1.30E 03	1.05E 03	8.87E 02	1.34E 03	4.49E 05
15	0.04812	8.00E 03	5.81E 03	4.17E 03	3.00E 03	2.19E 03	1.62E 03	1.25E 03	1.00E 03	8.37E 02	1.31E 03	4.49E 05
14	0.04562	8.38E 03	5.98E 03	4.23E 03	3.01E 03	2.17E 03	1.59E 03	1.21E 03	9.69E 02	8.07E 02	1.29E 03	4.49E 05
13	0.04328	8.66E 03	6.12E 03	4.28E 03	3.01E 03	2.15E 03	1.57E 03	1.19E 03	9.47E 02	7.87E 02	1.27E 03	4.49E 05
12	0.04094	8.88E 03	6.22E 03	4.32E 03	3.02E 03	2.14E 03	1.55E 03	1.17E 03	9.28E 02	7.69E 02	1.24E 03	4.49E 05
11	0.03719	9.05E 03	6.29E 03	4.33E 03	3.00E 03	2.11E 03	1.52E 03	1.14E 03	8.98E 02	7.43E 02	1.20E 03	4.49E 05
10	0.03437	9.03E 03	6.26E 03	4.29E 03	2.96E 03	2.07E 03	1.48E 03	1.11E 03	8.73E 02	7.20E 02	1.15E 03	4.49E 05
9	0.03219	8.94E 03	6.19E 03	4.24E 03	2.91E 03	2.03E 03	1.45E 03	1.08E 03	8.50E 02	7.00E 02	1.11E 03	4.49E 05
8	0.03031	8.82E 03	6.11E 03	4.17E 03	2.86E 03	2.00E 03	1.42E 03	1.06E 03	8.30E 02	6.82E 02	1.07E 03	4.49E 05
7	0.02687	8.49E 03	5.89E 03	4.02E 03	2.75E 03	1.91E 03	1.36E 03	1.01E 03	7.89E 02	6.47E 02	9.95E 02	4.49E 05
6	0.02187	7.86E 03	5.49E 03	3.75E 03	2.56E 03	1.78E 03	1.26E 03	9.33E 02	7.27E 02	5.94E 02	8.85E 02	4.49E 05
5	0.01625	7.06E 03	4.98E 03	3.42E 03	2.34E 03	1.62E 03	1.15E 03	8.50E 02	6.60E 02	5.38E 02	7.71E 02	4.49E 05
4	0.01062	6.34E 03	4.51E 03	3.13E 03	2.16E 03	1.50E 03	1.06E 03	7.82E 02	6.07E 02	4.94E 02	6.81E 02	4.49E 05
3	0.00562	5.87E 03	4.22E 03	2.95E 03	2.04E 03	1.42E 03	1.01E 03	7.44E 02	5.78E 02	4.70E 02	6.30E 02	4.49E 05
2	0.00156	5.65E 03	4.09E 03	2.87E 03	2.00E 03	1.40E 03	9.94E 02	7.37E 02	5.74E 02	4.67E 02	6.12E 02	4.49E 05
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAM FUNCTION -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	9.83E-01	9.66E-01	9.64E-01	9.67E-01	9.69E-01	9.71E-01	9.73E-01
19	0.05937	0.00	0.00	0.00	0.00	0.00	8.83E-01	8.10E-01	8.03E-01	8.17E-01	8.32E-01	8.44E-01	8.54E-01
18	0.05594	0.00	0.00	0.00	0.00	0.00	6.83E-01	5.66E-01	5.66E-01	6.02E-01	6.39E-01	6.69E-01	6.92E-01
17	0.05344	0.00	0.00	0.00	0.00	8.92E-01	4.99E-01	3.76E-01	3.91E-01	4.48E-01	5.04E-01	5.47E-01	5.80E-01
16	0.05078	0.00	0.00	0.00	0.00	6.72E-01	2.93E-01	1.80E-01	2.18E-01	2.98E-01	3.71E-01	4.27E-01	4.69E-01
15	0.04812	0.00	0.00	0.00	0.00	4.70E-01	1.02E-01	9.36E-03	7.05E-02	1.69E-01	2.54E-01	3.19E-01	3.68E-01
14	0.04562	0.00	0.00	0.00	8.69E-01	2.77E-01	-5.97E-02	-1.20E-01	-3.99E-02	6.85E-02	1.59E-01	2.29E-01	2.83E-01
13	0.04328	0.00	0.00	0.00	6.50E-01	1.10E-01	-1.79E-01	-2.09E-01	-1.17E-01	-6.78E-03	8.46E-02	1.56E-01	2.12E-01
12	0.04094	0.00	0.00	0.00	4.82E-01	-2.32E-02	-2.62E-01	-2.65E-01	-1.71E-01	-6.51E-02	2.30E-02	9.34E-02	1.51E-01
11	0.03719	0.00	0.00	8.47E-01	2.49E-01	-1.83E-01	-3.27E-01	-3.02E-01	-2.18E-01	-1.28E-01	-5.00E-02	1.57E-02	7.17E-02
10	0.03437	0.00	0.00	6.52E-01	1.06E-01	-2.50E-01	-3.30E-01	-2.99E-01	-2.29E-01	-1.54E-01	-8.57E-02	-2.55E-02	2.74E-02
9	0.03219	0.00	0.00	5.45E-01	2.39E-02	-2.67E-01	-3.13E-01	-2.84E-01	-2.27E-01	-1.64E-01	-1.04E-01	-4.84E-02	1.33E-03
8	0.03031	0.00	9.41E-01	4.61E-01	-3.11E-02	-2.67E-01	-2.92E-01	-2.67E-01	-2.20E-01	-1.66E-01	-1.13E-01	-6.22E-02	-1.58E-02
7	0.02687	0.00	7.40E-01	3.17E-01	-1.03E-01	-2.45E-01	-2.46E-01	-2.28E-01	-1.97E-01	-1.58E-01	-1.17E-01	-7.57E-02	-3.60E-02
6	0.02187	0.00	4.90E-01	1.45E-01	-1.48E-01	-1.86E-01	-1.76E-01	-1.65E-01	-1.50E-01	-1.28E-01	-1.02E-01	-7.38E-02	-4.49E-02
5	0.01625	0.00	2.70E-01	1.79E-02	-1.21E-01	-1.13E-01	-1.04E-01	-9.84E-02	-9.23E-02	-8.28E-02	-6.94E-02	-5.31E-02	-3.59E-02
4	0.01062	0.00	1.16E-01	-3.01E-02	-6.00E-02	-5.22E-02	-4.71E-02	-4.45E-02	-4.24E-02	-3.91E-02	-3.38E-02	-2.67E-02	-1.90E-02
3	0.00562	0.00	3.24E-02	-1.89E-02	-1.80E-02	-1.53E-02	-1.37E-02	-1.29E-02	-1.24E-02	-1.15E-02	-1.01E-02	-8.15E-03	-5.92E-03
2	0.00156	0.00	2.50E-03	-2.04E-03	-1.46E-03	-1.21E-03	-1.07E-03	-1.01E-03	-9.70E-04	-9.11E-04	-8.04E-04	-6.53E-04	-4.79E-04
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J	Y											

DIMENSIONLESS LENGTH SCALE

J	Y	I = 2	3	4	5	6	7	8	9	10	11	12	13
		X = 0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.17E-01	2.18E-01	2.24E-01	2.54E-01	3.07E-01	3.38E-01	3.41E-01	3.27E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	2.06E-01	2.21E-01	2.51E-01	3.29E-01	4.41E-01	5.21E-01	5.55E-01	5.56E-01
17	0.05344	0.00	0.00	5.10E-02	1.48E-01	1.89E-01	2.24E-01	2.78E-01	3.77E-01	4.97E-01	5.92E-01	6.45E-01	6.62E-01
16	0.05078	0.00	0.00	1.78E-01	1.90E-01	2.14E-01	2.52E-01	3.22E-01	4.27E-01	5.42E-01	6.43E-01	7.11E-01	7.43E-01
15	0.04812	0.00	0.00	1.78E-01	1.88E-01	2.28E-01	2.87E-01	3.70E-01	4.72E-01	5.81E-01	6.83E-01	7.59E-01	8.03E-01
14	0.04562	0.00	5.10E-02	1.25E-01	1.85E-01	2.55E-01	3.30E-01	4.14E-01	5.10E-01	6.15E-01	7.15E-01	7.96E-01	8.48E-01
13	0.04328	0.00	1.60E-01	1.61E-01	2.18E-01	2.95E-01	3.71E-01	4.52E-01	5.44E-01	6.45E-01	7.45E-01	8.28E-01	8.84E-01
12	0.04094	0.00	1.60E-01	1.57E-01	2.41E-01	3.35E-01	4.11E-01	4.88E-01	5.77E-01	6.76E-01	7.73E-01	8.57E-01	9.17E-01
11	0.03719	7.64E-02	8.42E-02	1.49E-01	2.81E-01	4.07E-01	4.71E-01	5.44E-01	6.30E-01	7.25E-01	8.20E-01	9.03E-01	9.64E-01
10	0.03437	1.60E-01	8.32E-02	1.71E-01	3.42E-01	4.58E-01	5.14E-01	5.84E-01	6.68E-01	7.61E-01	8.54E-01	9.36E-01	9.98E-01
9	0.03219	1.60E-01	6.11E-02	1.89E-01	3.93E-01	4.97E-01	5.48E-01	6.16E-01	6.99E-01	7.90E-01	8.80E-01	9.61E-01	1.02E 00
8	0.03031	5.55E-03	5.23E-02	2.10E-01	4.37E-01	5.31E-01	5.80E-01	6.46E-01	7.26E-01	8.14E-01	9.02E-01	9.82E-01	1.04E 00
7	0.02687	5.75E-03	6.65E-02	2.54E-01	5.20E-01	5.95E-01	6.39E-01	7.01E-01	7.77E-01	8.60E-01	9.44E-01	1.02E 00	1.08E 00
6	0.02187	6.35E-03	9.56E-02	3.73E-01	6.27E-01	6.86E-01	7.26E-01	7.82E-01	8.51E-01	9.27E-01	1.00E 00	1.08E 00	1.14E 00
5	0.01625	8.19E-03	1.51E-01	5.03E-01	7.36E-01	7.84E-01	8.22E-01	8.72E-01	9.32E-01	1.00E 00	1.07E 00	1.14E 00	1.19E 00
4	0.01062	1.36E-02	2.97E-01	6.57E-01	8.30E-01	8.71E-01	9.08E-01	9.54E-01	1.01E 00	1.07E 00	1.13E 00	1.20E 00	1.25E 00
3	0.00562	2.86E-02	3.79E-01	7.74E-01	8.94E-01	9.32E-01	9.69E-01	1.01E 00	1.07E 00	1.12E 00	1.18E 00	1.24E 00	1.29E 00
2	0.00156	3.91E-02	4.86E-01	8.52E-01	9.39E-01	9.73E-01	1.01E 00	1.05E 00	1.11E 00	1.17E 00	1.22E 00	1.28E 00	1.33E 00

J	Y	I = 14	15	16	17	18	19	20	21	22	23
		X = 0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	5.00E-03
19	0.05937	3.03E-01	2.73E-01	2.40E-01	2.08E-01	1.80E-01	1.57E-01	1.42E-01	1.31E-01	1.52E-01	5.00E-03
18	0.05594	5.36E-01	5.02E-01	4.61E-01	4.17E-01	3.74E-01	3.38E-01	3.09E-01	2.87E-01	3.25E-01	5.00E-03
17	0.05344	6.53E-01	6.27E-01	5.89E-01	5.46E-01	5.04E-01	4.66E-01	4.35E-01	4.10E-01	4.49E-01	5.00E-03
16	0.05078	7.46E-01	7.29E-01	6.99E-01	6.61E-01	6.21E-01	5.85E-01	5.55E-01	5.31E-01	5.63E-01	5.00E-03
15	0.04812	8.18E-01	8.10E-01	7.87E-01	7.55E-01	7.19E-01	6.86E-01	6.58E-01	6.36E-01	6.57E-01	5.00E-03
14	0.04562	8.71E-01	8.71E-01	8.55E-01	8.28E-01	7.97E-01	7.67E-01	7.42E-01	7.21E-01	7.33E-01	5.00E-03
13	0.04328	9.13E-01	9.19E-01	9.09E-01	8.87E-01	8.59E-01	8.32E-01	8.09E-01	7.90E-01	7.93E-01	5.00E-03
12	0.04094	9.50E-01	9.61E-01	9.55E-01	9.37E-01	9.13E-01	8.89E-01	8.68E-01	8.50E-01	8.46E-01	5.00E-03
11	0.03719	1.00E 00	1.02E 00	1.02E 00	1.01E 00	9.86E-01	9.66E-01	9.47E-01	9.32E-01	9.19E-01	5.00E-03
10	0.03437	1.04E 00	1.06E 00	1.06E 00	1.05E 00	1.03E 00	1.02E 00	9.99E-01	9.85E-01	9.68E-01	5.00E-03
9	0.03219	1.06E 00	1.09E 00	1.09E 00	1.08E 00	1.07E 00	1.05E 00	1.04E 00	1.02E 00	1.00E 00	5.00E-03
8	0.03031	1.09E 00	1.11E 00	1.11E 00	1.11E 00	1.09E 00	1.08E 00	1.06E 00	1.05E 00	1.03E 00	5.00E-03
7	0.02687	1.12E 00	1.15E 00	1.16E 00	1.15E 00	1.14E 00	1.13E 00	1.11E 00	1.10E 00	1.08E 00	5.00E-03
6	0.02187	1.18E 00	1.21E 00	1.21E 00	1.21E 00	1.20E 00	1.19E 00	1.18E 00	1.17E 00	1.14E 00	5.00E-03
5	0.01625	1.24E 00	1.26E 00	1.27E 00	1.27E 00	1.26E 00	1.25E 00	1.24E 00	1.23E 00	1.21E 00	5.00E-03
4	0.01062	1.29E 00	1.31E 00	1.32E 00	1.32E 00	1.31E 00	1.30E 00	1.29E 00	1.28E 00	1.26E 00	5.00E-03
3	0.00562	1.33E 00	1.35E 00	1.36E 00	1.35E 00	1.34E 00	1.33E 00	1.32E 00	1.31E 00	1.30E 00	5.00E-03
2	0.00156	1.36E 00	1.38E 00	1.38E 00	1.37E 00	1.36E 00	1.34E 00	1.33E 00	1.32E 00	1.33E 00	5.00E-03

DIMENSIONLESS EFF. VISCOSITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.32E 01	2.33E 01	2.12E 01	1.98E 01	1.98E 01	2.14E 01	2.30E 01	2.35E 01
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.04E 02	4.95E 02	4.47E 02	4.13E 02	4.57E 02	5.94E 02	6.96E 02	7.02E 02

DIMENSIONLESS U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	2.42E-01	4.06E-01	4.47E-01	4.35E-01	4.08E-01	3.85E-01	3.67E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	3.14E-01	4.47E-01	4.80E-01	4.68E-01	4.42E-01	4.17E-01	3.92E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	3.86E-01	4.85E-01	5.03E-01	4.84E-01	4.56E-01	4.24E-01	3.92E-01
17	0.42750	0.00	0.00	0.00	0.00	5.02E-01	4.53E-01	5.03E-01	5.06E-01	4.83E-01	4.49E-01	4.13E-01	3.82E-01
16	0.40625	0.00	0.00	0.00	0.00	4.34E-01	4.50E-01	4.82E-01	4.80E-01	4.56E-01	4.22E-01	3.89E-01	3.63E-01
15	0.38500	0.00	0.00	0.00	0.00	4.31E-01	4.52E-01	4.58E-01	4.41E-01	4.10E-01	3.79E-01	3.56E-01	3.39E-01
14	0.36500	0.00	0.00	0.00	5.37E-01	4.62E-01	4.45E-01	4.24E-01	3.88E-01	3.53E-01	3.33E-01	3.22E-01	3.14E-01
13	0.34625	0.00	0.00	0.00	4.46E-01	4.54E-01	4.24E-01	3.76E-01	3.25E-01	2.96E-01	2.90E-01	2.90E-01	2.89E-01
12	0.32750	0.00	0.00	0.00	4.29E-01	4.53E-01	3.98E-01	3.19E-01	2.58E-01	2.42E-01	2.48E-01	2.57E-01	2.62E-01
11	0.29750	0.00	0.00	4.20E-01	4.65E-01	4.54E-01	3.54E-01	2.12E-01	1.52E-01	1.62E-01	1.86E-01	2.05E-01	2.18E-01
10	0.27500	0.00	0.00	4.94E-01	5.36E-01	4.50E-01	2.83E-01	1.14E-01	8.31E-02	1.11E-01	1.42E-01	1.66E-01	1.84E-01
9	0.25750	0.00	0.00	6.15E-01	5.82E-01	4.26E-01	2.02E-01	4.20E-02	3.75E-02	7.34E-02	1.09E-01	1.36E-01	1.58E-01
8	0.24250	0.00	1.00E 00	7.51E-01	6.03E-01	3.89E-01	1.29E-01	-1.10E-02	2.95E-03	4.34E-02	8.08E-02	1.11E-01	1.36E-01
7	0.21500	0.00	1.00E 00	8.03E-01	5.95E-01	3.19E-01	-4.18E-03	-8.36E-02	-5.13E-02	-7.96E-03	3.16E-02	6.52E-02	9.48E-02
6	0.17500	0.00	1.00E 00	8.23E-01	5.40E-01	1.52E-01	-1.72E-01	-1.55E-01	-1.17E-01	-7.53E-02	-3.48E-02	2.92E-03	3.90E-02
5	0.13000	0.00	1.00E 00	7.74E-01	3.70E-01	-2.21E-01	-2.45E-01	-2.15E-01	-1.79E-01	-1.40E-01	-9.90E-02	-5.74E-02	-1.52E-02
4	0.08500	0.00	1.00E 00	6.17E-01	-7.74E-02	-3.36E-01	-3.00E-01	-2.62E-01	-2.27E-01	-1.89E-01	-1.48E-01	-1.03E-01	-5.63E-02
3	0.04500	0.00	1.00E 00	2.28E-01	-5.09E-01	-4.01E-01	-3.35E-01	-2.90E-01	-2.53E-01	-2.16E-01	-1.75E-01	-1.29E-01	-7.93E-02
2	0.01250	0.00	1.00E 00	-4.13E-01	-5.18E-01	-4.20E-01	-3.48E-01	-3.01E-01	-2.63E-01	-2.26E-01	-1.85E-01	-1.38E-01	-8.76E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.50E-01	3.32E-01	3.15E-01	3.03E-01	2.94E-01	2.89E-01	2.85E-01	2.82E-01	2.80E-01	2.80E-01	2.80E-01
19	0.47500	3.66E-01	3.44E-01	3.26E-01	3.13E-01	3.05E-01	3.00E-01	2.97E-01	2.97E-01	2.97E-01	2.98E-01	2.99E-01
18	0.44750	3.64E-01	3.41E-01	3.24E-01	3.11E-01	3.03E-01	2.98E-01	2.95E-01	2.94E-01	2.94E-01	2.94E-01	2.94E-01
17	0.42750	3.56E-01	3.35E-01	3.18E-01	3.07E-01	2.99E-01	2.93E-01	2.90E-01	2.88E-01	2.88E-01	2.88E-01	2.88E-01
16	0.40625	3.42E-01	3.24E-01	3.10E-01	3.00E-01	2.92E-01	2.87E-01	2.84E-01	2.82E-01	2.81E-01	2.81E-01	2.81E-01
15	0.38500	3.24E-01	3.11E-01	3.00E-01	2.91E-01	2.84E-01	2.79E-01	2.76E-01	2.74E-01	2.73E-01	2.73E-01	2.73E-01
14	0.36500	3.05E-01	2.96E-01	2.88E-01	2.81E-01	2.75E-01	2.71E-01	2.68E-01	2.66E-01	2.65E-01	2.65E-01	2.65E-01
13	0.34625	2.85E-01	2.80E-01	2.75E-01	2.70E-01	2.66E-01	2.63E-01	2.61E-01	2.59E-01	2.58E-01	2.57E-01	2.57E-01
12	0.32750	2.64E-01	2.63E-01	2.61E-01	2.59E-01	2.57E-01	2.54E-01	2.53E-01	2.51E-01	2.50E-01	2.49E-01	2.49E-01
11	0.29750	2.27E-01	2.33E-01	2.37E-01	2.39E-01	2.40E-01	2.39E-01	2.39E-01	2.38E-01	2.38E-01	2.37E-01	2.37E-01
10	0.27500	1.99E-01	2.10E-01	2.18E-01	2.23E-01	2.26E-01	2.28E-01	2.29E-01	2.29E-01	2.28E-01	2.28E-01	2.28E-01
9	0.25750	1.76E-01	1.91E-01	2.03E-01	2.11E-01	2.16E-01	2.19E-01	2.21E-01	2.21E-01	2.21E-01	2.21E-01	2.21E-01
8	0.24250	1.57E-01	1.76E-01	1.90E-01	2.00E-01	2.07E-01	2.11E-01	2.14E-01	2.15E-01	2.15E-01	2.15E-01	2.15E-01
7	0.21500	1.22E-01	1.47E-01	1.66E-01	1.81E-01	1.91E-01	1.98E-01	2.02E-01	2.04E-01	2.05E-01	2.05E-01	2.05E-01
6	0.17500	7.39E-02	1.06E-01	1.33E-01	1.54E-01	1.69E-01	1.79E-01	1.86E-01	1.90E-01	1.92E-01	1.92E-01	1.92E-01
5	0.13000	2.68E-02	6.64E-02	1.01E-01	1.27E-01	1.47E-01	1.61E-01	1.70E-01	1.76E-01	1.79E-01	1.79E-01	1.79E-01
4	0.08500	-9.07E-03	3.59E-02	7.53E-02	1.07E-01	1.31E-01	1.47E-01	1.59E-01	1.66E-01	1.69E-01	1.70E-01	1.70E-01
3	0.04500	-2.92E-02	1.87E-02	6.10E-02	9.56E-02	1.21E-01	1.39E-01	1.52E-01	1.60E-01	1.64E-01	1.65E-01	1.65E-01
2	0.01250	-3.65E-02	1.24E-02	5.58E-02	9.14E-02	1.18E-01	1.37E-01	1.50E-01	1.58E-01	1.62E-01	1.63E-01	1.63E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS V VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

```
        4  1.643E-01  3.449E-03

        5  2.419E-01  2.102E-03

        6  3.280E-01  2.276E-03

        7  4.235E-01  2.343E-03

        8  5.296E-01  2.239E-03

        9  6.473E-01  2.087E-03

       10  7.780E-01  1.966E-03

       11  9.231E-01  1.988E-03

       12  1.084E 00  2.242E-03

       13  1.263E 00  2.509E-03

       14  1.461E 00  2.656E-03

       15  1.682E 00  2.691E-03

       16  1.926E 00  2.652E-03

       17  2.197E 00  2.570E-03

       18  2.499E 00  2.466E-03

       19  2.833E 00  2.357E-03

       20  3.167E 00  2.252E-03

       21  3.502E 00  2.155E-03

       22  3.836E 00  2.105E-03
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1X-AXIS IS XI
 Y-AXES ARE             00         02         04         06         08         10
 SYMBOL                  0          2          4          6          8          1
 MAXIMUM VALUES  0.333E 00  0.381E 00  0.415E 00  0.444E 00  0.472E 00  0.500E 00

                                                 RADIAL POSITION R/D

0         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.........+2....4..6+.8..1....+.........+.........+.........+.........+.........+.........+..........  0.00
 X  0.02   .  0          2    4   6  8    1                                                                    .  0.02
 X  0.04   .            0      2    4   6    8  1                                                              .  0.04
 X  0.06   .                     0     2    4   6   8  1                                                       .  0.06
 X  0.08   .                             0    2   4  6   8   1                                                 .  0.08
 X  0.10   +                                0    2  4  6  8  1                                                 +  0.10
```

```
   156 0.2670E-01 0.1048E-01 0.1670E-01 0.5333E-02 0.2151E-02 0.4442E 08 0.6092E 01 0.3394E-02 0.1273E 02 0.1321E 04 0.1334E 04
   157 0.2607E-01 0.1039E-01 0.1674E-01 0.5305E-02 0.2137E-02 0.4415E 08 0.6098E 01 0.3262E-02 0.1273E 02 0.1322E 04 0.1334E 04
   158 0.2547E-01 0.1028E-01 0.1678E-01 0.5344E-02 0.2121E-02 0.4402E 08 0.6103E 01 0.3131E-02 0.1274E 02 0.1322E 04 0.1334E 04
   159 0.2487E-01 0.1020E-01 0.1680E-01 0.5324E-02 0.2105E-02 0.4390E 08 0.6109E 01 0.2999E-02 0.1275E 02 0.1322E 04 0.1334E 04
   160 0.2429E-01 0.1011E-01 0.1682E-01 0.5353E-02 0.2087E-02 0.4376E 08 0.6114E 01 0.2866E-02 0.1275E 02 0.1323E 04 0.1334E 04
   161 0.2373E-01 0.1002E-01 0.1683E-01 0.5347E-02 0.2067E-02 0.4332E 08 0.6119E 01 0.2735E-02 0.1276E 02 0.1323E 04 0.1334E 04
   162 0.2318E-01 0.9937E-02 0.1683E-01 0.5387E-02 0.2048E-02 0.4340E 08 0.6124E 01 0.2603E-02 0.1276E 02 0.1324E 04 0.1334E 04
   163 0.2265E-01 0.9833E-02 0.1682E-01 0.5400E-02 0.2026E-02 0.4306E 08 0.6129E 01 0.2474E-02 0.1277E 02 0.1324E 04 0.1335E 04
   164 0.2214E-01 0.9742E-02 0.1681E-01 0.5417E-02 0.2004E-02 0.4298E 08 0.6133E 01 0.2346E-02 0.1277E 02 0.1324E 04 0.1335E 04
   165 0.2165E-01 0.9668E-02 0.1679E-01 0.5396E-02 0.1982E-02 0.4272E 08 0.6138E 01 0.2221E-02 0.1278E 02 0.1325E 04 0.1335E 04
   166 0.2118E-01 0.9608E-02 0.1676E-01 0.5391E-02 0.1958E-02 0.4269E 08 0.6142E 01 0.2097E-02 0.1278E 02 0.1325E 04 0.1335E 04
   167 0.2072E-01 0.9567E-02 0.1672E-01 0.5433E-02 0.1933E-02 0.4220E 08 0.6146E 01 0.1978E-02 0.1279E 02 0.1326E 04 0.1335E 04
   168 0.2028E-01 0.9514E-02 0.1668E-01 0.5449E-02 0.1909E-02 0.4220E 08 0.6150E 01 0.1862E-02 0.1279E 02 0.1326E 04 0.1335E 04
   169 0.1986E-01 0.9463E-02 0.1663E-01 0.5413E-02 0.1884E-02 0.4169E 08 0.6154E 01 0.1749E-02 0.1280E 02 0.1326E 04 0.1335E 04
   170 0.1945E-01 0.9417E-02 0.1657E-01 0.5459E-02 0.1859E-02 0.4178E 08 0.6157E 01 0.1640E-02 0.1280E 02 0.1327E 04 0.1335E 04
   171 0.1907E-01 0.9383E-02 0.1651E-01 0.5411E-02 0.1832E-02 0.4157E 08 0.6160E 01 0.1535E-02 0.1281E 02 0.1327E 04 0.1335E 04
   172 0.1869E-01 0.9381E-02 0.1644E-01 0.5456E-02 0.1806E-02 0.4125E 08 0.6164E 01 0.1433E-02 0.1282E 02 0.1328E 04 0.1335E 04
   173 0.1834E-01 0.9374E-02 0.1636E-01 0.5414E-02 0.1780E-02 0.4115E 08 0.6167E 01 0.1337E-02 0.1282E 02 0.1328E 04 0.1335E 04
   174 0.1800E-01 0.9387E-02 0.1628E-01 0.5427E-02 0.1754E-02 0.4090E 08 0.6170E 01 0.1245E-02 0.1283E 02 0.1328E 04 0.1335E 04
   175 0.1767E-01 0.9389E-02 0.1620E-01 0.5443E-02 0.1727E-02 0.4081E 08 0.6173E 01 0.1158E-02 0.1283E 02 0.1329E 04 0.1336E 04
   176 0.1737E-01 0.9391E-02 0.1610E-01 0.5400E-02 0.1699E-02 0.4056E 08 0.6175E 01 0.1076E-02 0.1284E 02 0.1329E 04 0.1336E 04
   177 0.1707E-01 0.9390E-02 0.1601E-01 0.5379E-02 0.1673E-02 0.4037E 08 0.6178E 01 0.9976E-03 0.1285E 02 0.1330E 04 0.1336E 04
   178 0.1679E-01 0.9406E-02 0.1591E-01 0.5376E-02 0.1646E-02 0.4033E 08 0.6180E 01 0.9247E-03 0.1285E 02 0.1330E 04 0.1336E 04
   179 0.1652E-01 0.9416E-02 0.1580E-01 0.5339E-02 0.1618E-02 0.4002E 08 0.6183E 01 0.8568E-03 0.1286E 02 0.1330E 04 0.1336E 04
   180 0.1627E-01 0.9424E-02 0.1570E-01 0.5336E-02 0.1591E-02 0.3984E 08 0.6185E 01 0.7932E-03 0.1286E 02 0.1331E 04 0.1336E 04
   181 0.1603E-01 0.9441E-02 0.1558E-01 0.5312E-02 0.1564E-02 0.3941E 08 0.6187E 01 0.7345E-03 0.1287E 02 0.1331E 04 0.1336E 04
   182 0.1580E-01 0.9435E-02 0.1547E-01 0.5293E-02 0.1537E-02 0.3940E 08 0.6189E 01 0.6807E-03 0.1288E 02 0.1331E 04 0.1337E 04
   183 0.1558E-01 0.9429E-02 0.1535E-01 0.5294E-02 0.1511E-02 0.3912E 08 0.6191E 01 0.6305E-03 0.1288E 02 0.1332E 04 0.1337E 04
   184 0.1537E-01 0.9419E-02 0.1524E-01 0.5263E-02 0.1485E-02 0.3886E 08 0.6192E 01 0.5855E-03 0.1289E 02 0.1332E 04 0.1337E 04
   185 0.1518E-01 0.9401E-02 0.1512E-01 0.5255E-02 0.1459E-02 0.3865E 08 0.6194E 01 0.5450E-03 0.1289E 02 0.1332E 04 0.1337E 04
   186 0.1500E-01 0.9374E-02 0.1499E-01 0.5221E-02 0.1433E-02 0.3857E 08 0.6196E 01 0.5079E-03 0.1290E 02 0.1333E 04 0.1337E 04
   187 0.1482E-01 0.9344E-02 0.1487E-01 0.5197E-02 0.1407E-02 0.3811E 08 0.6197E 01 0.4753E-03 0.1291E 02 0.1333E 04 0.1337E 04
   188 0.1465E-01 0.9306E-02 0.1474E-01 0.5163E-02 0.1382E-02 0.3792E 08 0.6199E 01 0.4465E-03 0.1291E 02 0.1334E 04 0.1338E 04
   189 0.1449E-01 0.9262E-02 0.1462E-01 0.5125E-02 0.1357E-02 0.3784E 08 0.6200E 01 0.4219E-03 0.1292E 02 0.1334E 04 0.1338E 04
   190 0.1433E-01 0.9214E-02 0.1449E-01 0.5116E-02 0.1333E-02 0.3726E 08 0.6201E 01 0.4000E-03 0.1293E 02 0.1334E 04 0.1338E 04
   191 0.1419E-01 0.9162E-02 0.1436E-01 0.5074E-02 0.1310E-02 0.3717E 08 0.6203E 01 0.3815E-03 0.1293E 02 0.1335E 04 0.1338E 04
   192 0.1405E-01 0.9106E-02 0.1424E-01 0.5033E-02 0.1287E-02 0.3717E 08 0.6204E 01 0.3661E-03 0.1294E 02 0.1335E 04 0.1338E 04
   193 0.1391E-01 0.9045E-02 0.1411E-01 0.5015E-02 0.1264E-02 0.3678E 08 0.6205E 01 0.3535E-03 0.1294E 02 0.1335E 04 0.1339E 04
   194 0.1378E-01 0.8984E-02 0.1398E-01 0.5007E-02 0.1241E-02 0.3658E 08 0.6206E 01 0.3428E-03 0.1295E 02 0.1336E 04 0.1339E 04
   195 0.1366E-01 0.8915E-02 0.1386E-01 0.4937E-02 0.1220E-02 0.3641E 08 0.6207E 01 0.3352E-03 0.1296E 02 0.1336E 04 0.1339E 04
   196 0.1354E-01 0.8843E-02 0.1373E-01 0.4906E-02 0.1198E-02 0.3618E 08 0.6208E 01 0.3293E-03 0.1296E 02 0.1336E 04 0.1339E 04
   197 0.1342E-01 0.8771E-02 0.1360E-01 0.4856E-02 0.1176E-02 0.3580E 08 0.6209E 01 0.3265E-03 0.1297E 02 0.1337E 04 0.1339E 04
   198 0.1331E-01 0.8701E-02 0.1348E-01 0.4831E-02 0.1155E-02 0.3558E 08 0.6210E 01 0.3248E-03 0.1297E 02 0.1337E 04 0.1340E 04
   199 0.1320E-01 0.8623E-02 0.1336E-01 0.4795E-02 0.1136E-02 0.3546E 08 0.6211E 01 0.3244E-03 0.1298E 02 0.1337E 04 0.1340E 04
   200 0.1309E-01 0.8545E-02 0.1323E-01 0.4776E-02 0.1115E-02 0.3519E 08 0.6212E 01 0.3260E-03 0.1299E 02 0.1338E 04 0.1340E 04
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


 SWIRL CASE WITH LFS  =  4
            AND NSBR =  0

 CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =      1.250

 OR IF NSBR = 0 TO SWIRL VANE ANGLE =    60.000
```

```
  5 0.01625  4.49E 05 8.35E 04 4.53E 04 3.81E 04 7.41E 03 5.47E 03 5.41E 03 5.63E 03 5.77E 03 5.64E 03 5.18E 03 4.47E 03
  4 0.01062  4.49E 05 8.99E 04 6.58E 04 1.19E 04 5.34E 03 4.63E 03 4.62E 03 4.80E 03 4.94E 03 4.88E 03 4.54E 03 3.96E 03
  3 0.00562  4.49E 05 1.12E 05 6.01E 04 7.07E 03 4.50E 03 4.16E 03 4.18E 03 4.33E 03 4.45E 03 4.41E 03 4.14E 03 3.65E 03
  2 0.00156  4.49E 05 1.54E 05 2.72E 04 5.63E 03 4.11E 03 3.93E 03 3.97E 03 4.11E 03 4.22E 03 4.19E 03 3.94E 03 3.48E 03
  1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0       I =     13        14        15        16        17        18        19        20        21        22        23
        X =   0.15786   0.18266   0.21019   0.24075   0.27467   0.31232   0.35411   0.39590   0.43769   0.47948   0.52127
0 J     Y
 21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.06187  3.06E 03 2.99E 03 2.70E 03 2.36E 03 2.06E 03 1.82E 03 1.63E 03 1.48E 03 1.37E 03 1.34E 03 4.49E 05
 19 0.05937  2.82E 03 2.65E 03 2.29E 03 1.90E 03 1.55E 03 1.27E 03 1.06E 03 9.06E 02 7.92E 02 8.34E 02 4.49E 05
 18 0.05594  3.02E 03 2.66E 03 2.18E 03 1.72E 03 1.34E 03 1.04E 03 8.14E 02 6.58E 02 5.46E 02 6.16E 02 4.49E 05
 17 0.05344  3.28E 03 2.76E 03 2.19E 03 1.68E 03 1.27E 03 9.58E 02 7.33E 02 5.78E 02 4.68E 02 5.52E 02 4.49E 05
 16 0.05078  3.62E 03 2.92E 03 2.25E 03 1.69E 03 1.25E 03 9.20E 02 6.90E 02 5.35E 02 4.27E 02 5.20E 02 4.49E 05
 15 0.04812  3.94E 03 3.09E 03 2.32E 03 1.71E 03 1.24E 03 9.01E 02 6.68E 02 5.11E 02 4.04E 02 5.04E 02 4.49E 05
 14 0.04562  4.21E 03 3.23E 03 2.39E 03 1.73E 03 1.24E 03 8.93E 02 6.55E 02 4.98E 02 3.92E 02 4.93E 02 4.49E 05
 13 0.04328  4.41E 03 3.34E 03 2.44E 03 1.75E 03 1.24E 03 8.88E 02 6.48E 02 4.90E 02 3.84E 02 4.84E 02 4.49E 05
 12 0.04094  4.56E 03 3.41E 03 2.47E 03 1.76E 03 1.25E 03 8.84E 02 6.41E 02 4.83E 02 3.77E 02 4.74E 02 4.49E 05
 11 0.03719  4.68E 03 3.48E 03 2.50E 03 1.77E 03 1.24E 03 8.74E 02 6.31E 02 4.73E 02 3.68E 02 4.57E 02 4.49E 05
 10 0.03437  4.67E 03 3.47E 03 2.49E 03 1.75E 03 1.23E 03 8.63E 02 6.21E 02 4.65E 02 3.61E 02 4.41E 02 4.49E 05
  9 0.03219  4.62E 03 3.43E 03 2.46E 03 1.73E 03 1.21E 03 8.51E 02 6.12E 02 4.57E 02 3.55E 02 4.27E 02 4.49E 05
  8 0.03031  4.54E 03 3.38E 03 2.42E 03 1.71E 03 1.19E 03 8.38E 02 6.03E 02 4.50E 02 3.49E 02 4.14E 02 4.49E 05
  7 0.02687  4.36E 03 3.25E 03 2.34E 03 1.65E 03 1.16E 03 8.12E 02 5.84E 02 4.36E 02 3.37E 02 3.90E 02 4.49E 05
  6 0.02187  4.02E 03 3.02E 03 2.19E 03 1.55E 03 1.09E 03 7.68E 02 5.53E 02 4.13E 02 3.19E 02 3.53E 02 4.49E 05
  5 0.01625  3.61E 03 2.75E 03 2.00E 03 1.43E 03 1.01E 03 7.18E 02 5.19E 02 3.87E 02 2.99E 02 3.16E 02 4.49E 05
  4 0.01062  3.25E 03 2.51E 03 1.84E 03 1.32E 03 9.46E 02 6.75E 02 4.90E 02 3.67E 02 2.83E 02 2.86E 02 4.49E 05
  3 0.00562  3.02E 03 2.35E 03 1.74E 03 1.26E 03 9.06E 02 6.50E 02 4.74E 02 3.56E 02 2.75E 02 2.69E 02 4.49E 05
  2 0.00156  2.90E 03 2.28E 03 1.70E 03 1.23E 03 8.92E 02 6.44E 02 4.71E 02 3.55E 02 2.75E 02 2.64E 02 4.49E 05
  1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                DIMENSIONLESS STREAM FUNCTION           -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1         2         3         4         5         6         7         8         9        10        11        12
        X =   0.00000   0.00000   0.00787   0.01617   0.02539   0.03561   0.04697   0.05957   0.07356   0.08909   0.10632   0.12545
0 J     Y
 21 0.06312      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.06187      0.00      0.00      0.00      0.00      0.00 9.81E-01 9.66E-01 9.64E-01 9.65E-01 9.68E-01 9.70E-01 9.72E-01
 19 0.05937      0.00      0.00      0.00      0.00      0.00 8.82E-01 8.17E-01 8.05E-01 8.14E-01 8.27E-01 8.39E-01 8.50E-01
 18 0.05594      0.00      0.00      0.00      0.00      0.00 7.13E-01 5.99E-01 5.82E-01 6.03E-01 6.33E-01 6.61E-01 6.87E-01
 17 0.05344      0.00      0.00      0.00      0.00 9.18E-01 5.70E-01 4.37E-01 4.23E-01 4.56E-01 4.99E-01 5.40E-01 5.76E-01
 16 0.05078      0.00      0.00      0.00      0.00 7.51E-01 4.15E-01 2.76E-01 2.68E-01 3.13E-01 3.70E-01 4.23E-01 4.69E-01
 15 0.04812      0.00      0.00      0.00      0.00 6.06E-01 2.71E-01 1.34E-01 1.35E-01 1.93E-01 2.60E-01 3.21E-01 3.73E-01
 14 0.04562      0.00      0.00      0.00 9.21E-01 4.73E-01 1.48E-01 2.25E-02 3.54E-02 1.02E-01 1.74E-01 2.39E-01 2.93E-01
 13 0.04328      0.00      0.00      0.00 7.80E-01 3.55E-01 4.77E-02-6.00E-02-3.54E-02 3.49E-02 1.08E-01 1.73E-01 2.28E-01
 12 0.04094      0.00      0.00      0.00 6.69E-01 2.51E-01-3.46E-02-1.20E-01-8.60E-02-1.58E-02 5.48E-02 1.17E-01 1.72E-01
 11 0.03719      0.00      0.00 9.20E-01 5.09E-01 1.08E-01-1.32E-01-1.76E-01-1.33E-01-7.01E-02-7.90E-03 4.83E-02 9.92E-02
 10 0.03437      0.00      0.00 8.01E-01 3.97E-01 1.94E-02-1.75E-01-1.90E-01-1.48E-01-9.30E-02-3.89E-02 1.13E-02 5.82E-02
  9 0.03219      0.00      0.00 7.13E-01 3.14E-01-3.62E-02-1.88E-01-1.88E-01-1.50E-01-1.03E-01-5.50E-02-9.77E-03 3.33E-02
  8 0.03031      0.00 9.41E-01 6.32E-01 2.47E-01-7.36E-02-1.90E-01-1.81E-01-1.47E-01-1.06E-01-6.40E-02-2.31E-02 1.65E-02
  7 0.02687      0.00 7.40E-01 4.80E-01 1.39E-01-1.20E-01-1.76E-01-1.61E-01-1.34E-01-1.04E-01-7.10E-02-3.80E-02-5.00E-03
  6 0.02187      0.00 4.90E-01 2.84E-01 1.94E-02-1.36E-01-1.37E-01-1.21E-01-1.05E-01-8.59E-02-6.50E-02-4.25E-02-1.92E-02
  5 0.01625      0.00 2.70E-01 1.19E-01-5.05E-02-9.74E-02-8.51E-02-7.49E-02-6.58E-02-5.63E-02-4.52E-02-3.25E-02-1.89E-02
  4 0.01062      0.00 1.16E-01 2.09E-02-4.67E-02-4.44E-02-3.94E-02-3.46E-02-3.08E-02-2.69E-02-2.23E-02-1.68E-02-1.08E-02
  3 0.00562      0.00 3.24E-02-5.97E-03-1.55E-02-1.31E-02-1.15E-02-1.01E-02-9.04E-03-7.98E-03-6.72E-03-5.19E-03-3.45E-03
  2 0.00156      0.00 2.50E-03-1.42E-03-1.28E-03-1.03E-03-9.08E-04-7.99E-04-7.14E-04-6.32E-04-5.36E-04-4.18E-04-2.82E-04
  1-0.00156      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
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  3 0.04500  4.19E-02 3.63E-02 3.02E-02 2.44E-02 1.97E-02 1.58E-02 1.28E-02 1.05E-02 8.87E-03 8.86E-03 3.00E-02
  2 0.01250  4.16E-02 3.61E-02 3.01E-02 2.44E-02 1.96E-02 1.58E-02 1.28E-02 1.06E-02 8.90E-03 8.84E-03 3.00E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-          DIMENSIONLESS LENGTH SCALE          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     2        3        4        5        6        7        8        9       10       11       12       13
       X =  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552  0.15786
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02
 19 0.05937      0.00     0.00     0.00 1.98E-01 2.05E-01 1.99E-01 1.92E-01 1.90E-01 2.14E-01 2.80E-01 3.24E-01 3.32E-01
 18 0.05594      0.00     0.00     0.00 1.98E-01 1.88E-01 1.91E-01 1.98E-01 2.21E-01 3.05E-01 4.38E-01 5.25E-01 5.55E-01
 17 0.05344      0.00     0.00 5.10E-02 1.23E-01 1.46E-01 1.70E-01 1.96E-01 2.51E-01 3.73E-01 5.10E-01 6.06E-01 6.51E-01
 16 0.05078      0.00     0.00 1.78E-01 1.59E-01 1.62E-01 1.77E-01 2.15E-01 3.09E-01 4.41E-01 5.67E-01 6.63E-01 7.20E-01
 15 0.04812      0.00     0.00 1.78E-01 1.42E-01 1.53E-01 1.87E-01 2.62E-01 3.77E-01 4.99E-01 6.12E-01 7.06E-01 7.71E-01
 14 0.04562      0.00 5.10E-02 9.40E-02 1.17E-01 1.54E-01 2.21E-01 3.24E-01 4.36E-01 5.44E-01 6.48E-01 7.40E-01 8.08E-01
 13 0.04328      0.00 1.60E-01 1.11E-01 1.24E-01 1.81E-01 2.74E-01 3.81E-01 4.83E-01 5.82E-01 6.80E-01 7.69E-01 8.39E-01
 12 0.04094      0.00 1.60E-01 8.87E-02 1.24E-01 2.11E-01 3.29E-01 4.32E-01 5.25E-01 6.17E-01 7.10E-01 7.97E-01 8.67E-01
 11 0.03719  7.64E-02 6.28E-02 6.39E-02 1.33E-01 2.74E-01 4.15E-01 5.04E-01 5.85E-01 6.70E-01 7.57E-01 8.40E-01 9.10E-01
 10 0.03437  1.60E-01 5.52E-02 6.04E-02 1.60E-01 3.41E-01 4.71E-01 5.49E-01 6.26E-01 7.08E-01 7.92E-01 8.72E-01 9.41E-01
  9 0.03219  1.60E-01 2.76E-02 5.87E-02 1.92E-01 3.94E-01 5.11E-01 5.84E-01 6.58E-01 7.37E-01 8.18E-01 8.97E-01 9.64E-01
  8 0.03031  5.30E-03 9.47E-03 6.36E-02 2.23E-01 4.40E-01 5.47E-01 6.15E-01 6.85E-01 7.62E-01 8.41E-01 9.18E-01 9.85E-01
  7 0.02687  5.31E-03 1.17E-02 8.18E-02 2.86E-01 5.23E-01 6.10E-01 6.71E-01 7.36E-01 8.08E-01 8.83E-01 9.58E-01 1.02E 00
  6 0.02187  5.35E-03 1.79E-02 1.22E-01 4.44E-01 6.30E-01 6.98E-01 7.51E-01 8.10E-01 8.75E-01 9.44E-01 1.01E 00 1.08E 00
  5 0.01625  5.50E-03 3.49E-02 2.09E-01 5.77E-01 7.36E-01 7.91E-01 8.37E-01 8.89E-01 9.48E-01 1.01E 00 1.07E 00 1.13E 00
  4 0.01062  6.18E-03 8.15E-02 3.45E-01 7.11E-01 8.27E-01 8.73E-01 9.15E-01 9.62E-01 1.01E 00 1.07E 00 1.13E 00 1.19E 00
  3 0.00562  9.35E-03 3.17E-01 5.17E-01 8.07E-01 8.92E-01 9.33E-01 9.73E-01 1.02E 00 1.07E 00 1.12E 00 1.18E 00 1.23E 00
  2 0.00156  2.11E-02 4.45E-01 6.56E-01 8.75E-01 9.37E-01 9.76E-01 1.02E 00 1.06E 00 1.11E 00 1.16E 00 1.22E 00 1.26E 00
0      I =    14       15       16       17       18       19       20       21       22       23
       X =  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 5.00E-03
 19 0.05937  3.20E-01 2.99E-01 2.71E-01 2.40E-01 2.08E-01 1.81E-01 1.59E-01 1.42E-01 1.48E-01 5.00E-03
 18 0.05594  5.52E-01 5.30E-01 4.97E-01 4.58E-01 4.15E-01 3.74E-01 3.39E-01 3.09E-01 3.23E-01 5.00E-03
 17 0.05344  6.60E-01 6.47E-01 6.20E-01 5.84E-01 5.42E-01 5.02E-01 4.67E-01 4.36E-01 4.50E-01 5.00E-03
 16 0.05078  7.43E-01 7.40E-01 7.21E-01 6.91E-01 6.55E-01 6.19E-01 5.86E-01 5.58E-01 5.71E-01 5.00E-03
 15 0.04812  8.03E-01 8.10E-01 8.00E-01 7.78E-01 7.48E-01 7.17E-01 6.89E-01 6.64E-01 6.73E-01 5.00E-03
 14 0.04562  8.48E-01 8.63E-01 8.60E-01 8.44E-01 8.21E-01 7.95E-01 7.71E-01 7.50E-01 7.54E-01 5.00E-03
 13 0.04328  8.83E-01 9.04E-01 9.07E-01 8.97E-01 8.78E-01 8.57E-01 8.37E-01 8.20E-01 8.21E-01 5.00E-03
 12 0.04094  9.15E-01 9.40E-01 9.47E-01 9.42E-01 9.28E-01 9.11E-01 8.95E-01 8.80E-01 8.79E-01 5.00E-03
 11 0.03719  9.60E-01 9.90E-01 1.00E 00 1.00E 00 9.96E-01 9.85E-01 9.73E-01 9.62E-01 9.58E-01 5.00E-03
 10 0.03437  9.92E-01 1.02E 00 1.04E 00 1.04E 00 1.04E 00 1.03E 00 1.02E 00 1.02E 00 1.01E 00 5.00E-03
  9 0.03219  1.02E 00 1.05E 00 1.07E 00 1.07E 00 1.07E 00 1.06E 00 1.06E 00 1.05E 00 1.05E 00 5.00E-03
  8 0.03031  1.04E 00 1.07E 00 1.09E 00 1.10E 00 1.10E 00 1.09E 00 1.09E 00 1.08E 00 1.08E 00 5.00E-03
  7 0.02687  1.07E 00 1.11E 00 1.13E 00 1.13E 00 1.14E 00 1.13E 00 1.13E 00 1.13E 00 1.13E 00 5.00E-03
  6 0.02187  1.13E 00 1.16E 00 1.18E 00 1.19E 00 1.19E 00 1.19E 00 1.19E 00 1.19E 00 1.19E 00 5.00E-03
  5 0.01625  1.18E 00 1.21E 00 1.23E 00 1.24E 00 1.24E 00 1.24E 00 1.24E 00 1.24E 00 1.25E 00 5.00E-03
  4 0.01062  1.23E 00 1.26E 00 1.28E 00 1.28E 00 1.29E 00 1.29E 00 1.29E 00 1.29E 00 1.30E 00 5.00E-03
  3 0.00562  1.27E 00 1.30E 00 1.31E 00 1.31E 00 1.32E 00 1.31E 00 1.31E 00 1.31E 00 1.34E 00 5.00E-03
  2 0.00156  1.30E 00 1.33E 00 1.33E 00 1.33E 00 1.33E 00 1.32E 00 1.32E 00 1.32E 00 1.36E 00 5.00E-03
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-          DIMENSIONLESS EFF. VISCOSITY          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J    Y
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49	0.2517E 00	0.1532E 00	0.1053E 00	0.4535E-01	0.4483E-01	0.7754E 09	0.6226E 01	-0.1070E-02	0.1321E 02	0.1496E 04	0.1361E 04
50	0.2479E 00	0.1504E 00	0.1049E 00	0.4639E-01	0.4476E-01	0.7305E 09	0.6225E 01	-0.1232E-02	0.1321E 02	0.1496E 04	0.1363E 04
51	0.2438E 00	0.1477E 00	0.1045E 00	0.4744E-01	0.4462E-01	0.6817E 09	0.6224E 01	-0.1404E-02	0.1322E 02	0.1496E 04	0.1365E 04
52	0.2395E 00	0.1456E 00	0.1041E 00	0.4848E-01	0.4438E-01	0.6309E 09	0.6222E 01	-0.1588E-02	0.1322E 02	0.1495E 04	0.1367E 04
53	0.2360E 00	0.1439E 00	0.1039E 00	0.4953E-01	0.4405E-01	0.5876E 09	0.6221E 01	-0.1784E-02	0.1323E 02	0.1495E 04	0.1369E 04
54	0.2326E 00	0.1421E 00	0.1034E 00	0.5060E-01	0.4365E-01	0.5489E 09	0.6219E 01	-0.1989E-02	0.1324E 02	0.1495E 04	0.1372E 04
55	0.2292E 00	0.1406E 00	0.1029E 00	0.5172E-01	0.4320E-01	0.5094E 09	0.6216E 01	-0.2207E-02	0.1324E 02	0.1494E 04	0.1375E 04
56	0.2256E 00	0.1395E 00	0.1025E 00	0.5282E-01	0.4271E-01	0.4693E 09	0.6214E 01	-0.2435E-02	0.1325E 02	0.1494E 04	0.1377E 04
57	0.2222E 00	0.1386E 00	0.1019E 00	0.5399E-01	0.4219E-01	0.4289E 09	0.6211E 01	-0.2675E-02	0.1326E 02	0.1494E 04	0.1381E 04
58	0.2191E 00	0.1376E 00	0.1015E 00	0.5507E-01	0.4163E-01	0.3938E 09	0.6208E 01	-0.2924E-02	0.1326E 02	0.1494E 04	0.1384E 04
59	0.2163E 00	0.1368E 00	0.1011E 00	0.5612E-01	0.4109E-01	0.3708E 09	0.6204E 01	-0.3183E-02	0.1327E 02	0.1494E 04	0.1387E 04
60	0.2136E 00	0.1359E 00	0.1006E 00	0.5714E-01	0.4051E-01	0.3519E 09	0.6200E 01	-0.3452E-02	0.1328E 02	0.1494E 04	0.1391E 04
61	0.2111E 00	0.1351E 00	0.9987E-01	0.5813E-01	0.3987E-01	0.3346E 09	0.6196E 01	-0.3729E-02	0.1329E 02	0.1494E 04	0.1395E 04
62	0.2087E 00	0.1346E 00	0.9899E-01	0.5904E-01	0.3918E-01	0.3158E 09	0.6191E 01	-0.4014E-02	0.1330E 02	0.1494E 04	0.1399E 04
63	0.2061E 00	0.1342E 00	0.9814E-01	0.5991E-01	0.3847E-01	0.2980E 09	0.6186E 01	-0.4307E-02	0.1331E 02	0.1494E 04	0.1404E 04
64	0.2034E 00	0.1338E 00	0.9723E-01	0.6084E-01	0.3773E-01	0.2819E 09	0.6180E 01	-0.4608E-02	0.1332E 02	0.1494E 04	0.1409E 04
65	0.2015E 00	0.1334E 00	0.9655E-01	0.6161E-01	0.3696E-01	0.2655E 09	0.6174E 01	-0.4914E-02	0.1333E 02	0.1494E 04	0.1414E 04
66	0.1999E 00	0.1330E 00	0.9588E-01	0.6230E-01	0.3616E-01	0.2504E 09	0.6168E 01	-0.5225E-02	0.1334E 02	0.1494E 04	0.1419E 04
67	0.1979E 00	0.1327E 00	0.9507E-01	0.6290E-01	0.3534E-01	0.2382E 09	0.6161E 01	-0.5540E-02	0.1335E 02	0.1494E 04	0.1425E 04
68	0.1955E 00	0.1323E 00	0.9412E-01	0.6347E-01	0.3449E-01	0.2257E 09	0.6154E 01	-0.5857E-02	0.1336E 02	0.1494E 04	0.1431E 04
69	0.1933E 00	0.1318E 00	0.9299E-01	0.6385E-01	0.3365E-01	0.2204E 09	0.6146E 01	-0.6177E-02	0.1337E 02	0.1494E 04	0.1437E 04
70	0.1910E 00	0.1311E 00	0.9176E-01	0.6425E-01	0.3279E-01	0.2152E 09	0.6137E 01	-0.6496E-02	0.1338E 02	0.1494E 04	0.1444E 04
71	0.1887E 00	0.1306E 00	0.9041E-01	0.6451E-01	0.3194E-01	0.2110E 09	0.6129E 01	-0.6814E-02	0.1340E 02	0.1495E 04	0.1450E 04
72	0.1867E 00	0.1303E 00	0.8907E-01	0.6467E-01	0.3108E-01	0.2066E 09	0.6119E 01	-0.7130E-02	0.1341E 02	0.1495E 04	0.1457E 04
73	0.1848E 00	0.1302E 00	0.8796E-01	0.6476E-01	0.3022E-01	0.2007E 09	0.6110E 01	-0.7440E-02	0.1342E 02	0.1495E 04	0.1465E 04
74	0.1831E 00	0.1298E 00	0.8680E-01	0.6471E-01	0.2936E-01	0.1953E 09	0.6099E 01	-0.7744E-02	0.1344E 02	0.1496E 04	0.1472E 04
75	0.1810E 00	0.1291E 00	0.8553E-01	0.6464E-01	0.2850E-01	0.1907E 09	0.6089E 01	-0.8041E-02	0.1346E 02	0.1496E 04	0.1480E 04
76	0.1786E 00	0.1283E 00	0.8415E-01	0.6439E-01	0.2765E-01	0.1853E 09	0.6077E 01	-0.8328E-02	0.1347E 02	0.1496E 04	0.1488E 04
77	0.1761E 00	0.1273E 00	0.8265E-01	0.6413E-01	0.2680E-01	0.1793E 09	0.6066E 01	-0.8604E-02	0.1349E 02	0.1497E 04	0.1497E 04
78	0.1741E 00	0.1261E 00	0.8110E-01	0.6367E-01	0.2595E-01	0.1727E 09	0.6054E 01	-0.8867E-02	0.1351E 02	0.1497E 04	0.1506E 04
79	0.1722E 00	0.1247E 00	0.7944E-01	0.6315E-01	0.2511E-01	0.1650E 09	0.6041E 01	-0.9115E-02	0.1352E 02	0.1498E 04	0.1514E 04
80	0.1704E 00	0.1234E 00	0.7769E-01	0.6258E-01	0.2429E-01	0.1572E 09	0.6028E 01	-0.9346E-02	0.1354E 02	0.1498E 04	0.1524E 04
81	0.1682E 00	0.1220E 00	0.7598E-01	0.6189E-01	0.2347E-01	0.1491E 09	0.6015E 01	-0.9559E-02	0.1356E 02	0.1499E 04	0.1533E 04
82	0.1663E 00	0.1212E 00	0.7447E-01	0.6112E-01	0.2266E-01	0.1404E 09	0.6001E 01	-0.9753E-02	0.1358E 02	0.1500E 04	0.1542E 04
83	0.1641E 00	0.1201E 00	0.7287E-01	0.6028E-01	0.2187E-01	0.1318E 09	0.5987E 01	-0.9925E-02	0.1360E 02	0.1500E 04	0.1552E 04
84	0.1617E 00	0.1187E 00	0.7122E-01	0.5935E-01	0.2109E-01	0.1243E 09	0.5972E 01	-0.1008E-01	0.1362E 02	0.1501E 04	0.1562E 04
85	0.1595E 00	0.1172E 00	0.6952E-01	0.5835E-01	0.2032E-01	0.1182E 09	0.5958E 01	-0.1020E-01	0.1364E 02	0.1502E 04	0.1572E 04
86	0.1577E 00	0.1154E 00	0.6782E-01	0.5729E-01	0.1958E-01	0.1118E 09	0.5943E 01	-0.1030E-01	0.1366E 02	0.1502E 04	0.1582E 04
87	0.1560E 00	0.1134E 00	0.6606E-01	0.5613E-01	0.1887E-01	0.1061E 09	0.5927E 01	-0.1038E-01	0.1369E 02	0.1503E 04	0.1592E 04
88	0.1540E 00	0.1112E 00	0.6426E-01	0.5496E-01	0.1823E-01	0.1006E 09	0.5912E 01	-0.1042E-01	0.1371E 02	0.1504E 04	0.1602E 04
89	0.1518E 00	0.1089E 00	0.6245E-01	0.5374E-01	0.1761E-01	0.9514E 08	0.5896E 01	-0.1044E-01	0.1373E 02	0.1505E 04	0.1613E 04
90	0.1497E 00	0.1066E 00	0.6065E-01	0.5248E-01	0.1700E-01	0.8964E 08	0.5880E 01	-0.1043E-01	0.1376E 02	0.1505E 04	0.1623E 04
91	0.1475E 00	0.1042E 00	0.5892E-01	0.5115E-01	0.1644E-01	0.8415E 08	0.5864E 01	-0.1040E-01	0.1378E 02	0.1506E 04	0.1633E 04
92	0.1453E 00	0.1019E 00	0.5727E-01	0.4982E-01	0.1597E-01	0.7962E 08	0.5848E 01	-0.1033E-01	0.1380E 02	0.1507E 04	0.1644E 04
93	0.1432E 00	0.9998E-01	0.5559E-01	0.4848E-01	0.1550E-01	0.7606E 08	0.5832E 01	-0.1024E-01	0.1383E 02	0.1508E 04	0.1654E 04
94	0.1415E 00	0.9795E-01	0.5390E-01	0.4706E-01	0.1506E-01	0.7382E 08	0.5816E 01	-0.1011E-01	0.1385E 02	0.1509E 04	0.1664E 04
95	0.1397E 00	0.9576E-01	0.5219E-01	0.4568E-01	0.1463E-01	0.7197E 08	0.5800E 01	-0.9961E-02	0.1388E 02	0.1510E 04	0.1674E 04
96	0.1377E 00	0.9345E-01	0.5051E-01	0.4431E-01	0.1420E-01	0.6986E 08	0.5784E 01	-0.9783E-02	0.1390E 02	0.1510E 04	0.1684E 04
97	0.1357E 00	0.9101E-01	0.4881E-01	0.4287E-01	0.1382E-01	0.6899E 08	0.5768E 01	-0.9578E-02	0.1393E 02	0.1511E 04	0.1694E 04
98	0.1337E 00	0.8844E-01	0.4715E-01	0.4150E-01	0.1352E-01	0.6834E 08	0.5752E 01	-0.9348E-02	0.1395E 02	0.1512E 04	0.1704E 04
99	0.1317E 00	0.8576E-01	0.4557E-01	0.4008E-01	0.1323E-01	0.6762E 08	0.5737E 01	-0.9095E-02	0.1398E 02	0.1513E 04	0.1714E 04
100	0.1297E 00	0.8303E-01	0.4399E-01	0.3867E-01	0.1296E-01	0.6693E 08	0.5721E 01	-0.8817E-02	0.1400E 02	0.1514E 04	0.1724E 04
101	0.1278E 00	0.8026E-01	0.4249E-01	0.3728E-01	0.1268E-01	0.6700E 08	0.5706E 01	-0.8519E-02	0.1403E 02	0.1515E 04	0.1733E 04
102	0.1260E 00	0.7746E-01	0.4104E-01	0.3592E-01	0.1238E-01	0.6751E 08	0.5692E 01	-0.8200E-02	0.1405E 02	0.1516E 04	0.1742E 04

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 14 0.04562       0.00     0.00-9.24E-02 4.40E-02 6.25E-02 8.77E-02 9.10E-02 7.72E-02 5.88E-02 4.29E-02 2.82E-02 1.80E-02
 13 0.04328       0.00     0.00-7.02E-02 1.35E-02 5.81E-02 8.36E-02 8.22E-02 6.60E-02 4.62E-02 2.95E-02 1.42E-02 2.72E-03
 12 0.04094       0.00     0.00-3.99E-02-1.39E-03 4.86E-02 7.25E-02 6.89E-02 5.15E-02 3.13E-02 1.43E-02-1.11E-03-1.33E-02
 11 0.03719       0.00-1.28E-01-5.38E-02-1.84E-02 3.00E-02 4.44E-02 3.87E-02 2.18E-02 3.03E-03-1.30E-02-2.74E-02-4.04E-02
 10 0.03437       0.00-1.18E-01-8.13E-02-3.81E-02 4.51E-03 1.38E-02 1.05E-02-4.80E-03-2.19E-02-3.63E-02-4.93E-02-6.16E-02
  9 0.03219       0.00-1.10E-01-9.65E-02-5.62E-02-2.09E-02-1.12E-02-1.42E-02-2.77E-02-4.25E-02-5.58E-02-6.78E-02-7.89E-02
  8 0.03031       0.00-1.14E-01-1.08E-01-7.68E-02-4.70E-02-3.46E-02-3.67E-02-4.83E-02-6.10E-02-7.31E-02-8.38E-02-9.40E-02
  7 0.02687       0.00-1.42E-01-1.40E-01-1.19E-01-8.99E-02-8.02E-02-8.13E-02-8.81E-02-9.65E-02-1.05E-01-1.13E-01-1.21E-01
  6 0.02187       0.00-1.92E-01-1.94E-01-1.70E-01-1.55E-01-1.51E-01-1.48E-01-1.47E-01-1.48E-01-1.49E-01-1.52E-01-1.57E-01
  5 0.01625       0.00-2.50E-01-2.48E-01-2.48E-01-2.37E-01-2.27E-01-2.18E-01-2.09E-01-2.00E-01-1.94E-01-1.91E-01-1.91E-01
  4 0.01062       0.00-3.11E-01-3.09E-01-3.20E-01-3.07E-01-2.91E-01-2.74E-01-2.57E-01-2.42E-01-2.29E-01-2.20E-01-2.16E-01
  3 0.00562       0.00-3.57E-01-3.58E-01-3.62E-01-3.50E-01-3.29E-01-3.07E-01-2.86E-01-2.66E-01-2.49E-01-2.38E-01-2.31E-01
  2 0.00156       0.00-3.80E-01-3.81E-01-3.79E-01-3.67E-01-3.44E-01-3.19E-01-2.97E-01-2.76E-01-2.57E-01-2.44E-01-2.36E-01
  1-0.00156       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =     13       14       15       16       17       18       19       20       21       22       23
        X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  1.13E-01 1.15E-01 1.17E-01 1.20E-01 1.26E-01 1.34E-01 1.42E-01 1.45E-01 1.46E-01 1.47E-01     0.00
 19 0.05937  9.80E-02 9.84E-02 1.00E-01 1.03E-01 1.10E-01 1.19E-01 1.27E-01 1.31E-01 1.32E-01 1.34E-01     0.00
 18 0.05594  7.62E-02 7.43E-02 7.50E-02 7.77E-02 8.39E-02 9.17E-02 9.89E-02 1.03E-01 1.04E-01 1.05E-01     0.00
 17 0.05344  6.01E-02 5.61E-02 5.64E-02 5.85E-02 6.37E-02 7.04E-02 7.64E-02 7.93E-02 7.99E-02 8.03E-02     0.00
 16 0.05078  4.29E-02 3.71E-02 3.63E-02 3.78E-02 4.18E-02 4.71E-02 5.15E-02 5.33E-02 5.33E-02 5.31E-02     0.00
 15 0.04812  2.52E-02 1.76E-02 1.60E-02 1.69E-02 1.97E-02 2.31E-02 2.60E-02 2.66E-02 2.61E-02 2.55E-02     0.00
 14 0.04562  8.17E-03-8.06E-04-3.05E-03-2.51E-03-1.12E-03 3.35E-04 1.69E-03 1.25E-03 1.16E-04-1.87E-04     0.00
 13 0.04328 -8.14E-03-1.79E-02-2.09E-02-2.09E-02-2.07E-02-2.08E-02-2.12E-02-2.24E-02-2.40E-02-2.39E-02     0.00
 12 0.04094 -2.47E-02-3.50E-02-3.85E-02-3.89E-02-4.03E-02-4.20E-02-4.39E-02-4.62E-02-4.78E-02-4.72E-02     0.00
 11 0.03719 -5.22E-02-6.22E-02-6.58E-02-6.74E-02-7.07E-02-7.55E-02-8.00E-02-8.33E-02-8.48E-02-8.34E-02     0.00
 10 0.03437 -7.33E-02-8.26E-02-8.61E-02-8.83E-02-9.30E-02-9.99E-02-1.06E-01-1.10E-01-1.11E-01-1.09E-01     0.00
  9 0.03219 -8.99E-02-9.81E-02-1.02E-01-1.04E-01-1.10E-01-1.18E-01-1.26E-01-1.30E-01-1.31E-01-1.27E-01     0.00
  8 0.03031 -1.04E-01-1.11E-01-1.15E-01-1.18E-01-1.24E-01-1.33E-01-1.41E-01-1.46E-01-1.47E-01-1.43E-01     0.00
  7 0.02687 -1.29E-01-1.34E-01-1.38E-01-1.41E-01-1.49E-01-1.60E-01-1.69E-01-1.75E-01-1.75E-01-1.69E-01     0.00
  6 0.02187 -1.61E-01-1.65E-01-1.67E-01-1.71E-01-1.81E-01-1.94E-01-2.05E-01-2.10E-01-2.09E-01-2.03E-01     0.00
  5 0.01625 -1.93E-01-1.93E-01-1.95E-01-2.00E-01-2.11E-01-2.26E-01-2.38E-01-2.42E-01-2.40E-01-2.33E-01     0.00
  4 0.01062 -2.16E-01-2.14E-01-2.15E-01-2.21E-01-2.33E-01-2.49E-01-2.61E-01-2.65E-01-2.62E-01-2.54E-01     0.00
  3 0.00562 -2.28E-01-2.27E-01-2.27E-01-2.33E-01-2.46E-01-2.62E-01-2.74E-01-2.77E-01-2.74E-01-2.66E-01     0.00
  2 0.00156 -2.33E-01-2.31E-01-2.31E-01-2.38E-01-2.50E-01-2.66E-01-2.78E-01-2.82E-01-2.78E-01-2.70E-01     0.00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-               TURBULENCE  ENERGY          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06312       0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187       0.00     0.00     0.00     0.00 4.38E 00 4.07E 00 3.28E 00 2.76E 00 2.54E 00 2.80E 00 3.42E 00 3.83E 00
 19 0.05937       0.00     0.00     0.00     0.00 2.46E 01 2.68E 01 2.10E 01 1.63E 01 1.39E 01 1.54E 01 1.90E 01 2.09E 01
 18 0.05594       0.00     0.00     0.00     0.00 3.89E 01 3.15E 01 2.48E 01 2.05E 01 2.01E 01 2.47E 01 2.98E 01 3.13E 01
 17 0.05344       0.00     0.00     0.00 1.29E 01 2.64E 01 2.48E 01 2.29E 01 2.25E 01 2.61E 01 3.24E 01 3.68E 01 3.72E 01
 16 0.05078       0.00     0.00     0.00 4.50E 01 3.28E 01 2.71E 01 2.54E 01 2.83E 01 3.50E 01 4.12E 01 4.40E 01 4.28E 01
 15 0.04812       0.00     0.00     0.00 4.28E 01 3.05E 01 2.78E 01 3.04E 01 3.76E 01 4.50E 01 4.96E 01 5.05E 01 4.78E 01
 14 0.04562       0.00     0.00 1.88E 01 2.67E 01 2.78E 01 3.11E 01 3.87E 01 4.77E 01 5.39E 01 5.65E 01 5.58E 01 5.19E 01
 13 0.04328       0.00     0.00 5.15E 01 3.06E 01 3.11E 01 3.78E 01 4.77E 01 5.62E 01 6.08E 01 6.19E 01 5.99E 01 5.50E 01
 12 0.04094       0.00     0.00 3.49E 01 2.50E 01 3.40E 01 4.45E 01 5.53E 01 6.27E 01 6.60E 01 6.60E 01 6.32E 01 5.76E 01
 11 0.03719       0.00 2.46E 01 1.97E 01 2.37E 01 4.24E 01 5.55E 01 6.40E 01 6.95E 01 7.14E 01 7.05E 01 6.70E 01 6.06E 01
 10 0.03437       0.00 5.40E 01 1.95E 01 2.80E 01 5.47E 01 5.90E 01 6.59E 01 7.11E 01 7.31E 01 7.22E 01 6.85E 01 6.19E 01
```

0 J Y

J	Y											
11	1.00000	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000	4.82E-01	4.81E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01	4.80E-01
9	0.80000	4.64E-01	4.62E-01	4.60E-01	4.60E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.59E-01	4.60E-01	4.60E-01
8	0.70000	4.46E-01	4.42E-01	4.40E-01	4.38E-01	4.38E-01	4.37E-01	4.37E-01	4.38E-01	4.38E-01	4.38E-01	4.38E-01
7	0.60000	4.26E-01	4.21E-01	4.18E-01	4.16E-01	4.14E-01	4.14E-01	4.14E-01	4.14E-01	4.14E-01	4.14E-01	4.14E-01
6	0.50000	4.05E-01	3.99E-01	3.94E-01	3.91E-01	3.89E-01	3.88E-01	3.87E-01	3.87E-01	3.87E-01	3.88E-01	3.88E-01
5	0.40000	3.82E-01	3.73E-01	3.67E-01	3.63E-01	3.60E-01	3.58E-01	3.57E-01	3.56E-01	3.57E-01	3.57E-01	3.57E-01
4	0.30000	3.55E-01	3.45E-01	3.36E-01	3.30E-01	3.26E-01	3.23E-01	3.21E-01	3.20E-01	3.20E-01	3.20E-01	3.20E-01
3	0.20000	3.23E-01	3.09E-01	2.98E-01	2.88E-01	2.82E-01	2.78E-01	2.76E-01	2.74E-01	2.74E-01	2.74E-01	2.74E-01
2	0.10000	2.80E-01	2.60E-01	2.43E-01	2.29E-01	2.20E-01	2.14E-01	2.09E-01	2.07E-01	2.06E-01	2.05E-01	2.05E-01
1	0.00000	1.85E-01	1.04E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS PRESSURE -*

0 I = 1 2 3 4 5 6 7 8 9 10 11 12

X = -0.03148 0.03148 0.09443 0.16430 0.24187 0.32796 0.42352 0.52960 0.64735 0.77804 0.92311 1.08415

0 J Y

J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.93E 05	6.10E 05	5.87E 05	5.84E 05	5.91E 05	5.99E 05	6.05E 05	6.10E 05
19	0.47500	0.00	0.00	0.00	0.00	5.78E 05	6.00E 05	5.78E 05	5.76E 05	5.83E 05	5.91E 05	5.96E 05	5.99E 05
18	0.44750	0.00	0.00	0.00	0.00	5.48E 05	5.82E 05	5.63E 05	5.63E 05	5.71E 05	5.78E 05	5.81E 05	5.82E 05
17	0.42750	0.00	0.00	0.00	5.83E 05	5.43E 05	5.61E 05	5.49E 05	5.53E 05	5.61E 05	5.67E 05	5.69E 05	5.69E 05
16	0.40625	0.00	0.00	0.00	5.39E 05	5.39E 05	5.36E 05	5.32E 05	5.40E 05	5.49E 05	5.54E 05	5.55E 05	5.54E 05
15	0.38500	0.00	0.00	0.00	4.83E 05	5.22E 05	5.11E 05	5.14E 05	5.26E 05	5.35E 05	5.39E 05	5.39E 05	5.38E 05
14	0.36500	0.00	0.00	6.26E 05	4.80E 05	4.94E 05	4.87E 05	4.96E 05	5.11E 05	5.20E 05	5.24E 05	5.24E 05	5.22E 05
13	0.34625	0.00	0.00	5.62E 05	4.89E 05	4.69E 05	4.65E 05	4.79E 05	4.95E 05	5.04E 05	5.08E 05	5.08E 05	5.07E 05
12	0.32750	0.00	0.00	4.70E 05	4.74E 05	4.47E 05	4.44E 05	4.61E 05	4.78E 05	4.87E 05	4.91E 05	4.92E 05	4.91E 05
11	0.29750	0.00	5.30E 05	4.27E 05	4.29E 05	4.09E 05	4.13E 05	4.32E 05	4.47E 05	4.57E 05	4.62E 05	4.64E 05	4.65E 05
10	0.27500	0.00	4.11E 05	4.17E 05	3.98E 05	3.82E 05	3.92E 05	4.08E 05	4.23E 05	4.32E 05	4.38E 05	4.43E 05	4.45E 05
9	0.25750	0.00	2.91E 05	3.90E 05	3.74E 05	3.64E 05	3.75E 05	3.89E 05	4.03E 05	4.13E 05	4.20E 05	4.26E 05	4.30E 05
8	0.24250	0.00	2.39E 05	3.61E 05	3.58E 05	3.49E 05	3.60E 05	3.72E 05	3.85E 05	3.96E 05	4.04E 05	4.11E 05	4.17E 05
7	0.21500	0.00	2.44E 05	3.21E 05	3.27E 05	3.24E 05	3.31E 05	3.41E 05	3.53E 05	3.64E 05	3.75E 05	3.85E 05	3.93E 05
6	0.17500	0.00	2.26E 05	2.74E 05	2.79E 05	2.83E 05	2.90E 05	2.98E 05	3.09E 05	3.21E 05	3.35E 05	3.49E 05	3.61E 05
5	0.13000	0.00	1.85E 05	2.25E 05	2.38E 05	2.41E 05	2.47E 05	2.55E 05	2.65E 05	2.80E 05	2.96E 05	3.14E 05	3.30E 05
4	0.08500	0.00	1.25E 05	1.78E 05	1.86E 05	2.03E 05	2.13E 05	2.21E 05	2.33E 05	2.48E 05	2.67E 05	2.87E 05	3.07E 05
3	0.04500	0.00	4.34E 04	1.54E 05	1.64E 05	1.80E 05	1.92E 05	2.02E 05	2.14E 05	2.30E 05	2.50E 05	2.72E 05	2.94E 05
2	0.01250	0.00	0.00	1.26E 05	1.53E 05	1.72E 05	1.85E 05	1.95E 05	2.07E 05	2.23E 05	2.43E 05	2.66E 05	2.89E 05
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I = 13 14 15 16 17 18 19 20 21 22 23

X = 1.26289 1.46130 1.68153 1.92598 2.19733 2.49852 2.83285 3.16718 3.50150 3.83583 4.17015

0 J Y

J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	6.13E 05	6.15E 05	6.15E 05	6.13E 05	6.11E 05	6.07E 05	6.03E 05	5.99E 05	5.95E 05	5.91E 05	0.00
19	0.47500	6.01E 05	6.01E 05	6.00E 05	5.98E 05	5.96E 05	5.93E 05	5.89E 05	5.86E 05	5.82E 05	5.78E 05	0.00
18	0.44750	5.82E 05	5.81E 05	5.79E 05	5.77E 05	5.74E 05	5.71E 05	5.68E 05	5.65E 05	5.62E 05	5.59E 05	0.00
17	0.42750	5.67E 05	5.66E 05	5.63E 05	5.61E 05	5.58E 05	5.56E 05	5.53E 05	5.50E 05	5.48E 05	5.46E 05	0.00
16	0.40625	5.52E 05	5.49E 05	5.47E 05	5.44E 05	5.42E 05	5.40E 05	5.37E 05	5.35E 05	5.33E 05	5.31E 05	0.00
15	0.38500	5.35E 05	5.33E 05	5.30E 05	5.28E 05	5.26E 05	5.24E 05	5.22E 05	5.20E 05	5.19E 05	5.17E 05	0.00
14	0.36500	5.20E 05	5.17E 05	5.15E 05	5.13E 05	5.11E 05	5.09E 05	5.08E 05	5.07E 05	5.06E 05	5.05E 05	0.00
13	0.34625	5.05E 05	5.02E 05	5.00E 05	4.99E 05	4.97E 05	4.96E 05	4.95E 05	4.95E 05	4.94E 05	4.94E 05	0.00
12	0.32750	4.90E 05	4.88E 05	4.86E 05	4.85E 05	4.84E 05	4.84E 05	4.83E 05	4.83E 05	4.83E 05	4.83E 05	0.00
11	0.29750	4.65E 05	4.65E 05	4.64E 05	4.64E 05	4.64E 05	4.65E 05	4.65E 05	4.66E 05	4.66E 05	4.67E 05	0.00
10	0.27500	4.47E 05	4.48E 05	4.49E 05	4.49E 05	4.50E 05	4.51E 05	4.53E 05	4.54E 05	4.55E 05	4.56E 05	0.00
9	0.25750	4.33E 05	4.35E 05	4.37E 05	4.38E 05	4.40E 05	4.42E 05	4.43E 05	4.45E 05	4.46E 05	4.48E 05	0.00
8	0.24250	4.21E 05	4.24E 05	4.27E 05	4.29E 05	4.32E 05	4.34E 05	4.36E 05	4.38E 05	4.40E 05	4.42E 05	0.00

```
X  0.50   +                                                                  +  0.50
X  0.52   0                    2              4              6         8      1  0.52
X  0.54   .                                                                  .  0.54
X  0.56   .                                                                  .  0.56
X  0.58   0                    2              4              6         8      1  0.58
X  0.60   +                                                                  +  0.60
X  0.62   .                                                                  .  0.62
X  0.64   .                                                                  .  0.64
X  0.66   0                    2              4              6         8      1  0.66
X  0.68   .                                                                  .  0.68
X  0.70   +                                                                  +  0.70
X  0.72   .                                                                  .  0.72
X  0.74   0                    2              4              6         8      1  0.74
X  0.76   .                                                                  .  0.76
X  0.78   .                                                                  .  0.78
X  0.80   +                                                                  +  0.80
X  0.82   .                                                                  .  0.82
X  0.84   0                    2              4              6         8      1  0.84
X  0.86   .                                                                  .  0.86
X  0.88   .                                                                  .  0.88
X  0.90   +                                                                  +  0.90
X  0.92   0                    2              4              6         8      1  0.92
X  0.94   .                                                                  .  0.94
X  0.96   .                                                                  .  0.96
X  0.98   .                                                                  .  0.98
X  1.00   0.....+.....+.....+.....+.....+....2....+.....+....4.....+...6.....+...8.....1  1.00
         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
```

```
 20 0.48500      0.00     0.00     0.00     0.00 4.51E-02 2.75E-02 6.14E-03-1.65E-03-3.20E-03-2.60E-03-1.76E-03-1.53E-03
 19 0.46125      0.00     0.00     0.00     0.00 1.41E-01 6.46E-02 1.44E-02-4.54E-03-8.33E-03-7.18E-03-5.87E-03-5.26E-03
 18 0.43750      0.00     0.00     0.00     0.00 2.64E-01 9.48E-02 1.95E-02-8.85E-03-1.44E-02-1.31E-02-1.13E-02-9.59E-03
 17 0.41687      0.00     0.00     0.00 1.44E-01 2.64E-01 1.11E-01 2.12E-02-1.38E-02-2.08E-02-1.93E-02-1.62E-02-1.33E-02
 16 0.39562      0.00     0.00     0.00 2.80E-01 2.82E-01 1.25E-01 2.19E-02-1.92E-02-2.80E-02-2.56E-02-2.08E-02-1.67E-02
 15 0.37500      0.00     0.00     0.00 4.19E-01 3.03E-01 1.33E-01 1.95E-02-2.60E-02-3.49E-02-3.05E-02-2.43E-02-1.95E-02
 14 0.35562      0.00     0.00 1.61E-01 4.22E-01 3.16E-01 1.36E-01 1.34E-02-3.37E-02-4.01E-02-3.37E-02-2.67E-02-2.16E-02
 13 0.33687      0.00     0.00 2.99E-01 4.48E-01 3.26E-01 1.34E-01 4.34E-03-4.05E-02-4.33E-02-3.55E-02-2.83E-02-2.32E-02
 12 0.31250      0.00     0.00 4.86E-01 4.91E-01 3.34E-01 1.22E-01-1.06E-02-4.73E-02-4.53E-02-3.66E-02-2.97E-02-2.48E-02
 11 0.28625      0.00 1.83E-01 5.49E-01 5.33E-01 3.31E-01 9.03E-02-2.79E-02-4.91E-02-4.42E-02-3.62E-02-3.01E-02-2.56E-02
 10 0.26625      0.00 3.59E-01 6.04E-01 5.48E-01 3.13E-01 5.85E-02-3.64E-02-4.77E-02-4.23E-02-3.53E-02-2.99E-02-2.58E-02
  9 0.25000      0.00 5.47E-01 6.35E-01 5.49E-01 2.88E-01 3.27E-02-3.95E-02-4.54E-02-4.03E-02-3.42E-02-2.94E-02-2.56E-02
  8 0.22875      0.00 5.09E-01 6.44E-01 5.35E-01 2.44E-01 1.54E-03-4.01E-02-4.16E-02-3.73E-02-3.25E-02-2.86E-02-2.52E-02
  7 0.19500      0.00 4.83E-01 6.41E-01 4.90E-01 1.42E-01-3.03E-02-3.53E-02-3.46E-02-3.21E-02-2.92E-02-2.65E-02-2.36E-02
  6 0.15250      0.00 4.81E-01 6.13E-01 3.72E-01-1.06E-02-2.95E-02-2.73E-02-2.60E-02-2.53E-02-2.41E-02-2.24E-02-2.03E-02
  5 0.10750      0.00 4.87E-01 5.38E-01 9.11E-02-3.11E-02-2.37E-02-1.93E-02-1.79E-02-1.78E-02-1.77E-02-1.68E-02-1.53E-02
  4 0.06500      0.00 4.63E-01 3.00E-01-4.68E-02-2.69E-02-1.60E-02-1.19E-02-1.07E-02-1.08E-02-1.10E-02-1.06E-02-9.62E-03
  3 0.02875      0.00 3.23E-01 2.27E-02-1.90E-02-1.28E-02-7.47E-03-5.35E-03-4.73E-03-4.76E-03-4.88E-03-4.75E-03-4.32E-03
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =     13       14       15       16       17       18       19       20       21       22       23
        X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J     Y
 21 0.50000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.48500 -1.48E-03-1.20E-03-8.19E-04-5.04E-04-3.03E-04-1.92E-04-1.19E-04-7.57E-05-1.18E-05 5.75E-06     0.00
 19 0.46125 -4.50E-03-3.36E-03-2.20E-03-1.30E-03-7.32E-04-4.00E-04-1.77E-04-4.05E-05 8.33E-05 1.26E-05     0.00
 18 0.43750 -7.71E-03-5.59E-03-3.62E-03-2.16E-03-1.21E-03-6.53E-04-2.72E-04-3.88E-05 1.45E-04 1.72E-05     0.00
 17 0.41687 -1.04E-02-7.51E-03-4.87E-03-2.92E-03-1.66E-03-9.05E-04-3.86E-04-6.91E-05 1.70E-04 2.03E-05     0.00
 16 0.39562 -1.30E-02-9.38E-03-6.12E-03-3.71E-03-2.15E-03-1.19E-03-5.29E-04-1.28E-04 1.69E-04 2.27E-05     0.00
 15 0.37500 -1.53E-02-1.10E-02-7.27E-03-4.46E-03-2.61E-03-1.47E-03-6.83E-04-2.05E-04 1.50E-04 2.43E-05     0.00
 14 0.35562 -1.71E-02-1.24E-02-8.25E-03-5.11E-03-3.04E-03-1.74E-03-8.34E-04-2.88E-04 1.19E-04 2.52E-05     0.00
 13 0.33687 -1.85E-02-1.36E-02-9.11E-03-5.70E-03-3.42E-03-1.99E-03-9.79E-04-3.72E-04 8.30E-05 2.56E-05     0.00
 12 0.31250 -2.00E-02-1.49E-02-1.01E-02-6.38E-03-3.88E-03-2.29E-03-1.16E-03-4.81E-04 3.01E-05 2.55E-05     0.00
 11 0.28625 -2.09E-02-1.57E-02-1.08E-02-6.91E-03-4.26E-03-2.54E-03-1.32E-03-5.85E-04-2.72E-05 2.45E-05     0.00
 10 0.26625 -2.13E-02-1.61E-02-1.11E-02-7.19E-03-4.46E-03-2.69E-03-1.42E-03-6.52E-04-6.77E-05 2.33E-05     0.00
  9 0.25000 -2.13E-02-1.62E-02-1.13E-02-7.32E-03-4.57E-03-2.77E-03-1.48E-03-6.96E-04-9.73E-05 2.20E-05     0.00
  8 0.22875 -2.11E-02-1.62E-02-1.14E-02-7.42E-03-4.66E-03-2.85E-03-1.54E-03-7.43E-04-1.32E-04 2.03E-05     0.00
  7 0.19500 -2.00E-02-1.56E-02-1.10E-02-7.26E-03-4.61E-03-2.84E-03-1.55E-03-7.76E-04-1.72E-04 1.73E-05     0.00
  6 0.15250 -1.73E-02-1.36E-02-9.79E-03-6.49E-03-4.15E-03-2.58E-03-1.43E-03-7.34E-04-1.88E-04 1.32E-05     0.00
  5 0.10750 -1.31E-02-1.04E-02-7.61E-03-5.05E-03-3.25E-03-2.03E-03-1.14E-03-5.94E-04-1.65E-04 8.94E-06     0.00
  4 0.06500 -8.29E-03-6.61E-03-4.86E-03-3.24E-03-2.09E-03-1.31E-03-7.38E-04-3.89E-04-1.13E-04 5.15E-06     0.00
  3 0.02875 -3.73E-03-2.98E-03-2.20E-03-1.47E-03-9.47E-04-5.94E-04-3.36E-04-1.78E-04-5.25E-05 2.20E-06     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-                DIMENSIONLESS W VELOCITY                 -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J     Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00 4.83E-01 4.83E-01 4.82E-01 4.81E-01 4.79E-01 4.79E-01 4.88E-01 5.18E-01
 19 0.47500      0.00     0.00     0.00     0.00 5.01E-01 4.97E-01 4.97E-01 4.99E-01 5.01E-01 5.06E-01 5.23E-01 5.55E-01
 18 0.44750      0.00     0.00     0.00     0.00 5.18E-01 5.05E-01 5.01E-01 5.03E-01 5.07E-01 5.19E-01 5.45E-01 5.77E-01
 17 0.42750      0.00     0.00     0.00 5.85E-01 5.43E-01 5.18E-01 5.09E-01 5.09E-01 5.15E-01 5.35E-01 5.64E-01 5.88E-01
 16 0.40625      0.00     0.00     0.00 6.06E-01 5.52E-01 5.19E-01 5.12E-01 5.15E-01 5.29E-01 5.57E-01 5.83E-01 5.99E-01
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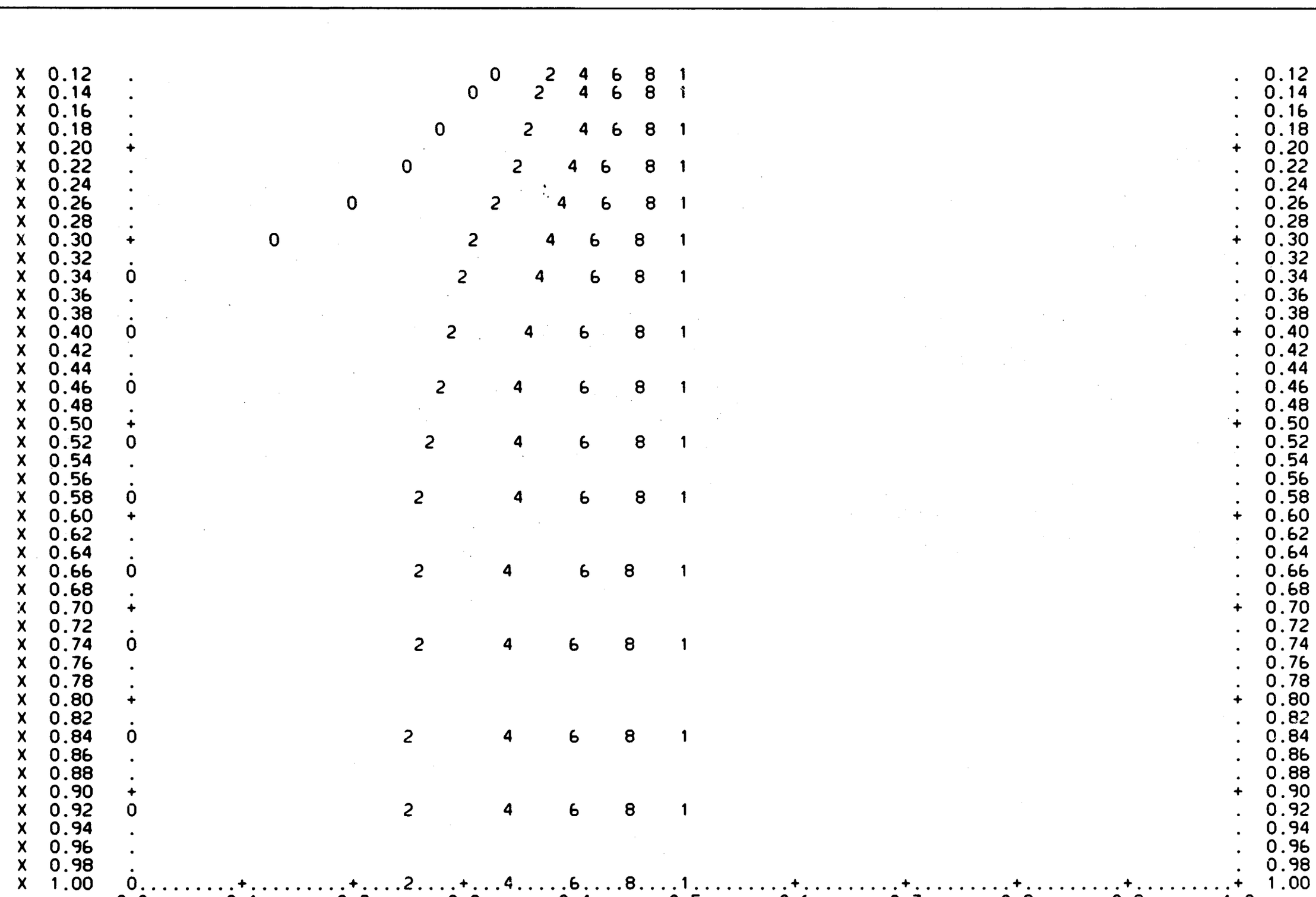


DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.333E 02	0.381E 02	0.415E 02	0.444E 02	0.472E 02	0.500E 02

COMPUTED INLET SWIRL NUMBER = 1.1566

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y \ I	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	8.12E 00	1.37E 01	1.47E 01	1.40E 01	1.31E 01	1.22E 01	1.15E 01
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.10E 01	1.53E 01	1.60E 01	1.53E 01	1.42E 01	1.31E 01	1.21E 01
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.40E 01	1.69E 01	1.70E 01	1.59E 01	1.46E 01	1.32E 01	1.20E 01
17	0.05344	0.00	0.00	0.00	0.00	1.89E 01	1.67E 01	1.76E 01	1.71E 01	1.57E 01	1.41E 01	1.27E 01	1.16E 01
16	0.05078	0.00	0.00	0.00	0.00	1.63E 01	1.62E 01	1.65E 01	1.58E 01	1.44E 01	1.30E 01	1.19E 01	1.11E 01
15	0.04812	0.00	0.00	0.00	0.00	1.61E 01	1.58E 01	1.50E 01	1.37E 01	1.24E 01	1.15E 01	1.09E 01	1.03E 01
14	0.04562	0.00	0.00	0.00	2.22E 01	1.73E 01	1.50E 01	1.29E 01	1.12E 01	1.03E 01	9.98E 00	9.79E 00	9.56E 00
13	0.04328	0.00	0.00	0.00	1.73E 01	1.58E 01	1.31E 01	1.03E 01	8.66E 00	8.39E 00	8.59E 00	8.75E 00	8.76E 00
12	0.04094	0.00	0.00	0.00	1.57E 01	1.49E 01	1.12E 01	7.61E 00	6.29E 00	6.61E 00	7.24E 00	7.69E 00	7.92E 00
11	0.03719	0.00	0.00	1.80E 01	1.62E 01	1.37E 01	8.20E 00	3.35E 00	3.01E 00	4.12E 00	5.21E 00	5.99E 00	6.50E 00
10	0.03437	0.00	0.00	1.66E 01	1.65E 01	1.20E 01	3.95E 00	4.87E-01	1.07E 00	2.48E 00	3.77E 00	4.72E 00	5.41E 00
9	0.03219	0.00	0.00	1.88E 01	1.68E 01	1.03E 01	1.33E 00	-1.18E 00	-2.16E-01	1.32E 00	2.68E 00	3.74E 00	4.55E 00
8	0.03031	0.00	3.00E 01	2.21E 01	1.67E 01	8.38E 00	-6.11E-01	-2.32E 00	-1.19E 00	3.76E-01	1.78E 00	2.91E 00	3.83E 00
7	0.02687	0.00	3.00E 01	2.34E 01	1.56E 01	5.15E 00	-3.61E 00	-3.93E 00	-2.72E 00	-1.21E 00	2.11E-01	1.44E 00	2.51E 00
6	0.02187	0.00	3.00E 01	2.36E 01	1.28E 01	-1.93E 00	-6.12E 00	-5.67E 00	-4.58E 00	-3.24E 00	-1.87E 00	-5.54E-01	7.07E-01
5	0.01625	0.00	3.00E 01	2.14E 01	5.24E 00	-9.80E 00	-8.29E 00	-7.29E 00	-6.29E 00	-5.14E 00	-3.85E 00	-2.47E 00	-1.05E 00
4	0.01062	0.00	3.00E 01	1.54E 01	-9.88E 00	-1.10E 01	-9.75E 00	-8.57E 00	-7.58E 00	-6.54E 00	-5.33E 00	-3.91E 00	-2.38E 00
3	0.00562	0.00	3.00E 01	-1.09E 00	-1.39E 01	-1.20E 01	-1.06E 01	-9.32E 00	-8.30E 00	-7.31E 00	-6.14E 00	-4.72E 00	-3.12E 00
2	0.00156	0.00	3.00E 01	-1.71E 01	-1.54E 01	-1.24E 01	-1.09E 01	-9.59E 00	-8.56E 00	-7.59E 00	-6.43E 00	-5.02E 00	-3.39E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y \ I	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.07E 01	1.01E 01	9.56E 00	9.22E 00	9.03E 00	8.92E 00	8.84E 00	8.80E 00	8.78E 00	8.79E 00	8.80E 00
19	0.05937	1.11E 01	1.04E 01	9.87E 00	9.54E 00	9.35E 00	9.25E 00	9.22E 00	9.23E 00	9.28E 00	9.33E 00	9.33E 00
18	0.05594	1.11E 01	1.03E 01	9.83E 00	9.49E 00	9.28E 00	9.15E 00	9.09E 00	9.08E 00	9.09E 00	9.12E 00	9.13E 00
17	0.05344	1.08E 01	1.02E 01	9.68E 00	9.35E 00	9.13E 00	8.99E 00	8.91E 00	8.87E 00	8.86E 00	8.88E 00	8.88E 00
16	0.05078	1.04E 01	9.85E 00	9.43E 00	9.12E 00	8.91E 00	8.77E 00	8.67E 00	8.61E 00	8.59E 00	8.58E 00	8.58E 00
15	0.04812	9.87E 00	9.45E 00	9.11E 00	8.84E 00	8.64E 00	8.50E 00	8.40E 00	8.34E 00	8.30E 00	8.28E 00	8.28E 00
14	0.04562	9.28E 00	9.00E 00	8.74E 00	8.52E 00	8.35E 00	8.22E 00	8.12E 00	8.06E 00	8.01E 00	7.99E 00	7.99E 00
13	0.04328	8.67E 00	8.52E 00	8.35E 00	8.19E 00	8.05E 00	7.94E 00	7.85E 00	7.79E 00	7.74E 00	7.71E 00	7.71E 00
12	0.04094	8.00E 00	7.98E 00	7.92E 00	7.82E 00	7.72E 00	7.64E 00	7.57E 00	7.51E 00	7.47E 00	7.44E 00	7.44E 00
11	0.03719	6.84E 00	7.04E 00	7.14E 00	7.17E 00	7.16E 00	7.13E 00	7.09E 00	7.05E 00	7.02E 00	6.99E 00	6.99E 00
10	0.03437	5.93E 00	6.30E 00	6.53E 00	6.65E 00	6.71E 00	6.73E 00	6.73E 00	6.71E 00	6.69E 00	6.66E 00	6.66E 00
9	0.03219	5.21E 00	5.70E 00	6.04E 00	6.24E 00	6.36E 00	6.42E 00	6.45E 00	6.45E 00	6.44E 00	6.42E 00	6.42E 00
8	0.03031	4.59E 00	5.19E 00	5.61E 00	5.89E 00	6.06E 00	6.16E 00	6.22E 00	6.23E 00	6.23E 00	6.21E 00	6.21E 00
7	0.02687	3.46E 00	4.25E 00	4.84E 00	5.25E 00	5.52E 00	5.69E 00	5.80E 00	5.85E 00	5.86E 00	5.85E 00	5.85E 00
6	0.02187	1.89E 00	2.93E 00	3.75E 00	4.34E 00	4.76E 00	5.04E 00	5.23E 00	5.33E 00	5.37E 00	5.38E 00	5.37E 00

0 I =	13	14	15	16	17	18	19	20	21	22	23
X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J Y											
21 0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.06187	9.73E-01	9.75E-01	9.76E-01	9.77E-01	9.77E-01	9.77E-01	9.77E-01	9.77E-01	9.77E-01	9.77E-01	9.77E-01
19 0.05937	8.60E-01	8.69E-01	8.75E-01	8.80E-01	8.82E-01	8.83E-01	8.84E-01	8.84E-01	8.84E-01	8.84E-01	8.84E-01
18 0.05594	7.10E-01	7.29E-01	7.42E-01	7.51E-01	7.56E-01	7.59E-01	7.60E-01	7.60E-01	7.60E-01	7.59E-01	7.59E-01
17 0.05344	6.08E-01	6.33E-01	6.51E-01	6.63E-01	6.70E-01	6.74E-01	6.76E-01	6.76E-01	6.76E-01	6.75E-01	6.75E-01
16 0.05078	5.07E-01	5.38E-01	5.61E-01	5.76E-01	5.85E-01	5.90E-01	5.93E-01	5.94E-01	5.93E-01	5.92E-01	5.92E-01
15 0.04812	4.17E-01	4.52E-01	4.78E-01	4.95E-01	5.06E-01	5.13E-01	5.16E-01	5.18E-01	5.18E-01	5.16E-01	5.16E-01
14 0.04562	3.40E-01	3.78E-01	4.06E-01	4.26E-01	4.38E-01	4.46E-01	4.50E-01	4.52E-01	4.52E-01	4.51E-01	4.51E-01
13 0.04328	2.76E-01	3.16E-01	3.45E-01	3.66E-01	3.80E-01	3.88E-01	3.93E-01	3.96E-01	3.96E-01	3.95E-01	3.95E-01
12 0.04094	2.20E-01	2.60E-01	2.91E-01	3.12E-01	3.26E-01	3.36E-01	3.41E-01	3.44E-01	3.45E-01	3.44E-01	3.44E-01
11 0.03719	1.45E-01	1.85E-01	2.15E-01	2.37E-01	2.52E-01	2.62E-01	2.68E-01	2.71E-01	2.72E-01	2.72E-01	2.72E-01
10 0.03437	1.01E-01	1.39E-01	1.68E-01	1.89E-01	2.04E-01	2.14E-01	2.20E-01	2.24E-01	2.25E-01	2.25E-01	2.25E-01
9 0.03219	7.36E-02	1.09E-01	1.37E-01	1.57E-01	1.72E-01	1.81E-01	1.88E-01	1.91E-01	1.93E-01	1.93E-01	1.93E-01
8 0.03031	5.40E-02	8.70E-02	1.13E-01	1.33E-01	1.47E-01	1.56E-01	1.62E-01	1.66E-01	1.67E-01	1.67E-01	1.67E-01
7 0.02687	2.68E-02	5.51E-02	7.82E-02	9.55E-02	1.08E-01	1.16E-01	1.22E-01	1.25E-01	1.27E-01	1.27E-01	1.27E-01
6 0.02187	3.85E-03	2.47E-02	4.20E-02	5.52E-02	6.47E-02	7.13E-02	7.58E-02	7.84E-02	7.97E-02	8.00E-02	7.99E-02
5 0.01625	-5.19E-03	7.41E-03	1.80E-02	2.62E-02	3.22E-02	3.64E-02	3.93E-02	4.09E-02	4.18E-02	4.20E-02	4.20E-02
4 0.01062	-4.61E-03	1.12E-03	5.99E-03	9.81E-03	1.26E-02	1.46E-02	1.59E-02	1.67E-02	1.72E-02	1.73E-02	1.73E-02
3 0.00562	-1.68E-03	-1.99E-05	1.40E-03	2.52E-03	3.35E-03	3.93E-03	4.33E-03	4.57E-03	4.70E-03	4.74E-03	4.73E-03
2 0.00156	-1.44E-04	-1.40E-05	9.74E-05	1.86E-04	2.51E-04	2.97E-04	3.29E-04	3.48E-04	3.58E-04	3.61E-04	3.61E-04
1 -0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RADIAL COORDINATE OF STREAMLINES

0 I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J Y												
11 1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10 0.90000	0.00	2.96E-02	3.67E-02	4.53E-02	5.32E-02	5.98E-02	6.08E-02	6.09E-02	6.08E-02	6.07E-02	6.05E-02	6.04E-02
9 0.80000	0.00	2.79E-02	3.43E-02	4.36E-02	5.16E-02	5.77E-02	5.91E-02	5.93E-02	5.91E-02	5.89E-02	5.86E-02	5.83E-02
8 0.70000	0.00	2.61E-02	3.19E-02	4.16E-02	4.98E-02	5.57E-02	5.75E-02	5.78E-02	5.75E-02	5.71E-02	5.67E-02	5.62E-02
7 0.60000	0.00	2.41E-02	2.96E-02	3.93E-02	4.80E-02	5.40E-02	5.60E-02	5.62E-02	5.59E-02	5.53E-02	5.47E-02	5.40E-02
6 0.50000	0.00	2.21E-02	2.73E-02	3.70E-02	4.61E-02	5.22E-02	5.44E-02	5.46E-02	5.42E-02	5.35E-02	5.25E-02	5.16E-02
5 0.40000	0.00	1.96E-02	2.48E-02	3.45E-02	4.42E-02	5.05E-02	5.28E-02	5.30E-02	5.24E-02	5.14E-02	5.02E-02	4.89E-02
4 0.30000	0.00	1.70E-02	2.23E-02	3.18E-02	4.20E-02	4.87E-02	5.12E-02	5.13E-02	5.05E-02	4.91E-02	4.75E-02	4.58E-02
3 0.20000	0.00	1.37E-02	1.90E-02	2.88E-02	3.96E-02	4.67E-02	4.94E-02	4.94E-02	4.83E-02	4.64E-02	4.43E-02	4.21E-02
2 0.10000	0.00	9.69E-03	1.52E-02	2.53E-02	3.69E-02	4.45E-02	4.74E-02	4.72E-02	4.56E-02	4.29E-02	4.00E-02	3.72E-02
1 0.00000	0.00	0.00	6.74E-03	2.03E-02	3.36E-02	4.19E-02	4.50E-02	4.45E-02	4.17E-02	3.77E-02	3.32E-02	2.77E-02

0 I =	13	14	15	16	17	18	19	20	21	22	23
X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J Y											
11 1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10 0.90000	6.03E-02	6.01E-02	6.00E-02	5.99E-02	5.99E-02	5.98E-02	5.98E-02	5.98E-02	5.98E-02	5.98E-02	5.98E-02
9 0.80000	5.80E-02	5.77E-02	5.74E-02	5.73E-02	5.71E-02	5.71E-02	5.71E-02	5.70E-02	5.71E-02	5.71E-02	5.71E-02
8 0.70000	5.57E-02	5.52E-02	5.48E-02	5.45E-02	5.43E-02	5.42E-02	5.42E-02	5.41E-02	5.42E-02	5.42E-02	5.42E-02
7 0.60000	5.32E-02	5.25E-02	5.19E-02	5.15E-02	5.13E-02	5.11E-02	5.10E-02	5.10E-02	5.10E-02	5.10E-02	5.10E-02
6 0.50000	5.06E-02	4.96E-02	4.88E-02	4.83E-02	4.79E-02	4.77E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02
5 0.40000	4.76E-02	4.64E-02	4.54E-02	4.46E-02	4.41E-02	4.38E-02	4.36E-02	4.35E-02	4.34E-02	4.35E-02	4.35E-02
4 0.30000	4.42E-02	4.26E-02	4.13E-02	4.03E-02	3.96E-02	3.91E-02	3.88E-02	3.87E-02	3.86E-02	3.86E-02	3.86E-02
3 0.20000	3.99E-02	3.80E-02	3.63E-02	3.50E-02	3.41E-02	3.34E-02	3.30E-02	3.28E-02	3.27E-02	3.27E-02	3.27E-02
2 0.10000	3.43E-02	3.14E-02	2.90E-02	2.73E-02	2.60E-02	2.51E-02	2.45E-02	2.42E-02	2.40E-02	2.40E-02	2.40E-02
1 0.00000	1.95E-02	5.71E-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DIMENSIONLESS U VELOCITY

21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.91E 01	1.79E 01	1.62E 01	1.50E 01	1.41E 01	1.40E 01	1.52E 01	1.67E 01	
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.29E 02	3.40E 02	2.90E 02	2.45E 02	2.17E 02	2.39E 02	3.56E 02	4.62E 02	
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.92E 02	3.27E 02	2.92E 02	2.72E 02	2.83E 02	4.23E 02	7.08E 02	9.28E 02	
17	0.42750	1.00E 00	1.00E 00	1.00E 00	6.00E 01	1.92E 02	2.13E 02	2.36E 02	2.62E 02	3.50E 02	6.06E 02	9.40E 02	1.18E 03	
16	0.40625	1.00E 00	1.00E 00	1.00E 00	3.77E 02	2.71E 02	2.42E 02	2.47E 02	3.05E 02	5.03E 02	8.33E 02	1.17E 03	1.40E 03	
15	0.38500	1.00E 00	1.00E 00	1.00E 00	3.54E 02	2.25E 02	2.20E 02	2.68E 02	4.25E 02	7.22E 02	1.06E 03	1.37E 03	1.59E 03	
14	0.36500	1.00E 00	1.00E 00	6.92E 01	1.44E 02	1.72E 02	2.24E 02	3.52E 02	6.14E 02	9.43E 02	1.26E 03	1.54E 03	1.75E 03	
13	0.34625	1.00E 00	1.00E 00	3.59E 02	1.81E 02	1.88E 02	2.90E 02	5.02E 02	8.17E 02	1.14E 03	1.43E 03	1.69E 03	1.88E 03	
12	0.32750	1.00E 00	1.00E 00	3.03E 02	1.29E 02	1.94E 02	3.75E 02	6.81E 02	1.01E 03	1.31E 03	1.58E 03	1.82E 03	2.00E 03	
11	0.29750	1.00E 00	1.19E 02	9.17E 01	8.73E 01	2.28E 02	5.79E 02	9.90E 02	1.29E 03	1.55E 03	1.80E 03	2.01E 03	2.17E 03	
10	0.27500	1.00E 00	4.05E 02	8.32E 01	8.64E 01	3.16E 02	7.90E 02	1.18E 03	1.45E 03	1.69E 03	1.93E 03	2.14E 03	2.28E 03	
9	0.25750	1.00E 00	3.74E 02	3.42E 01	8.78E 01	4.23E 02	9.44E 02	1.30E 03	1.55E 03	1.79E 03	2.02E 03	2.22E 03	2.35E 03	
8	0.24250	1.00E 00	7.02E 00	9.62E 00	1.03E 02	5.30E 02	1.07E 03	1.39E 03	1.63E 03	1.87E 03	2.09E 03	2.28E 03	2.41E 03	
7	0.21500	1.00E 00	7.02E 00	1.29E 01	1.54E 02	7.44E 02	1.27E 03	1.54E 03	1.77E 03	1.99E 03	2.21E 03	2.39E 03	2.51E 03	
6	0.17500	1.00E 00	7.09E 00	2.36E 01	2.86E 02	1.15E 03	1.53E 03	1.74E 03	1.94E 03	2.15E 03	2.36E 03	2.52E 03	2.62E 03	
5	0.13000	1.00E 00	7.38E 00	6.22E 01	6.27E 02	1.41E 03	1.76E 03	1.93E 03	2.11E 03	2.31E 03	2.49E 03	2.64E 03	2.72E 03	
4	0.08500	1.00E 00	8.64E 00	2.15E 02	8.31E 02	1.67E 03	1.94E 03	2.09E 03	2.25E 03	2.43E 03	2.60E 03	2.73E 03	2.80E 03	
3	0.04500	1.00E 00	1.52E 01	1.27E 03	1.20E 03	1.86E 03	2.07E 03	2.21E 03	2.36E 03	2.53E 03	2.69E 03	2.81E 03	2.87E 03	
2	0.01250	1.00E 00	4.80E 01	1.53E 03	1.52E 03	2.01E 03	2.17E 03	2.30E 03	2.46E 03	2.63E 03	2.78E 03	2.90E 03	2.95E 03	
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.73E 01	1.72E 01	1.67E 01	1.60E 01	1.53E 01	1.47E 01	1.42E 01	1.38E 01	1.35E 01	1.34E 01	1.00E 00
19	0.47500	4.88E 02	4.57E 02	3.96E 02	3.27E 02	2.60E 02	2.02E 02	1.57E 02	1.26E 02	1.04E 02	1.12E 02	1.00E 00
18	0.44750	9.91E 02	9.43E 02	8.37E 02	7.10E 02	5.85E 02	4.71E 02	3.79E 02	3.10E 02	2.58E 02	2.84E 02	1.00E 00
17	0.42750	1.26E 03	1.21E 03	1.09E 03	9.45E 02	7.95E 02	6.56E 02	5.42E 02	4.54E 02	3.86E 02	4.27E 02	1.00E 00
16	0.40625	1.49E 03	1.44E 03	1.32E 03	1.16E 03	9.89E 02	8.32E 02	7.02E 02	6.00E 02	5.21E 02	5.73E 02	1.00E 00
15	0.38500	1.68E 03	1.63E 03	1.50E 03	1.33E 03	1.16E 03	9.87E 02	8.44E 02	7.32E 02	6.45E 02	7.06E 02	1.00E 00
14	0.36500	1.83E 03	1.78E 03	1.65E 03	1.48E 03	1.29E 03	1.11E 03	9.62E 02	8.43E 02	7.50E 02	8.16E 02	1.00E 00
13	0.34625	1.95E 03	1.90E 03	1.77E 03	1.59E 03	1.40E 03	1.22E 03	1.06E 03	9.36E 02	8.38E 02	9.07E 02	1.00E 00
12	0.32750	2.06E 03	2.01E 03	1.87E 03	1.69E 03	1.49E 03	1.31E 03	1.15E 03	1.02E 03	9.17E 02	9.87E 02	1.00E 00
11	0.29750	2.22E 03	2.16E 03	2.01E 03	1.82E 03	1.62E 03	1.43E 03	1.26E 03	1.13E 03	1.02E 03	1.09E 03	1.00E 00
10	0.27500	2.32E 03	2.25E 03	2.10E 03	1.91E 03	1.70E 03	1.51E 03	1.34E 03	1.20E 03	1.09E 03	1.16E 03	1.00E 00
9	0.25750	2.38E 03	2.31E 03	2.16E 03	1.97E 03	1.76E 03	1.56E 03	1.39E 03	1.25E 03	1.14E 03	1.21E 03	1.00E 00
8	0.24250	2.44E 03	2.36E 03	2.21E 03	2.01E 03	1.80E 03	1.60E 03	1.43E 03	1.29E 03	1.17E 03	1.24E 03	1.00E 00
7	0.21500	2.53E 03	2.44E 03	2.28E 03	2.08E 03	1.87E 03	1.66E 03	1.49E 03	1.34E 03	1.23E 03	1.29E 03	1.00E 00
6	0.17500	2.63E 03	2.54E 03	2.37E 03	2.16E 03	1.94E 03	1.74E 03	1.56E 03	1.41E 03	1.29E 03	1.34E 03	1.00E 00
5	0.13000	2.72E 03	2.63E 03	2.45E 03	2.23E 03	2.01E 03	1.80E 03	1.62E 03	1.47E 03	1.35E 03	1.38E 03	1.00E 00
4	0.08500	2.79E 03	2.69E 03	2.52E 03	2.29E 03	2.06E 03	1.85E 03	1.66E 03	1.51E 03	1.38E 03	1.41E 03	1.00E 00
3	0.04500	2.85E 03	2.75E 03	2.57E 03	2.33E 03	2.09E 03	1.88E 03	1.68E 03	1.53E 03	1.40E 03	1.43E 03	1.00E 00
2	0.01250	2.92E 03	2.80E 03	2.61E 03	2.36E 03	2.12E 03	1.90E 03	1.70E 03	1.54E 03	1.41E 03	1.45E 03	1.00E 00
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

I	X/D	S.S.COEFF.
2	3.148E-02	9.794E-03
3	9.443E-02	6.821E-03

103	0.1242E 00	0.7476E-01	0.3960E-01	0.3459E-01	0.1209E-01	0.6847E 08	0.5677E 01	-0.7863E-02	0.1407E 02	0.1517E 04	0.1752E 04
104	0.1223E 00	0.7237E-01	0.3820E-01	0.3327E-01	0.1182E-01	0.6917E 08	0.5663E 01	-0.7510E-02	0.1410E 02	0.1518E 04	0.1760E 04
105	0.1203E 00	0.7001E-01	0.3682E-01	0.3196E-01	0.1159E-01	0.7045E 08	0.5650E 01	-0.7142E-02	0.1412E 02	0.1519E 04	0.1769E 04
106	0.1184E 00	0.6764E-01	0.3552E-01	0.3068E-01	0.1139E-01	0.7107E 08	0.5636E 01	-0.6761E-02	0.1415E 02	0.1519E 04	0.1778E 04
107	0.1164E 00	0.6520E-01	0.3426E-01	0.2947E-01	0.1118E-01	0.7251E 08	0.5623E 01	-0.6369E-02	0.1417E 02	0.1520E 04	0.1786E 04
108	0.1146E 00	0.6272E-01	0.3304E-01	0.2823E-01	0.1095E-01	0.7442E 08	0.5611E 01	-0.5967E-02	0.1419E 02	0.1521E 04	0.1794E 04
109	0.1128E 00	0.6023E-01	0.3187E-01	0.2704E-01	0.1070E-01	0.7641E 08	0.5599E 01	-0.5559E-02	0.1422E 02	0.1522E 04	0.1802E 04
110	0.1111E 00	0.5772E-01	0.3072E-01	0.2590E-01	0.1045E-01	0.7795E 08	0.5588E 01	-0.5144E-02	0.1424E 02	0.1523E 04	0.1809E 04
111	0.1094E 00	0.5525E-01	0.2961E-01	0.2480E-01	0.1020E-01	0.7940E 08	0.5577E 01	-0.4727E-02	0.1426E 02	0.1524E 04	0.1817E 04
112	0.1076E 00	0.5277E-01	0.2857E-01	0.2370E-01	0.9964E-02	0.8095E 08	0.5567E 01	-0.4307E-02	0.1428E 02	0.1525E 04	0.1824E 04
113	0.1058E 00	0.5033E-01	0.2758E-01	0.2268E-01	0.9746E-02	0.8239E 08	0.5557E 01	-0.3887E-02	0.1430E 02	0.1526E 04	0.1831E 04
114	0.1042E 00	0.4804E-01	0.2670E-01	0.2167E-01	0.9399E-02	0.7779E 08	0.5548E 01	-0.3490E-02	0.1432E 02	0.1527E 04	0.1838E 04
115	0.1026E 00	0.4600E-01	0.2588E-01	0.2059E-01	0.9072E-02	0.7789E 08	0.5539E 01	-0.3103E-02	0.1434E 02	0.1528E 04	0.1844E 04
116	0.1011E 00	0.4407E-01	0.2509E-01	0.1965E-01	0.8770E-02	0.7912E 08	0.5531E 01	-0.2719E-02	0.1436E 02	0.1528E 04	0.1850E 04
117	0.9963E-01	0.4215E-01	0.2432E-01	0.1877E-01	0.8490E-02	0.8096E 08	0.5523E 01	-0.2336E-02	0.1438E 02	0.1529E 04	0.1856E 04
118	0.9823E-01	0.4030E-01	0.2359E-01	0.1816E-01	0.8238E-02	0.8702E 08	0.5514E 01	-0.2153E-02	0.1440E 02	0.1530E 04	0.1862E 04
119	0.9544E-01	0.4457E-01	0.2290E-01	0.1737E-01	0.8013E-02	0.9202E 08	0.5507E 01	-0.1777E-02	0.1442E 02	0.1531E 04	0.1867E 04
120	0.9392E-01	0.4166E-01	0.2229E-01	0.1648E-01	0.7807E-02	0.9654E 08	0.5499E 01	-0.1365E-02	0.1444E 02	0.1532E 04	0.1871E 04
121	0.9201E-01	0.3980E-01	0.2170E-01	0.1579E-01	0.7618E-02	0.9869E 08	0.5493E 01	-0.9176E-03	0.1445E 02	0.1533E 04	0.1876E 04
122	0.9045E-01	0.3721E-01	0.2116E-01	0.1512E-01	0.7448E-02	0.9910E 08	0.5487E 01	-0.4753E-03	0.1447E 02	0.1534E 04	0.1880E 04
123	0.8888E-01	0.3488E-01	0.2070E-01	0.1446E-01	0.7301E-02	0.9851E 08	0.5482E 01	-0.3682E-04	0.1449E 02	0.1535E 04	0.1885E 04
124	0.8742E-01	0.3270E-01	0.2026E-01	0.1386E-01	0.7152E-02	0.9878E 08	0.5478E 01	0.3876E-03	0.1450E 02	0.1536E 04	0.1888E 04
125	0.8608E-01	0.3072E-01	0.1985E-01	0.1326E-01	0.6998E-02	0.9881E 08	0.5475E 01	0.7995E-03	0.1452E 02	0.1537E 04	0.1892E 04
126	0.8486E-01	0.2889E-01	0.1945E-01	0.1268E-01	0.6846E-02	0.9955E 08	0.5472E 01	0.1195E-02	0.1453E 02	0.1538E 04	0.1896E 04
127	0.8363E-01	0.2711E-01	0.1910E-01	0.1216E-01	0.6693E-02	0.9982E 08	0.5470E 01	0.1574E-02	0.1455E 02	0.1539E 04	0.1899E 04
128	0.8238E-01	0.2540E-01	0.1877E-01	0.1166E-01	0.6541E-02	0.1002E 09	0.5468E 01	0.1933E-02	0.1456E 02	0.1539E 04	0.1902E 04
129	0.8123E-01	0.2375E-01	0.1850E-01	0.1119E-01	0.6393E-02	0.1006E 09	0.5467E 01	0.2274E-02	0.1457E 02	0.1540E 04	0.1905E 04
130	0.8015E-01	0.2220E-01	0.1826E-01	0.1072E-01	0.6257E-02	0.1008E 09	0.5467E 01	0.2594E-02	0.1459E 02	0.1541E 04	0.1908E 04
131	0.7911E-01	0.2077E-01	0.1806E-01	0.1031E-01	0.6138E-02	0.1010E 09	0.5467E 01	0.2895E-02	0.1460E 02	0.1542E 04	0.1911E 04
132	0.7811E-01	0.1946E-01	0.1785E-01	0.1002E-01	0.6057E-02	0.1058E 09	0.5468E 01	0.3645E-02	0.1461E 02	0.1543E 04	0.1913E 04
133	0.7625E-01	0.2201E-01	0.1770E-01	0.9648E-02	0.5965E-02	0.1104E 09	0.5470E 01	0.4055E-02	0.1462E 02	0.1544E 04	0.1915E 04
134	0.7531E-01	0.1928E-01	0.1758E-01	0.9261E-02	0.5876E-02	0.1141E 09	0.5472E 01	0.4375E-02	0.1463E 02	0.1545E 04	0.1917E 04
135	0.7392E-01	0.1852E-01	0.1745E-01	0.8888E-02	0.5776E-02	0.1146E 09	0.5475E 01	0.4614E-02	0.1464E 02	0.1546E 04	0.1919E 04
136	0.7280E-01	0.1713E-01	0.1736E-01	0.8593E-02	0.5675E-02	0.1142E 09	0.5479E 01	0.4824E-02	0.1465E 02	0.1547E 04	0.1921E 04
137	0.7166E-01	0.1630E-01	0.1729E-01	0.8364E-02	0.5585E-02	0.1128E 09	0.5483E 01	0.5002E-02	0.1466E 02	0.1547E 04	0.1922E 04
138	0.7048E-01	0.1559E-01	0.1723E-01	0.8077E-02	0.5506E-02	0.1121E 09	0.5488E 01	0.5161E-02	0.1467E 02	0.1548E 04	0.1924E 04
139	0.6924E-01	0.1509E-01	0.1718E-01	0.7814E-02	0.5436E-02	0.1119E 09	0.5493E 01	0.5296E-02	0.1467E 02	0.1549E 04	0.1925E 04
140	0.6797E-01	0.1477E-01	0.1714E-01	0.7618E-02	0.5368E-02	0.1119E 09	0.5498E 01	0.5411E-02	0.1468E 02	0.1550E 04	0.1926E 04
141	0.6671E-01	0.1470E-01	0.1710E-01	0.7418E-02	0.5301E-02	0.1120E 09	0.5504E 01	0.5505E-02	0.1469E 02	0.1551E 04	0.1927E 04
142	0.6544E-01	0.1491E-01	0.1707E-01	0.7263E-02	0.5235E-02	0.1117E 09	0.5510E 01	0.5580E-02	0.1470E 02	0.1552E 04	0.1928E 04
143	0.6414E-01	0.1522E-01	0.1707E-01	0.7077E-02	0.5172E-02	0.1117E 09	0.5517E 01	0.5636E-02	0.1471E 02	0.1553E 04	0.1929E 04
144	0.6284E-01	0.1551E-01	0.1711E-01	0.6957E-02	0.5127E-02	0.1113E 09	0.5524E 01	0.5673E-02	0.1471E 02	0.1553E 04	0.1930E 04
145	0.6153E-01	0.1578E-01	0.1717E-01	0.6808E-02	0.5087E-02	0.1114E 09	0.5531E 01	0.5692E-02	0.1472E 02	0.1554E 04	0.1930E 04
146	0.6022E-01	0.1604E-01	0.1724E-01	0.6734E-02	0.5045E-02	0.1111E 09	0.5538E 01	0.5694E-02	0.1473E 02	0.1555E 04	0.1931E 04
147	0.5889E-01	0.1627E-01	0.1732E-01	0.6607E-02	0.5006E-02	0.1110E 09	0.5545E 01	0.5680E-02	0.1473E 02	0.1556E 04	0.1931E 04
148	0.5755E-01	0.1652E-01	0.1742E-01	0.6584E-02	0.4982E-02	0.1111E 09	0.5553E 01	0.5650E-02	0.1474E 02	0.1557E 04	0.1932E 04
149	0.5622E-01	0.1671E-01	0.1755E-01	0.6523E-02	0.4955E-02	0.1106E 09	0.5560E 01	0.5605E-02	0.1474E 02	0.1557E 04	0.1932E 04
150	0.5489E-01	0.1690E-01	0.1771E-01	0.6498E-02	0.4926E-02	0.1108E 09	0.5568E 01	0.5547E-02	0.1475E 02	0.1558E 04	0.1932E 04
151	0.5357E-01	0.1703E-01	0.1789E-01	0.6449E-02	0.4891E-02	0.1106E 09	0.5575E 01	0.5476E-02	0.1476E 02	0.1559E 04	0.1933E 04
152	0.5225E-01	0.1712E-01	0.1806E-01	0.6425E-02	0.4852E-02	0.1103E 09	0.5583E 01	0.5392E-02	0.1476E 02	0.1560E 04	0.1933E 04
153	0.5093E-01	0.1719E-01	0.1822E-01	0.6449E-02	0.4810E-02	0.1103E 09	0.5591E 01	0.5299E-02	0.1477E 02	0.1560E 04	0.1933E 04
154	0.4963E-01	0.1721E-01	0.1838E-01	0.6440E-02	0.4761E-02	0.1102E 09	0.5599E 01	0.5196E-02	0.1477E 02	0.1561E 04	0.1933E 04
155	0.4834E-01	0.1722E-01	0.1854E-01	0.6427E-02	0.4713E-02	0.1101E 09	0.5606E 01	0.5082E-02	0.1478E 02	0.1562E 04	0.1933E 04
156	0.4706E-01	0.1722E-01	0.1869E-01	0.6447E-02	0.4663E-02	0.1098E 09	0.5614E 01	0.4961E-02	0.1478E 02	0.1563E 04	0.1933E 04

9	0.03219	0.00	3.62E 01	1.30E 01	3.28E 01	5.89E 01	5.93E 01	6.56E 01	7.09E 01	7.32E 01	7.26E 01	6.91E 01	6.25E 01
8	0.03031	2.70E 01	9.06E 00	1.02E 01	3.93E 01	6.05E 01	5.85E 01	6.46E 01	7.00E 01	7.27E 01	7.25E 01	6.91E 01	6.26E 01
7	0.02687	2.70E 01	9.11E 00	1.36E 01	5.05E 01	6.02E 01	5.68E 01	6.21E 01	6.77E 01	7.11E 01	7.15E 01	6.85E 01	6.23E 01
6	0.02187	2.70E 01	9.32E 00	2.17E 01	7.09E 01	5.32E 01	5.42E 01	5.85E 01	6.40E 01	6.79E 01	6.89E 01	6.65E 01	6.08E 01
5	0.01625	2.70E 01	1.00E 01	4.04E 01	7.24E 01	5.02E 01	5.18E 01	5.53E 01	6.01E 01	6.40E 01	6.53E 01	6.33E 01	5.82E 01
4	0.01062	2.70E 01	1.27E 01	7.47E 01	5.75E 01	4.91E 01	5.00E 01	5.30E 01	5.70E 01	6.05E 01	6.19E 01	6.02E 01	5.55E 01
3	0.00562	2.70E 01	2.23E 01	7.38E 01	5.13E 01	4.83E 01	4.91E 01	5.17E 01	5.54E 01	5.85E 01	5.98E 01	5.82E 01	5.38E 01
2	0.00156	2.70E 01	3.49E 01	7.04E 01	5.00E 01	4.81E 01	4.89E 01	5.15E 01	5.50E 01	5.80E 01	5.92E 01	5.77E 01	5.34E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	3.86E 00	3.65E 00	3.34E 00	3.04E 00	2.78E 00	2.56E 00	2.39E 00	2.25E 00	2.13E 00	2.12E 00	2.70E 01	
19	0.05937	2.02E 01	1.78E 01	1.49E 01	1.20E 01	9.59E 00	7.63E 00	6.17E 00	5.16E 00	4.46E 00	5.04E 00	2.70E 01	
18	0.05594	2.93E 01	2.54E 01	2.10E 01	1.68E 01	1.33E 01	1.05E 01	8.39E 00	6.89E 00	5.82E 00	6.98E 00	2.70E 01	
17	0.05344	3.41E 01	2.93E 01	2.40E 01	1.92E 01	1.51E 01	1.19E 01	9.54E 00	7.84E 00	6.62E 00	8.15E 00	2.70E 01	
16	0.05078	3.85E 01	3.27E 01	2.66E 01	2.12E 01	1.67E 01	1.32E 01	1.06E 01	8.70E 00	7.37E 00	9.21E 00	2.70E 01	
15	0.04812	4.23E 01	3.56E 01	2.88E 01	2.29E 01	1.80E 01	1.42E 01	1.14E 01	9.42E 00	8.00E 00	1.01E 01	2.70E 01	
14	0.04562	4.54E 01	3.79E 01	3.06E 01	2.42E 01	1.91E 01	1.50E 01	1.21E 01	9.99E 00	8.51E 00	1.07E 01	2.70E 01	
13	0.04328	4.78E 01	3.97E 01	3.20E 01	2.53E 01	1.99E 01	1.57E 01	1.26E 01	1.04E 01	8.90E 00	1.12E 01	2.70E 01	
12	0.04094	4.98E 01	4.12E 01	3.31E 01	2.62E 01	2.06E 01	1.62E 01	1.30E 01	1.08E 01	9.23E 00	1.16E 01	2.70E 01	
11	0.03719	5.22E 01	4.30E 01	3.45E 01	2.72E 01	2.14E 01	1.69E 01	1.36E 01	1.13E 01	9.62E 00	1.19E 01	2.70E 01	
10	0.03437	5.33E 01	4.39E 01	3.51E 01	2.77E 01	2.18E 01	1.72E 01	1.38E 01	1.15E 01	9.82E 00	1.20E 01	2.70E 01	
9	0.03219	5.37E 01	4.43E 01	3.55E 01	2.80E 01	2.20E 01	1.73E 01	1.40E 01	1.16E 01	9.91E 00	1.21E 01	2.70E 01	
8	0.03031	5.39E 01	4.44E 01	3.56E 01	2.81E 01	2.21E 01	1.74E 01	1.40E 01	1.17E 01	9.96E 00	1.20E 01	2.70E 01	
7	0.02687	5.38E 01	4.44E 01	3.56E 01	2.81E 01	2.21E 01	1.74E 01	1.41E 01	1.17E 01	9.97E 00	1.18E 01	2.70E 01	
6	0.02187	5.27E 01	4.37E 01	3.51E 01	2.77E 01	2.18E 01	1.73E 01	1.39E 01	1.16E 01	9.87E 00	1.14E 01	2.70E 01	
5	0.01625	5.07E 01	4.23E 01	3.41E 01	2.70E 01	2.13E 01	1.69E 01	1.37E 01	1.13E 01	9.68E 00	1.09E 01	2.70E 01	
4	0.01062	4.87E 01	4.08E 01	3.31E 01	2.63E 01	2.08E 01	1.65E 01	1.34E 01	1.11E 01	9.48E 00	1.04E 01	2.70E 01	
3	0.00562	4.74E 01	3.99E 01	3.25E 01	2.59E 01	2.05E 01	1.63E 01	1.32E 01	1.10E 01	9.38E 00	1.01E 01	2.70E 01	
2	0.00156	4.70E 01	3.97E 01	3.24E 01	2.58E 01	2.04E 01	1.63E 01	1.32E 01	1.10E 01	9.41E 00	1.01E 01	2.70E 01	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- TURBULENCE DISSIPATION -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	5.77E 03	5.16E 03	3.74E 03	2.88E 03	2.54E 03	2.94E 03	3.97E 03	4.71E 03	
19	0.05937	0.00	0.00	0.00	0.00	9.89E 03	1.05E 04	7.42E 03	5.13E 03	3.82E 03	3.61E 03	4.15E 03	4.54E 03	
18	0.05594	0.00	0.00	0.00	0.00	1.97E 04	1.45E 04	9.76E 03	6.78E 03	5.33E 03	5.13E 03	5.30E 03	5.14E 03	
17	0.05344	0.00	0.00	0.00	1.46E 04	1.61E 04	1.17E 04	8.91E 03	7.26E 03	6.68E 03	6.63E 03	6.41E 03	5.79E 03	
16	0.05078	0.00	0.00	0.00	2.71E 04	1.72E 04	1.19E 04	9.40E 03	8.69E 03	8.71E 03	8.47E 03	7.69E 03	6.53E 03	
15	0.04812	0.00	0.00	0.00	2.51E 04	1.64E 04	1.20E 04	1.07E 04	1.11E 04	1.11E 04	1.03E 04	8.88E 03	7.24E 03	
14	0.04562	0.00	0.00	2.56E 04	2.10E 04	1.56E 04	1.30E 04	1.30E 04	1.37E 04	1.32E 04	1.17E 04	9.81E 03	7.81E 03	
13	0.04328	0.00	0.00	3.69E 04	2.06E 04	1.63E 04	1.46E 04	1.53E 04	1.57E 04	1.46E 04	1.27E 04	1.05E 04	8.22E 03	
12	0.04094	0.00	0.00	2.06E 04	1.74E 04	1.73E 04	1.60E 04	1.68E 04	1.69E 04	1.54E 04	1.33E 04	1.09E 04	8.50E 03	
11	0.03719	0.00	2.56E 04	2.11E 04	1.96E 04	2.11E 04	1.76E 04	1.77E 04	1.75E 04	1.59E 04	1.36E 04	1.12E 04	8.72E 03	
10	0.03437	0.00	3.95E 04	2.38E 04	2.38E 04	2.43E 04	1.67E 04	1.68E 04	1.68E 04	1.54E 04	1.34E 04	1.11E 04	8.68E 03	
9	0.03219	0.00	2.17E 04	2.45E 04	2.83E 04	2.38E 04	1.52E 04	1.56E 04	1.58E 04	1.48E 04	1.30E 04	1.09E 04	8.56E 03	
8	0.03031	4.49E 05	8.18E 04	3.16E 04	3.31E 04	2.20E 04	1.38E 04	1.44E 04	1.48E 04	1.41E 04	1.26E 04	1.06E 04	8.40E 03	
7	0.02687	4.49E 05	8.21E 04	3.67E 04	3.88E 04	1.74E 04	1.17E 04	1.23E 04	1.29E 04	1.27E 04	1.16E 04	9.99E 03	8.01E 03	
6	0.02187	4.49E 05	8.32E 04	4.65E 04	4.53E 04	1.13E 04	9.41E 03	9.95E 03	1.07E 04	1.08E 04	1.02E 04	8.96E 03	7.30E 03	
5	0.01625	4.49E 05	8.71E 04	6.39E 04	2.34E 04	8.32E 03	7.69E 03	8.11E 03	8.71E 03	9.01E 03	8.71E 03	7.79E 03	6.46E 03	

7	0.21500	4.00E 05	4.05E 05	4.10E 05	4.14E 05	4.17E 05	4.20E 05	4.23E 05	4.26E 05	4.28E 05	4.31E 05	0.00	
6	0.17500	3.72E 05	3.80E 05	3.87E 05	3.93E 05	3.98E 05	4.03E 05	4.07E 05	4.11E 05	4.14E 05	4.17E 05	0.00	
5	0.13000	3.45E 05	3.57E 05	3.67E 05	3.75E 05	3.82E 05	3.88E 05	3.93E 05	3.97E 05	4.01E 05	4.05E 05	0.00	
4	0.08500	3.25E 05	3.40E 05	3.52E 05	3.61E 05	3.69E 05	3.76E 05	3.82E 05	3.88E 05	3.92E 05	3.97E 05	0.00	
3	0.04500	3.13E 05	3.30E 05	3.43E 05	3.54E 05	3.63E 05	3.70E 05	3.77E 05	3.82E 05	3.87E 05	3.92E 05	0.00	
2	0.01250	3.09E 05	3.26E 05	3.40E 05	3.51E 05	3.60E 05	3.68E 05	3.75E 05	3.80E 05	3.85E 05	3.90E 05	0.00	
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- DIMENSIONLESS TURBULENCE ENERGY -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0	J	Y												
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		0.00	0.00	0.00	0.00	4.87E-03	4.52E-03	3.65E-03	3.07E-03	2.82E-03	3.11E-03	3.80E-03	4.26E-03
19	0.47500		0.00	0.00	0.00	0.00	2.74E-02	2.97E-02	2.33E-02	1.81E-02	1.55E-02	1.71E-02	2.12E-02	2.33E-02
18	0.44750		0.00	0.00	0.00	0.00	4.33E-02	3.50E-02	2.76E-02	2.28E-02	2.24E-02	2.75E-02	3.31E-02	3.48E-02
17	0.42750		0.00	0.00	0.00	1.44E-02	2.93E-02	2.75E-02	2.54E-02	2.50E-02	2.91E-02	3.60E-02	4.09E-02	4.13E-02
16	0.40625		0.00	0.00	0.00	5.00E-02	3.64E-02	3.01E-02	2.82E-02	3.15E-02	3.89E-02	4.57E-02	4.89E-02	4.76E-02
15	0.38500		0.00	0.00	0.00	4.75E-02	3.39E-02	3.08E-02	3.38E-02	4.18E-02	5.00E-02	5.51E-02	5.61E-02	5.31E-02
14	0.36500		0.00	0.00	2.09E-02	2.97E-02	3.08E-02	3.46E-02	4.30E-02	5.30E-02	5.99E-02	6.28E-02	6.20E-02	5.76E-02
13	0.34625		0.00	0.00	5.73E-02	3.39E-02	3.46E-02	4.20E-02	5.30E-02	6.25E-02	6.75E-02	6.87E-02	6.66E-02	6.11E-02
12	0.32750		0.00	0.00	3.88E-02	2.77E-02	3.77E-02	4.94E-02	6.14E-02	6.97E-02	7.33E-02	7.33E-02	7.02E-02	6.40E-02
11	0.29750		0.00	2.74E-02	2.19E-02	2.63E-02	4.71E-02	6.16E-02	7.11E-02	7.72E-02	7.94E-02	7.84E-02	7.44E-02	6.74E-02
10	0.27500		0.00	5.99E-02	2.17E-02	3.11E-02	6.08E-02	6.56E-02	7.32E-02	7.90E-02	8.12E-02	8.02E-02	7.61E-02	6.88E-02
9	0.25750		0.00	4.02E-02	1.44E-02	3.65E-02	6.54E-02	6.59E-02	7.29E-02	7.87E-02	8.13E-02	8.07E-02	7.67E-02	6.94E-02
8	0.24250		3.00E-02	1.01E-02	1.14E-02	4.36E-02	6.72E-02	6.50E-02	7.17E-02	7.77E-02	8.08E-02	8.05E-02	7.68E-02	6.96E-02
7	0.21500		3.00E-02	1.01E-02	1.51E-02	5.61E-02	6.69E-02	6.31E-02	6.90E-02	7.52E-02	7.90E-02	7.94E-02	7.62E-02	6.92E-02
6	0.17500		3.00E-02	1.04E-02	2.41E-02	7.88E-02	5.92E-02	6.02E-02	6.51E-02	7.11E-02	7.55E-02	7.66E-02	7.39E-02	6.75E-02
5	0.13000		3.00E-02	1.12E-02	4.49E-02	8.05E-02	5.57E-02	5.75E-02	6.15E-02	6.67E-02	7.11E-02	7.26E-02	7.04E-02	6.46E-02
4	0.08500		3.00E-02	1.41E-02	8.30E-02	6.39E-02	5.45E-02	5.56E-02	5.89E-02	6.33E-02	6.72E-02	6.88E-02	6.69E-02	6.17E-02
3	0.04500		3.00E-02	2.48E-02	8.20E-02	5.70E-02	5.36E-02	5.45E-02	5.75E-02	6.15E-02	6.50E-02	6.64E-02	6.47E-02	5.98E-02
2	0.01250		3.00E-02	3.88E-02	7.82E-02	5.56E-02	5.34E-02	5.43E-02	5.73E-02	6.11E-02	6.45E-02	6.58E-02	6.41E-02	5.93E-02
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		4.29E-03	4.05E-03	3.71E-03	3.38E-03	3.09E-03	2.84E-03	2.65E-03	2.50E-03	2.37E-03	2.35E-03	3.00E-02
19	0.47500		2.24E-02	1.98E-02	1.65E-02	1.34E-02	1.07E-02	8.47E-03	6.86E-03	5.73E-03	4.95E-03	5.60E-03	3.00E-02
18	0.44750		3.26E-02	2.82E-02	2.33E-02	1.87E-02	1.48E-02	1.17E-02	9.32E-03	7.66E-03	6.47E-03	7.76E-03	3.00E-02
17	0.42750		3.79E-02	3.25E-02	2.67E-02	2.13E-02	1.68E-02	1.33E-02	1.06E-02	8.71E-03	7.36E-03	9.06E-03	3.00E-02
16	0.40625		4.28E-02	3.63E-02	2.96E-02	2.36E-02	1.86E-02	1.46E-02	1.17E-02	9.66E-03	8.19E-03	1.02E-02	3.00E-02
15	0.38500		4.70E-02	3.95E-02	3.20E-02	2.54E-02	2.00E-02	1.58E-02	1.27E-02	1.05E-02	8.89E-03	1.12E-02	3.00E-02
14	0.36500		5.04E-02	4.21E-02	3.40E-02	2.69E-02	2.12E-02	1.67E-02	1.34E-02	1.11E-02	9.45E-03	1.19E-02	3.00E-02
13	0.34625		5.31E-02	4.41E-02	3.55E-02	2.81E-02	2.21E-02	1.74E-02	1.40E-02	1.16E-02	9.89E-03	1.25E-02	3.00E-02
12	0.32750		5.54E-02	4.58E-02	3.68E-02	2.91E-02	2.28E-02	1.80E-02	1.45E-02	1.20E-02	1.03E-02	1.29E-02	3.00E-02
11	0.29750		5.80E-02	4.78E-02	3.83E-02	3.02E-02	2.37E-02	1.87E-02	1.51E-02	1.25E-02	1.07E-02	1.33E-02	3.00E-02
10	0.27500		5.92E-02	4.88E-02	3.91E-02	3.08E-02	2.42E-02	1.91E-02	1.54E-02	1.28E-02	1.09E-02	1.34E-02	3.00E-02
9	0.25750		5.97E-02	4.92E-02	3.94E-02	3.11E-02	2.44E-02	1.93E-02	1.55E-02	1.29E-02	1.10E-02	1.34E-02	3.00E-02
8	0.24250		5.99E-02	4.94E-02	3.95E-02	3.12E-02	2.45E-02	1.94E-02	1.56E-02	1.29E-02	1.11E-02	1.33E-02	3.00E-02
7	0.21500		5.97E-02	4.93E-02	3.95E-02	3.12E-02	2.45E-02	1.94E-02	1.56E-02	1.30E-02	1.11E-02	1.31E-02	3.00E-02
6	0.17500		5.86E-02	4.85E-02	3.90E-02	3.08E-02	2.42E-02	1.92E-02	1.55E-02	1.28E-02	1.10E-02	1.27E-02	3.00E-02
5	0.13000		5.64E-02	4.70E-02	3.79E-02	3.00E-02	2.37E-02	1.88E-02	1.52E-02	1.26E-02	1.08E-02	1.21E-02	3.00E-02
4	0.08500		5.41E-02	4.54E-02	3.68E-02	2.92E-02	2.31E-02	1.84E-02	1.49E-02	1.23E-02	1.05E-02	1.15E-02	3.00E-02
3	0.04500		5.26E-02	4.43E-02	3.61E-02	2.87E-02	2.27E-02	1.81E-02	1.47E-02	1.22E-02	1.04E-02	1.12E-02	3.00E-02

DIMENSIONLESS STREAMLINE PLOT

OITER NO	ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D
1	0.1578E-01	0.1545E-01	0.1466E 00	0.5586E-02	0.8554E-02	0.5085E 10	0.5782E 01	0.4879E-04	0.1505E 02	0.1590E 04	0.1935E 04
2	0.1535E-01	0.1793E 00	0.1250E 00	0.1949E-01	0.1379E-01	0.8745E 10	0.5782E 01	0.3198E-04	0.1505E 02	0.1773E 04	0.1935E 04
3	0.9220E-01	0.2586E 00	0.1127E 00	0.2831E-01	0.1742E-01	0.1089E 11	0.5783E 01	-0.8485E-05	0.1506E 02	0.1941E 04	0.1935E 04
4	0.2346E 00	0.2346E 00	0.1050E 00	0.1843E-01	0.1909E-01	0.1025E 11	0.5783E 01	-0.3282E-04	0.1506E 02	0.1905E 04	0.1935E 04
5	0.2449E 00	0.2529E 00	0.1006E 00	0.1920E-01	0.1988E-01	0.8319E 10	0.5783E 01	-0.4619E-04	0.1507E 02	0.1866E 04	0.1935E 04
6	0.2676E 00	0.2534E 00	0.9846E-01	0.2035E-01	0.2130E-01	0.7485E 10	0.5783E 01	-0.5834E-04	0.1507E 02	0.1823E 04	0.1935E 04
7	0.2772E 00	0.2558E 00	0.9733E-01	0.2071E-01	0.2179E-01	0.7102E 10	0.5783E 01	-0.7043E-04	0.1508E 02	0.1787E 04	0.1935E 04
8	0.2806E 00	0.2558E 00	0.9621E-01	0.2085E-01	0.2190E-01	0.6836E 10	0.5783E 01	-0.8161E-04	0.1508E 02	0.1759E 04	0.1936E 04
9	0.2839E 00	0.2561E 00	0.9496E-01	0.2113E-01	0.2194E-01	0.6409E 10	0.5783E 01	-0.9163E-04	0.1509E 02	0.1737E 04	0.1936E 04
10	0.2849E 00	0.2562E 00	0.9365E-01	0.2154E-01	0.2209E-01	0.5707E 10	0.5783E 01	-0.1014E-03	0.1509E 02	0.1722E 04	0.1936E 04
11	0.2853E 00	0.2563E 00	0.9287E-01	0.2228E-01	0.2234E-01	0.5247E 10	0.5783E 01	-0.1111E-03	0.1510E 02	0.1712E 04	0.1936E 04
12	0.2877E 00	0.2554E 00	0.9231E-01	0.2323E-01	0.2274E-01	0.5038E 10	0.5783E 01	-0.1194E-03	0.1510E 02	0.1706E 04	0.1936E 04
13	0.2906E 00	0.2522E 00	0.9168E-01	0.2429E-01	0.2324E-01	0.4896E 10	0.5783E 01	-0.1269E-03	0.1511E 02	0.1703E 04	0.1936E 04
14	0.2936E 00	0.2476E 00	0.9149E-01	0.2534E-01	0.2396E-01	0.4792E 10	0.5783E 01	-0.1338E-03	0.1511E 02	0.1702E 04	0.1936E 04
15	0.2952E 00	0.2417E 00	0.9120E-01	0.2630E-01	0.2474E-01	0.4702E 10	0.5783E 01	-0.1401E-03	0.1512E 02	0.1702E 04	0.1936E 04
16	0.2955E 00	0.2353E 00	0.9123E-01	0.2710E-01	0.2556E-01	0.4616E 10	0.5783E 01	-0.1459E-03	0.1512E 02	0.1703E 04	0.1936E 04
17	0.2955E 00	0.2279E 00	0.9125E-01	0.2777E-01	0.2639E-01	0.4526E 10	0.5783E 01	-0.1506E-03	0.1513E 02	0.1704E 04	0.1937E 04
18	0.2954E 00	0.2206E 00	0.9117E-01	0.2813E-01	0.2710E-01	0.4430E 10	0.5784E 01	-0.1552E-03	0.1513E 02	0.1706E 04	0.1937E 04
19	0.2948E 00	0.2134E 00	0.9096E-01	0.2822E-01	0.2775E-01	0.4329E 10	0.5784E 01	-0.1582E-03	0.1514E 02	0.1708E 04	0.1937E 04
20	0.2936E 00	0.2071E 00	0.9063E-01	0.2816E-01	0.2844E-01	0.4221E 10	0.5784E 01	-0.1611E-03	0.1514E 02	0.1710E 04	0.1937E 04
21	0.2915E 00	0.2021E 00	0.9037E-01	0.2793E-01	0.2898E-01	0.4107E 10	0.5784E 01	-0.1638E-03	0.1515E 02	0.1712E 04	0.1937E 04
22	0.2894E 00	0.1989E 00	0.9008E-01	0.2759E-01	0.2939E-01	0.3986E 10	0.5784E 01	-0.1660E-03	0.1515E 02	0.1714E 04	0.1938E 04
23	0.2879E 00	0.1958E 00	0.8970E-01	0.2702E-01	0.2978E-01	0.3859E 10	0.5784E 01	-0.1679E-03	0.1516E 02	0.1716E 04	0.1938E 04
24	0.2856E 00	0.1926E 00	0.8940E-01	0.2695E-01	0.3009E-01	0.3722E 10	0.5784E 01	-0.1697E-03	0.1516E 02	0.1719E 04	0.1938E 04
25	0.2830E 00	0.1910E 00	0.8892E-01	0.2665E-01	0.3031E-01	0.3591E 10	0.5784E 01	-0.1702E-03	0.1517E 02	0.1721E 04	0.1939E 04
26	0.2809E 00	0.1896E 00	0.8827E-01	0.2628E-01	0.3060E-01	0.3447E 10	0.5783E 01	-0.1705E-03	0.1518E 02	0.1723E 04	0.1939E 04
27	0.2781E 00	0.1876E 00	0.8768E-01	0.2595E-01	0.3076E-01	0.3292E 10	0.5783E 01	-0.1700E-03	0.1518E 02	0.1726E 04	0.1939E 04
28	0.2751E 00	0.1857E 00	0.8707E-01	0.2569E-01	0.3094E-01	0.3126E 10	0.5783E 01	-0.1701E-03	0.1519E 02	0.1728E 04	0.1940E 04
29	0.2717E 00	0.1830E 00	0.8632E-01	0.2550E-01	0.3118E-01	0.2952E 10	0.5783E 01	-0.1701E-03	0.1519E 02	0.1730E 04	0.1940E 04
30	0.2674E 00	0.1800E 00	0.8559E-01	0.2555E-01	0.3139E-01	0.2772E 10	0.5783E 01	-0.1699E-03	0.1520E 02	0.1732E 04	0.1941E 04
31	0.2642E 00	0.1772E 00	0.8481E-01	0.2572E-01	0.3171E-01	0.2585E 10	0.5783E 01	-0.1705E-03	0.1520E 02	0.1733E 04	0.1941E 04
32	0.2613E 00	0.1747E 00	0.8402E-01	0.2583E-01	0.3200E-01	0.2414E 10	0.5783E 01	-0.1716E-03	0.1521E 02	0.1735E 04	0.1941E 04
33	0.2577E 00	0.1720E 00	0.8321E-01	0.2607E-01	0.3238E-01	0.2240E 10	0.5783E 01	-0.1741E-03	0.1522E 02	0.1736E 04	0.1942E 04
34	0.2542E 00	0.1693E 00	0.8240E-01	0.2625E-01	0.3299E-01	0.2063E 10	0.5783E 01	-0.1786E-03	0.1522E 02	0.1738E 04	0.1943E 04
35	0.2503E 00	0.1671E 00	0.8167E-01	0.2641E-01	0.3361E-01	0.1916E 10	0.5783E 01	-0.1864E-03	0.1523E 02	0.1739E 04	0.1943E 04
36	0.2463E 00	0.1650E 00	0.8096E-01	0.2680E-01	0.3431E-01	0.1793E 10	0.5783E 01	-0.1968E-03	0.1523E 02	0.1740E 04	0.1944E 04
37	0.2418E 00	0.1631E 00	0.8038E-01	0.2729E-01	0.3509E-01	0.1670E 10	0.5783E 01	-0.2114E-03	0.1524E 02	0.1741E 04	0.1944E 04
38	0.2368E 00	0.1610E 00	0.7977E-01	0.2791E-01	0.3581E-01	0.1542E 10	0.5783E 01	-0.2302E-03	0.1524E 02	0.1742E 04	0.1945E 04
39	0.2326E 00	0.1584E 00	0.7922E-01	0.2859E-01	0.3660E-01	0.1408E 10	0.5783E 01	-0.2547E-03	0.1525E 02	0.1742E 04	0.1946E 04
40	0.2278E 00	0.1556E 00	0.7881E-01	0.2931E-01	0.3735E-01	0.1286E 10	0.5783E 01	-0.2846E-03	0.1526E 02	0.1743E 04	0.1947E 04
41	0.2222E 00	0.1533E 00	0.7855E-01	0.2983E-01	0.3793E-01	0.1155E 10	0.5783E 01	-0.3151E-03	0.1526E 02	0.1744E 04	0.1948E 04
42	0.2175E 00	0.1491E 00	0.7832E-01	0.3015E-01	0.3844E-01	0.1020E 10	0.5782E 01	-0.3501E-03	0.1527E 02	0.1744E 04	0.1949E 04
43	0.2138E 00	0.1455E 00	0.7807E-01	0.3063E-01	0.3889E-01	0.9313E 09	0.5782E 01	-0.3907E-03	0.1527E 02	0.1745E 04	0.1950E 04
44	0.2102E 00	0.1421E 00	0.7780E-01	0.3116E-01	0.3939E-01	0.8502E 09	0.5782E 01	-0.4361E-03	0.1528E 02	0.1745E 04	0.1951E 04
45	0.2066E 00	0.1385E 00	0.7767E-01	0.3170E-01	0.3982E-01	0.8200E 09	0.5781E 01	-0.4878E-03	0.1529E 02	0.1746E 04	0.1952E 04
46	0.2029E 00	0.1347E 00	0.7756E-01	0.3231E-01	0.4016E-01	0.8076E 09	0.5781E 01	-0.5467E-03	0.1529E 02	0.1746E 04	0.1953E 04
47	0.1997E 00	0.1314E 00	0.7737E-01	0.3290E-01	0.4039E-01	0.7881E 09	0.5780E 01	-0.6117E-03	0.1530E 02	0.1746E 04	0.1955E 04
48	0.1968E 00	0.1287E 00	0.7717E-01	0.3359E-01	0.4055E-01	0.7597E 09	0.5780E 01	-0.6841E-03	0.1530E 02	0.1746E 04	0.1956E 04
49	0.1937E 00	0.1258E 00	0.7693E-01	0.3432E-01	0.4057E-01	0.7238E 09	0.5779E 01	-0.7632E-03	0.1531E 02	0.1746E 04	0.1958E 04

15	0.38500	0.00	0.00	0.00	6.31E-01	5.58E-01	5.18E-01	5.12E-01	5.23E-01	5.50E-01	5.81E-01	5.99E-01	6.06E-01
14	0.36500	0.00	0.00	7.58E-01	6.63E-01	5.62E-01	5.16E-01	5.14E-01	5.38E-01	5.75E-01	6.00E-01	6.10E-01	6.09E-01
13	0.34625	0.00	0.00	7.87E-01	6.68E-01	5.57E-01	5.11E-01	5.19E-01	5.58E-01	5.96E-01	6.15E-01	6.16E-01	6.09E-01
12	0.32750	0.00	0.00	8.21E-01	6.73E-01	5.51E-01	5.08E-01	5.31E-01	5.80E-01	6.14E-01	6.24E-01	6.19E-01	6.05E-01
11	0.29750	0.00	1.04E 00	8.78E-01	6.80E-01	5.43E-01	5.09E-01	5.59E-01	6.12E-01	6.31E-01	6.28E-01	6.12E-01	5.91E-01
10	0.27500	0.00	1.09E 00	9.04E-01	6.76E-01	5.30E-01	5.16E-01	5.83E-01	6.24E-01	6.32E-01	6.20E-01	5.99E-01	5.74E-01
9	0.25750	0.00	1.16E 00	9.21E-01	6.63E-01	5.17E-01	5.26E-01	5.96E-01	6.26E-01	6.26E-01	6.09E-01	5.84E-01	5.56E-01
8	0.24250	1.43E 00	1.23E 00	9.23E-01	6.44E-01	5.07E-01	5.37E-01	6.01E-01	6.21E-01	6.15E-01	5.95E-01	5.68E-01	5.39E-01
7	0.21500	1.43E 00	1.22E 00	8.90E-01	6.09E-01	4.97E-01	5.51E-01	5.92E-01	5.97E-01	5.83E-01	5.59E-01	5.30E-01	5.01E-01
6	0.17500	1.43E 00	1.18E 00	8.18E-01	5.50E-01	4.86E-01	5.29E-01	5.38E-01	5.30E-01	5.12E-01	4.87E-01	4.59E-01	4.31E-01
5	0.13000	1.43E 00	1.10E 00	7.00E-01	4.69E-01	4.40E-01	4.41E-01	4.33E-01	4.21E-01	4.04E-01	3.83E-01	3.60E-01	3.37E-01
4	0.08500	1.43E 00	9.89E-01	5.34E-01	2.92E-01	3.27E-01	3.10E-01	2.99E-01	2.88E-01	2.76E-01	2.61E-01	2.45E-01	2.29E-01
3	0.04500	1.43E 00	8.04E-01	2.70E-01	1.86E-01	1.86E-01	1.71E-01	1.63E-01	1.57E-01	1.50E-01	1.42E-01	1.33E-01	1.24E-01
2	0.01250	1.43E 00	2.23E-01	7.50E-02	5.16E-02	5.16E-02	4.76E-02	4.54E-02	4.36E-02	4.17E-02	3.95E-02	3.71E-02	3.46E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		5.60E-01	5.99E-01	6.29E-01	6.47E-01	6.54E-01	6.52E-01	6.43E-01	6.29E-01	6.14E-01	6.03E-01	0.00
19	0.47500		5.93E-01	6.26E-01	6.52E-01	6.68E-01	6.76E-01	6.78E-01	6.74E-01	6.67E-01	6.59E-01	6.49E-01	0.00
18	0.44750		6.06E-01	6.30E-01	6.48E-01	6.59E-01	6.64E-01	6.64E-01	6.60E-01	6.54E-01	6.47E-01	6.38E-01	0.00
17	0.42750		6.09E-01	6.27E-01	6.40E-01	6.47E-01	6.49E-01	6.47E-01	6.42E-01	6.36E-01	6.28E-01	6.19E-01	0.00
16	0.40625		6.11E-01	6.21E-01	6.28E-01	6.31E-01	6.30E-01	6.26E-01	6.19E-01	6.12E-01	6.04E-01	5.94E-01	0.00
15	0.38500		6.10E-01	6.13E-01	6.14E-01	6.13E-01	6.09E-01	6.02E-01	5.95E-01	5.86E-01	5.77E-01	5.67E-01	0.00
14	0.36500		6.06E-01	6.03E-01	5.99E-01	5.94E-01	5.87E-01	5.79E-01	5.70E-01	5.60E-01	5.51E-01	5.41E-01	0.00
13	0.34625		6.00E-01	5.91E-01	5.83E-01	5.75E-01	5.65E-01	5.56E-01	5.46E-01	5.36E-01	5.26E-01	5.15E-01	0.00
12	0.32750		5.91E-01	5.78E-01	5.66E-01	5.54E-01	5.43E-01	5.32E-01	5.21E-01	5.10E-01	5.00E-01	4.90E-01	0.00
11	0.29750		5.70E-01	5.51E-01	5.34E-01	5.18E-01	5.04E-01	4.91E-01	4.79E-01	4.68E-01	4.57E-01	4.47E-01	0.00
10	0.27500		5.49E-01	5.27E-01	5.07E-01	4.89E-01	4.74E-01	4.60E-01	4.47E-01	4.35E-01	4.25E-01	4.15E-01	0.00
9	0.25750		5.30E-01	5.06E-01	4.84E-01	4.65E-01	4.49E-01	4.34E-01	4.21E-01	4.10E-01	3.99E-01	3.89E-01	0.00
8	0.24250		5.11E-01	4.86E-01	4.63E-01	4.44E-01	4.27E-01	4.12E-01	3.99E-01	3.87E-01	3.77E-01	3.67E-01	0.00
7	0.21500		4.72E-01	4.46E-01	4.22E-01	4.02E-01	3.85E-01	3.70E-01	3.57E-01	3.46E-01	3.36E-01	3.27E-01	0.00
6	0.17500		4.04E-01	3.79E-01	3.56E-01	3.37E-01	3.20E-01	3.06E-01	2.95E-01	2.85E-01	2.76E-01	2.68E-01	0.00
5	0.13000		3.14E-01	2.93E-01	2.73E-01	2.57E-01	2.43E-01	2.31E-01	2.22E-01	2.14E-01	2.07E-01	2.00E-01	0.00
4	0.08500		2.13E-01	1.98E-01	1.84E-01	1.72E-01	1.62E-01	1.54E-01	1.47E-01	1.41E-01	1.36E-01	1.32E-01	0.00
3	0.04500		1.16E-01	1.07E-01	9.93E-02	9.26E-02	8.71E-02	8.26E-02	7.88E-02	7.57E-02	7.30E-02	7.07E-02	0.00
2	0.01250		3.21E-02	2.97E-02	2.76E-02	2.57E-02	2.42E-02	2.29E-02	2.19E-02	2.10E-02	2.03E-02	1.96E-02	0.00
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAMLINE COORDS -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y												
11	1.00000		0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000		0.00	2.37E-01	2.87E-01	3.57E-01	4.22E-01	4.76E-01	4.84E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01	4.83E-01
9	0.80000		0.00	2.23E-01	2.64E-01	3.38E-01	4.06E-01	4.56E-01	4.69E-01	4.72E-01	4.71E-01	4.69E-01	4.67E-01	4.66E-01
8	0.70000		0.00	2.09E-01	2.45E-01	3.16E-01	3.87E-01	4.38E-01	4.55E-01	4.58E-01	4.57E-01	4.54E-01	4.51E-01	4.48E-01
7	0.60000		0.00	1.93E-01	2.27E-01	2.94E-01	3.69E-01	4.21E-01	4.40E-01	4.44E-01	4.42E-01	4.39E-01	4.34E-01	4.30E-01
6	0.50000		0.00	1.77E-01	2.09E-01	2.72E-01	3.50E-01	4.04E-01	4.26E-01	4.30E-01	4.28E-01	4.23E-01	4.16E-01	4.10E-01
5	0.40000		0.00	1.57E-01	1.89E-01	2.51E-01	3.29E-01	3.87E-01	4.11E-01	4.15E-01	4.12E-01	4.05E-01	3.97E-01	3.88E-01
4	0.30000		0.00	1.36E-01	1.68E-01	2.29E-01	3.08E-01	3.68E-01	3.94E-01	3.99E-01	3.94E-01	3.85E-01	3.74E-01	3.62E-01
3	0.20000		0.00	1.10E-01	1.42E-01	2.04E-01	2.84E-01	3.48E-01	3.77E-01	3.81E-01	3.74E-01	3.62E-01	3.47E-01	3.31E-01
2	0.10000		0.00	7.75E-02	1.09E-01	1.76E-01	2.59E-01	3.26E-01	3.57E-01	3.60E-01	3.49E-01	3.31E-01	3.09E-01	2.89E-01
1	0.00000		0.00	0.00	2.51E-02	1.32E-01	2.25E-01	2.99E-01	3.32E-01	3.33E-01	3.11E-01	2.81E-01	2.45E-01	1.97E-01

RADIAL POSITION 2R/D

```
0          0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.....+.....+.2.....+4.....6+....8....1.....+.....+.....+.....+.....+.....  0.00
 X  0.02   .    0                    2       4      6       8       1                              .  0.02
 X  0.04   .                   0              2       4       6       8      1                    .  0.04
 X  0.06   .                              0            2       4       6      8      1             .  0.06
 X  0.08   .                                                  0       2       4      6      8     1  0.08
 X  0.10   +                                                          0       2      4      6     8  1  0.10
 X  0.12   .                                                          0       2      4      6     8  1  0.12
 X  0.14   .                                                                  0      2      4     6  8  1  0.14
 X  0.16   .                                                                                          .  0.16
 X  0.18   .                                                  0                   2      4     6  8  1  0.18
 X  0.20   +                                                                                          +  0.20
 X  0.22   .                                        0                   2       4      6     8     1  0.22
 X  0.24   .                                                                                          .  0.24
 X  0.26   .                         0                                 2       4      6     8     1  0.26
 X  0.28   .                                                                                          .  0.28
 X  0.30   +                   0                                 2       4      6     8     1        0.30
 X  0.32   .                                                                                          .  0.32
 X  0.34   0                                              2                4      6     8     1        0.34
 X  0.36   .                                                                                          .  0.36
 X  0.38   .                                                                                          .  0.38
 X  0.40   0                                        2                4      6     8     1              0.40
 X  0.42   .                                                                                          .  0.42
 X  0.44   .                                                                                          .  0.44
 X  0.46   0                                  2                4      6     8     1                    0.46
```

```
  5 0.01625  3.52E-01 1.62E 00 2.66E 00 3.45E 00 4.02E 00 4.41E 00 4.68E 00 4.83E 00 4.91E 00 4.92E 00 4.92E 00
  4 0.01062 -8.26E-01 6.09E-01 1.82E 00 2.76E 00 3.45E 00 3.94E 00 4.27E 00 4.46E 00 4.56E 00 4.59E 00 4.59E 00
  3 0.00562 -1.49E 00 3.93E-02 1.34E 00 2.37E 00 3.13E 00 3.67E 00 4.04E 00 4.25E 00 4.37E 00 4.40E 00 4.40E 00
  2 0.00156 -1.73E 00-1.69E-01 1.17E 00 2.23E 00 3.02E 00 3.57E 00 3.95E 00 4.18E 00 4.30E 00 4.34E 00 4.33E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 1.51E 00 9.29E-01 1.57E-01-8.97E-02-1.20E-01-9.13E-02-7.35E-02-6.74E-02
 19 0.05766      0.00     0.00     0.00     0.00 4.88E 00 2.12E 00 3.32E-01-2.59E-01-3.35E-01-2.85E-01-2.43E-01-2.04E-01
 18 0.05469      0.00     0.00     0.00     0.00 9.32E 00 3.02E 00 3.61E-01-5.05E-01-6.19E-01-5.43E-01-4.44E-01-3.51E-01
 17 0.05211      0.00     0.00     0.00 5.43E 00 9.20E 00 3.40E 00 2.59E-01-7.87E-01-9.19E-01-7.83E-01-6.16E-01-4.73E-01
 16 0.04945      0.00     0.00     0.00 1.05E 01 9.68E 00 3.66E 00 1.10E-01-1.10E 00-1.22E 00-9.98E-01-7.67E-01-5.85E-01
 15 0.04687      0.00     0.00     0.00 1.57E 01 1.01E 01 3.67E 00-1.59E-01-1.40E 00-1.44E 00-1.15E 00-8.81E-01-6.75E-01
 14 0.04445      0.00     0.00 6.65E 00 1.53E 01 1.01E 01 3.40E 00-5.01E-01-1.63E 00-1.57E 00-1.24E 00-9.58E-01-7.44E-01
 13 0.04211      0.00     0.00 1.20E 01 1.57E 01 1.01E 01 2.98E 00-8.33E-01-1.77E 00-1.63E 00-1.29E 00-1.01E 00-7.96E-01
 12 0.03906      0.00     0.00 1.89E 01 1.67E 01 9.72E 00 2.21E 00-1.23E 00-1.84E 00-1.63E 00-1.31E 00-1.05E 00-8.47E-01
 11 0.03578      0.00 7.83E 00 2.00E 01 1.73E 01 8.76E 00 9.42E-01-1.43E 00-1.73E 00-1.54E 00-1.27E 00-1.06E 00-8.70E-01
 10 0.03328      0.00 1.39E 01 2.14E 01 1.73E 01 7.37E 00 2.21E-01-1.42E 00-1.60E 00-1.44E 00-1.22E 00-1.04E 00-8.72E-01
  9 0.03125      0.00 1.98E 01 2.23E 01 1.70E 01 6.01E 00-2.28E-01-1.35E 00-1.47E 00-1.35E 00-1.17E 00-1.02E 00-8.64E-01
  8 0.02859      0.00 1.88E 01 2.26E 01 1.61E 01 4.13E 00-6.69E-01-1.23E 00-1.30E 00-1.22E 00-1.10E 00-9.81E-01-8.45E-01
  7 0.02437      0.00 1.83E 01 2.22E 01 1.36E 01 9.20E-01-9.17E-01-1.00E 00-1.03E 00-1.01E 00-9.66E-01-8.93E-01-7.87E-01
  6 0.01906      0.00 1.84E 01 2.05E 01 7.78E 00-1.30E 00-9.30E-01-7.57E-01-7.36E-01-7.65E-01-7.73E-01-7.44E-01-6.68E-01
  5 0.01344      0.00 1.86E 01 1.59E 01-6.78E-02-8.46E-01-7.17E-01-5.34E-01-4.88E-01-5.19E-01-5.52E-01-5.49E-01-5.01E-01
  4 0.00812      0.00 1.77E 01 4.88E 00-9.43E-01-5.60E-01-4.55E-01-3.28E-01-2.86E-01-3.06E-01-3.34E-01-3.41E-01-3.13E-01
  3 0.00359      0.00 1.07E 01-3.57E-01-5.85E-01-2.67E-01-2.06E-01-1.46E-01-1.25E-01-1.34E-01-1.48E-01-1.53E-01-1.41E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062 -5.50E-02-3.73E-02-2.17E-02-1.15E-02-6.04E-03-3.52E-03-1.89E-03-9.93E-04 6.94E-04 9.54E-05     0.00
 19 0.05766 -1.54E-01-1.01E-01-5.79E-02-3.00E-02-1.44E-02-6.31E-03-1.01E-03 2.05E-03 4.73E-03 2.00E-04     0.00
 18 0.05469 -2.56E-01-1.66E-01-9.68E-02-5.16E-02-2.56E-02-1.15E-02-2.13E-03 3.35E-03 7.28E-03 2.67E-04     0.00
 17 0.05211 -3.41E-01-2.23E-01-1.32E-01-7.19E-02-3.70E-02-1.76E-02-4.54E-03 3.11E-03 8.36E-03 3.14E-04     0.00
 16 0.04945 -4.23E-01-2.79E-01-1.67E-01-9.38E-02-5.01E-02-2.52E-02-8.26E-03 1.63E-03 8.46E-03 3.52E-04     0.00
 15 0.04687 -4.93E-01-3.29E-01-2.01E-01-1.15E-01-6.35E-02-3.34E-02-1.27E-02-6.51E-04 7.81E-03 3.81E-04     0.00
 14 0.04445 -5.50E-01-3.71E-01-2.30E-01-1.35E-01-7.60E-02-4.13E-02-1.73E-02-3.29E-03 6.74E-03 4.00E-04     0.00
 13 0.04211 -5.96E-01-4.07E-01-2.56E-01-1.53E-01-8.78E-02-4.90E-02-2.19E-02-6.08E-03 5.43E-03 4.12E-04     0.00
 12 0.03906 -6.44E-01-4.47E-01-2.87E-01-1.74E-01-1.02E-01-5.86E-02-2.79E-02-9.85E-03 3.49E-03 4.16E-04     0.00
 11 0.03578 -6.73E-01-4.75E-01-3.10E-01-1.91E-01-1.15E-01-6.71E-02-3.34E-02-1.36E-02 1.36E-03 4.01E-04     0.00
 10 0.03328 -6.83E-01-4.88E-01-3.22E-01-2.01E-01-1.22E-01-7.22E-02-3.69E-02-1.60E-02-1.70E-04 3.80E-04     0.00
  9 0.03125 -6.83E-01-4.93E-01-3.28E-01-2.06E-01-1.26E-01-7.55E-02-3.92E-02-1.77E-02-1.30E-03 3.57E-04     0.00
  8 0.02859 -6.76E-01-4.93E-01-3.32E-01-2.11E-01-1.30E-01-7.86E-02-4.16E-02-1.96E-02-2.64E-03 3.26E-04     0.00
  7 0.02437 -6.40E-01-4.75E-01-3.25E-01-2.09E-01-1.31E-01-7.98E-02-4.32E-02-2.13E-02-4.23E-03 2.74E-04     0.00
  6 0.01906 -5.53E-01-4.17E-01-2.91E-01-1.89E-01-1.19E-01-7.37E-02-4.07E-02-2.08E-02-5.09E-03 2.09E-04     0.00
  5 0.01344 -4.19E-01-3.20E-01-2.26E-01-1.49E-01-9.44E-02-5.87E-02-3.28E-02-1.71E-02-4.68E-03 1.44E-04     0.00
  4 0.00812 -2.64E-01-2.03E-01-1.45E-01-9.63E-02-6.10E-02-3.80E-02-2.14E-02-1.13E-02-3.26E-03 8.52E-05     0.00
  3 0.00359 -1.19E-01-9.19E-02-6.57E-02-4.38E-02-2.77E-02-1.73E-02-9.79E-03-5.20E-03-1.54E-03 3.73E-05     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
```

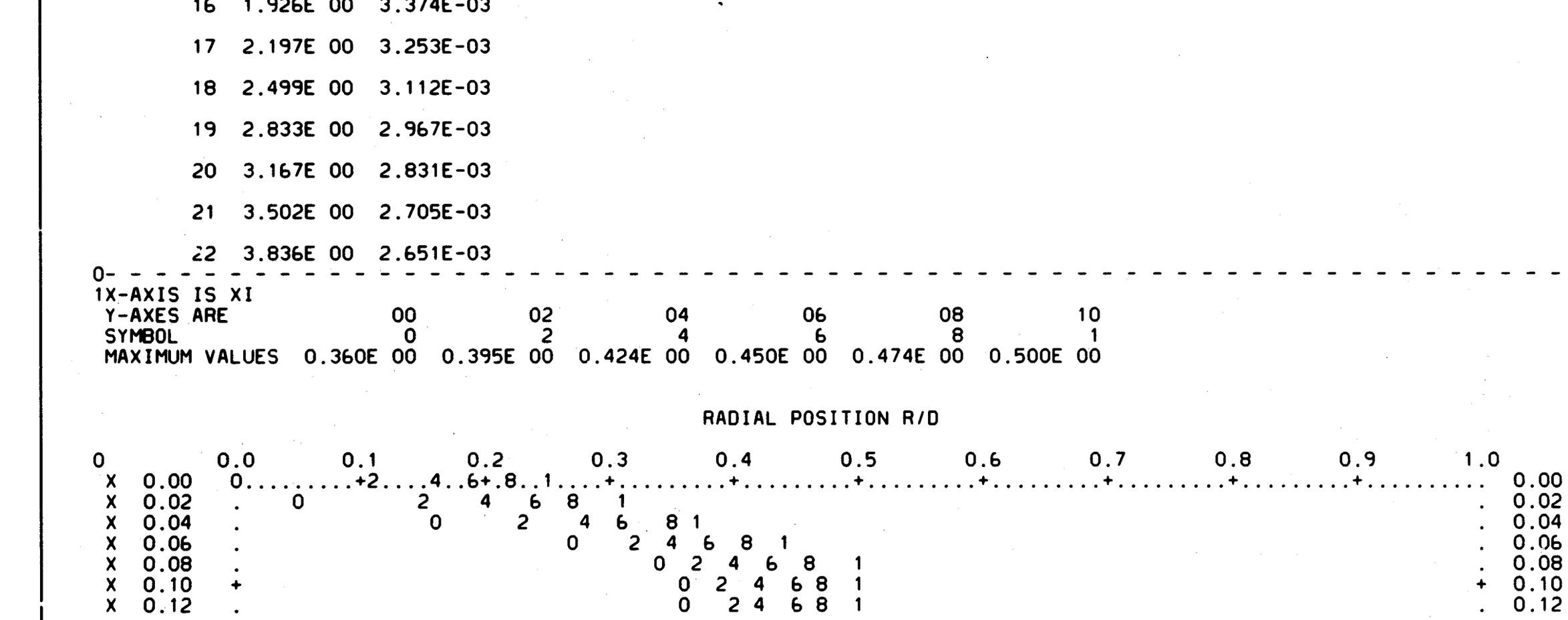
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	0.00	2.71E-01	4.55E-01	4.90E-01	4.68E-01	4.36E-01	4.08E-01	3.83E-01
19	0.47500	0.00	0.00	0.00	0.00	0.00	3.68E-01	5.11E-01	5.34E-01	5.09E-01	4.73E-01	4.37E-01	4.03E-01
18	0.44750	0.00	0.00	0.00	0.00	0.00	4.68E-01	5.64E-01	5.66E-01	5.31E-01	4.85E-01	4.40E-01	4.00E-01
17	0.42750	0.00	0.00	0.00	0.00	6.31E-01	5.55E-01	5.88E-01	5.69E-01	5.23E-01	4.71E-01	4.24E-01	3.88E-01
16	0.40625	0.00	0.00	0.00	0.00	5.42E-01	5.40E-01	5.51E-01	5.26E-01	4.80E-01	4.33E-01	3.97E-01	3.69E-01
15	0.38500	0.00	0.00	0.00	0.00	5.37E-01	5.28E-01	5.01E-01	4.57E-01	4.14E-01	3.83E-01	3.62E-01	3.45E-01
14	0.36500	0.00	0.00	0.00	7.39E-01	5.76E-01	5.00E-01	4.29E-01	3.73E-01	3.44E-01	3.33E-01	3.26E-01	3.19E-01
13	0.34625	0.00	0.00	0.00	5.76E-01	5.27E-01	4.38E-01	3.42E-01	2.89E-01	2.80E-01	2.86E-01	2.92E-01	2.92E-01
12	0.32750	0.00	0.00	0.00	5.23E-01	4.96E-01	3.74E-01	2.54E-01	2.10E-01	2.20E-01	2.41E-01	2.56E-01	2.64E-01
11	0.29750	0.00	0.00	5.99E-01	5.40E-01	4.57E-01	2.73E-01	1.12E-01	1.00E-01	1.37E-01	1.74E-01	2.00E-01	2.17E-01
10	0.27500	0.00	0.00	5.53E-01	5.50E-01	4.02E-01	1.32E-01	1.62E-02	3.55E-02	8.28E-02	1.26E-01	1.57E-01	1.80E-01
9	0.25750	0.00	0.00	6.26E-01	5.60E-01	3.43E-01	4.44E-02	-3.93E-02	-7.21E-03	4.39E-02	8.94E-02	1.25E-01	1.52E-01
8	0.24250	0.00	1.00E 00	7.36E-01	5.55E-01	2.79E-01	-2.04E-02	-7.75E-02	-3.96E-02	1.25E-02	5.94E-02	9.70E-02	1.28E-01
7	0.21500	0.00	1.00E 00	7.80E-01	5.21E-01	1.72E-01	-1.20E-01	-1.31E-01	-9.06E-02	-4.02E-02	7.05E-03	4.79E-02	8.37E-02
6	0.17500	0.00	1.00E 00	7.85E-01	4.25E-01	-6.44E-02	-2.04E-01	-1.89E-01	-1.53E-01	-1.08E-01	-6.24E-02	-1.85E-02	2.36E-02
5	0.13000	0.00	1.00E 00	7.12E-01	1.75E-01	-3.27E-01	-2.76E-01	-2.43E-01	-2.10E-01	-1.71E-01	-1.28E-01	-8.23E-02	-3.49E-02
4	0.08500	0.00	1.00E 00	5.12E-01	-3.29E-01	-3.66E-01	-3.25E-01	-2.86E-01	-2.53E-01	-2.18E-01	-1.78E-01	-1.30E-01	-7.92E-02
3	0.04500	0.00	1.00E 00	-3.64E-02	-4.63E-01	-3.99E-01	-3.53E-01	-3.11E-01	-2.77E-01	-2.44E-01	-2.05E-01	-1.57E-01	-1.04E-01
2	0.01250	0.00	1.00E 00	-5.69E-01	-5.14E-01	-4.14E-01	-3.63E-01	-3.20E-01	-2.85E-01	-2.53E-01	-2.14E-01	-1.67E-01	-1.13E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0 J	Y											
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	3.58E-01	3.36E-01	3.19E-01	3.07E-01	3.01E-01	2.97E-01	2.95E-01	2.93E-01	2.93E-01	2.93E-01	2.93E-01
19	0.47500	3.72E-01	3.47E-01	3.29E-01	3.18E-01	3.12E-01	3.08E-01	3.07E-01	3.08E-01	3.09E-01	3.11E-01	3.11E-01
18	0.44750	3.69E-01	3.45E-01	3.28E-01	3.16E-01	3.09E-01	3.05E-01	3.03E-01	3.03E-01	3.03E-01	3.04E-01	3.04E-01
17	0.42750	3.60E-01	3.38E-01	3.23E-01	3.12E-01	3.04E-01	3.00E-01	2.97E-01	2.96E-01	2.95E-01	2.96E-01	2.96E-01
16	0.40625	3.47E-01	3.28E-01	3.14E-01	3.04E-01	2.97E-01	2.92E-01	2.89E-01	2.87E-01	2.86E-01	2.86E-01	2.86E-01
15	0.38500	3.29E-01	3.15E-01	3.04E-01	2.95E-01	2.88E-01	2.83E-01	2.80E-01	2.78E-01	2.77E-01	2.76E-01	2.76E-01
14	0.36500	3.09E-01	3.00E-01	2.91E-01	2.84E-01	2.78E-01	2.74E-01	2.71E-01	2.69E-01	2.67E-01	2.66E-01	2.66E-01
13	0.34625	2.89E-01	2.84E-01	2.78E-01	2.73E-01	2.68E-01	2.65E-01	2.62E-01	2.60E-01	2.58E-01	2.57E-01	2.57E-01
12	0.32750	2.67E-01	2.66E-01	2.64E-01	2.61E-01	2.57E-01	2.55E-01	2.52E-01	2.50E-01	2.49E-01	2.48E-01	2.48E-01
11	0.29750	2.28E-01	2.35E-01	2.38E-01	2.39E-01	2.39E-01	2.38E-01	2.36E-01	2.35E-01	2.34E-01	2.33E-01	2.33E-01
10	0.27500	1.98E-01	2.10E-01	2.18E-01	2.22E-01	2.24E-01	2.24E-01	2.24E-01	2.24E-01	2.23E-01	2.22E-01	2.22E-01
9	0.25750	1.74E-01	1.90E-01	2.01E-01	2.08E-01	2.12E-01	2.14E-01	2.15E-01	2.15E-01	2.15E-01	2.14E-01	2.14E-01
8	0.24250	1.53E-01	1.73E-01	1.87E-01	1.96E-01	2.02E-01	2.05E-01	2.07E-01	2.08E-01	2.08E-01	2.07E-01	2.07E-01
7	0.21500	1.15E-01	1.42E-01	1.61E-01	1.75E-01	1.84E-01	1.90E-01	1.93E-01	1.95E-01	1.95E-01	1.95E-01	1.95E-01
6	0.17500	6.30E-02	9.75E-02	1.25E-01	1.45E-01	1.59E-01	1.68E-01	1.74E-01	1.78E-01	1.79E-01	1.79E-01	1.79E-01
5	0.13000	1.17E-02	5.39E-02	8.86E-02	1.15E-01	1.34E-01	1.47E-01	1.56E-01	1.61E-01	1.64E-01	1.64E-01	1.64E-01
4	0.08500	-2.75E-02	2.03E-02	6.06E-02	9.21E-02	1.15E-01	1.31E-01	1.42E-01	1.49E-01	1.52E-01	1.53E-01	1.53E-01
3	0.04500	-4.96E-02	1.31E-03	4.48E-02	7.91E-02	1.04E-01	1.22E-01	1.35E-01	1.42E-01	1.46E-01	1.47E-01	1.47E-01
2	0.01250	-5.76E-02	-5.62E-03	3.90E-02	7.43E-02	1.01E-01	1.19E-01	1.32E-01	1.39E-01	1.43E-01	1.45E-01	1.44E-01
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS V VELOCITY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	0.00	0.00	0.00	0.00	5.04E-02	3.10E-02	5.24E-03	-2.99E-03	-3.99E-03	-3.04E-03	-2.45E-03	-2.25E-03

4	1.643E-01	4.706E-03
5	2.419E-01	2.692E-03
6	3.280E-01	2.954E-03
7	4.235E-01	2.992E-03
8	5.296E-01	2.811E-03
9	6.473E-01	2.610E-03
10	7.780E-01	2.542E-03
11	9.231E-01	2.761E-03
12	1.084E 00	3.111E-03
13	1.263E 00	3.359E-03
14	1.461E 00	3.464E-03
15	1.682E 00	3.455E-03
16	1.926E 00	3.374E-03
17	2.197E 00	3.253E-03
18	2.499E 00	3.112E-03
19	2.833E 00	2.967E-03
20	3.167E 00	2.831E-03
21	3.502E 00	2.705E-03
22	3.836E 00	2.651E-03



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   158 0.4456E-01 0.1717E-01 0.1897E-01 0.6525E-02 0.4592E-02 0.1092E 09 0.5629E 01 0.4695E-02 0.1479E 02 0.1564E 04 0.1933E 04
   159 0.4333E-01 0.1714E-01 0.1909E-01 0.6559E-02 0.4563E-02 0.1088E 09 0.5636E 01 0.4554E-02 0.1480E 02 0.1565E 04 0.1933E 04
   160 0.4214E-01 0.1706E-01 0.1921E-01 0.6614E-02 0.4530E-02 0.1089E 09 0.5643E 01 0.4408E-02 0.1480E 02 0.1566E 04 0.1933E 04
   161 0.4096E-01 0.1698E-01 0.1932E-01 0.6639E-02 0.4493E-02 0.1083E 09 0.5650E 01 0.4257E-02 0.1481E 02 0.1566E 04 0.1933E 04
   162 0.3981E-01 0.1688E-01 0.1942E-01 0.6666E-02 0.4453E-02 0.1081E 09 0.5657E 01 0.4102E-02 0.1481E 02 0.1567E 04 0.1933E 04
   163 0.3869E-01 0.1677E-01 0.1951E-01 0.6736E-02 0.4410E-02 0.1074E 09 0.5664E 01 0.3945E-02 0.1482E 02 0.1568E 04 0.1933E 04
   164 0.3758E-01 0.1666E-01 0.1959E-01 0.6768E-02 0.4364E-02 0.1071E 09 0.5670E 01 0.3785E-02 0.1483E 02 0.1568E 04 0.1932E 04
   165 0.3651E-01 0.1654E-01 0.1966E-01 0.6785E-02 0.4318E-02 0.1070E 09 0.5677E 01 0.3623E-02 0.1483E 02 0.1569E 04 0.1932E 04
   166 0.3547E-01 0.1643E-01 0.1972E-01 0.6848E-02 0.4269E-02 0.1065E 09 0.5683E 01 0.3462E-02 0.1484E 02 0.1570E 04 0.1932E 04
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   171 0.3066E-01 0.1603E-01 0.1988E-01 0.7053E-02 0.4000E-02 0.1041E 09 0.5710E 01 0.2663E-02 0.1486E 02 0.1573E 04 0.1931E 04
   172 0.2978E-01 0.1597E-01 0.1988E-01 0.7087E-02 0.3941E-02 0.1033E 09 0.5715E 01 0.2509E-02 0.1487E 02 0.1574E 04 0.1931E 04
   173 0.2901E-01 0.1595E-01 0.1987E-01 0.7130E-02 0.3824E-02 0.9474E 08 0.5720E 01 0.2365E-02 0.1487E 02 0.1574E 04 0.1931E 04
   174 0.2825E-01 0.1592E-01 0.1985E-01 0.7189E-02 0.3730E-02 0.9280E 08 0.5724E 01 0.2228E-02 0.1488E 02 0.1575E 04 0.1931E 04
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   177 0.2613E-01 0.1584E-01 0.1975E-01 0.7321E-02 0.3512E-02 0.9313E 08 0.5737E 01 0.1836E-02 0.1490E 02 0.1577E 04 0.1931E 04
   178 0.2547E-01 0.1582E-01 0.1970E-01 0.7366E-02 0.3452E-02 0.9274E 08 0.5740E 01 0.1711E-02 0.1490E 02 0.1578E 04 0.1931E 04
   179 0.2481E-01 0.1583E-01 0.1964E-01 0.7355E-02 0.3394E-02 0.9271E 08 0.5744E 01 0.1590E-02 0.1491E 02 0.1578E 04 0.1931E 04
   180 0.2418E-01 0.1586E-01 0.1958E-01 0.7390E-02 0.3338E-02 0.9193E 08 0.5747E 01 0.1472E-02 0.1492E 02 0.1579E 04 0.1931E 04
   181 0.2358E-01 0.1588E-01 0.1951E-01 0.7393E-02 0.3285E-02 0.9151E 08 0.5750E 01 0.1357E-02 0.1492E 02 0.1579E 04 0.1931E 04
   182 0.2300E-01 0.1591E-01 0.1943E-01 0.7411E-02 0.3233E-02 0.9080E 08 0.5753E 01 0.1247E-02 0.1493E 02 0.1580E 04 0.1931E 04
   183 0.2244E-01 0.1592E-01 0.1935E-01 0.7448E-02 0.3181E-02 0.9023E 08 0.5756E 01 0.1141E-02 0.1493E 02 0.1581E 04 0.1931E 04
   184 0.2190E-01 0.1594E-01 0.1926E-01 0.7432E-02 0.3130E-02 0.8970E 08 0.5758E 01 0.1040E-02 0.1494E 02 0.1581E 04 0.1932E 04
   185 0.2138E-01 0.1596E-01 0.1916E-01 0.7425E-02 0.3080E-02 0.8898E 08 0.5761E 01 0.9426E-03 0.1495E 02 0.1582E 04 0.1932E 04
   186 0.2088E-01 0.1598E-01 0.1906E-01 0.7453E-02 0.3030E-02 0.8812E 08 0.5763E 01 0.8503E-03 0.1495E 02 0.1582E 04 0.1932E 04
   187 0.2041E-01 0.1600E-01 0.1896E-01 0.7455E-02 0.2978E-02 0.8739E 08 0.5765E 01 0.7637E-03 0.1496E 02 0.1583E 04 0.1932E 04
   188 0.1997E-01 0.1602E-01 0.1885E-01 0.7419E-02 0.2928E-02 0.8668E 08 0.5767E 01 0.6815E-03 0.1497E 02 0.1583E 04 0.1932E 04
   189 0.1954E-01 0.1604E-01 0.1873E-01 0.7391E-02 0.2879E-02 0.8612E 08 0.5769E 01 0.6044E-03 0.1497E 02 0.1584E 04 0.1932E 04
   190 0.1912E-01 0.1603E-01 0.1862E-01 0.7394E-02 0.2829E-02 0.8532E 08 0.5771E 01 0.5318E-03 0.1498E 02 0.1585E 04 0.1933E 04
   191 0.1873E-01 0.1603E-01 0.1849E-01 0.7404E-02 0.2779E-02 0.8449E 08 0.5772E 01 0.4648E-03 0.1498E 02 0.1585E 04 0.1933E 04
   192 0.1837E-01 0.1601E-01 0.1837E-01 0.7383E-02 0.2728E-02 0.8379E 08 0.5774E 01 0.4021E-03 0.1499E 02 0.1586E 04 0.1933E 04
   193 0.1801E-01 0.1599E-01 0.1824E-01 0.7330E-02 0.2678E-02 0.8300E 08 0.5775E 01 0.3438E-03 0.1500E 02 0.1586E 04 0.1933E 04
   194 0.1768E-01 0.1595E-01 0.1811E-01 0.7348E-02 0.2632E-02 0.8242E 08 0.5776E 01 0.2904E-03 0.1500E 02 0.1587E 04 0.1934E 04
   195 0.1735E-01 0.1590E-01 0.1797E-01 0.7280E-02 0.2583E-02 0.8177E 08 0.5777E 01 0.2423E-03 0.1501E 02 0.1587E 04 0.1934E 04
   196 0.1706E-01 0.1584E-01 0.1784E-01 0.7306E-02 0.2537E-02 0.8074E 08 0.5778E 01 0.1976E-03 0.1502E 02 0.1588E 04 0.1934E 04
   197 0.1676E-01 0.1578E-01 0.1770E-01 0.7258E-02 0.2490E-02 0.8033E 08 0.5779E 01 0.1575E-03 0.1502E 02 0.1588E 04 0.1934E 04
   198 0.1650E-01 0.1571E-01 0.1756E-01 0.7239E-02 0.2443E-02 0.7916E 08 0.5780E 01 0.1215E-03 0.1503E 02 0.1589E 04 0.1935E 04
   199 0.1624E-01 0.1563E-01 0.1742E-01 0.7202E-02 0.2400E-02 0.7870E 08 0.5781E 01 0.8936E-04 0.1504E 02 0.1589E 04 0.1935E 04
   200 0.1600E-01 0.1554E-01 0.1728E-01 0.7188E-02 0.2356E-02 0.7766E 08 0.5781E 01 0.6010E-04 0.1504E 02 0.1590E 04 0.1935E 04
0- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 SWIRL CASE WITH LFS  =  5
              AND NSBR =  0

 CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER =      1.500

 OR IF NSBR = 0 TO SWIRL VANE ANGLE =    65.000
```

4	0.01062	4.49E 05	9.90E 04	8.28E 04	1.27E 04	6.94E 03	6.59E 03	6.90E 03	7.37E 03	7.66E 03	7.51E 03	6.81E 03	5.72E 03	
3	0.00562	4.49E 05	1.29E 05	3.28E 04	8.65E 03	6.19E 03	5.99E 03	6.25E 03	6.64E 03	6.89E 03	6.78E 03	6.21E 03	5.26E 03	
2	0.00156	4.49E 05	1.56E 05	2.12E 04	7.11E 03	5.82E 03	5.70E 03	5.95E 03	6.30E 03	6.52E 03	6.42E 03	5.91E 03	5.02E 03	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	I =	13	14	15	16	17	18	19	20	21	22	23		
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127		
0 J	Y													
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
20	0.06187	4.77E 03	4.38E 03	3.84E 03	3.33E 03	2.91E 03	2.57E 03	2.31E 03	2.11E 03	1.95E 03	1.94E 03	4.49E 05		
19	0.05937	4.37E 03	3.82E 03	3.18E 03	2.59E 03	2.11E 03	1.73E 03	1.45E 03	1.25E 03	1.11E 03	1.22E 03	4.49E 05		
18	0.05594	4.56E 03	3.76E 03	2.96E 03	2.29E 03	1.77E 03	1.37E 03	1.09E 03	8.89E 02	7.51E 02	9.10E 02	4.49E 05		
17	0.05344	4.86E 03	3.85E 03	2.95E 03	2.21E 03	1.66E 03	1.25E 03	9.68E 02	7.74E 02	6.40E 02	8.22E 02	4.49E 05		
16	0.05078	5.25E 03	4.02E 03	2.99E 03	2.20E 03	1.61E 03	1.19E 03	9.05E 02	7.13E 02	5.82E 02	7.81E 02	4.49E 05		
15	0.04812	5.63E 03	4.20E 03	3.06E 03	2.21E 03	1.59E 03	1.16E 03	8.71E 02	6.80E 02	5.50E 02	7.60E 02	4.49E 05		
14	0.04562	5.94E 03	4.36E 03	3.13E 03	2.22E 03	1.59E 03	1.15E 03	8.52E 02	6.61E 02	5.32E 02	7.46E 02	4.49E 05		
13	0.04328	6.17E 03	4.48E 03	3.18E 03	2.24E 03	1.59E 03	1.14E 03	8.40E 02	6.48E 02	5.20E 02	7.34E 02	4.49E 05		
12	0.04094	6.34E 03	4.56E 03	3.22E 03	2.25E 03	1.58E 03	1.13E 03	8.29E 02	6.37E 02	5.11E 02	7.19E 02	4.49E 05		
11	0.03719	6.47E 03	4.63E 03	3.24E 03	2.25E 03	1.57E 03	1.11E 03	8.12E 02	6.21E 02	4.96E 02	6.91E 02	4.49E 05		
10	0.03437	6.45E 03	4.61E 03	3.21E 03	2.22E 03	1.55E 03	1.09E 03	7.96E 02	6.07E 02	4.84E 02	6.65E 02	4.49E 05		
9	0.03219	6.38E 03	4.55E 03	3.17E 03	2.20E 03	1.53E 03	1.07E 03	7.81E 02	5.95E 02	4.73E 02	6.42E 02	4.49E 05		
8	0.03031	6.27E 03	4.49E 03	3.13E 03	2.16E 03	1.50E 03	1.06E 03	7.67E 02	5.84E 02	4.64E 02	6.21E 02	4.49E 05		
7	0.02687	6.02E 03	4.32E 03	3.02E 03	2.09E 03	1.45E 03	1.02E 03	7.39E 02	5.61E 02	4.45E 02	5.81E 02	4.49E 05		
6	0.02187	5.56E 03	4.02E 03	2.82E 03	1.95E 03	1.36E 03	9.55E 02	6.93E 02	5.25E 02	4.15E 02	5.20E 02	4.49E 05		
5	0.01625	4.99E 03	3.65E 03	2.58E 03	1.79E 03	1.25E 03	8.84E 02	6.42E 02	4.87E 02	3.84E 02	4.58E 02	4.49E 05		
4	0.01062	4.49E 03	3.33E 03	2.37E 03	1.66E 03	1.16E 03	8.24E 02	6.00E 02	4.55E 02	3.59E 02	4.09E 02	4.49E 05		
3	0.00562	4.16E 03	3.12E 03	2.24E 03	1.58E 03	1.11E 03	7.90E 02	5.77E 02	4.38E 02	3.46E 02	3.82E 02	4.49E 05		
2	0.00156	4.00E 03	3.02E 03	2.19E 03	1.54E 03	1.09E 03	7.81E 02	5.73E 02	4.37E 02	3.45E 02	3.73E 02	4.49E 05		
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- DIMENSIONLESS STREAM FUNCTION -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12	
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545	
0 J	Y													
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	0.00	0.00	0.00	0.00	0.00	9.81E-01	9.65E-01	9.63E-01	9.65E-01	9.68E-01	9.70E-01	9.72E-01	
19	0.05937	0.00	0.00	0.00	0.00	0.00	8.77E-01	8.07E-01	7.98E-01	8.10E-01	8.25E-01	8.38E-01	8.50E-01	
18	0.05594	0.00	0.00	0.00	0.00	0.00	6.87E-01	5.69E-01	5.61E-01	5.92E-01	6.28E-01	6.60E-01	6.87E-01	
17	0.05344	0.00	0.00	0.00	0.00	9.02E-01	5.21E-01	3.89E-01	3.91E-01	4.39E-01	4.92E-01	5.38E-01	5.76E-01	
16	0.05078	0.00	0.00	0.00	0.00	7.06E-01	3.39E-01	2.08E-01	2.24E-01	2.91E-01	3.61E-01	4.20E-01	4.67E-01	
15	0.04812	0.00	0.00	0.00	0.00	5.32E-01	1.71E-01	5.16E-02	8.40E-02	1.67E-01	2.48E-01	3.15E-01	3.69E-01	
14	0.04562	0.00	0.00	0.00	8.96E-01	3.70E-01	2.88E-02	-6.79E-02	-1.93E-02	7.22E-02	1.59E-01	2.30E-01	2.87E-01	
13	0.04328	0.00	0.00	0.00	7.17E-01	2.29E-01	-8.00E-02	-1.51E-01	-9.06E-02	3.21E-03	8.97E-02	1.61E-01	2.20E-01	
12	0.04094	0.00	0.00	0.00	5.79E-01	1.12E-01	-1.61E-01	-2.05E-01	-1.40E-01	-4.91E-02	3.36E-02	1.03E-01	1.61E-01	
11	0.03719	0.00	0.00	8.89E-01	3.88E-01	-3.96E-02	-2.37E-01	-2.44E-01	-1.82E-01	-1.04E-01	-3.20E-02	3.09E-02	8.64E-02	
10	0.03437	0.00	0.00	7.38E-01	2.63E-01	-1.21E-01	-2.56E-01	-2.45E-01	-1.92E-01	-1.26E-01	-6.39E-02	-7.22E-03	4.42E-02	
9	0.03219	0.00	0.00	6.42E-01	1.80E-01	-1.62E-01	-2.52E-01	-2.35E-01	-1.90E-01	-1.34E-01	-7.98E-02	-2.86E-02	1.90E-02	
8	0.03031	0.00	9.41E-01	5.60E-01	1.18E-01	-1.83E-01	-2.40E-01	-2.22E-01	-1.83E-01	-1.36E-01	-8.81E-02	-4.18E-02	2.21E-03	
7	0.02687	0.00	7.40E-01	4.12E-01	2.34E-02	-1.94E-01	-2.09E-01	-1.91E-01	-1.64E-01	-1.30E-01	-9.29E-02	-5.54E-02	-1.85E-02	
6	0.02187	0.00	4.90E-01	2.26E-01	-6.70E-02	-1.64E-01	-1.54E-01	-1.40E-01	-1.25E-01	-1.05E-01	-8.20E-02	-5.65E-02	-3.02E-02	
5	0.01625	0.00	2.70E-01	7.63E-02	-9.44E-02	-1.03E-01	-9.27E-02	-8.43E-02	-7.68E-02	-6.77E-02	-5.58E-02	-4.15E-02	-2.61E-02	
4	0.01062	0.00	1.16E-01	-2.02E-03	-5.71E-02	-4.84E-02	-4.24E-02	-3.84E-02	-3.54E-02	-3.19E-02	-2.72E-02	-2.11E-02	-1.42E-02	
3	0.00562	0.00	3.24E-02	-1.25E-02	-1.63E-02	-1.42E-02	-1.24E-02	-1.12E-02	-1.03E-02	-9.43E-03	-8.15E-03	-6.46E-03	-4.49E-03	
2	0.00156	0.00	2.50E-03	-1.71E-03	-1.31E-03	-1.12E-03	-9.71E-04	-8.76E-04	-8.12E-04	-7.45E-04	-6.48E-04	-5.18E-04	-3.65E-04	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0	I =	13	14	15	16	17	18	19	20	21	22	23		

2	0.01250	5.23E-02	4.41E-02	3.60E-02	2.87E-02	2.27E-02	1.81E-02	1.47E-02	1.22E-02	1.05E-02	1.12E-02	3.00E-02	
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

DIMENSIONLESS LENGTH SCALE

0	I =	2	3	4	5	6	7	8	9	10	11	12	13
	X =	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552	0.15786
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
19	0.05937	0.00	0.00	0.00	1.98E-01	2.10E-01	2.07E-01	2.05E-01	2.17E-01	2.68E-01	3.20E-01	3.38E-01	3.33E-01
18	0.05594	0.00	0.00	0.00	1.98E-01	1.95E-01	2.03E-01	2.19E-01	2.71E-01	3.83E-01	4.90E-01	5.45E-01	5.57E-01
17	0.05344	0.00	0.00	5.10E-02	1.34E-01	1.68E-01	1.96E-01	2.36E-01	3.20E-01	4.45E-01	5.57E-01	6.28E-01	6.57E-01
16	0.05078	0.00	0.00	1.78E-01	1.74E-01	1.89E-01	2.18E-01	2.78E-01	3.80E-01	4.99E-01	6.08E-01	6.87E-01	7.30E-01
15	0.04812	0.00	0.00	1.78E-01	1.65E-01	1.95E-01	2.50E-01	3.33E-01	4.36E-01	5.44E-01	6.47E-01	7.30E-01	7.84E-01
14	0.04562	0.00	5.10E-02	1.05E-01	1.50E-01	2.14E-01	2.96E-01	3.86E-01	4.81E-01	5.81E-01	6.80E-01	7.65E-01	8.24E-01
13	0.04328	0.00	1.60E-01	1.31E-01	1.71E-01	2.54E-01	3.44E-01	4.30E-01	5.19E-01	6.14E-01	7.10E-01	7.94E-01	8.57E-01
12	0.04094	0.00	1.60E-01	1.15E-01	1.83E-01	2.96E-01	3.91E-01	4.71E-01	5.55E-01	6.46E-01	7.39E-01	8.22E-01	8.87E-01
11	0.03719	7.64E-02	6.63E-02	9.40E-02	2.09E-01	3.75E-01	4.62E-01	5.30E-01	6.09E-01	6.96E-01	7.85E-01	8.66E-01	9.32E-01
10	0.03437	1.60E-01	5.80E-02	9.97E-02	2.66E-01	4.35E-01	5.09E-01	5.72E-01	6.48E-01	7.32E-01	8.18E-01	8.98E-01	9.64E-01
9	0.03219	1.60E-01	3.05E-02	1.06E-01	3.04E-01	4.81E-01	5.45E-01	6.04E-01	6.78E-01	7.60E-01	8.45E-01	9.23E-01	9.88E-01
8	0.03031	5.34E-03	1.65E-02	1.19E-01	3.42E-01	5.20E-01	5.77E-01	6.33E-01	7.05E-01	7.85E-01	8.67E-01	9.44E-01	1.01E 00
7	0.02687	5.36E-03	2.18E-02	1.48E-01	4.28E-01	5.87E-01	6.36E-01	6.88E-01	7.55E-01	8.30E-01	9.09E-01	9.83E-01	1.05E 00
6	0.02187	5.47E-03	3.46E-02	2.11E-01	5.51E-01	6.78E-01	7.20E-01	7.68E-01	8.28E-01	8.97E-01	9.69E-01	1.04E 00	1.10E 00
5	0.01625	5.85E-03	6.42E-02	4.22E-01	6.83E-01	7.74E-01	8.12E-01	8.55E-01	9.08E-01	9.70E-01	1.04E 00	1.10E 00	1.16E 00
4	0.01062	7.27E-03	1.25E-01	5.49E-01	7.93E-01	8.59E-01	8.94E-01	9.34E-01	9.82E-01	1.04E 00	1.10E 00	1.16E 00	1.21E 00
3	0.00562	1.31E-02	3.10E-01	6.80E-01	8.67E-01	9.19E-01	9.53E-01	9.92E-01	1.04E 00	1.09E 00	1.14E 00	1.20E 00	1.25E 00
2	0.00156	2.12E-02	4.46E-01	7.95E-01	9.17E-01	9.60E-01	9.95E-01	1.04E 00	1.08E 00	1.14E 00	1.19E 00	1.24E 00	1.29E 00

0	I =	14	15	16	17	18	19	20	21	22	23
	X =	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y										
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	5.00E-03
19	0.05937	3.14E-01	2.88E-01	2.57E-01	2.25E-01	1.95E-01	1.69E-01	1.50E-01	1.36E-01	1.49E-01	5.00E-03
18	0.05594	5.45E-01	5.18E-01	4.82E-01	4.40E-01	3.97E-01	3.58E-01	3.25E-01	2.99E-01	3.25E-01	5.00E-03
17	0.05344	6.57E-01	6.38E-01	6.07E-01	5.68E-01	5.26E-01	4.87E-01	4.54E-01	4.26E-01	4.53E-01	5.00E-03
16	0.05078	7.43E-01	7.35E-01	7.11E-01	6.79E-01	6.42E-01	6.06E-01	5.76E-01	5.50E-01	5.73E-01	5.00E-03
15	0.04812	8.08E-01	8.09E-01	7.95E-01	7.69E-01	7.38E-01	7.07E-01	6.81E-01	6.58E-01	6.74E-01	5.00E-03
14	0.04562	8.56E-01	8.66E-01	8.58E-01	8.39E-01	8.14E-01	7.88E-01	7.65E-01	7.46E-01	7.54E-01	5.00E-03
13	0.04328	8.95E-01	9.10E-01	9.08E-01	8.95E-01	8.74E-01	8.53E-01	8.33E-01	8.17E-01	8.19E-01	5.00E-03
12	0.04094	9.28E-01	9.48E-01	9.51E-01	9.43E-01	9.27E-01	9.09E-01	8.92E-01	8.78E-01	8.76E-01	5.00E-03
11	0.03719	9.77E-01	1.00E 00	1.01E 00	1.01E 00	9.98E-01	9.85E-01	9.73E-01	9.63E-01	9.54E-01	5.00E-03
10	0.03437	1.01E 00	1.04E 00	1.05E 00	1.05E 00	1.04E 00	1.03E 00	1.03E 00	1.02E 00	1.01E 00	5.00E-03
9	0.03219	1.04E 00	1.06E 00	1.08E 00	1.08E 00	1.08E 00	1.07E 00	1.06E 00	1.05E 00	1.04E 00	5.00E-03
8	0.03031	1.06E 00	1.09E 00	1.10E 00	1.10E 00	1.10E 00	1.10E 00	1.09E 00	1.08E 00	1.07E 00	5.00E-03
7	0.02687	1.09E 00	1.12E 00	1.14E 00	1.15E 00	1.15E 00	1.14E 00	1.14E 00	1.13E 00	1.12E 00	5.00E-03
6	0.02187	1.15E 00	1.18E 00	1.19E 00	1.20E 00	1.20E 00	1.20E 00	1.20E 00	1.20E 00	1.19E 00	5.00E-03
5	0.01625	1.21E 00	1.24E 00	1.25E 00	1.26E 00	1.26E 00	1.26E 00	1.26E 00	1.25E 00	1.25E 00	5.00E-03
4	0.01062	1.26E 00	1.29E 00	1.30E 00	1.30E 00	1.30E 00	1.30E 00	1.30E 00	1.30E 00	1.31E 00	5.00E-03
3	0.00562	1.29E 00	1.32E 00	1.34E 00	1.34E 00	1.33E 00	1.33E 00	1.33E 00	1.33E 00	1.35E 00	5.00E-03
2	0.00156	1.32E 00	1.35E 00	1.36E 00	1.35E 00	1.35E 00	1.34E 00	1.34E 00	1.34E 00	1.37E 00	5.00E-03

DIMENSIONLESS EFF. VISCOSITY

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

50	0.1907E 00	0.1228E 00	0.7677E-01	0.3509E-01	0.4048E-01	0.6857E 09	0.5778E 01	-0.8495E-03	0.1532E 02	0.1746E 04	0.1959E 04
51	0.1879E 00	0.1205E 00	0.7657E-01	0.3586E-01	0.4029E-01	0.6618E 09	0.5777E 01	-0.9437E-03	0.1532E 02	0.1746E 04	0.1961E 04
52	0.1853E 00	0.1188E 00	0.7629E-01	0.3672E-01	0.4002E-01	0.6316E 09	0.5776E 01	-0.1045E-02	0.1533E 02	0.1746E 04	0.1963E 04
53	0.1828E 00	0.1173E 00	0.7597E-01	0.3754E-01	0.3970E-01	0.5968E 09	0.5775E 01	-0.1154E-02	0.1533E 02	0.1746E 04	0.1965E 04
54	0.1803E 00	0.1164E 00	0.7568E-01	0.3842E-01	0.3932E-01	0.5579E 09	0.5774E 01	-0.1270E-02	0.1534E 02	0.1746E 04	0.1967E 04
55	0.1778E 00	0.1155E 00	0.7535E-01	0.3929E-01	0.3887E-01	0.5164E 09	0.5772E 01	-0.1395E-02	0.1535E 02	0.1746E 04	0.1969E 04
56	0.1758E 00	0.1148E 00	0.7516E-01	0.4020E-01	0.3839E-01	0.4734E 09	0.5770E 01	-0.1527E-02	0.1535E 02	0.1746E 04	0.1972E 04
57	0.1742E 00	0.1142E 00	0.7489E-01	0.4106E-01	0.3786E-01	0.4348E 09	0.5769E 01	-0.1665E-02	0.1536E 02	0.1746E 04	0.1974E 04
58	0.1728E 00	0.1136E 00	0.7454E-01	0.4188E-01	0.3734E-01	0.4157E 09	0.5767E 01	-0.1811E-02	0.1537E 02	0.1745E 04	0.1977E 04
59	0.1711E 00	0.1132E 00	0.7408E-01	0.4269E-01	0.3680E-01	0.3970E 09	0.5764E 01	-0.1965E-02	0.1537E 02	0.1745E 04	0.1980E 04
60	0.1695E 00	0.1128E 00	0.7356E-01	0.4356E-01	0.3623E-01	0.3784E 09	0.5762E 01	-0.2125E-02	0.1538E 02	0.1745E 04	0.1983E 04
61	0.1677E 00	0.1126E 00	0.7309E-01	0.4440E-01	0.3563E-01	0.3623E 09	0.5759E 01	-0.2290E-02	0.1539E 02	0.1745E 04	0.1986E 04
62	0.1662E 00	0.1129E 00	0.7265E-01	0.4522E-01	0.3499E-01	0.3448E 09	0.5756E 01	-0.2463E-02	0.1540E 02	0.1745E 04	0.1990E 04
63	0.1650E 00	0.1127E 00	0.7236E-01	0.4602E-01	0.3433E-01	0.3261E 09	0.5753E 01	-0.2642E-02	0.1540E 02	0.1746E 04	0.1994E 04
64	0.1640E 00	0.1123E 00	0.7197E-01	0.4682E-01	0.3363E-01	0.3060E 09	0.5750E 01	-0.2825E-02	0.1541E 02	0.1746E 04	0.1997E 04
65	0.1625E 00	0.1121E 00	0.7148E-01	0.4752E-01	0.3292E-01	0.2859E 09	0.5746E 01	-0.3014E-02	0.1542E 02	0.1746E 04	0.2001E 04
66	0.1612E 00	0.1118E 00	0.7089E-01	0.4825E-01	0.3219E-01	0.2688E 09	0.5742E 01	-0.3208E-02	0.1543E 02	0.1746E 04	0.2006E 04
67	0.1596E 00	0.1115E 00	0.7021E-01	0.4889E-01	0.3145E-01	0.2559E 09	0.5738E 01	-0.3405E-02	0.1544E 02	0.1746E 04	0.2010E 04
68	0.1579E 00	0.1111E 00	0.6947E-01	0.4949E-01	0.3070E-01	0.2455E 09	0.5733E 01	-0.3605E-02	0.1545E 02	0.1746E 04	0.2015E 04
69	0.1564E 00	0.1110E 00	0.6867E-01	0.5008E-01	0.2994E-01	0.2421E 09	0.5728E 01	-0.3808E-02	0.1545E 02	0.1746E 04	0.2020E 04
70	0.1552E 00	0.1112E 00	0.6803E-01	0.5055E-01	0.2919E-01	0.2407E 09	0.5723E 01	-0.4014E-02	0.1546E 02	0.1747E 04	0.2025E 04
71	0.1541E 00	0.1115E 00	0.6745E-01	0.5104E-01	0.2841E-01	0.2377E 09	0.5718E 01	-0.4219E-02	0.1547E 02	0.1747E 04	0.2030E 04
72	0.1527E 00	0.1115E 00	0.6678E-01	0.5142E-01	0.2762E-01	0.2355E 09	0.5712E 01	-0.4426E-02	0.1548E 02	0.1747E 04	0.2036E 04
73	0.1513E 00	0.1113E 00	0.6606E-01	0.5177E-01	0.2682E-01	0.2328E 09	0.5706E 01	-0.4631E-02	0.1549E 02	0.1748E 04	0.2042E 04
74	0.1497E 00	0.1110E 00	0.6524E-01	0.5198E-01	0.2603E-01	0.2281E 09	0.5700E 01	-0.4835E-02	0.1550E 02	0.1748E 04	0.2048E 04
75	0.1481E 00	0.1105E 00	0.6437E-01	0.5218E-01	0.2524E-01	0.2230E 09	0.5693E 01	-0.5037E-02	0.1552E 02	0.1748E 04	0.2054E 04
76	0.1468E 00	0.1098E 00	0.6341E-01	0.5230E-01	0.2446E-01	0.2159E 09	0.5686E 01	-0.5236E-02	0.1553E 02	0.1749E 04	0.2061E 04
77	0.1457E 00	0.1090E 00	0.6240E-01	0.5234E-01	0.2368E-01	0.2086E 09	0.5679E 01	-0.5431E-02	0.1554E 02	0.1749E 04	0.2068E 04
78	0.1444E 00	0.1081E 00	0.6137E-01	0.5228E-01	0.2290E-01	0.2004E 09	0.5671E 01	-0.5620E-02	0.1555E 02	0.1750E 04	0.2075E 04
79	0.1431E 00	0.1077E 00	0.6044E-01	0.5215E-01	0.2213E-01	0.1932E 09	0.5663E 01	-0.5803E-02	0.1556E 02	0.1750E 04	0.2082E 04
80	0.1418E 00	0.1073E 00	0.5956E-01	0.5202E-01	0.2137E-01	0.1852E 09	0.5655E 01	-0.5978E-02	0.1558E 02	0.1751E 04	0.2089E 04
81	0.1402E 00	0.1066E 00	0.5860E-01	0.5174E-01	0.2063E-01	0.1772E 09	0.5647E 01	-0.6145E-02	0.1559E 02	0.1752E 04	0.2097E 04
82	0.1383E 00	0.1057E 00	0.5759E-01	0.5148E-01	0.1989E-01	0.1680E 09	0.5638E 01	-0.6303E-02	0.1560E 02	0.1752E 04	0.2104E 04
83	0.1367E 00	0.1046E 00	0.5651E-01	0.5108E-01	0.1918E-01	0.1588E 09	0.5629E 01	-0.6451E-02	0.1561E 02	0.1753E 04	0.2112E 04
84	0.1354E 00	0.1033E 00	0.5541E-01	0.5062E-01	0.1849E-01	0.1508E 09	0.5619E 01	-0.6588E-02	0.1563E 02	0.1754E 04	0.2120E 04
85	0.1341E 00	0.1019E 00	0.5430E-01	0.5010E-01	0.1786E-01	0.1434E 09	0.5610E 01	-0.6713E-02	0.1564E 02	0.1754E 04	0.2129E 04
86	0.1327E 00	0.1003E 00	0.5316E-01	0.4954E-01	0.1726E-01	0.1360E 09	0.5600E 01	-0.6825E-02	0.1566E 02	0.1755E 04	0.2137E 04
87	0.1311E 00	0.9866E-01	0.5200E-01	0.4889E-01	0.1667E-01	0.1286E 09	0.5590E 01	-0.6923E-02	0.1567E 02	0.1756E 04	0.2145E 04
88	0.1297E 00	0.9696E-01	0.5083E-01	0.4823E-01	0.1611E-01	0.1212E 09	0.5579E 01	-0.7007E-02	0.1569E 02	0.1757E 04	0.2154E 04
89	0.1280E 00	0.9553E-01	0.4971E-01	0.4749E-01	0.1565E-01	0.1140E 09	0.5569E 01	-0.7076E-02	0.1570E 02	0.1757E 04	0.2163E 04
90	0.1263E 00	0.9429E-01	0.4860E-01	0.4669E-01	0.1520E-01	0.1085E 09	0.5558E 01	-0.7130E-02	0.1572E 02	0.1758E 04	0.2172E 04
91	0.1246E 00	0.9291E-01	0.4745E-01	0.4587E-01	0.1477E-01	0.1043E 09	0.5547E 01	-0.7167E-02	0.1573E 02	0.1759E 04	0.2180E 04
92	0.1233E 00	0.9138E-01	0.4630E-01	0.4502E-01	0.1435E-01	0.1005E 09	0.5536E 01	-0.7188E-02	0.1575E 02	0.1760E 04	0.2189E 04
93	0.1219E 00	0.8969E-01	0.4518E-01	0.4410E-01	0.1394E-01	0.9740E 08	0.5525E 01	-0.7193E-02	0.1577E 02	0.1761E 04	0.2198E 04
94	0.1204E 00	0.8788E-01	0.4404E-01	0.4316E-01	0.1357E-01	0.9629E 08	0.5514E 01	-0.7179E-02	0.1578E 02	0.1762E 04	0.2208E 04
95	0.1187E 00	0.8592E-01	0.4287E-01	0.4220E-01	0.1328E-01	0.9571E 08	0.5503E 01	-0.7149E-02	0.1580E 02	0.1762E 04	0.2217E 04
96	0.1172E 00	0.8382E-01	0.4170E-01	0.4116E-01	0.1302E-01	0.9496E 08	0.5492E 01	-0.7101E-02	0.1582E 02	0.1763E 04	0.2226E 04
97	0.1156E 00	0.8165E-01	0.4053E-01	0.4019E-01	0.1277E-01	0.9473E 08	0.5480E 01	-0.7036E-02	0.1583E 02	0.1764E 04	0.2235E 04
98	0.1140E 00	0.7940E-01	0.3937E-01	0.3913E-01	0.1250E-01	0.9410E 08	0.5469E 01	-0.6954E-02	0.1585E 02	0.1765E 04	0.2244E 04
99	0.1123E 00	0.7709E-01	0.3824E-01	0.3809E-01	0.1222E-01	0.9409E 08	0.5458E 01	-0.6855E-02	0.1587E 02	0.1766E 04	0.2253E 04
100	0.1108E 00	0.7499E-01	0.3717E-01	0.3700E-01	0.1193E-01	0.9381E 08	0.5447E 01	-0.6739E-02	0.1589E 02	0.1767E 04	0.2262E 04
101	0.1093E 00	0.7311E-01	0.3616E-01	0.3593E-01	0.1168E-01	0.9357E 08	0.5436E 01	-0.6607E-02	0.1590E 02	0.1768E 04	0.2270E 04
102	0.1078E 00	0.7125E-01	0.3515E-01	0.3486E-01	0.1148E-01	0.9416E 08	0.5424E 01	-0.6459E-02	0.1592E 02	0.1769E 04	0.2279E 04
103	0.1061E 00	0.6929E-01	0.3413E-01	0.3377E-01	0.1132E-01	0.9468E 08	0.5414E 01	-0.6297E-02	0.1594E 02	0.1770E 04	0.2288E 04

0 I =	13	14	15	16	17	18	19	20	21	22	23
X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0 J Y											
11 1.00000	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10 0.90000	4.82E-01	4.81E-01	4.80E-01	4.79E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01	4.78E-01
9 0.80000	4.63E-01	4.61E-01	4.59E-01	4.57E-01	4.56E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01	4.55E-01
8 0.70000	4.45E-01	4.41E-01	4.38E-01	4.35E-01	4.33E-01	4.32E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01	4.31E-01
7 0.60000	4.25E-01	4.19E-01	4.14E-01	4.11E-01	4.08E-01	4.06E-01	4.05E-01	4.04E-01	4.04E-01	4.05E-01	4.05E-01
6 0.50000	4.03E-01	3.96E-01	3.89E-01	3.84E-01	3.80E-01	3.78E-01	3.76E-01	3.75E-01	3.75E-01	3.75E-01	3.75E-01
5 0.40000	3.78E-01	3.69E-01	3.61E-01	3.54E-01	3.49E-01	3.46E-01	3.44E-01	3.42E-01	3.42E-01	3.42E-01	3.42E-01
4 0.30000	3.50E-01	3.38E-01	3.28E-01	3.19E-01	3.12E-01	3.08E-01	3.05E-01	3.03E-01	3.03E-01	3.03E-01	3.03E-01
3 0.20000	3.15E-01	3.00E-01	2.86E-01	2.75E-01	2.67E-01	2.61E-01	2.58E-01	2.55E-01	2.54E-01	2.54E-01	2.54E-01
2 0.10000	2.67E-01	2.45E-01	2.26E-01	2.12E-01	2.00E-01	1.93E-01	1.89E-01	1.87E-01	1.85E-01	1.85E-01	1.85E-01
1 0.00000	1.31E-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS PRESSURE -*

0 I =	1	2	3	4	5	6	7	8	9	10	11	12
X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J Y												
21 0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.49500	0.00	0.00	0.00	0.00	4.46E 05	4.53E 05	4.33E 05	4.26E 05	4.28E 05	4.32E 05	4.35E 05	4.38E 05
19 0.47500	0.00	0.00	0.00	0.00	4.37E 05	4.47E 05	4.28E 05	4.22E 05	4.24E 05	4.28E 05	4.31E 05	4.34E 05
18 0.44750	0.00	0.00	0.00	0.00	4.20E 05	4.36E 05	4.20E 05	4.15E 05	4.18E 05	4.22E 05	4.25E 05	4.26E 05
17 0.42750	0.00	0.00	0.00	4.39E 05	4.17E 05	4.25E 05	4.12E 05	4.09E 05	4.13E 05	4.17E 05	4.19E 05	4.20E 05
16 0.40625	0.00	0.00	0.00	4.17E 05	4.15E 05	4.12E 05	4.03E 05	4.03E 05	4.07E 05	4.11E 05	4.12E 05	4.13E 05
15 0.38500	0.00	0.00	0.00	3.90E 05	4.06E 05	3.99E 05	3.93E 05	3.95E 05	4.00E 05	4.04E 05	4.05E 05	4.05E 05
14 0.36500	0.00	0.00	4.21E 05	3.82E 05	3.92E 05	3.87E 05	3.83E 05	3.88E 05	3.93E 05	3.96E 05	3.97E 05	3.97E 05
13 0.34625	0.00	0.00	3.93E 05	3.82E 05	3.80E 05	3.74E 05	3.74E 05	3.80E 05	3.85E 05	3.88E 05	3.89E 05	3.89E 05
12 0.32750	0.00	0.00	3.52E 05	3.71E 05	3.67E 05	3.63E 05	3.65E 05	3.72E 05	3.77E 05	3.79E 05	3.80E 05	3.81E 05
11 0.29750	0.00	2.90E 05	3.13E 05	3.45E 05	3.45E 05	3.43E 05	3.49E 05	3.56E 05	3.61E 05	3.64E 05	3.65E 05	3.66E 05
10 0.27500	0.00	2.31E 05	2.98E 05	3.26E 05	3.28E 05	3.28E 05	3.36E 05	3.43E 05	3.48E 05	3.51E 05	3.54E 05	3.56E 05
9 0.25750	0.00	1.63E 05	2.83E 05	3.11E 05	3.14E 05	3.17E 05	3.26E 05	3.33E 05	3.37E 05	3.41E 05	3.44E 05	3.47E 05
8 0.24250	0.00	1.41E 05	2.65E 05	2.99E 05	3.04E 05	3.08E 05	3.16E 05	3.23E 05	3.28E 05	3.32E 05	3.36E 05	3.40E 05
7 0.21500	0.00	1.64E 05	2.44E 05	2.79E 05	2.86E 05	2.91E 05	2.98E 05	3.05E 05	3.10E 05	3.16E 05	3.21E 05	3.26E 05
6 0.17500	0.00	1.69E 05	2.21E 05	2.51E 05	2.58E 05	2.65E 05	2.71E 05	2.78E 05	2.85E 05	2.93E 05	3.01E 05	3.08E 05
5 0.13000	0.00	1.52E 05	1.95E 05	2.18E 05	2.30E 05	2.36E 05	2.43E 05	2.51E 05	2.60E 05	2.70E 05	2.80E 05	2.90E 05
4 0.08500	0.00	1.11E 05	1.69E 05	1.94E 05	2.03E 05	2.11E 05	2.20E 05	2.29E 05	2.40E 05	2.52E 05	2.65E 05	2.77E 05
3 0.04500	0.00	4.40E 04	1.46E 05	1.65E 05	1.84E 05	1.96E 05	2.06E 05	2.17E 05	2.29E 05	2.42E 05	2.56E 05	2.69E 05
2 0.01250	0.00	0.00	1.36E 05	1.58E 05	1.77E 05	1.90E 05	2.01E 05	2.12E 05	2.25E 05	2.38E 05	2.52E 05	2.66E 05
1-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 I =	13	14	15	16	17	18	19	20	21	22	23
X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J Y											
21 0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 0.49500	4.40E 05	4.42E 05	4.43E 05	4.43E 05	4.42E 05	4.41E 05	4.39E 05	4.37E 05	4.35E 05	4.33E 05	0.00
19 0.47500	4.35E 05	4.36E 05	4.36E 05	4.36E 05	4.35E 05	4.34E 05	4.32E 05	4.30E 05	4.28E 05	4.26E 05	0.00
18 0.44750	4.27E 05	4.27E 05	4.26E 05	4.25E 05	4.24E 05	4.23E 05	4.21E 05	4.20E 05	4.18E 05	4.16E 05	0.00
17 0.42750	4.20E 05	4.19E 05	4.18E 05	4.17E 05	4.16E 05	4.15E 05	4.13E 05	4.12E 05	4.11E 05	4.09E 05	0.00
16 0.40625	4.12E 05	4.11E 05	4.10E 05	4.09E 05	4.08E 05	4.06E 05	4.05E 05	4.04E 05	4.03E 05	4.02E 05	0.00
15 0.38500	4.04E 05	4.03E 05	4.02E 05	4.01E 05	3.99E 05	3.98E 05	3.97E 05	3.96E 05	3.95E 05	3.94E 05	0.00
14 0.36500	3.96E 05	3.95E 05	3.94E 05	3.93E 05	3.92E 05	3.91E 05	3.90E 05	3.89E 05	3.88E 05	3.88E 05	0.00
13 0.34625	3.88E 05	3.88E 05	3.87E 05	3.86E 05	3.85E 05	3.84E 05	3.83E 05	3.83E 05	3.82E 05	3.82E 05	0.00
12 0.32750	3.80E 05	3.80E 05	3.79E 05	3.78E 05	3.78E 05	3.77E 05	3.77E 05	3.77E 05	3.76E 05	3.76E 05	0.00
11 0.29750	3.67E 05	3.68E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.67E 05	3.68E 05	0.00
10 0.27500	3.57E 05	3.58E 05	3.59E 05	3.59E 05	3.60E 05	3.60E 05	3.60E 05	3.61E 05	3.61E 05	3.62E 05	0.00

```
X  0.48   .                                                                .  0.48
X  0.50   +                                                                +  0.50
X  0.52   0                    2                   4                   6   8  1  0.52
X  0.54   .                                                                .  0.54
X  0.56   .                                                                .  0.56
X  0.58   0                    2                   4                   6   8  1  0.58
X  0.60   +                                                                +  0.60
X  0.62   .                                                                .  0.62
X  0.64   .                                                                .  0.64
X  0.66   0                    2                   4                   6   8  1  0.66
X  0.68   .                                                                .  0.68
X  0.70   +                                                                +  0.70
X  0.72   .                                                                .  0.72
X  0.74   0                    2                   4                   6   8  1  0.74
X  0.76   .                                                                .  0.76
X  0.78   .                                                                .  0.78
X  0.80   +                                                                +  0.80
X  0.82   .                                                                .  0.82
X  0.84   0                    2                   4                   6   8  1  0.84
X  0.86   .                                                                .  0.86
X  0.88   .                                                                .  0.88
X  0.90   +                                                                +  0.90
X  0.92   0                    2                   4                   6   8  1  0.92
X  0.94   .                                                                .  0.94
X  0.96   .                                                                .  0.96
X  0.98   .                                                                .  0.98
X  1.00   0.....+.....+.....+.....+.....+2.....+.....4.+.....+6.....+8.....1  1.00
         0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
```

W VELOCITY

O J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.66E 01	1.66E 01	1.66E 01	1.67E 01	1.67E 01	1.69E 01	1.77E 01	1.91E 01
19	0.05937	0.00	0.00	0.00	0.00	1.72E 01	1.71E 01	1.71E 01	1.73E 01	1.74E 01	1.79E 01	1.89E 01	2.02E 01
18	0.05594	0.00	0.00	0.00	0.00	1.77E 01	1.74E 01	1.74E 01	1.75E 01	1.78E 01	1.86E 01	1.97E 01	2.08E 01
17	0.05344	0.00	0.00	0.00	1.99E 01	1.86E 01	1.79E 01	1.77E 01	1.79E 01	1.84E 01	1.93E 01	2.02E 01	2.11E 01
16	0.05078	0.00	0.00	0.00	2.06E 01	1.89E 01	1.80E 01	1.80E 01	1.84E 01	1.92E 01	2.01E 01	2.08E 01	2.13E 01
15	0.04812	0.00	0.00	0.00	2.14E 01	1.91E 01	1.81E 01	1.82E 01	1.90E 01	2.01E 01	2.08E 01	2.12E 01	2.14E 01
14	0.04562	0.00	0.00	2.59E 01	2.25E 01	1.92E 01	1.81E 01	1.86E 01	1.98E 01	2.08E 01	2.14E 01	2.15E 01	2.15E 01
13	0.04328	0.00	0.00	2.68E 01	2.25E 01	1.89E 01	1.80E 01	1.90E 01	2.05E 01	2.14E 01	2.17E 01	2.16E 01	2.14E 01
12	0.04094	0.00	0.00	2.80E 01	2.25E 01	1.87E 01	1.81E 01	1.96E 01	2.11E 01	2.18E 01	2.19E 01	2.16E 01	2.12E 01
11	0.03719	0.00	3.63E 01	2.99E 01	2.25E 01	1.83E 01	1.84E 01	2.05E 01	2.18E 01	2.21E 01	2.19E 01	2.13E 01	2.06E 01
10	0.03437	0.00	3.82E 01	3.03E 01	2.19E 01	1.79E 01	1.89E 01	2.09E 01	2.19E 01	2.19E 01	2.15E 01	2.07E 01	1.99E 01
9	0.03219	0.00	4.05E 01	3.06E 01	2.13E 01	1.76E 01	1.92E 01	2.09E 01	2.17E 01	2.16E 01	2.10E 01	2.02E 01	1.93E 01
8	0.03031	5.20E 01	4.30E 01	3.04E 01	2.06E 01	1.75E 01	1.93E 01	2.08E 01	2.13E 01	2.11E 01	2.05E 01	1.96E 01	1.87E 01
7	0.02687	5.20E 01	4.23E 01	2.91E 01	1.95E 01	1.74E 01	1.91E 01	2.00E 01	2.02E 01	1.98E 01	1.91E 01	1.82E 01	1.73E 01
6	0.02187	5.20E 01	4.06E 01	2.66E 01	1.76E 01	1.68E 01	1.75E 01	1.77E 01	1.77E 01	1.73E 01	1.66E 01	1.58E 01	1.49E 01
5	0.01625	5.20E 01	3.75E 01	2.25E 01	1.46E 01	1.44E 01	1.43E 01	1.41E 01	1.39E 01	1.35E 01	1.30E 01	1.23E 01	1.16E 01
4	0.01062	5.20E 01	3.31E 01	1.67E 01	1.05E 01	1.02E 01	9.93E 00	9.64E 00	9.43E 00	9.18E 00	8.82E 00	8.37E 00	7.85E 00
3	0.00562	5.20E 01	2.65E 01	4.59E 00	6.18E 00	5.69E 00	5.46E 00	5.26E 00	5.12E 00	4.99E 00	4.80E 00	4.55E 00	4.27E 00
2	0.00156	5.20E 01	7.37E 00	1.27E 00	1.72E 00	1.58E 00	1.52E 00	1.46E 00	1.42E 00	1.39E 00	1.33E 00	1.26E 00	1.19E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

O J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
		X = 0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.06E 01	2.19E 01	2.28E 01	2.32E 01	2.33E 01	2.31E 01	2.27E 01	2.21E 01	2.15E 01	2.12E 01	0.00
19	0.05937	2.16E 01	2.27E 01	2.34E 01	2.39E 01	2.41E 01	2.40E 01	2.38E 01	2.36E 01	2.32E 01	2.29E 01	0.00
18	0.05594	2.18E 01	2.26E 01	2.32E 01	2.35E 01	2.36E 01	2.35E 01	2.34E 01	2.31E 01	2.28E 01	2.25E 01	0.00
17	0.05344	2.18E 01	2.24E 01	2.28E 01	2.30E 01	2.30E 01	2.29E 01	2.27E 01	2.25E 01	2.22E 01	2.19E 01	0.00
16	0.05078	2.18E 01	2.21E 01	2.23E 01	2.24E 01	2.23E 01	2.21E 01	2.19E 01	2.16E 01	2.13E 01	2.10E 01	0.00
15	0.04812	2.16E 01	2.17E 01	2.18E 01	2.17E 01	2.15E 01	2.13E 01	2.10E 01	2.07E 01	2.04E 01	2.01E 01	0.00
14	0.04562	2.14E 01	2.13E 01	2.12E 01	2.10E 01	2.07E 01	2.04E 01	2.01E 01	1.98E 01	1.95E 01	1.91E 01	0.00
13	0.04328	2.11E 01	2.08E 01	2.06E 01	2.02E 01	1.99E 01	1.96E 01	1.92E 01	1.89E 01	1.86E 01	1.82E 01	0.00
12	0.04094	2.07E 01	2.03E 01	1.99E 01	1.95E 01	1.91E 01	1.87E 01	1.83E 01	1.80E 01	1.77E 01	1.73E 01	0.00
11	0.03719	1.99E 01	1.93E 01	1.87E 01	1.82E 01	1.77E 01	1.73E 01	1.69E 01	1.65E 01	1.61E 01	1.58E 01	0.00
10	0.03437	1.91E 01	1.84E 01	1.77E 01	1.71E 01	1.66E 01	1.61E 01	1.57E 01	1.53E 01	1.50E 01	1.47E 01	0.00
9	0.03219	1.84E 01	1.76E 01	1.69E 01	1.63E 01	1.57E 01	1.52E 01	1.48E 01	1.44E 01	1.41E 01	1.38E 01	0.00
8	0.03031	1.77E 01	1.69E 01	1.62E 01	1.55E 01	1.49E 01	1.44E 01	1.40E 01	1.36E 01	1.33E 01	1.30E 01	0.00
7	0.02687	1.64E 01	1.55E 01	1.47E 01	1.40E 01	1.34E 01	1.30E 01	1.25E 01	1.22E 01	1.19E 01	1.16E 01	0.00
6	0.02187	1.40E 01	1.31E 01	1.23E 01	1.17E 01	1.12E 01	1.07E 01	1.03E 01	1.00E 01	9.71E 00	9.46E 00	0.00
5	0.01625	1.08E 01	1.01E 01	9.45E 00	8.90E 00	8.45E 00	8.07E 00	7.76E 00	7.50E 00	7.27E 00	7.06E 00	0.00
4	0.01062	7.32E 00	6.80E 00	6.33E 00	5.94E 00	5.61E 00	5.35E 00	5.13E 00	4.95E 00	4.79E 00	4.65E 00	0.00
3	0.00562	3.97E 00	3.68E 00	3.42E 00	3.20E 00	3.02E 00	2.88E 00	2.75E 00	2.65E 00	2.57E 00	2.49E 00	0.00
2	0.00156	1.10E 00	1.02E 00	9.51E-01	8.89E-01	8.39E-01	7.99E-01	7.64E-01	7.37E-01	7.12E-01	6.91E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PRESSURE

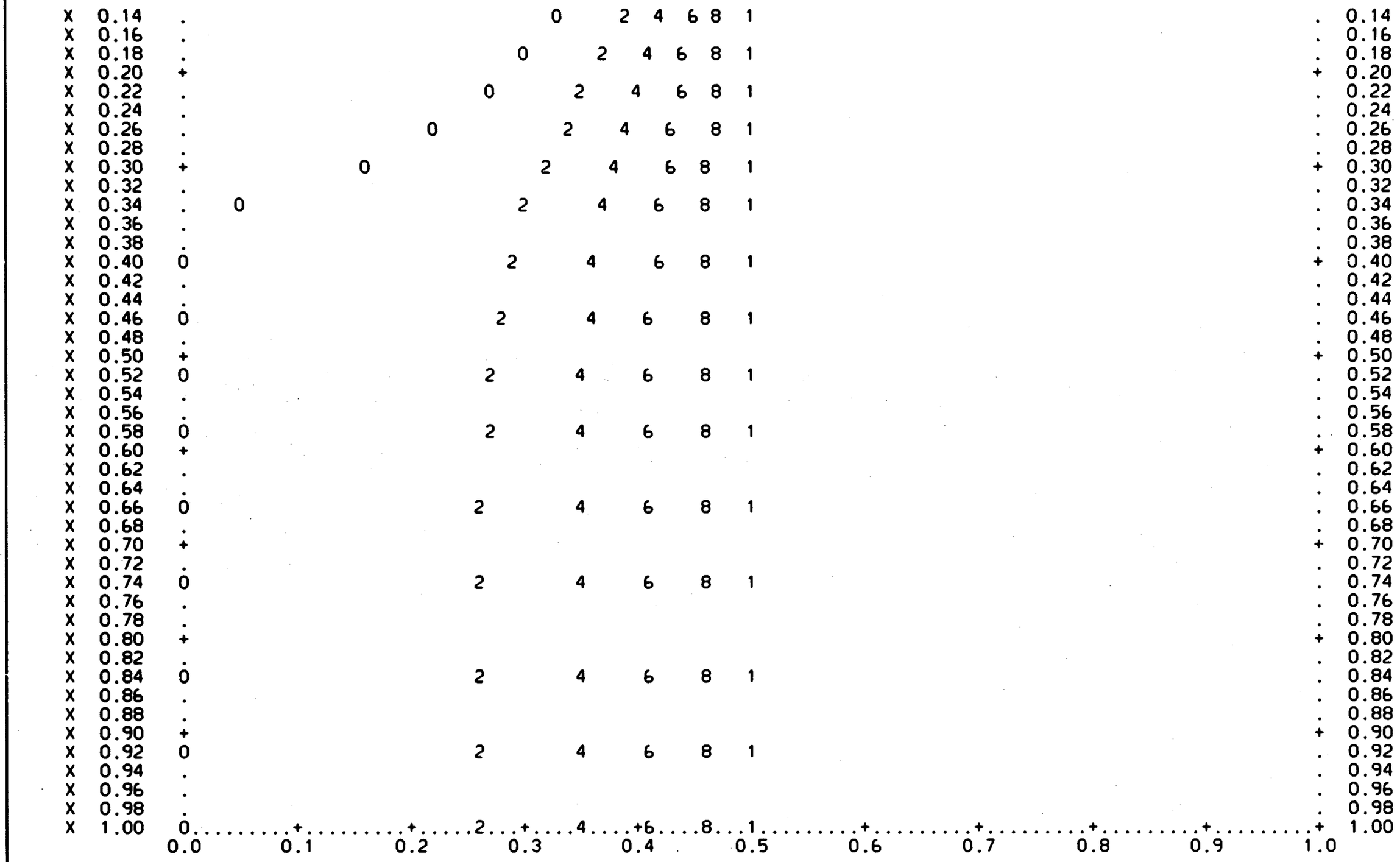
O J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
		X = -0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

19	0.46125	0.00	0.00	0.00	0.00	1.63E-01	7.08E-02	1.11E-02	-8.64E-03	-1.12E-02	-9.50E-03	-8.09E-03	-6.81E-03
18	0.43750	0.00	0.00	0.00	0.00	3.11E-01	1.01E-01	1.20E-02	-1.68E-02	-2.06E-02	-1.81E-02	-1.48E-02	-1.17E-02
17	0.41687	0.00	0.00	0.00	1.81E-01	3.07E-01	1.13E-01	8.63E-03	-2.62E-02	-3.06E-02	-2.61E-02	-2.05E-02	-1.58E-02
16	0.39562	0.00	0.00	0.00	3.51E-01	3.23E-01	1.22E-01	3.66E-03	-3.66E-02	-4.05E-02	-3.33E-02	-2.56E-02	-1.95E-02
15	0.37500	0.00	0.00	0.00	5.25E-01	3.38E-01	1.22E-01	-5.31E-03	-4.68E-02	-4.80E-02	-3.83E-02	-2.94E-02	-2.25E-02
14	0.35562	0.00	0.00	2.22E-01	5.09E-01	3.38E-01	1.13E-01	-1.67E-02	-5.45E-02	-5.24E-02	-4.14E-02	-3.19E-02	-2.48E-02
13	0.33687	0.00	0.00	4.01E-01	5.25E-01	3.35E-01	9.95E-02	-2.78E-02	-5.91E-02	-5.43E-02	-4.29E-02	-3.37E-02	-2.65E-02
12	0.31250	0.00	0.00	6.32E-01	5.57E-01	3.24E-01	7.35E-02	-4.10E-02	-6.12E-02	-5.43E-02	-4.35E-02	-3.50E-02	-2.82E-02
11	0.28625	0.00	2.61E-01	6.65E-01	5.77E-01	2.92E-01	3.14E-02	-4.78E-02	-5.78E-02	-5.13E-02	-4.24E-02	-3.52E-02	-2.90E-02
10	0.26625	0.00	4.63E-01	7.14E-01	5.78E-01	2.46E-01	7.38E-03	-4.74E-02	-5.33E-02	-4.80E-02	-4.08E-02	-3.47E-02	-2.91E-02
9	0.25000	0.00	6.60E-01	7.44E-01	5.66E-01	2.00E-01	-7.60E-03	-4.51E-02	-4.91E-02	-4.50E-02	-3.92E-02	-3.40E-02	-2.88E-02
8	0.22875	0.00	6.28E-01	7.53E-01	5.36E-01	1.38E-01	-2.23E-02	-4.10E-02	-4.34E-02	-4.07E-02	-3.67E-02	-3.27E-02	-2.82E-02
7	0.19500	0.00	6.08E-01	7.40E-01	4.54E-01	3.07E-02	-3.06E-02	-3.33E-02	-3.43E-02	-3.38E-02	-3.22E-02	-2.98E-02	-2.62E-02
6	0.15250	0.00	6.13E-01	6.84E-01	2.59E-01	-4.34E-02	-3.10E-02	-2.52E-02	-2.45E-02	-2.55E-02	-2.58E-02	-2.48E-02	-2.23E-02
5	0.10750	0.00	6.20E-01	5.31E-01	-2.26E-03	-2.82E-02	-2.39E-02	-1.78E-02	-1.63E-02	-1.73E-02	-1.84E-02	-1.83E-02	-1.67E-02
4	0.06500	0.00	5.89E-01	1.63E-01	-3.14E-02	-1.87E-02	-1.52E-02	-1.09E-02	-9.54E-03	-1.02E-02	-1.11E-02	-1.14E-02	-1.04E-02
3	0.02875	0.00	3.58E-01	-1.19E-02	-1.95E-02	-8.91E-03	-6.86E-03	-4.88E-03	-4.17E-03	-4.46E-03	-4.92E-03	-5.09E-03	-4.68E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	-1.83E-03	-1.24E-03	-7.22E-04	-3.84E-04	-2.01E-04	-1.17E-04	-6.29E-05	-3.31E-05	2.31E-05	3.18E-06	0.00
19	0.46125	-5.14E-03	-3.36E-03	-1.93E-03	-1.00E-03	-4.78E-04	-2.10E-04	-3.37E-05	6.83E-05	1.58E-04	6.65E-06	0.00
18	0.43750	-8.53E-03	-5.54E-03	-3.23E-03	-1.72E-03	-8.52E-04	-3.84E-04	-7.10E-05	1.12E-04	2.43E-04	8.92E-06	0.00
17	0.41687	-1.14E-02	-7.43E-03	-4.39E-03	-2.40E-03	-1.23E-03	-5.88E-04	-1.51E-04	1.04E-04	2.79E-04	1.05E-05	0.00
16	0.39562	-1.41E-02	-9.29E-03	-5.58E-03	-3.13E-03	-1.67E-03	-8.41E-04	-2.75E-04	5.44E-05	2.82E-04	1.17E-05	0.00
15	0.37500	-1.64E-02	-1.10E-02	-6.69E-03	-3.84E-03	-2.12E-03	-1.11E-03	-4.24E-04	-2.17E-05	2.60E-04	1.27E-05	0.00
14	0.35562	-1.83E-02	-1.24E-02	-7.67E-03	-4.49E-03	-2.53E-03	-1.38E-03	-5.77E-04	-1.10E-04	2.25E-04	1.33E-05	0.00
13	0.33687	-1.99E-02	-1.36E-02	-8.54E-03	-5.08E-03	-2.93E-03	-1.63E-03	-7.31E-04	-2.03E-04	1.81E-04	1.37E-05	0.00
12	0.31250	-2.15E-02	-1.49E-02	-9.55E-03	-5.79E-03	-3.41E-03	-1.95E-03	-9.29E-04	-3.28E-04	1.16E-04	1.39E-05	0.00
11	0.28625	-2.24E-02	-1.58E-02	-1.03E-02	-6.37E-03	-3.82E-03	-2.24E-03	-1.11E-03	-4.52E-04	4.52E-05	1.34E-05	0.00
10	0.26625	-2.28E-02	-1.63E-02	-1.07E-02	-6.70E-03	-4.06E-03	-2.41E-03	-1.23E-03	-5.34E-04	-5.66E-06	1.27E-05	0.00
9	0.25000	-2.28E-02	-1.64E-02	-1.09E-02	-6.88E-03	-4.21E-03	-2.52E-03	-1.31E-03	-5.91E-04	-4.32E-05	1.19E-05	0.00
8	0.22875	-2.25E-02	-1.64E-02	-1.11E-02	-7.03E-03	-4.34E-03	-2.62E-03	-1.39E-03	-6.54E-04	-8.79E-05	1.09E-05	0.00
7	0.19500	-2.13E-02	-1.58E-02	-1.08E-02	-6.97E-03	-4.35E-03	-2.66E-03	-1.44E-03	-7.10E-04	-1.41E-04	9.12E-06	0.00
6	0.15250	-1.84E-02	-1.39E-02	-9.69E-03	-6.31E-03	-3.98E-03	-2.46E-03	-1.36E-03	-6.92E-04	-1.70E-04	6.97E-06	0.00
5	0.10750	-1.40E-02	-1.07E-02	-7.55E-03	-4.97E-03	-3.15E-03	-1.96E-03	-1.09E-03	-5.71E-04	-1.56E-04	4.79E-06	0.00
4	0.06500	-8.81E-03	-6.78E-03	-4.83E-03	-3.21E-03	-2.03E-03	-1.27E-03	-7.14E-04	-3.77E-04	-1.09E-04	2.84E-06	0.00
3	0.02875	-3.97E-03	-3.06E-03	-2.19E-03	-1.46E-03	-9.25E-04	-5.77E-03	-3.26E-04	-1.73E-04	-5.12E-05	1.24E-06	0.00
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- DIMENSIONLESS W VELOCITY -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	5.53E-01	5.54E-01	5.55E-01	5.55E-01	5.56E-01	5.64E-01	5.91E-01	6.38E-01
19	0.47500	0.00	0.00	0.00	0.00	5.72E-01	5.69E-01	5.71E-01	5.75E-01	5.81E-01	5.97E-01	6.30E-01	6.75E-01
18	0.44750	0.00	0.00	0.00	0.00	5.91E-01	5.79E-01	5.78E-01	5.83E-01	5.95E-01	6.20E-01	6.56E-01	6.93E-01
17	0.42750	0.00	0.00	0.00	6.62E-01	6.20E-01	5.96E-01	5.91E-01	5.96E-01	6.13E-01	6.44E-01	6.75E-01	7.02E-01
16	0.40625	0.00	0.00	0.00	6.86E-01	6.29E-01	6.01E-01	6.00E-01	6.13E-01	6.40E-01	6.70E-01	6.93E-01	7.10E-01
15	0.38500	0.00	0.00	0.00	7.14E-01	6.37E-01	6.03E-01	6.08E-01	6.35E-01	6.69E-01	6.94E-01	7.07E-01	7.14E-01



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.360E 02	0.395E 02	0.424E 02	0.450E 02	0.474E 02	0.500E 02

COMPUTED INLET SWIRL NUMBER = 1.4320

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

0 J	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	8.11E 00	1.42E 01	1.51E 01	1.42E 01	1.32E 01	1.23E 01	1.15E 01
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.20E 01	1.64E 01	1.68E 01	1.57E 01	1.44E 01	1.31E 01	1.20E 01
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.62E 01	1.88E 01	1.82E 01	1.66E 01	1.48E 01	1.32E 01	1.20E 01
17	0.05344	0.00	0.00	0.00	0.00	2.22E 01	1.95E 01	1.98E 01	1.83E 01	1.63E 01	1.43E 01	1.29E 01	1.18E 01
16	0.05078	0.00	0.00	0.00	0.00	1.94E 01	1.90E 01	1.85E 01	1.69E 01	1.49E 01	1.33E 01	1.21E 01	1.13E 01
15	0.04812	0.00	0.00	0.00	0.00	1.94E 01	1.84E 01	1.64E 01	1.43E 01	1.28E 01	1.19E 01	1.12E 01	1.06E 01
14	0.04562	0.00	0.00	0.00	2.85E 01	2.11E 01	1.70E 01	1.34E 01	1.14E 01	1.07E 01	1.04E 01	1.02E 01	9.86E 00
13	0.04328	0.00	0.00	0.00	2.16E 01	1.84E 01	1.35E 01	9.77E 00	8.55E 00	8.68E 00	9.01E 00	9.14E 00	9.07E 00
12	0.04094	0.00	0.00	0.00	1.91E 01	1.64E 01	1.03E 01	6.30E 00	5.91E 00	6.80E 00	7.61E 00	8.05E 00	8.21E 00
11	0.03719	0.00	0.00	2.47E 01	1.93E 01	1.38E 01	4.73E 00	1.36E 00	2.40E 00	4.10E 00	5.41E 00	6.23E 00	6.71E 00
10	0.03437	0.00	0.00	1.90E 01	1.71E 01	9.85E 00	4.71E-01	-1.26E 00	3.05E-01	2.27E 00	3.80E 00	4.83E 00	5.52E 00
9	0.03219	0.00	0.00	1.94E 01	1.61E 01	6.58E 00	-2.09E 00	-2.82E 00	-1.09E 00	9.47E-01	2.57E 00	3.74E 00	4.59E 00
8	0.03031	0.00	3.00E 01	2.18E 01	1.50E 01	3.68E 00	-3.71E 00	-3.89E 00	-2.15E 00	-1.21E-01	1.55E 00	2.81E 00	3.78E 00
7	0.02687	0.00	3.00E 01	2.26E 01	1.30E 01	-6.16E-01	-5.77E 00	-5.39E 00	-3.81E 00	-1.92E 00	-2.40E-01	1.15E 00	2.32E 00
6	0.02187	0.00	3.00E 01	2.19E 01	8.29E 00	-7.37E 00	-7.68E 00	-7.00E 00	-5.78E 00	-4.22E 00	-2.62E 00	-1.11E 00	2.87E-01
5	0.01625	0.00	3.00E 01	1.85E 01	-2.39E 00	-9.64E 00	-9.23E 00	-8.45E 00	-7.52E 00	-6.32E 00	-4.88E 00	-3.30E 00	-1.70E 00
4	0.01062	0.00	3.00E 01	1.00E 01	-1.46E 01	-1.20E 01	-1.06E 01	-9.59E 00	-8.79E 00	-7.84E 00	-6.55E 00	-4.96E 00	-3.22E 00
3	0.00562	0.00	3.00E 01	-8.09E 00	-1.49E 01	-1.30E 01	-1.14E 01	-1.03E 01	-9.49E 00	-8.65E 00	-7.46E 00	-5.89E 00	-4.07E 00
2	0.00156	0.00	3.00E 01	-2.05E 01	-1.57E 01	-1.34E 01	-1.17E 01	-1.05E 01	-9.74E 00	-8.94E 00	-7.78E 00	-6.22E 00	-4.38E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0 J	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.07E 01	1.02E 01	9.81E 00	9.63E 00	9.55E 00	9.53E 00	9.51E 00	9.52E 00	9.53E 00	9.57E 00	9.57E 00
19	0.05937	1.12E 01	1.05E 01	1.01E 01	9.92E 00	9.83E 00	9.81E 00	9.83E 00	9.88E 00	9.95E 00	1.00E 01	1.00E 01
18	0.05594	1.11E 01	1.05E 01	1.01E 01	9.81E 00	9.66E 00	9.58E 00	9.55E 00	9.56E 00	9.59E 00	9.62E 00	9.62E 00
17	0.05344	1.09E 01	1.03E 01	9.91E 00	9.63E 00	9.44E 00	9.33E 00	9.27E 00	9.24E 00	9.24E 00	9.25E 00	9.25E 00
16	0.05078	1.06E 01	1.00E 01	9.64E 00	9.35E 00	9.15E 00	9.02E 00	8.93E 00	8.87E 00	8.85E 00	8.84E 00	8.84E 00
15	0.04812	1.01E 01	9.64E 00	9.28E 00	9.01E 00	8.81E 00	8.66E 00	8.56E 00	8.49E 00	8.45E 00	8.43E 00	8.43E 00
14	0.04562	9.51E 00	9.17E 00	8.88E 00	8.64E 00	8.45E 00	8.30E 00	8.20E 00	8.12E 00	8.07E 00	8.04E 00	8.04E 00
13	0.04328	8.89E 00	8.67E 00	8.45E 00	8.24E 00	8.08E 00	7.95E 00	7.84E 00	7.77E 00	7.72E 00	7.68E 00	7.68E 00
12	0.04094	8.20E 00	8.11E 00	7.97E 00	7.82E 00	7.68E 00	7.57E 00	7.48E 00	7.41E 00	7.36E 00	7.32E 00	7.32E 00
11	0.03719	6.98E 00	7.09E 00	7.11E 00	7.07E 00	7.01E 00	6.95E 00	6.89E 00	6.84E 00	6.79E 00	6.76E 00	6.76E 00
10	0.03437	5.99E 00	6.28E 00	6.43E 00	6.48E 00	6.49E 00	6.47E 00	6.44E 00	6.41E 00	6.38E 00	6.35E 00	6.34E 00
9	0.03219	5.21E 00	5.63E 00	5.88E 00	6.02E 00	6.08E 00	6.10E 00	6.10E 00	6.09E 00	6.07E 00	6.04E 00	6.04E 00
8	0.03031	4.53E 00	5.06E 00	5.41E 00	5.62E 00	5.73E 00	5.79E 00	5.82E 00	5.82E 00	5.81E 00	5.78E 00	5.78E 00
7	0.02687	3.28E 00	4.03E 00	4.54E 00	4.89E 00	5.10E 00	5.23E 00	5.31E 00	5.35E 00	5.35E 00	5.34E 00	5.33E 00
6	0.02187	1.54E 00	2.56E 00	3.33E 00	3.87E 00	4.23E 00	4.47E 00	4.63E 00	4.72E 00	4.75E 00	4.75E 00	4.75E 00
5	0.01625	-1.93E-01	1.10E 00	2.12E 00	2.86E 00	3.38E 00	3.74E 00	3.98E 00	4.12E 00	4.18E 00	4.19E 00	4.19E 00

	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037	
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.06187	9.73E-01	9.75E-01	9.75E-01	9.76E-01	9.76E-01	9.76E-01	9.76E-01	9.76E-01	9.75E-01	9.75E-01	9.75E-01	
19	0.05937	8.60E-01	8.68E-01	8.72E-01	8.75E-01	8.75E-01	8.76E-01	8.76E-01	8.75E-01	8.75E-01	8.74E-01	8.74E-01	
18	0.05594	7.09E-01	7.25E-01	7.35E-01	7.41E-01	7.44E-01	7.44E-01	7.44E-01	7.44E-01	7.43E-01	7.41E-01	7.41E-01	
17	0.05344	6.06E-01	6.28E-01	6.42E-01	6.50E-01	6.54E-01	6.56E-01	6.57E-01	6.56E-01	6.55E-01	6.53E-01	6.53E-01	
16	0.05078	5.05E-01	5.32E-01	5.50E-01	5.61E-01	5.66E-01	5.69E-01	5.71E-01	5.70E-01	5.69E-01	5.68E-01	5.68E-01	
15	0.04812	4.12E-01	4.44E-01	4.65E-01	4.78E-01	4.86E-01	4.90E-01	4.92E-01	4.92E-01	4.92E-01	4.90E-01	4.90E-01	
14	0.04562	3.33E-01	3.68E-01	3.92E-01	4.08E-01	4.17E-01	4.22E-01	4.25E-01	4.26E-01	4.25E-01	4.24E-01	4.24E-01	
13	0.04328	2.68E-01	3.05E-01	3.31E-01	3.47E-01	3.58E-01	3.64E-01	3.68E-01	3.69E-01	3.69E-01	3.68E-01	3.68E-01	
12	0.04094	2.10E-01	2.48E-01	2.75E-01	2.93E-01	3.05E-01	3.12E-01	3.16E-01	3.18E-01	3.18E-01	3.18E-01	3.18E-01	
11	0.03719	1.34E-01	1.72E-01	2.00E-01	2.19E-01	2.31E-01	2.39E-01	2.44E-01	2.47E-01	2.48E-01	2.47E-01	2.47E-01	
10	0.03437	8.93E-02	1.26E-01	1.53E-01	1.72E-01	1.85E-01	1.93E-01	1.99E-01	2.01E-01	2.02E-01	2.02E-01	2.02E-01	
9	0.03219	6.14E-02	9.63E-02	1.22E-01	1.41E-01	1.54E-01	1.62E-01	1.67E-01	1.70E-01	1.71E-01	1.71E-01	1.71E-01	
8	0.03031	4.19E-02	7.48E-02	9.98E-02	1.18E-01	1.30E-01	1.38E-01	1.43E-01	1.46E-01	1.48E-01	1.48E-01	1.47E-01	
7	0.02687	1.55E-02	4.41E-02	6.63E-02	8.23E-02	9.34E-02	1.01E-01	1.06E-01	1.09E-01	1.10E-01	1.10E-01	1.10E-01	
6	0.02187	-5.33E-03	1.61E-02	3.30E-02	4.55E-02	5.42E-02	6.03E-02	6.43E-02	6.66E-02	6.78E-02	6.79E-02	6.79E-02	
5	0.01625	-1.12E-02	1.93E-03	1.24E-02	2.03E-02	2.59E-02	2.98E-02	3.24E-02	3.40E-02	3.47E-02	3.49E-02	3.49E-02	
4	0.01062	-7.48E-03	-1.46E-03	3.42E-03	7.11E-03	9.78E-03	1.16E-02	1.29E-02	1.36E-02	1.40E-02	1.41E-02	1.41E-02	
3	0.00562	-2.54E-03	-7.82E-04	6.49E-04	1.74E-03	2.53E-03	3.08E-03	3.45E-03	3.68E-03	3.79E-03	3.82E-03	3.82E-03	
2	0.00156	-2.12E-04	-7.43E-05	3.85E-05	1.25E-04	1.87E-04	2.31E-04	2.61E-04	2.78E-04	2.88E-04	2.90E-04	2.90E-04	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- RADIAL COORDINATE OF STREAMLINES -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
0 J	Y												
11	1.00000	0.00	3.12E-02	3.91E-02	4.69E-02	5.47E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	0.00	2.96E-02	3.91E-02	4.69E-02	5.34E-02	5.99E-02	6.09E-02	6.09E-02	6.08E-02	6.07E-02	6.05E-02	6.04E-02
9	0.80000	0.00	2.79E-02	3.55E-02	4.44E-02	5.21E-02	5.80E-02	5.93E-02	5.94E-02	5.92E-02	5.89E-02	5.86E-02	5.83E-02
8	0.70000	0.00	2.61E-02	3.35E-02	4.30E-02	5.07E-02	5.62E-02	5.78E-02	5.80E-02	5.76E-02	5.72E-02	5.67E-02	5.62E-02
7	0.60000	0.00	2.41E-02	3.12E-02	4.13E-02	4.92E-02	5.46E-02	5.64E-02	5.65E-02	5.61E-02	5.54E-02	5.47E-02	5.40E-02
6	0.50000	0.00	2.21E-02	2.89E-02	3.94E-02	4.76E-02	5.31E-02	5.50E-02	5.50E-02	5.44E-02	5.36E-02	5.26E-02	5.16E-02
5	0.40000	0.00	1.96E-02	2.66E-02	3.74E-02	4.61E-02	5.17E-02	5.36E-02	5.36E-02	5.27E-02	5.16E-02	5.03E-02	4.90E-02
4	0.30000	0.00	1.70E-02	2.39E-02	3.52E-02	4.45E-02	5.02E-02	5.21E-02	5.20E-02	5.09E-02	4.93E-02	4.77E-02	4.60E-02
3	0.20000	0.00	1.37E-02	2.09E-02	3.27E-02	4.27E-02	4.86E-02	5.06E-02	5.03E-02	4.88E-02	4.68E-02	4.46E-02	4.25E-02
2	0.10000	0.00	9.69E-03	1.71E-02	2.97E-02	4.06E-02	4.69E-02	4.89E-02	4.84E-02	4.64E-02	4.36E-02	4.08E-02	3.79E-02
1	0.00000	0.00	0.00	1.08E-02	2.56E-02	3.82E-02	4.50E-02	4.70E-02	4.61E-02	4.31E-02	3.90E-02	3.49E-02	2.99E-02

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
0 J	Y											
11	1.00000	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
10	0.90000	6.03E-02	6.01E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02
9	0.80000	5.80E-02	5.77E-02	5.76E-02	5.75E-02	5.74E-02	5.74E-02	5.74E-02	5.74E-02	5.74E-02	5.75E-02	5.75E-02
8	0.70000	5.57E-02	5.53E-02	5.50E-02	5.48E-02	5.47E-02	5.47E-02	5.47E-02	5.47E-02	5.47E-02	5.48E-02	5.48E-02
7	0.60000	5.33E-02	5.27E-02	5.22E-02	5.19E-02	5.18E-02	5.17E-02	5.17E-02	5.17E-02	5.17E-02	5.18E-02	5.18E-02
6	0.50000	5.07E-02	4.98E-02	4.92E-02	4.88E-02	4.86E-02	4.85E-02	4.84E-02	4.84E-02	4.84E-02	4.85E-02	4.85E-02
5	0.40000	4.77E-02	4.67E-02	4.59E-02	4.53E-02	4.50E-02	4.47E-02	4.46E-02	4.46E-02	4.46E-02	4.46E-02	4.46E-02
4	0.30000	4.44E-02	4.31E-02	4.20E-02	4.12E-02	4.07E-02	4.03E-02	4.01E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02
3	0.20000	4.04E-02	3.86E-02	3.72E-02	3.61E-02	3.53E-02	3.48E-02	3.45E-02	3.43E-02	3.42E-02	3.42E-02	3.42E-02
2	0.10000	3.50E-02	3.25E-02	3.03E-02	2.86E-02	2.75E-02	2.68E-02	2.62E-02	2.58E-02	2.57E-02	2.57E-02	2.57E-02
1	0.00000	2.32E-02	1.30E-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS U VELOCITY -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12

20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.12E 01	2.05E 01	1.85E 01	1.70E 01	1.64E 01	1.71E 01	1.88E 01	1.99E 01
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.72E 02	4.12E 02	3.60E 02	3.14E 02	3.08E 02	3.99E 02	5.29E 02	5.87E 02
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	4.68E 02	4.15E 02	3.83E 02	3.77E 02	4.62E 02	7.22E 02	1.01E 03	1.15E 03
17	0.42750	1.00E 00	1.00E 00	1.00E 00	7.04E 01	2.62E 02	3.17E 02	3.56E 02	4.24E 02	6.21E 02	9.60E 02	1.28E 03	1.45E 03
16	0.40625	1.00E 00	1.00E 00	1.00E 00	4.53E 02	3.78E 02	3.74E 02	4.16E 02	5.61E 02	8.52E 02	1.21E 03	1.53E 03	1.70E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	4.42E 02	3.46E 02	3.90E 02	5.22E 02	7.75E 02	1.11E 03	1.45E 03	1.74E 03	1.91E 03
14	0.36500	1.00E 00	1.00E 00	8.47E 01	2.07E 02	3.00E 02	4.53E 02	6.97E 02	1.01E 03	1.34E 03	1.65E 03	1.92E 03	2.09E 03
13	0.34625	1.00E 00	1.00E 00	4.37E 02	2.75E 02	3.62E 02	5.92E 02	9.01E 02	1.22E 03	1.53E 03	1.83E 03	2.08E 03	2.23E 03
12	0.32750	1.00E 00	1.00E 00	3.60E 02	2.18E 02	4.05E 02	7.49E 02	1.10E 03	1.41E 03	1.71E 03	1.99E 03	2.22E 03	2.36E 03
11	0.29750	1.00E 00	1.45E 02	1.12E 02	1.74E 02	5.17E 02	1.06E 03	1.40E 03	1.67E 03	1.95E 03	2.21E 03	2.43E 03	2.55E 03
10	0.27500	1.00E 00	4.47E 02	9.78E 01	2.01E 02	7.46E 02	1.27E 03	1.56E 03	1.83E 03	2.10E 03	2.35E 03	2.56E 03	2.68E 03
9	0.25750	1.00E 00	3.66E 02	4.25E 01	2.32E 02	8.84E 02	1.40E 03	1.67E 03	1.93E 03	2.20E 03	2.45E 03	2.66E 03	2.76E 03
8	0.24250	1.00E 00	7.08E 00	2.10E 01	2.83E 02	1.01E 03	1.51E 03	1.75E 03	2.01E 03	2.28E 03	2.53E 03	2.73E 03	2.83E 03
7	0.21500	1.00E 00	7.12E 00	3.14E 01	4.00E 02	1.26E 03	1.67E 03	1.90E 03	2.14E 03	2.41E 03	2.66E 03	2.85E 03	2.94E 03
6	0.17500	1.00E 00	7.32E 00	6.20E 01	6.73E 02	1.52E 03	1.89E 03	2.09E 03	2.32E 03	2.58E 03	2.82E 03	2.99E 03	3.06E 03
5	0.13000	1.00E 00	8.01E 00	1.55E 02	1.36E 03	1.83E 03	2.11E 03	2.29E 03	2.51E 03	2.75E 03	2.97E 03	3.12E 03	3.18E 03
4	0.08500	1.00E 00	1.08E 01	4.10E 02	1.58E 03	2.10E 03	2.30E 03	2.46E 03	2.67E 03	2.89E 03	3.09E 03	3.22E 03	3.26E 03
3	0.04500	1.00E 00	2.44E 01	1.01E 03	1.85E 03	2.28E 03	2.44E 03	2.59E 03	2.79E 03	3.01E 03	3.19E 03	3.31E 03	3.34E 03
2	0.01250	1.00E 00	4.84E 01	1.42E 03	2.13E 03	2.41E 03	2.54E 03	2.70E 03	2.91E 03	3.13E 03	3.31E 03	3.41E 03	3.44E 03
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	2.00E 01	1.94E 01	1.86E 01	1.78E 01	1.71E 01	1.64E 01	1.59E 01	1.55E 01	1.51E 01	1.50E 01	1.00E 00	
19	0.47500	5.67E 02	5.03E 02	4.21E 02	3.39E 02	2.65E 02	2.04E 02	1.60E 02	1.30E 02	1.10E 02	1.28E 02	1.00E 00	
18	0.44750	1.14E 03	1.04E 03	8.99E 02	7.49E 02	6.08E 02	4.87E 02	3.93E 02	3.24E 02	2.74E 02	3.26E 02	1.00E 00	
17	0.42750	1.45E 03	1.35E 03	1.18E 03	1.01E 03	8.37E 02	6.89E 02	5.70E 02	4.82E 02	4.17E 02	4.91E 02	1.00E 00	
16	0.40625	1.72E 03	1.61E 03	1.44E 03	1.24E 03	1.05E 03	8.83E 02	7.47E 02	6.44E 02	5.67E 02	6.59E 02	1.00E 00	
15	0.38500	1.93E 03	1.82E 03	1.65E 03	1.44E 03	1.24E 03	1.05E 03	9.05E 02	7.92E 02	7.06E 02	8.11E 02	1.00E 00	
14	0.36500	2.10E 03	2.00E 03	1.81E 03	1.60E 03	1.39E 03	1.20E 03	1.04E 03	9.16E 02	8.25E 02	9.36E 02	1.00E 00	
13	0.34625	2.24E 03	2.13E 03	1.95E 03	1.73E 03	1.51E 03	1.31E 03	1.15E 03	1.02E 03	9.24E 02	1.04E 03	1.00E 00	
12	0.32750	2.37E 03	2.26E 03	2.07E 03	1.84E 03	1.62E 03	1.41E 03	1.24E 03	1.11E 03	1.01E 03	1.13E 03	1.00E 00	
11	0.29750	2.55E 03	2.43E 03	2.23E 03	2.00E 03	1.76E 03	1.55E 03	1.37E 03	1.24E 03	1.13E 03	1.25E 03	1.00E 00	
10	0.27500	2.66E 03	2.53E 03	2.33E 03	2.09E 03	1.86E 03	1.64E 03	1.46E 03	1.32E 03	1.21E 03	1.32E 03	1.00E 00	
9	0.25750	2.74E 03	2.61E 03	2.40E 03	2.16E 03	1.92E 03	1.70E 03	1.51E 03	1.37E 03	1.26E 03	1.37E 03	1.00E 00	
8	0.24250	2.81E 03	2.67E 03	2.45E 03	2.21E 03	1.97E 03	1.74E 03	1.56E 03	1.41E 03	1.30E 03	1.41E 03	1.00E 00	
7	0.21500	2.91E 03	2.76E 03	2.54E 03	2.29E 03	2.04E 03	1.81E 03	1.62E 03	1.47E 03	1.36E 03	1.46E 03	1.00E 00	
6	0.17500	3.02E 03	2.88E 03	2.64E 03	2.38E 03	2.12E 03	1.89E 03	1.70E 03	1.54E 03	1.42E 03	1.52E 03	1.00E 00	
5	0.13000	3.12E 03	2.97E 03	2.73E 03	2.46E 03	2.20E 03	1.96E 03	1.76E 03	1.60E 03	1.48E 03	1.56E 03	1.00E 00	
4	0.08500	3.20E 03	3.04E 03	2.80E 03	2.53E 03	2.25E 03	2.01E 03	1.80E 03	1.64E 03	1.52E 03	1.60E 03	1.00E 00	
3	0.04500	3.27E 03	3.09E 03	2.85E 03	2.57E 03	2.29E 03	2.04E 03	1.83E 03	1.67E 03	1.54E 03	1.62E 03	1.00E 00	
2	0.01250	3.35E 03	3.16E 03	2.90E 03	2.62E 03	2.32E 03	2.06E 03	1.85E 03	1.69E 03	1.56E 03	1.65E 03	1.00E 00	
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	1.386E-02
3	9.443E-02	9.531E-03
4	1.643E-01	6.273E-03

104	0.1046E 00	0.6729E-01	0.3311E-01	0.3271E-01	0.1113E-01	0.9499E 08	0.5403E 01	-0.6120E-02	0.1596E 02	0.1771E 04	0.2296E 04
105	0.1030E 00	0.6520E-01	0.3208E-01	0.3163E-01	0.1093E-01	0.9701E 08	0.5392E 01	-0.5929E-02	0.1597E 02	0.1772E 04	0.2305E 04
106	0.1014E 00	0.6304E-01	0.3107E-01	0.3056E-01	0.1070E-01	0.9956E 08	0.5382E 01	-0.5726E-02	0.1599E 02	0.1772E 04	0.2313E 04
107	0.9982E-01	0.6088E-01	0.3009E-01	0.2953E-01	0.1045E-01	0.1017E 09	0.5372E 01	-0.5509E-02	0.1601E 02	0.1773E 04	0.2321E 04
108	0.9830E-01	0.5877E-01	0.2915E-01	0.2865E-01	0.1024E-01	0.1091E 09	0.5360E 01	-0.5993E-02	0.1603E 02	0.1775E 04	0.2330E 04
109	0.9449E-01	0.6324E-01	0.2826E-01	0.2773E-01	0.1005E-01	0.1162E 09	0.5348E 01	-0.5921E-02	0.1604E 02	0.1776E 04	0.2337E 04
110	0.9344E-01	0.6040E-01	0.2740E-01	0.2651E-01	0.9911E-02	0.1221E 09	0.5336E 01	-0.5703E-02	0.1606E 02	0.1777E 04	0.2345E 04
111	0.9106E-01	0.5857E-01	0.2657E-01	0.2552E-01	0.9772E-02	0.1257E 09	0.5325E 01	-0.5374E-02	0.1608E 02	0.1778E 04	0.2353E 04
112	0.8949E-01	0.5590E-01	0.2579E-01	0.2447E-01	0.9458E-02	0.1183E 09	0.5315E 01	-0.5049E-02	0.1609E 02	0.1778E 04	0.2361E 04
113	0.8768E-01	0.5357E-01	0.2501E-01	0.2336E-01	0.9153E-02	0.1159E 09	0.5305E 01	-0.4712E-02	0.1611E 02	0.1779E 04	0.2368E 04
114	0.8597E-01	0.5130E-01	0.2425E-01	0.2237E-01	0.8870E-02	0.1160E 09	0.5295E 01	-0.4370E-02	0.1613E 02	0.1780E 04	0.2375E 04
115	0.8427E-01	0.4908E-01	0.2351E-01	0.2146E-01	0.8620E-02	0.1177E 09	0.5286E 01	-0.4023E-02	0.1614E 02	0.1781E 04	0.2382E 04
116	0.8261E-01	0.4687E-01	0.2281E-01	0.2059E-01	0.8395E-02	0.1190E 09	0.5277E 01	-0.3671E-02	0.1616E 02	0.1782E 04	0.2388E 04
117	0.8086E-01	0.4466E-01	0.2217E-01	0.1977E-01	0.8197E-02	0.1201E 09	0.5268E 01	-0.3314E-02	0.1617E 02	0.1783E 04	0.2394E 04
118	0.7911E-01	0.4249E-01	0.2159E-01	0.1894E-01	0.8032E-02	0.1214E 09	0.5261E 01	-0.2954E-02	0.1619E 02	0.1784E 04	0.2400E 04
119	0.7737E-01	0.4037E-01	0.2105E-01	0.1836E-01	0.7929E-02	0.1286E 09	0.5252E 01	-0.2873E-02	0.1621E 02	0.1785E 04	0.2406E 04
120	0.7424E-01	0.4307E-01	0.2053E-01	0.1763E-01	0.7816E-02	0.1343E 09	0.5244E 01	-0.2539E-02	0.1622E 02	0.1786E 04	0.2411E 04
121	0.7260E-01	0.4030E-01	0.2003E-01	0.1681E-01	0.7694E-02	0.1388E 09	0.5236E 01	-0.2174E-02	0.1623E 02	0.1788E 04	0.2417E 04
122	0.7045E-01	0.3875E-01	0.1954E-01	0.1610E-01	0.7558E-02	0.1406E 09	0.5230E 01	-0.1746E-02	0.1625E 02	0.1788E 04	0.2422E 04
123	0.6885E-01	0.3627E-01	0.1909E-01	0.1545E-01	0.7414E-02	0.1397E 09	0.5224E 01	-0.1326E-02	0.1626E 02	0.1789E 04	0.2426E 04
124	0.6714E-01	0.3414E-01	0.1868E-01	0.1478E-01	0.7267E-02	0.1388E 09	0.5219E 01	-0.8983E-03	0.1628E 02	0.1790E 04	0.2431E 04
125	0.6553E-01	0.3209E-01	0.1833E-01	0.1418E-01	0.7123E-02	0.1377E 09	0.5214E 01	-0.4844E-03	0.1629E 02	0.1791E 04	0.2435E 04
126	0.6396E-01	0.3020E-01	0.1801E-01	0.1358E-01	0.6996E-02	0.1380E 09	0.5210E 01	-0.8050E-04	0.1630E 02	0.1792E 04	0.2439E 04
127	0.6247E-01	0.2848E-01	0.1770E-01	0.1305E-01	0.6873E-02	0.1373E 09	0.5207E 01	0.3085E-03	0.1631E 02	0.1793E 04	0.2443E 04
128	0.6112E-01	0.2680E-01	0.1743E-01	0.1251E-01	0.6738E-02	0.1376E 09	0.5204E 01	0.6822E-03	0.1632E 02	0.1794E 04	0.2447E 04
129	0.5993E-01	0.2525E-01	0.1716E-01	0.1199E-01	0.6596E-02	0.1378E 09	0.5202E 01	0.1039E-02	0.1634E 02	0.1795E 04	0.2451E 04
130	0.5876E-01	0.2382E-01	0.1693E-01	0.1150E-01	0.6450E-02	0.1376E 09	0.5201E 01	0.1377E-02	0.1635E 02	0.1796E 04	0.2454E 04
131	0.5762E-01	0.2257E-01	0.1672E-01	0.1108E-01	0.6298E-02	0.1373E 09	0.5200E 01	0.1697E-02	0.1636E 02	0.1797E 04	0.2457E 04
132	0.5659E-01	0.2149E-01	0.1655E-01	0.1065E-01	0.6147E-02	0.1376E 09	0.5200E 01	0.1997E-02	0.1637E 02	0.1798E 04	0.2460E 04
133	0.5561E-01	0.2049E-01	0.1639E-01	0.1027E-01	0.5998E-02	0.1372E 09	0.5201E 01	0.2278E-02	0.1638E 02	0.1799E 04	0.2463E 04
134	0.5471E-01	0.1958E-01	0.1624E-01	0.9892E-02	0.5856E-02	0.1371E 09	0.5202E 01	0.2539E-02	0.1639E 02	0.1800E 04	0.2466E 04
135	0.5391E-01	0.1876E-01	0.1611E-01	0.9564E-02	0.5719E-02	0.1375E 09	0.5203E 01	0.2779E-02	0.1640E 02	0.1801E 04	0.2468E 04
136	0.5312E-01	0.1802E-01	0.1599E-01	0.9222E-02	0.5588E-02	0.1372E 09	0.5205E 01	0.3000E-02	0.1640E 02	0.1802E 04	0.2471E 04
137	0.5230E-01	0.1741E-01	0.1589E-01	0.8929E-02	0.5456E-02	0.1373E 09	0.5207E 01	0.3201E-02	0.1641E 02	0.1803E 04	0.2473E 04
138	0.5144E-01	0.1695E-01	0.1581E-01	0.8672E-02	0.5325E-02	0.1375E 09	0.5210E 01	0.3381E-02	0.1642E 02	0.1804E 04	0.2475E 04
139	0.5062E-01	0.1654E-01	0.1574E-01	0.8409E-02	0.5193E-02	0.1373E 09	0.5213E 01	0.3543E-02	0.1643E 02	0.1805E 04	0.2477E 04
140	0.4979E-01	0.1628E-01	0.1569E-01	0.8179E-02	0.5063E-02	0.1375E 09	0.5217E 01	0.3686E-02	0.1644E 02	0.1806E 04	0.2479E 04
141	0.4893E-01	0.1620E-01	0.1565E-01	0.8025E-02	0.4939E-02	0.1380E 09	0.5221E 01	0.3809E-02	0.1644E 02	0.1807E 04	0.2480E 04
142	0.4806E-01	0.1628E-01	0.1561E-01	0.7843E-02	0.4821E-02	0.1372E 09	0.5225E 01	0.3914E-02	0.1645E 02	0.1807E 04	0.2482E 04
143	0.4719E-01	0.1647E-01	0.1559E-01	0.7666E-02	0.4711E-02	0.1371E 09	0.5229E 01	0.4001E-02	0.1646E 02	0.1808E 04	0.2484E 04
144	0.4631E-01	0.1668E-01	0.1562E-01	0.7536E-02	0.4611E-02	0.1373E 09	0.5234E 01	0.4071E-02	0.1647E 02	0.1809E 04	0.2485E 04
145	0.4541E-01	0.1691E-01	0.1565E-01	0.7460E-02	0.4513E-02	0.1372E 09	0.5239E 01	0.4125E-02	0.1647E 02	0.1810E 04	0.2486E 04
146	0.4449E-01	0.1712E-01	0.1572E-01	0.7352E-02	0.4416E-02	0.1369E 09	0.5244E 01	0.4163E-02	0.1648E 02	0.1811E 04	0.2487E 04
147	0.4358E-01	0.1731E-01	0.1580E-01	0.7255E-02	0.4326E-02	0.1366E 09	0.5249E 01	0.4185E-02	0.1649E 02	0.1812E 04	0.2489E 04
148	0.4267E-01	0.1748E-01	0.1590E-01	0.7227E-02	0.4247E-02	0.1368E 09	0.5255E 01	0.4192E-02	0.1649E 02	0.1812E 04	0.2490E 04
149	0.4176E-01	0.1763E-01	0.1600E-01	0.7159E-02	0.4181E-02	0.1364E 09	0.5260E 01	0.4187E-02	0.1650E 02	0.1813E 04	0.2491E 04
150	0.4084E-01	0.1775E-01	0.1610E-01	0.7134E-02	0.4118E-02	0.1360E 09	0.5266E 01	0.4168E-02	0.1650E 02	0.1814E 04	0.2491E 04
151	0.3992E-01	0.1786E-01	0.1620E-01	0.7152E-02	0.4062E-02	0.1356E 09	0.5272E 01	0.4137E-02	0.1651E 02	0.1815E 04	0.2492E 04
152	0.3900E-01	0.1796E-01	0.1630E-01	0.7125E-02	0.4015E-02	0.1351E 09	0.5278E 01	0.4093E-02	0.1652E 02	0.1816E 04	0.2493E 04
153	0.3808E-01	0.1804E-01	0.1640E-01	0.7131E-02	0.3973E-02	0.1345E 09	0.5283E 01	0.4040E-02	0.1652E 02	0.1816E 04	0.2494E 04
154	0.3717E-01	0.1808E-01	0.1649E-01	0.7128E-02	0.3931E-02	0.1344E 09	0.5289E 01	0.3976E-02	0.1653E 02	0.1817E 04	0.2495E 04
155	0.3633E-01	0.1812E-01	0.1657E-01	0.7171E-02	0.3823E-02	0.1232E 09	0.5295E 01	0.3910E-02	0.1653E 02	0.1818E 04	0.2495E 04
156	0.3550E-01	0.1810E-01	0.1665E-01	0.7192E-02	0.3742E-02	0.1207E 09	0.5301E 01	0.3837E-02	0.1654E 02	0.1819E 04	0.2496E 04
157	0.3468E-01	0.1807E-01	0.1673E-01	0.7263E-02	0.3676E-02	0.1207E 09	0.5307E 01	0.3757E-02	0.1654E 02	0.1819E 04	0.2496E 04

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  9 0.25750   3.49E 05 3.51E 05 3.52E 05 3.53E 05 3.54E 05 3.55E 05 3.55E 05 3.56E 05 3.57E 05 3.57E 05      0.00
  8 0.24250   3.43E 05 3.45E 05 3.47E 05 3.48E 05 3.49E 05 3.50E 05 3.51E 05 3.52E 05 3.53E 05 3.54E 05      0.00
  7 0.21500   3.31E 05 3.35E 05 3.37E 05 3.40E 05 3.41E 05 3.43E 05 3.44E 05 3.46E 05 3.47E 05 3.48E 05      0.00
  6 0.17500   3.15E 05 3.20E 05 3.25E 05 3.28E 05 3.31E 05 3.33E 05 3.36E 05 3.37E 05 3.39E 05 3.41E 05      0.00
  5 0.13000   2.99E 05 3.07E 05 3.13E 05 3.18E 05 3.22E 05 3.25E 05 3.28E 05 3.30E 05 3.32E 05 3.34E 05      0.00
  4 0.08500   2.87E 05 2.97E 05 3.04E 05 3.10E 05 3.15E 05 3.18E 05 3.22E 05 3.25E 05 3.27E 05 3.30E 05      0.00
  3 0.04500   2.81E 05 2.91E 05 2.99E 05 3.06E 05 3.11E 05 3.15E 05 3.19E 05 3.22E 05 3.24E 05 3.27E 05      0.00
  2 0.01250   2.78E 05 2.89E 05 2.97E 05 3.04E 05 3.09E 05 3.14E 05 3.18E 05 3.21E 05 3.23E 05 3.26E 05      0.00
  1-0.01250       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS TURBULENCE ENERGY          -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0       I =      1         2         3         4         5         6         7         8         9        10        11        12
        X = -0.03148   0.03148   0.09443   0.16430   0.24187   0.32796   0.42352   0.52960   0.64735   0.77804   0.92311   1.08415
0 J     Y
 21 0.50500       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.49500       0.00      0.00      0.00      0.00 2.97E-03 2.49E-03 2.07E-03 1.79E-03 1.59E-03 1.47E-03 1.54E-03 1.95E-03
 19 0.47500       0.00      0.00      0.00      0.00 1.51E-02 1.44E-02 1.11E-02 8.49E-03 6.64E-03 5.57E-03 6.48E-03 9.57E-03
 18 0.44750       0.00      0.00      0.00      0.00 1.99E-02 1.48E-02 1.15E-02 9.16E-03 7.53E-03 7.30E-03 1.07E-02 1.54E-02
 17 0.42750       0.00      0.00      0.00 7.02E-03 1.16E-02 9.83E-03 8.59E-03 7.74E-03 7.29E-03 9.40E-03 1.48E-02 1.95E-02
 16 0.40625       0.00      0.00      0.00 2.27E-02 1.38E-02 9.94E-03 8.01E-03 7.21E-03 8.22E-03 1.35E-02 1.98E-02 2.38E-02
 15 0.38500       0.00      0.00      0.00 1.95E-02 1.15E-02 8.69E-03 7.27E-03 7.43E-03 1.18E-02 1.92E-02 2.50E-02 2.79E-02
 14 0.36500       0.00      0.00 8.79E-03 1.17E-02 9.65E-03 8.35E-03 7.70E-03 1.01E-02 1.75E-02 2.49E-02 2.96E-02 3.13E-02
 13 0.34625       0.00      0.00 2.57E-02 1.33E-02 1.00E-02 9.32E-03 9.94E-03 1.54E-02 2.36E-02 2.99E-02 3.33E-02 3.41E-02
 12 0.32750       0.00      0.00 2.08E-02 1.10E-02 1.01E-02 1.09E-02 1.40E-02 2.17E-02 2.92E-02 3.42E-02 3.65E-02 3.64E-02
 11 0.29750       0.00 1.25E-02 1.41E-02 9.26E-03 1.13E-02 1.49E-02 2.34E-02 3.17E-02 3.68E-02 3.96E-02 4.04E-02 3.93E-02
 10 0.27500       0.00 4.27E-02 1.63E-02 9.21E-03 1.42E-02 2.29E-02 3.07E-02 3.66E-02 4.03E-02 4.22E-02 4.23E-02 4.07E-02
  9 0.25750       0.00 4.53E-02 1.14E-02 8.64E-03 1.80E-02 2.81E-02 3.44E-02 3.90E-02 4.20E-02 4.34E-02 4.33E-02 4.14E-02
  8 0.24250   3.00E-02 9.97E-03 4.80E-03 9.27E-03 2.25E-02 3.17E-02 3.63E-02 4.01E-02 4.28E-02 4.41E-02 4.38E-02 4.18E-02
  7 0.21500   3.00E-02 9.94E-03 5.46E-03 1.28E-02 3.04E-02 3.57E-02 3.79E-02 4.11E-02 4.35E-02 4.45E-02 4.40E-02 4.19E-02
  6 0.17500   3.00E-02 9.96E-03 7.32E-03 2.14E-02 4.62E-02 3.64E-02 3.83E-02 4.10E-02 4.32E-02 4.41E-02 4.34E-02 4.13E-02
  5 0.13000   3.00E-02 1.00E-02 1.30E-02 4.15E-02 3.66E-02 3.57E-02 3.75E-02 3.98E-02 4.17E-02 4.25E-02 4.18E-02 3.98E-02
  4 0.08500   3.00E-02 1.03E-02 2.99E-02 6.46E-02 3.46E-02 3.50E-02 3.64E-02 3.83E-02 3.99E-02 4.06E-02 4.00E-02 3.82E-02
  3 0.04500   3.00E-02 1.15E-02 7.18E-02 4.97E-02 3.45E-02 3.45E-02 3.56E-02 3.72E-02 3.87E-02 3.94E-02 3.89E-02 3.72E-02
  2 0.01250   3.00E-02 1.98E-02 5.33E-02 4.54E-02 3.45E-02 3.43E-02 3.54E-02 3.70E-02 3.84E-02 3.91E-02 3.85E-02 3.69E-02
  1-0.01250       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
0       I =     13        14        15        16        17        18        19        20        21        22        23
        X =   1.26289   1.46130   1.68153   1.92598   2.19733   2.49852   2.83285   3.16718   3.50150   3.83583   4.17015
0 J     Y
 21 0.50500       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
 20 0.49500   2.33E-03 2.44E-03 2.35E-03 2.18E-03 2.00E-03 1.83E-03 1.70E-03 1.59E-03 1.50E-03 1.47E-03 3.00E-02
 19 0.47500   1.18E-02 1.21E-02 1.11E-02 9.43E-03 7.74E-03 6.23E-03 5.02E-03 4.12E-03 3.46E-03 3.52E-03 3.00E-02
 18 0.44750   1.78E-02 1.76E-02 1.58E-02 1.33E-02 1.08E-02 8.65E-03 6.91E-03 5.61E-03 4.64E-03 4.89E-03 3.00E-02
 17 0.42750   2.14E-02 2.06E-02 1.82E-02 1.52E-02 1.23E-02 9.84E-03 7.86E-03 6.38E-03 5.28E-03 5.68E-03 3.00E-02
 16 0.40625   2.48E-02 2.33E-02 2.03E-02 1.69E-02 1.36E-02 1.09E-02 8.68E-03 7.06E-03 5.86E-03 6.39E-03 3.00E-02
 15 0.38500   2.79E-02 2.56E-02 2.21E-02 1.83E-02 1.47E-02 1.17E-02 9.37E-03 7.64E-03 6.36E-03 6.98E-03 3.00E-02
 14 0.36500   3.04E-02 2.75E-02 2.35E-02 1.94E-02 1.56E-02 1.24E-02 9.92E-03 8.10E-03 6.76E-03 7.42E-03 3.00E-02
 13 0.34625   3.25E-02 2.91E-02 2.47E-02 2.03E-02 1.63E-02 1.29E-02 1.04E-02 8.47E-03 7.07E-03 7.76E-03 3.00E-02
 12 0.32750   3.42E-02 3.03E-02 2.57E-02 2.10E-02 1.68E-02 1.34E-02 1.07E-02 8.77E-03 7.34E-03 8.02E-03 3.00E-02
 11 0.29750   3.63E-02 3.19E-02 2.68E-02 2.19E-02 1.75E-02 1.39E-02 1.12E-02 9.16E-03 7.68E-03 8.30E-03 3.00E-02
 10 0.27500   3.74E-02 3.27E-02 2.74E-02 2.23E-02 1.79E-02 1.42E-02 1.14E-02 9.38E-03 7.87E-03 8.42E-03 3.00E-02
  9 0.25750   3.79E-02 3.30E-02 2.77E-02 2.26E-02 1.81E-02 1.44E-02 1.16E-02 9.50E-03 7.97E-03 8.46E-03 3.00E-02
  8 0.24250   3.81E-02 3.32E-02 2.78E-02 2.27E-02 1.82E-02 1.45E-02 1.17E-02 9.57E-03 8.04E-03 8.46E-03 3.00E-02
  7 0.21500   3.82E-02 3.32E-02 2.78E-02 2.27E-02 1.83E-02 1.46E-02 1.17E-02 9.65E-03 8.10E-03 8.40E-03 3.00E-02
  6 0.17500   3.77E-02 3.28E-02 2.75E-02 2.25E-02 1.81E-02 1.45E-02 1.17E-02 9.66E-03 8.12E-03 8.21E-03 3.00E-02
  5 0.13000   3.65E-02 3.19E-02 2.68E-02 2.20E-02 1.78E-02 1.44E-02 1.16E-02 9.59E-03 8.07E-03 7.95E-03 3.00E-02
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DIMENSIONLESS STREAMLINE PLOT

OITER NO	I--- ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	---I I--- FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D ---I
1	0.1031E-01	0.5975E-02	0.1857E 00	0.2804E-02	0.5508E-02	0.4766E 10	0.6454E 01	0.6346E-03	0.1102E 02	0.1165E 04	0.9597E 03
2	0.1030E-01	0.1534E 00	0.1616E 00	0.1839E-01	0.8486E-02	0.7190E 10	0.6456E 01	0.6544E-03	0.1103E 02	0.1347E 04	0.9597E 03
3	0.7791E-01	0.2200E 00	0.1452E 00	0.2851E-01	0.1025E-01	0.7882E 10	0.6457E 01	0.2855E-03	0.1103E 02	0.1534E 04	0.9596E 03
4	0.2046E 00	0.1976E 00	0.1336E 00	0.1916E-01	0.1072E-01	0.6360E 10	0.6457E 01	0.1847E-03	0.1104E 02	0.1524E 04	0.9597E 03
5	0.2141E 00	0.2127E 00	0.1265E 00	0.2178E-01	0.1167E-01	0.4419E 10	0.6457E 01	0.1798E-03	0.1104E 02	0.1498E 04	0.9597E 03
6	0.2351E 00	0.2178E 00	0.1224E 00	0.2372E-01	0.1282E-01	0.4815E 10	0.6458E 01	0.1865E-03	0.1105E 02	0.1460E 04	0.9598E 03
7	0.2473E 00	0.2210E 00	0.1201E 00	0.2526E-01	0.1353E-01	0.4804E 10	0.6458E 01	0.1961E-03	0.1106E 02	0.1421E 04	0.9599E 03
8	0.2540E 00	0.2244E 00	0.1185E 00	0.2667E-01	0.1399E-01	0.4929E 10	0.6459E 01	0.2072E-03	0.1106E 02	0.1385E 04	0.9600E 03
9	0.2602E 00	0.2257E 00	0.1175E 00	0.2765E-01	0.1429E-01	0.4564E 10	0.6459E 01	0.2172E-03	0.1107E 02	0.1352E 04	0.9601E 03
10	0.2655E 00	0.2254E 00	0.1165E 00	0.2875E-01	0.1453E-01	0.4028E 10	0.6460E 01	0.2285E-03	0.1107E 02	0.1324E 04	0.9602E 03
11	0.2687E 00	0.2252E 00	0.1160E 00	0.2949E-01	0.1478E-01	0.3516E 10	0.6460E 01	0.2399E-03	0.1108E 02	0.1300E 04	0.9603E 03
12	0.2716E 00	0.2259E 00	0.1155E 00	0.3027E-01	0.1509E-01	0.3282E 10	0.6461E 01	0.2515E-03	0.1108E 02	0.1281E 04	0.9604E 03
13	0.2749E 00	0.2250E 00	0.1151E 00	0.3105E-01	0.1547E-01	0.3120E 10	0.6462E 01	0.2630E-03	0.1109E 02	0.1266E 04	0.9606E 03
14	0.2773E 00	0.2228E 00	0.1146E 00	0.3180E-01	0.1591E-01	0.2996E 10	0.6462E 01	0.2756E-03	0.1109E 02	0.1256E 04	0.9607E 03
15	0.2791E 00	0.2200E 00	0.1147E 00	0.3280E-01	0.1645E-01	0.2895E 10	0.6463E 01	0.2884E-03	0.1110E 02	0.1249E 04	0.9609E 03
16	0.2802E 00	0.2166E 00	0.1150E 00	0.3356E-01	0.1703E-01	0.2806E 10	0.6464E 01	0.3016E-03	0.1111E 02	0.1245E 04	0.9611E 03
17	0.2811E 00	0.2136E 00	0.1152E 00	0.3409E-01	0.1765E-01	0.2725E 10	0.6464E 01	0.3155E-03	0.1111E 02	0.1243E 04	0.9613E 03
18	0.2816E 00	0.2099E 00	0.1152E 00	0.3458E-01	0.1842E-01	0.2649E 10	0.6465E 01	0.3284E-03	0.1112E 02	0.1243E 04	0.9614E 03
19	0.2815E 00	0.2068E 00	0.1153E 00	0.3480E-01	0.1922E-01	0.2577E 10	0.6466E 01	0.3419E-03	0.1112E 02	0.1244E 04	0.9616E 03
20	0.2809E 00	0.2040E 00	0.1153E 00	0.3500E-01	0.1995E-01	0.2507E 10	0.6467E 01	0.3548E-03	0.1113E 02	0.1245E 04	0.9618E 03
21	0.2800E 00	0.2016E 00	0.1153E 00	0.3488E-01	0.2051E-01	0.2439E 10	0.6467E 01	0.3686E-03	0.1113E 02	0.1247E 04	0.9620E 03
22	0.2791E 00	0.1988E 00	0.1152E 00	0.3449E-01	0.2105E-01	0.2372E 10	0.6468E 01	0.3813E-03	0.1114E 02	0.1250E 04	0.9622E 03
23	0.2780E 00	0.1959E 00	0.1150E 00	0.3381E-01	0.2157E-01	0.2304E 10	0.6469E 01	0.3932E-03	0.1115E 02	0.1252E 04	0.9624E 03
24	0.2774E 00	0.1929E 00	0.1147E 00	0.3349E-01	0.2196E-01	0.2236E 10	0.6470E 01	0.4050E-03	0.1115E 02	0.1255E 04	0.9627E 03
25	0.2765E 00	0.1904E 00	0.1144E 00	0.3285E-01	0.2223E-01	0.2165E 10	0.6471E 01	0.4159E-03	0.1116E 02	0.1258E 04	0.9629E 03
26	0.2745E 00	0.1876E 00	0.1139E 00	0.3240E-01	0.2259E-01	0.2094E 10	0.6472E 01	0.4259E-03	0.1116E 02	0.1261E 04	0.9631E 03
27	0.2716E 00	0.1845E 00	0.1134E 00	0.3170E-01	0.2278E-01	0.2023E 10	0.6473E 01	0.4345E-03	0.1117E 02	0.1263E 04	0.9634E 03
28	0.2693E 00	0.1809E 00	0.1129E 00	0.3069E-01	0.2285E-01	0.1955E 10	0.6474E 01	0.4409E-03	0.1117E 02	0.1266E 04	0.9636E 03
29	0.2661E 00	0.1774E 00	0.1123E 00	0.3062E-01	0.2307E-01	0.1889E 10	0.6475E 01	0.4465E-03	0.1118E 02	0.1268E 04	0.9639E 03
30	0.2632E 00	0.1745E 00	0.1117E 00	0.3057E-01	0.2327E-01	0.1817E 10	0.6476E 01	0.4487E-03	0.1119E 02	0.1269E 04	0.9642E 03
31	0.2600E 00	0.1720E 00	0.1111E 00	0.3068E-01	0.2336E-01	0.1740E 10	0.6477E 01	0.4492E-03	0.1119E 02	0.1271E 04	0.9645E 03
32	0.2558E 00	0.1689E 00	0.1104E 00	0.3054E-01	0.2350E-01	0.1660E 10	0.6478E 01	0.4453E-03	0.1120E 02	0.1272E 04	0.9648E 03
33	0.2518E 00	0.1654E 00	0.1098E 00	0.3061E-01	0.2381E-01	0.1577E 10	0.6479E 01	0.4383E-03	0.1120E 02	0.1273E 04	0.9652E 03
34	0.2480E 00	0.1616E 00	0.1090E 00	0.3079E-01	0.2418E-01	0.1491E 10	0.6480E 01	0.4269E-03	0.1121E 02	0.1274E 04	0.9656E 03
35	0.2439E 00	0.1582E 00	0.1082E 00	0.3115E-01	0.2454E-01	0.1404E 10	0.6481E 01	0.4105E-03	0.1122E 02	0.1275E 04	0.9660E 03
36	0.2396E 00	0.1552E 00	0.1074E 00	0.3133E-01	0.2495E-01	0.1326E 10	0.6482E 01	0.3872E-03	0.1122E 02	0.1275E 0	0.9664E 03
37	0.2352E 00	0.1524E 00	0.1065E 00	0.3145E-01	0.2545E-01	0.1248E 10	0.6483E 01	0.3575E-03	0.1123E 02	0.1275E 04	0.9669E 03
38	0.2309E 00	0.1490E 00	0.1058E 00	0.3183E-01	0.2595E-01	0.1166E 10	0.6484E 01	0.3198E-03	0.1123E 02	0.1276E 04	0.9674E 03
39	0.2267E 00	0.1456E 00	0.1052E 00	0.3228E-01	0.2641E-01	0.1082E 10	0.6485E 01	0.2738E-03	0.1124E 02	0.1276E 04	0.9680E 03
40	0.2222E 00	0.1423E 00	0.1045E 00	0.3291E-01	0.2694E-01	0.1003E 10	0.6486E 01	0.2176E-03	0.1124E 02	0.1276E 04	0.9687E 03
41	0.2175E 00	0.1395E 00	0.1037E 00	0.3331E-01	0.2739E-01	0.9180E 09	0.6487E 01	0.1507E-03	0.1125E 02	0.1275E 04	0.9694E 03
42	0.2131E 00	0.1353E 00	0.1031E 00	0.3353E-01	0.2774E-01	0.8309E 09	0.6488E 01	0.7538E-04	0.1126E 02	0.1275E 04	0.9701E 03
43	0.2082E 00	0.1315E 00	0.1027E 00	0.3386E-01	0.2807E-01	0.7455E 09	0.6488E 01	-0.7680E-05	0.1126E 02	0.1275E 04	0.9709E 03
44	0.2039E 00	0.1274E 00	0.1022E 00	0.3418E-01	0.2835E-01	0.6767E 09	0.6489E 01	-0.9840E-04	0.1127E 02	0.1275E 04	0.9718E 03
45	0.1997E 00	0.1237E 00	0.1017E 00	0.3456E-01	0.2853E-01	0.6121E 09	0.6489E 01	-0.1964E-03	0.1127E 02	0.1275E 04	0.9728E 03
46	0.1960E 00	0.1204E 00	0.1011E 00	0.3500E-01	0.2868E-01	0.5546E 09	0.6490E 01	-0.3031E-03	0.1128E 02	0.1275E 04	0.9738E 03
47	0.1925E 00	0.1174E 00	0.1006E 00	0.3544E-01	0.2881E-01	0.5156E 09	0.6490E 01	-0.4178E-03	0.1129E 02	0.1275E 04	0.9749E 03

20	0.06187	0.00	0.00	0.00	0.00	1.36E 03	1.39E 03	1.32E 03	1.31E 03	1.32E 03	1.34E 03	1.35E 03	1.36E 03		
19	0.05937	0.00	0.00	0.00	0.00	1.32E 03	1.36E 03	1.31E 03	1.29E 03	1.31E 03	1.32E 03	1.33E 03	1.34E 03		
18	0.05594	0.00	0.00	0.00	0.00	1.26E 03	1.33E 03	1.27E 03	1.27E 03	1.28E 03	1.30E 03	1.31E 03	1.31E 03		
17	0.05344	0.00	0.00	0.00	1.34E 03	1.25E 03	1.28E 03	1.25E 03	1.25E 03	1.26E 03	1.28E 03	1.29E 03	1.29E 03		
16	0.05078	0.00	0.00	0.00	1.26E 03	1.25E 03	1.24E 03	1.21E 03	1.22E 03	1.24E 03	1.26E 03	1.26E 03	1.26E 03		
15	0.04812	0.00	0.00	0.00	1.15E 03	1.21E 03	1.19E 03	1.18E 03	1.20E 03	1.22E 03	1.23E 03	1.23E 03	1.23E 03		
14	0.04562	0.00	0.00	1.37E 03	1.13E 03	1.16E 03	1.14E 03	1.14E 03	1.17E 03	1.19E 03	1.20E 03	1.20E 03	1.20E 03		
13	0.04328	0.00	0.00	1.25E 03	1.15E 03	1.12E 03	1.10E 03	1.11E 03	1.14E 03	1.16E 03	1.17E 03	1.17E 03	1.17E 03		
12	0.04094	0.00	0.00	1.08E 03	1.11E 03	1.07E 03	1.06E 03	1.08E 03	1.11E 03	1.13E 03	1.14E 03	1.14E 03	1.14E 03		
11	0.03719	0.00	1.03E 03	9.72E 02	1.02E 03	9.96E 02	9.93E 02	1.02E 03	1.05E 03	1.07E 03	1.08E 03	1.09E 03	1.09E 03		
10	0.03437	0.00	8.07E 02	9.37E 02	9.61E 02	9.40E 02	9.46E 02	9.76E 02	1.00E 03	1.02E 03	1.04E 03	1.04E 03	1.05E 03		
9	0.03219	0.00	5.68E 02	8.82E 02	9.11E 02	8.97E 02	9.12E 02	9.40E 02	9.65E 02	9.84E 02	9.99E 02	1.01E 03	1.02E 03		
8	0.03031	0.00	4.78E 02	8.21E 02	8.74E 02	8.64E 02	8.83E 02	9.07E 02	9.31E 02	9.51E 02	9.67E 02	9.82E 02	9.94E 02		
7	0.02687	0.00	5.24E 02	7.44E 02	8.09E 02	8.06E 02	8.26E 02	8.46E 02	8.68E 02	8.89E 02	9.10E 02	9.29E 02	9.47E 02		
6	0.02187	0.00	5.16E 02	6.57E 02	7.10E 02	7.28E 02	7.40E 02	7.57E 02	7.79E 02	8.03E 02	8.30E 02	8.57E 02	8.82E 02		
5	0.01625	0.00	4.43E 02	5.66E 02	6.03E 02	6.22E 02	6.47E 02	6.66E 02	6.90E 02	7.18E 02	7.51E 02	7.86E 02	8.19E 02		
4	0.01062	0.00	3.10E 02	4.61E 02	5.24E 02	5.43E 02	5.70E 02	5.95E 02	6.21E 02	6.53E 02	6.91E 02	7.31E 02	7.71E 02		
3	0.00562	0.00	1.24E 02	4.08E 02	4.61E 02	4.94E 02	5.25E 02	5.53E 02	5.81E 02	6.16E 02	6.56E 02	7.00E 02	7.43E 02		
2	0.00156	0.00	0.00	3.34E 02	4.33E 02	4.74E 02	5.08E 02	5.37E 02	5.67E 02	6.02E 02	6.43E 02	6.88E 02	7.33E 02		
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.37E 03	1.37E 03	1.38E 03	1.38E 03	1.37E 03	1.37E 03	1.36E 03	1.35E 03	1.35E 03	1.34E 03	0.00
19	0.05937	1.35E 03	1.35E 03	1.35E 03	1.35E 03	1.34E 03	1.34E 03	1.33E 03	1.33E 03	1.32E 03	1.31E 03	0.00
18	0.05594	1.31E 03	1.31E 03	1.31E 03	1.31E 03	1.30E 03	1.30E 03	1.29E 03	1.29E 03	1.28E 03	1.28E 03	0.00
17	0.05344	1.29E 03	1.29E 03	1.28E 03	1.28E 03	1.27E 03	1.27E 03	1.26E 03	1.26E 03	1.25E 03	1.25E 03	0.00
16	0.05078	1.26E 03	1.25E 03	1.25E 03	1.25E 03	1.24E 03	1.24E 03	1.23E 03	1.23E 03	1.22E 03	1.22E 03	0.00
15	0.04812	1.23E 03	1.22E 03	1.22E 03	1.21E 03	1.21E 03	1.21E 03	1.20E 03	1.20E 03	1.20E 03	1.19E 03	0.00
14	0.04562	1.20E 03	1.19E 03	1.19E 03	1.19E 03	1.18E 03	1.18E 03	1.18E 03	1.17E 03	1.17E 03	1.17E 03	0.00
13	0.04328	1.17E 03	1.17E 03	1.16E 03	1.16E 03	1.16E 03	1.15E 03	1.15E 03	1.15E 03	1.15E 03	1.15E 03	0.00
12	0.04094	1.14E 03	1.14E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	1.13E 03	0.00
11	0.03719	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	1.09E 03	0.00
10	0.03437	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.06E 03	1.07E 03	1.07E 03	1.07E 03	1.07E 03	0.00
9	0.03219	1.03E 03	1.03E 03	1.04E 03	1.04E 03	1.04E 03	1.04E 03	1.05E 03	1.05E 03	1.05E 03	1.06E 03	0.00
8	0.03031	1.00E 03	1.01E 03	1.02E 03	1.02E 03	1.02E 03	1.03E 03	1.03E 03	1.04E 03	1.04E 03	1.04E 03	0.00
7	0.02687	9.62E 02	9.73E 02	9.82E 02	9.89E 02	9.96E 02	1.00E 03	1.01E 03	1.01E 03	1.02E 03	1.02E 03	0.00
6	0.02187	9.04E 02	9.22E 02	9.36E 02	9.48E 02	9.58E 02	9.67E 02	9.74E 02	9.81E 02	9.87E 02	9.93E 02	0.00
5	0.01625	8.49E 02	8.74E 02	8.94E 02	9.10E 02	9.24E 02	9.35E 02	9.45E 02	9.54E 02	9.62E 02	9.69E 02	0.00
4	0.01062	8.07E 02	8.37E 02	8.62E 02	8.82E 02	8.99E 02	9.12E 02	9.24E 02	9.34E 02	9.43E 02	9.52E 02	0.00
3	0.00562	7.83E 02	8.17E 02	8.44E 02	8.67E 02	8.85E 02	9.00E 02	9.13E 02	9.24E 02	9.33E 02	9.42E 02	0.00
2	0.00156	7.74E 02	8.09E 02	8.38E 02	8.61E 02	8.80E 02	8.95E 02	9.09E 02	9.20E 02	9.29E 02	9.39E 02	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- PRESSURE -*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	2.05E-02	1.67E-02	4.42E-02	5.15E-02	4.87E-02	4.51E-02	4.52E-02	4.80E-02
19	0.05937	0.00	0.00	0.00	0.00	2.63E-02	1.80E-02	4.38E-02	5.00E-02	4.72E-02	4.34E-02	4.21E-02	4.34E-02
18	0.05594	0.00	0.00	0.00	0.00	3.78E-02	2.21E-02	4.42E-02	4.82E-02	4.46E-02	4.00E-02	3.72E-02	3.63E-02
17	0.05344	0.00	0.00	0.00	-1.09E-02	3.30E-02	2.93E-02	4.57E-02	4.70E-02	4.26E-02	3.70E-02	3.31E-02	3.06E-02
16	0.05078	0.00	0.00	0.00	3.25E-03	2.45E-02	3.50E-02	4.70E-02	4.56E-02	3.98E-02	3.34E-02	2.82E-02	2.42E-02

14	0.36500	0.00	0.00	8.62E-01	7.50E-01	6.41E-01	6.03E-01	6.20E-01	6.60E-01	6.94E-01	7.12E-01	7.17E-01	7.15E-01
13	0.34625	0.00	0.00	8.93E-01	7.50E-01	6.31E-01	6.00E-01	6.35E-01	6.83E-01	7.14E-01	7.24E-01	7.21E-01	7.12E-01
12	0.32750	0.00	0.00	9.33E-01	7.50E-01	6.22E-01	6.02E-01	6.53E-01	7.04E-01	7.28E-01	7.31E-01	7.21E-01	7.05E-01
11	0.29750	0.00	1.21E 00	9.97E-01	7.49E-01	6.11E-01	6.13E-01	6.84E-01	7.26E-01	7.38E-01	7.29E-01	7.09E-01	6.86E-01
10	0.27500	0.00	1.27E 00	1.01E 00	7.30E-01	5.96E-01	6.29E-01	6.97E-01	7.29E-01	7.32E-01	7.16E-01	6.92E-01	6.64E-01
9	0.25750	0.00	1.35E 00	1.02E 00	7.10E-01	5.87E-01	6.39E-01	6.98E-01	7.22E-01	7.19E-01	7.00E-01	6.73E-01	6.43E-01
8	0.24250	1.73E 00	1.43E 00	1.01E 00	6.87E-01	5.83E-01	6.43E-01	6.93E-01	7.10E-01	7.03E-01	6.82E-01	6.53E-01	6.22E-01
7	0.21500	1.73E 00	1.41E 00	9.72E-01	6.50E-01	5.79E-01	6.35E-01	6.66E-01	6.73E-01	6.61E-01	6.38E-01	6.08E-01	5.77E-01
6	0.17500	1.73E 00	1.35E 00	8.85E-01	5.86E-01	5.59E-01	5.84E-01	5.91E-01	5.89E-01	5.75E-01	5.53E-01	5.25E-01	4.96E-01
5	0.13000	1.73E 00	1.25E 00	7.51E-01	4.85E-01	4.81E-01	4.76E-01	4.70E-01	4.63E-01	4.51E-01	4.33E-01	4.11E-01	3.86E-01
4	0.08500	1.73E 00	1.10E 00	5.58E-01	3.52E-01	3.42E-01	3.31E-01	3.21E-01	3.14E-01	3.06E-01	2.94E-01	2.79E-01	2.62E-01
3	0.04500	1.73E 00	8.84E-01	1.53E-01	2.06E-01	1.90E-01	1.82E-01	1.75E-01	1.71E-01	1.66E-01	1.60E-01	1.52E-01	1.42E-01
2	0.01250	1.73E 00	2.46E-01	4.25E-02	5.72E-02	5.26E-02	5.05E-02	4.87E-02	4.74E-02	4.62E-02	4.44E-02	4.22E-02	3.95E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		6.88E-01	7.30E-01	7.59E-01	7.74E-01	7.77E-01	7.69E-01	7.55E-01	7.37E-01	7.17E-01	7.05E-01	0.00
19	0.47500		7.19E-01	7.56E-01	7.82E-01	7.97E-01	8.03E-01	8.01E-01	7.95E-01	7.85E-01	7.74E-01	7.63E-01	0.00
18	0.44750		7.27E-01	7.54E-01	7.73E-01	7.83E-01	7.87E-01	7.85E-01	7.79E-01	7.71E-01	7.61E-01	7.51E-01	0.00
17	0.42750		7.27E-01	7.47E-01	7.60E-01	7.67E-01	7.67E-01	7.64E-01	7.57E-01	7.49E-01	7.39E-01	7.29E-01	0.00
16	0.40625		7.25E-01	7.37E-01	7.44E-01	7.46E-01	7.43E-01	7.38E-01	7.30E-01	7.21E-01	7.11E-01	7.00E-01	0.00
15	0.38500		7.20E-01	7.24E-01	7.25E-01	7.22E-01	7.17E-01	7.09E-01	7.00E-01	6.90E-01	6.80E-01	6.69E-01	0.00
14	0.36500		7.13E-01	7.10E-01	7.05E-01	6.99E-01	6.90E-01	6.81E-01	6.70E-01	6.60E-01	6.49E-01	6.38E-01	0.00
13	0.34625		7.03E-01	6.94E-01	6.85E-01	6.75E-01	6.64E-01	6.53E-01	6.41E-01	6.30E-01	6.19E-01	6.08E-01	0.00
12	0.32750		6.90E-01	6.76E-01	6.63E-01	6.50E-01	6.37E-01	6.24E-01	6.12E-01	6.00E-01	5.88E-01	5.77E-01	0.00
11	0.29750		6.63E-01	6.43E-01	6.24E-01	6.06E-01	5.90E-01	5.76E-01	5.62E-01	5.50E-01	5.38E-01	5.27E-01	0.00
10	0.27500		6.38E-01	6.13E-01	5.91E-01	5.71E-01	5.54E-01	5.38E-01	5.24E-01	5.11E-01	5.00E-01	4.89E-01	0.00
9	0.25750		6.14E-01	5.87E-01	5.63E-01	5.42E-01	5.24E-01	5.08E-01	4.93E-01	4.81E-01	4.69E-01	4.59E-01	0.00
8	0.24250		5.92E-01	5.63E-01	5.38E-01	5.17E-01	4.98E-01	4.82E-01	4.67E-01	4.55E-01	4.43E-01	4.33E-01	0.00
7	0.21500		5.45E-01	5.16E-01	4.90E-01	4.67E-01	4.48E-01	4.32E-01	4.18E-01	4.06E-01	3.95E-01	3.85E-01	0.00
6	0.17500		4.66E-01	4.37E-01	4.12E-01	3.90E-01	3.72E-01	3.57E-01	3.44E-01	3.33E-01	3.24E-01	3.15E-01	0.00
5	0.13000		3.61E-01	3.37E-01	3.15E-01	2.97E-01	2.82E-01	2.69E-01	2.59E-01	2.50E-01	2.42E-01	2.35E-01	0.00
4	0.08500		2.44E-01	2.27E-01	2.11E-01	1.98E-01	1.87E-01	1.78E-01	1.71E-01	1.65E-01	1.60E-01	1.55E-01	0.00
3	0.04500		1.32E-01	1.23E-01	1.14E-01	1.07E-01	1.01E-01	9.59E-02	9.18E-02	8.85E-02	8.55E-02	8.30E-02	0.00
2	0.01250		3.68E-02	3.41E-02	3.17E-02	2.96E-02	2.80E-02	2.66E-02	2.55E-02	2.46E-02	2.37E-02	2.30E-02	0.00
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0C	0.00	0.00	0.00

0*- DIMENSIONLESS STREAMLINE COORDS -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y												
11	1.00000		0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000		0.00	2.37E-01	2.94E-01	3.62E-01	4.25E-01	4.79E-01	4.86E-01	4.87E-01	4.86E-01	4.85E-01	4.84E-01	4.83E-01
9	0.80000		0.00	2.23E-01	2.75E-01	3.49E-01	4.12E-01	4.62E-01	4.73E-01	4.74E-01	4.73E-01	4.71E-01	4.69E-01	4.67E-01
8	0.70000		0.00	2.09E-01	2.55E-01	3.33E-01	3.99E-01	4.46E-01	4.60E-01	4.62E-01	4.60E-01	4.57E-01	4.54E-01	4.50E-01
7	0.60000		0.00	1.93E-01	2.37E-01	3.15E-01	3.84E-01	4.32E-01	4.48E-01	4.50E-01	4.47E-01	4.43E-01	4.37E-01	4.32E-01
6	0.50000		0.00	1.77E-01	2.19E-01	2.96E-01	3.69E-01	4.18E-01	4.35E-01	4.37E-01	4.34E-01	4.28E-01	4.20E-01	4.12E-01
5	0.40000		0.00	1.57E-01	1.99E-01	2.76E-01	3.53E-01	4.04E-01	4.23E-01	4.24E-01	4.19E-01	4.11E-01	4.01E-01	3.91E-01
4	0.30000		0.00	1.36E-01	1.78E-01	2.54E-01	3.36E-01	3.89E-01	4.09E-01	4.11E-01	4.04E-01	3.93E-01	3.80E-01	3.67E-01
3	0.20000		0.00	1.10E-01	1.52E-01	2.31E-01	3.17E-01	3.73E-01	3.95E-01	3.95E-01	3.86E-01	3.71E-01	3.54E-01	3.37E-01
2	0.10000		0.00	7.75E-02	1.21E-01	2.02E-01	2.95E-01	3.56E-01	3.79E-01	3.78E-01	3.65E-01	3.43E-01	3.20E-01	2.98E-01
1	0.00000		0.00	0.00	5.39E-02	1.63E-01	2.69E-01	3.35E-01	3.60E-01	3.56E-01	3.33E-01	3.01E-01	2.66E-01	2.21E-01

0		I =	13	14	15	16	17	18	19	20	21	22	23

RADIAL POSITION 2R/D

```
0          0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.....+.....+.2.....+4.....6+....8....1.....+.....+.....+.....+.....+.....   0.00
 X  0.02   .         0                   2         4         6         8         1                                .   0.02
 X  0.04   .                             0                   2         4         6         8         1            .   0.04
 X  0.06   .                                                 0                   2         4         6         8    .   0.06
 X  0.08   .                                                                     0                   2         4    1   0.08
 X  0.10   +                                                                               0                   2    1   0.10
 X  0.12   .                                                                               0                   2    1   0.12
 X  0.14   .                                                                     0                   2         4    1   0.14
 X  0.16   .                                                                                                        .   0.16
 X  0.18   .                                                           0                   2         4         6    1   0.18
 X  0.20   +                                                                                                        +   0.20
 X  0.22   .                                                 0                   2         4         6         8    1   0.22
 X  0.24   .                                                                                                        .   0.24
 X  0.26   .                                       0                   2         4         6         8              1   0.26
 X  0.28   .                                                                                                        .   0.28
 X  0.30   +                             0                   2         4         6         8                        1   0.30
 X  0.32   .                                                                                                        .   0.32
 X  0.34   .         0                             2                   4         6         8                        1   0.34
 X  0.36   .                                                                                                        .   0.36
 X  0.38   .                                                                                                        .   0.38
 X  0.40   0                                               2                   4         6         8                  1   0.40
 X  0.42   .                                                                                                        .   0.42
 X  0.44   .                                                                                                        .   0.44
 X  0.46   0                                         2                   4         6         8                        1   0.46
 X  0.48   .                                                                                                        .   0.48
```

```
  4 0.01062 -1.52E 00-2.38E-02 1.18E 00 2.09E 00 2.74E 00 3.19E 00 3.50E 00 3.67E 00 3.77E 00 3.79E 00 3.79E 00
  3 0.00562 -2.27E 00-6.60E-01 6.55E-01 1.65E 00 2.38E 00 2.88E 00 3.23E 00 3.43E 00 3.53E 00 3.56E 00 3.56E 00
  2 0.00156 -2.55E 00-8.92E-01 4.62E-01 1.49E 00 2.25E 00 2.77E 00 3.13E 00 3.34E 00 3.45E 00 3.48E 00 3.48E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 1.51E 00 1.02E 00 1.34E-01-1.17E-01-1.28E-01-9.74E-02-8.24E-02-6.78E-02
 19 0.05766      0.00     0.00     0.00     0.00 5.17E 00 2.26E 00 2.31E-01-3.60E-01-3.93E-01-3.23E-01-2.61E-01-1.98E-01
 18 0.05469      0.00     0.00     0.00     0.00 1.03E 01 3.07E 00 1.06E-01-7.35E-01-7.66E-01-6.14E-01-4.66E-01-3.37E-01
 17 0.05211      0.00     0.00     0.00 6.35E 00 1.01E 01 3.28E 00-1.84E-01-1.16E 00-1.13E 00-8.72E-01-6.40E-01-4.56E-01
 16 0.04945      0.00     0.00     0.00 1.24E 01 1.06E 01 3.33E 00-5.48E-01-1.61E 00-1.48E 00-1.10E 00-7.98E-01-5.70E-01
 15 0.04687      0.00     0.00     0.00 1.87E 01 1.09E 01 3.04E 00-1.01E 00-1.58E 00-1.72E 00-1.27E 00-9.23E-01-6.67E-01
 14 0.04445      0.00     0.00 8.55E 00 1.77E 01 1.05E 01 2.42E 00-1.46E 00-2.22E 00-1.86E 00-1.37E 00-1.01E 00-7.44E-01
 13 0.04211      0.00     0.00 1.53E 01 1.79E 01 9.91E 00 1.75E 00-1.77E 00-2.32E 00-1.91E 00-1.43E 00-1.08E 00-8.05E-01
 12 0.03906      0.00     0.00 2.38E 01 1.83E 01 8.80E 00 7.73E-01-2.01E 00-2.30E 00-1.90E 00-1.46E 00-1.14E 00-8.69E-01
 11 0.03578      0.00 1.08E 01 2.37E 01 1.80E 01 6.57E 00-1.76E-01-1.91E 00-2.09E 00-1.78E 00-1.43E 00-1.15E 00-9.05E-01
 10 0.03328      0.00 1.78E 01 2.49E 01 1.73E 01 4.68E 00-5.85E-01-1.73E 00-1.89E 00-1.66E 00-1.38E 00-1.15E 00-9.16E-01
  9 0.03125      0.00 2.42E 01 2.57E 01 1.62E 01 3.21E 00-7.57E-01-1.55E 00-1.70E 00-1.55E 00-1.33E 00-1.13E 00-9.14E-01
  8 0.02859      0.00 2.35E 01 2.58E 01 1.43E 01 1.50E 00-8.71E-01-1.31E 00-1.46E 00-1.39E 00-1.25E 00-1.09E 00-9.01E-01
  7 0.02437      0.00 2.32E 01 2.50E 01 1.00E 01-5.52E-01-8.72E-01-9.64E-01-1.09E 00-1.13E 00-1.10E 00-1.00E 00-8.49E-01
  6 0.01906      0.00 2.35E 01 2.20E 01 2.55E 00-8.92E-01-7.52E-01-6.48E-01-7.19E-01-8.28E-01-8.73E-01-8.38E-01-7.29E-01
  5 0.01344      0.00 2.35E 01 1.40E 01-1.74E 00-9.91E-01-6.00E-01-4.20E-01-4.38E-01-5.41E-01-6.16E-01-6.21E-01-5.50E-01
  4 0.00812      0.00 2.09E 01 2.21E 00-8.47E-01-6.74E-01-3.96E-01-2.48E-01-2.42E-01-3.10E-01-3.70E-01-3.86E-01-3.46E-01
  3 0.00359      0.00 1.15E 01-1.05E 00-4.35E-01-3.14E-01-1.82E-01-1.09E-01-1.03E-01-1.34E-01-1.63E-01-1.72E-01-1.56E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062 -4.63E-02-2.58E-02-1.19E-02-4.53E-03-1.37E-03-5.70E-04 1.65E-04 4.79E-04 2.01E-03 3.49E-05     0.00
 19 0.05766 -1.30E-01-7.31E-02-3.49E-02-1.36E-02-3.22E-03 9.00E-04 4.02E-03 5.57E-03 7.02E-03 3.92E-05     0.00
 18 0.05469 -2.20E-01-1.27E-01-6.43E-02-2.85E-02-1.01E-02-1.60E-03 4.67E-03 7.97E-03 1.00E-02 3.92E-05     0.00
 17 0.05211 -2.99E-01-1.76E-01-9.31E-02-4.48E-02-1.89E-02-6.12E-03 3.21E-03 8.22E-03 1.13E-02 4.83E-05     0.00
 16 0.04945 -3.78E-01-2.27E-01-1.25E-01-6.39E-02-3.03E-02-1.27E-02 5.90E-06 6.94E-03 1.15E-02 6.76E-05     0.00
 15 0.04687 -4.49E-01-2.76E-01-1.57E-01-8.40E-02-4.28E-02-2.04E-02-4.25E-03 4.65E-03 1.09E-02 9.26E-05     0.00
 14 0.04445 -5.09E-01-3.19E-01-1.86E-01-1.03E-01-5.51E-02-2.83E-02-8.88E-03 1.91E-03 9.83E-03 1.17E-04     0.00
 13 0.04211 -5.60E-01-3.57E-01-2.13E-01-1.21E-01-6.71E-02-3.60E-02-1.36E-02-1.06E-03 8.47E-03 1.38E-04     0.00
 12 0.03906 -6.17E-01-4.02E-01-2.46E-01-1.44E-01-8.23E-02-4.61E-02-1.99E-02-5.12E-03 6.42E-03 1.53E-04     0.00
 11 0.03578 -6.56E-01-4.37E-01-2.73E-01-1.64E-01-9.60E-02-5.53E-02-2.60E-02-9.23E-03 4.08E-03 1.45E-04     0.00
 10 0.03328 -6.74E-01-4.55E-01-2.88E-01-1.76E-01-1.05E-01-6.12E-02-3.01E-02-1.20E-02 2.37E-03 1.22E-04     0.00
  9 0.03125 -6.80E-01-4.64E-01-2.97E-01-1.83E-01-1.10E-01-6.50E-02-3.28E-02-1.40E-02 1.08E-03 9.66E-05     0.00
  8 0.02859 -6.80E-01-4.70E-01-3.05E-01-1.90E-01-1.15E-01-6.91E-02-3.58E-02-1.62E-02-4.94E-04 6.01E-05     0.00
  7 0.02437 -6.54E-01-4.61E-01-3.04E-01-1.92E-01-1.18E-01-7.17E-02-3.83E-02-1.85E-02-2.47E-03 1.25E-05     0.00
  6 0.01906 -5.73E-01-4.12E-01-2.77E-01-1.78E-01-1.10E-01-6.74E-02-3.69E-02-1.86E-02-3.79E-03-1.85E-05     0.00
  5 0.01344 -4.40E-01-3.21E-01-2.18E-01-1.42E-01-8.85E-02-5.43E-02-3.02E-02-1.56E-02-3.81E-03-2.33E-05     0.00
  4 0.00812 -2.79E-01-2.05E-01-1.41E-01-9.20E-02-5.77E-02-3.55E-02-1.99E-02-1.04E-02-2.76E-03-1.35E-05     0.00
  3 0.00359 -1.26E-01-9.30E-02-6.38E-02-4.19E-02-2.63E-02-1.62E-02-9.11E-03-4.79E-03-1.32E-03-4.40E-06     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
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V VELOCITY

W VELOCITY

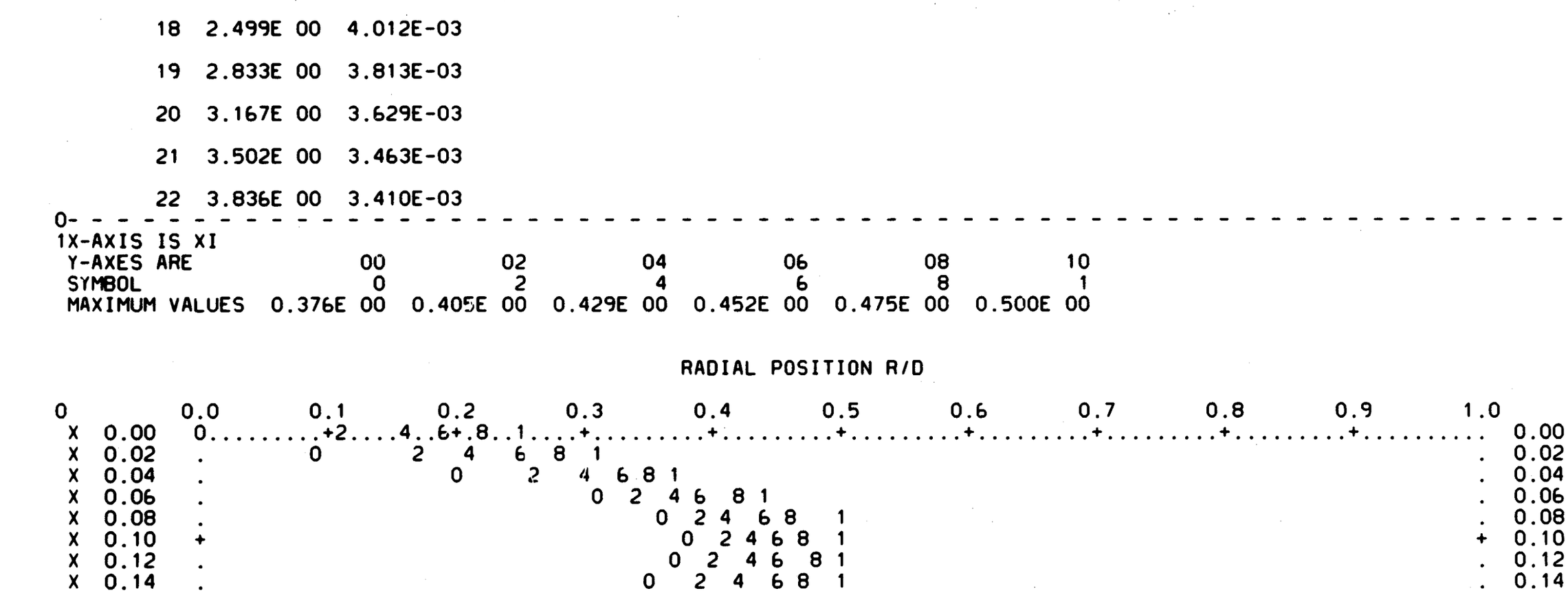
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0 J		Y												
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		0.00	0.00	0.00	0.00	0.00	2.70E-01	4.74E-01	5.04E-01	4.75E-01	4.40E-01	4.11E-01	3.83E-01
19	0.47500		0.00	0.00	0.00	0.00	0.00	4.01E-01	5.47E-01	5.60E-01	5.23E-01	4.79E-01	4.38E-01	4.01E-01
18	0.44750		0.00	0.00	0.00	0.00	0.00	5.40E-01	6.26E-01	6.07E-01	5.52E-01	4.93E-01	4.41E-01	4.01E-01
17	0.42750		0.00	0.00	0.00	0.00	7.39E-01	6.51E-01	6.59E-01	6.12E-01	5.43E-01	4.78E-01	4.29E-01	3.92E-01
16	0.40625		0.00	0.00	0.00	0.00	6.45E-01	6.33E-01	6.16E-01	5.62E-01	4.97E-01	4.43E-01	4.05E-01	3.76E-01
15	0.38500		0.00	0.00	0.00	0.00	6.48E-01	6.15E-01	5.47E-01	4.78E-01	4.28E-01	3.96E-01	3.73E-01	3.54E-01
14	0.36500		0.00	0.00	0.00	9.51E-01	7.04E-01	5.66E-01	4.46E-01	3.80E-01	3.56E-01	3.47E-01	3.39E-01	3.29E-01
13	0.34625		0.00	0.00	0.00	7.20E-01	6.12E-01	4.51E-01	3.26E-01	2.85E-01	2.89E-01	3.00E-01	3.05E-01	3.02E-01
12	0.32750		0.00	0.00	0.00	6.35E-01	5.46E-01	3.43E-01	2.10E-01	1.97E-01	2.27E-01	2.54E-01	2.68E-01	2.74E-01
11	0.29750		0.00	0.00	8.22E-01	6.42E-01	4.60E-01	1.58E-01	4.52E-02	8.01E-02	1.37E-01	1.80E-01	2.08E-01	2.24E-01
10	0.27500		0.00	0.00	6.35E-01	5.72E-01	3.28E-01	1.57E-02	-4.20E-02	1.02E-02	7.56E-02	1.27E-01	1.61E-01	1.84E-01
9	0.25750		0.00	0.00	6.46E-01	5.36E-01	2.19E-01	-6.96E-02	-9.38E-02	-3.63E-02	3.16E-02	8.58E-02	1.25E-01	1.53E-01
8	0.24250		0.00	1.00E 00	7.25E-01	5.00E-01	1.23E-01	-1.24E-01	-1.30E-01	-7.16E-02	-4.02E-03	5.18E-02	9.38E-02	1.26E-01
7	0.21500		0.00	1.00E 00	7.52E-01	4.32E-01	-2.05E-02	-1.92E-01	-1.80E-01	-1.27E-01	-6.41E-02	-7.99E-03	3.84E-02	7.72E-02
6	0.17500		0.00	1.00E 00	7.32E-01	2.76E-01	-2.46E-01	-2.56E-01	-2.33E-01	-1.93E-01	-1.41E-01	-8.74E-02	-3.72E-02	9.55E-03
5	0.13000		0.00	1.00E 00	6.18E-01	-7.95E-02	-3.21E-01	-3.08E-01	-2.82E-01	-2.51E-01	-2.11E-01	-1.63E-01	-1.10E-01	-5.67E-02
4	0.08500		0.00	1.00E 00	3.35E-01	-4.87E-01	-3.98E-01	-3.52E-01	-3.20E-01	-2.93E-01	-2.61E-01	-2.18E-01	-1.65E-01	-1.07E-01
3	0.04500		0.00	1.00E 00	-2.70E-01	-4.96E-01	-4.34E-01	-3.79E-01	-3.42E-01	-3.16E-01	-2.88E-01	-2.49E-01	-1.96E-01	-1.36E-01
2	0.01250		0.00	1.00E 00	-6.85E-01	-5.23E-01	-4.48E-01	-3.89E-01	-3.50E-01	-3.25E-01	-2.98E-01	-2.59E-01	-2.07E-01	-1.46E-01
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299
0 J		Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		3.58E-01	3.39E-01	3.27E-01	3.21E-01	3.18E-01	3.18E-01	3.17E-01	3.17E-01	3.18E-01	3.19E-01	3.19E-01
19	0.47500		3.72E-01	3.51E-01	3.38E-01	3.31E-01	3.28E-01	3.27E-01	3.28E-01	3.29E-01	3.32E-01	3.34E-01	3.34E-01
18	0.44750		3.71E-01	3.50E-01	3.36E-01	3.27E-01	3.22E-01	3.19E-01	3.18E-01	3.19E-01	3.20E-01	3.21E-01	3.21E-01
17	0.42750		3.65E-01	3.44E-01	3.30E-01	3.21E-01	3.15E-01	3.11E-01	3.09E-01	3.08E-01	3.08E-01	3.08E-01	3.08E-01
16	0.40625		3.53E-01	3.35E-01	3.21E-01	3.12E-01	3.05E-01	3.01E-01	2.98E-01	2.96E-01	2.95E-01	2.95E-01	2.95E-01
15	0.38500		3.36E-01	3.21E-01	3.09E-01	3.00E-01	2.94E-01	2.89E-01	2.85E-01	2.83E-01	2.82E-01	2.81E-01	2.81E-01
14	0.36500		3.17E-01	3.06E-01	2.96E-01	2.88E-01	2.82E-01	2.77E-01	2.73E-01	2.71E-01	2.69E-01	2.68E-01	2.68E-01
13	0.34625		2.96E-01	2.89E-01	2.82E-01	2.75E-01	2.69E-01	2.65E-01	2.61E-01	2.59E-01	2.57E-01	2.56E-01	2.56E-01
12	0.32750		2.73E-01	2.70E-01	2.66E-01	2.61E-01	2.56E-01	2.52E-01	2.49E-01	2.47E-01	2.45E-01	2.44E-01	2.44E-01
11	0.29750		2.33E-01	2.36E-01	2.37E-01	2.36E-01	2.34E-01	2.32E-01	2.30E-01	2.28E-01	2.26E-01	2.25E-01	2.25E-01
10	0.27500		2.00E-01	2.09E-01	2.14E-01	2.16E-01	2.16E-01	2.16E-01	2.15E-01	2.14E-01	2.13E-01	2.12E-01	2.11E-01
9	0.25750		1.74E-01	1.88E-01	1.96E-01	2.01E-01	2.03E-01	2.03E-01	2.03E-01	2.03E-01	2.02E-01	2.01E-01	2.01E-01
8	0.24250		1.51E-01	1.69E-01	1.80E-01	1.87E-01	1.91E-01	1.93E-01	1.94E-01	1.94E-01	1.94E-01	1.93E-01	1.93E-01
7	0.21500		1.09E-01	1.34E-01	1.51E-01	1.63E-01	1.70E-01	1.74E-01	1.77E-01	1.78E-01	1.78E-01	1.78E-01	1.78E-01
6	0.17500		5.12E-02	8.53E-02	1.11E-01	1.29E-01	1.41E-01	1.49E-01	1.54E-01	1.57E-01	1.58E-01	1.58E-01	1.58E-01
5	0.13000		-6.42E-03	3.67E-02	7.05E-02	9.53E-02	1.13E-01	1.25E-01	1.33E-01	1.37E-01	1.39E-01	1.40E-01	1.40E-01
4	0.08500		-5.07E-02	-7.92E-04	3.94E-02	6.96E-02	9.13E-02	1.06E-01	1.17E-01	1.22E-01	1.26E-01	1.26E-01	1.26E-01
3	0.04500		-7.58E-02	-2.20E-02	2.18E-02	5.51E-02	7.92E-02	9.60E-02	1.08E-01	1.14E-01	1.18E-01	1.19E-01	1.19E-01
2	0.01250		-8.49E-02	-2.97E-02	1.54E-02	4.98E-02	7.48E-02	9.23E-02	1.04E-01	1.11E-01	1.15E-01	1.16E-01	1.16E-01
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS V VELOCITY -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J		Y												
21	0.50000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500		0.00	0.00	0.00	0.00	5.03E-02	3.41E-02	4.46E-03	-3.90E-03	-4.25E-03	-3.25E-03	-2.75E-03	-2.26E-03
19	0.46125		0.00	0.00	0.00	0.00	1.72E-01	7.52E-02	7.68E-03	-1.20E-02	-1.31E-02	-1.08E-02	-8.70E-03	-6.60E-03

5	2.419E-01	3.436E-03
6	3.280E-01	3.773E-03
7	4.235E-01	3.765E-03
8	5.296E-01	3.520E-03
9	6.473E-01	3.351E-03
10	7.780E-01	3.506E-03
11	9.231E-01	3.949E-03
12	1.084E 00	4.354E-03
13	1.263E 00	4.576E-03
14	1.461E 00	4.624E-03
15	1.682E 00	4.547E-03
16	1.926E 00	4.398E-03
17	2.197E 00	4.213E-03
18	2.499E 00	4.012E-03
19	2.833E 00	3.813E-03
20	3.167E 00	3.629E-03
21	3.502E 00	3.463E-03
22	3.836E 00	3.410E-03



158	0.3387E-01	0.1802E-01	0.1680E-01	0.7271E-02	0.3622E-02	0.1214E 09	0.5312E 01	0.3671E-02	0.1655E 02	0.1820E 04	0.2497E 04
159	0.3306E-01	0.1795E-01	0.1687E-01	0.7341E-02	0.3571E-02	0.1218E 09	0.5318E 01	0.3577E-02	0.1655E 02	0.1821E 04	0.2497E 04
160	0.3225E-01	0.1785E-01	0.1693E-01	0.7392E-02	0.3523E-02	0.1217E 09	0.5323E 01	0.3477E-02	0.1656E 02	0.1822E 04	0.2498E 04
161	0.3145E-01	0.1775E-01	0.1699E-01	0.7434E-02	0.3476E-02	0.1210E 09	0.5329E 01	0.3372E-02	0.1656E 02	0.1822E 04	0.2498E 04
162	0.3065E-01	0.1767E-01	0.1705E-01	0.7502E-02	0.3431E-02	0.1206E 09	0.5334E 01	0.3262E-02	0.1657E 02	0.1823E 04	0.2499E 04
163	0.2987E-01	0.1757E-01	0.1709E-01	0.7570E-02	0.3390E-02	0.1201E 09	0.5339E 01	0.3147E-02	0.1657E 02	0.1824E 04	0.2499E 04
164	0.2910E-01	0.1747E-01	0.1713E-01	0.7597E-02	0.3359E-02	0.1190E 09	0.5344E 01	0.3029E-02	0.1658E 02	0.1824E 04	0.2500E 04
165	0.2833E-01	0.1736E-01	0.1716E-01	0.7641E-02	0.3334E-02	0.1187E 09	0.5349E 01	0.2909E-02	0.1659E 02	0.1825E 04	0.2500E 04
166	0.2760E-01	0.1724E-01	0.1719E-01	0.7666E-02	0.3308E-02	0.1177E 09	0.5354E 01	0.2785E-02	0.1659E 02	0.1826E 04	0.2501E 04
167	0.2687E-01	0.1713E-01	0.1721E-01	0.7710E-02	0.3286E-02	0.1171E 09	0.5359E 01	0.2660E-02	0.1660E 02	0.1826E 04	0.2501E 04
168	0.2616E-01	0.1703E-01	0.1722E-01	0.7757E-02	0.3264E-02	0.1163E 09	0.5363E 01	0.2534E-02	0.1660E 02	0.1827E 04	0.2502E 04
169	0.2547E-01	0.1692E-01	0.1722E-01	0.7767E-02	0.3240E-02	0.1153E 09	0.5368E 01	0.2407E-02	0.1661E 02	0.1828E 04	0.2502E 04
170	0.2480E-01	0.1683E-01	0.1722E-01	0.7805E-02	0.3216E-02	0.1143E 09	0.5372E 01	0.2281E-02	0.1661E 02	0.1828E 04	0.2503E 04
171	0.2416E-01	0.1675E-01	0.1721E-01	0.7850E-02	0.3191E-02	0.1136E 09	0.5376E 01	0.2155E-02	0.1662E 02	0.1829E 04	0.2503E 04
172	0.2353E-01	0.1666E-01	0.1719E-01	0.7858E-02	0.3165E-02	0.1127E 09	0.5380E 01	0.2029E-02	0.1662E 02	0.1830E 04	0.2504E 04
173	0.2292E-01	0.1657E-01	0.1717E-01	0.7896E-02	0.3137E-02	0.1113E 09	0.5384E 01	0.1906E-02	0.1663E 02	0.1830E 04	0.2504E 04
174	0.2234E-01	0.1648E-01	0.1713E-01	0.7906E-02	0.3110E-02	0.1107E 09	0.5387E 01	0.1783E-02	0.1663E 02	0.1831E 04	0.2505E 04
175	0.2177E-01	0.1640E-01	0.1710E-01	0.7922E-02	0.3079E-02	0.1098E 09	0.5390E 01	0.1663E-02	0.1664E 02	0.1832E 04	0.2505E 04
176	0.2123E-01	0.1633E-01	0.1705E-01	0.7960E-02	0.3050E-02	0.1089E 09	0.5394E 01	0.1546E-02	0.1664E 02	0.1832E 04	0.2506E 04
177	0.2071E-01	0.1629E-01	0.1700E-01	0.7945E-02	0.3017E-02	0.1078E 09	0.5397E 01	0.1431E-02	0.1665E 02	0.1833E 04	0.2506E 04
178	0.2021E-01	0.1626E-01	0.1694E-01	0.7958E-02	0.2985E-02	0.1068E 09	0.5399E 01	0.1319E-02	0.1666E 02	0.1833E 04	0.2507E 04
179	0.1972E-01	0.1625E-01	0.1688E-01	0.7973E-02	0.2953E-02	0.1058E 09	0.5402E 01	0.1211E-02	0.1666E 02	0.1834E 04	0.2508E 04
180	0.1927E-01	0.1624E-01	0.1681E-01	0.7977E-02	0.2920E-02	0.1049E 09	0.5405E 01	0.1107E 02	0.1667E 02	0.1835E 04	0.2508E 04
181	0.1882E-01	0.1622E-01	0.1674E-01	0.7957E-02	0.2886E-02	0.1040E 09	0.5407E 01	0.1007E-02	0.1667E 02	0.1835E 04	0.2509E 04
182	0.1841E-01	0.1620E-01	0.1665E-01	0.7951E-02	0.2850E-02	0.1027E 09	0.5409E 01	0.9101E-03	0.1668E 02	0.1836E 04	0.2509E 04
183	0.1801E-01	0.1618E-01	0.1657E-01	0.7951E-02	0.2816E-02	0.1019E 09	0.5411E 01	0.8184E-03	0.1668E 02	0.1836E 04	0.2510E 04
184	0.1763E-01	0.1617E-01	0.1648E-01	0.7965E-02	0.2780E-02	0.1010E 09	0.5413E 01	0.7306E-03	0.1669E 02	0.1837E 04	0.2510E 04
185	0.1725E-01	0.1616E-01	0.1639E-01	0.7915E-02	0.2744E-02	0.9985E 08	0.5415E 01	0.6471E-03	0.1670E 02	0.1837E 04	0.2511E 04
186	0.1691E-01	0.1614E-01	0.1629E-01	0.7911E-02	0.2709E-02	0.9903E 08	0.5416E 01	0.5679E-03	0.1670E 02	0.1838E 04	0.2512E 04
187	0.1658E-01	0.1612E-01	0.1618E-01	0.7890E-02	0.2672E-02	0.9784E 08	0.5418E 01	0.4936E-03	0.1671E 02	0.1839E 04	0.2512E 04
188	0.1628E-01	0.1611E-01	0.1608E-01	0.7871E-02	0.2635E-02	0.9674E 08	0.5419E 01	0.4245E-03	0.1671E 02	0.1839E 04	0.2513E 04
189	0.1598E-01	0.1606E-01	0.1597E-01	0.7805E-02	0.2601E-02	0.9580E 08	0.5420E 01	0.3591E-03	0.1672E 02	0.1840E 04	0.2513E 04
190	0.1571E-01	0.1604E-01	0.1586E-01	0.7824E-02	0.2565E-02	0.9508E 08	0.5421E 01	0.2993E-03	0.1673E 02	0.1840E 04	0.2514E 04
191	0.1543E-01	0.1598E-01	0.1574E-01	0.7775E-02	0.2530E-02	0.9402E 08	0.5422E 01	0.2430E-03	0.1673E 02	0.1841E 04	0.2515E 04
192	0.1519E-01	0.1592E-01	0.1562E-01	0.7765E-02	0.2496E-02	0.9307E 08	0.5423E 01	0.1916E-03	0.1674E 02	0.1841E 04	0.2515E 04
193	0.1495E-01	0.1584E-01	0.1550E-01	0.7729E-02	0.2461E-02	0.9232E 08	0.5424E 01	0.1445E-03	0.1675E 02	0.1842E 04	0.2516E 04
194	0.1474E-01	0.1576E-01	0.1538E-01	0.7674E-02	0.2427E-02	0.9122E 08	0.5425E 01	0.1016E-03	0.1675E 02	0.1842E 04	0.2516E 04
195	0.1453E-01	0.1568E-01	0.1526E-01	0.7644E-02	0.2392E-02	0.9009E 08	0.5425E 01	0.6318E-04	0.1676E 02	0.1843E 04	0.2517E 04
196	0.1434E-01	0.1559E-01	0.1513E-01	0.7609E-02	0.2359E-02	0.8953E 08	0.5426E 01	0.2843E-04	0.1676E 02	0.1843E 04	0.2518E 04
197	0.1418E-01	0.1548E-01	0.1501E-01	0.7562E-02	0.2325E-02	0.8839E 08	0.5426E 01	-0.2251E-05	0.1677E 02	0.1844E 04	0.2518E 04
198	0.1401E-01	0.1539E-01	0.1488E-01	0.7521E-02	0.2291E-02	0.8758E 08	0.5427E 01	-0.2939E-04	0.1678E 02	0.1844E 04	0.2519E 04
199	0.1387E-01	0.1527E-01	0.1476E-01	0.7496E-02	0.2257E-02	0.8687E 08	0.5427E 01	-0.5286E-04	0.1678E 02	0.1845E 04	0.2519E 04
200	0.1373E-01	0.1516E-01	0.1463E-01	0.7454E-02	0.2224E-02	0.8559E 08	0.5428E 01	-0.7349E-04	0.1679E 02	0.1845E 04	0.2520E 04

SWIRL CASE WITH LFS = 6
AND NSBR = 0

CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 1.750

OR IF NSBR = 0 TO SWIRL VANE ANGLE = 68.000

COMPUTED INLET SWIRL NUMBER = 1.6528

```
  4 0.08500  3.51E-02 3.10E-02 2.61E-02 2.15E-02 1.75E-02 1.42E-02 1.15E-02 9.50E-03 8.00E-03 7.71E-03 3.00E-02
  3 0.04500  3.43E-02 3.03E-02 2.57E-02 2.12E-02 1.73E-02 1.40E-02 1.14E-02 9.46E-03 7.96E-03 7.57E-03 3.00E-02
  2 0.01250  3.41E-02 3.02E-02 2.56E-02 2.12E-02 1.73E-02 1.40E-02 1.14E-02 9.48E-03 7.99E-03 7.57E-03 3.00E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     2        3        4        5        6        7        8        9       10       11       12       13
       X =  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552  0.15786
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187      0.00     0.00     0.00 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02
 19 0.05937      0.00     0.00     0.00 1.98E-01 2.01E-01 1.93E-01 1.84E-01 1.75E-01 1.74E-01 2.18E-01 2.92E-01 3.23E-01
 18 0.05594      0.00     0.00     0.00 1.98E-01 1.82E-01 1.82E-01 1.87E-01 1.93E-01 2.27E-01 3.58E-01 4.95E-01 5.55E-01
 17 0.05344      0.00     0.00 5.10E-02 1.16E-01 1.32E-01 1.51E-01 1.70E-01 1.93E-01 2.79E-01 4.48E-01 5.85E-01 6.56E-01
 16 0.05078      0.00     0.00 1.78E-01 1.45E-01 1.38E-01 1.45E-01 1.62E-01 2.12E-01 3.58E-01 5.24E-01 6.51E-01 7.27E-01
 15 0.04812      0.00     0.00 1.78E-01 1.22E-01 1.20E-01 1.32E-01 1.64E-01 2.74E-01 4.39E-01 5.84E-01 6.99E-01 7.79E-01
 14 0.04562      0.00 5.10E-02 8.78E-02 9.24E-02 1.08E-01 1.33E-01 2.04E-01 3.55E-01 5.03E-01 6.29E-01 7.36E-01 8.16E-01
 13 0.04328      0.00 1.60E-01 9.77E-02 8.99E-02 1.14E-01 1.60E-01 2.76E-01 4.23E-01 5.52E-01 6.65E-01 7.66E-01 8.47E-01
 12 0.04094      0.00 1.60E-01 7.46E-02 8.29E-02 1.24E-01 2.06E-01 3.46E-01 4.79E-01 5.94E-01 6.99E-01 7.95E-01 8.75E-01
 11 0.03719  7.64E-02 6.38E-02 4.93E-02 8.15E-02 1.52E-01 2.99E-01 4.42E-01 5.53E-01 6.54E-01 7.49E-01 8.39E-01 9.17E-01
 10 0.03437  1.60E-01 5.82E-02 4.11E-02 9.17E-02 2.10E-01 3.70E-01 4.97E-01 5.99E-01 6.94E-01 7.85E-01 8.71E-01 9.47E-01
  9 0.03219  1.60E-01 3.08E-02 3.32E-02 1.07E-01 2.52E-01 4.21E-01 5.37E-01 6.34E-01 7.25E-01 8.12E-01 8.96E-01 9.70E-01
  8 0.03031  5.29E-03 7.13E-03 3.19E-02 1.26E-01 2.95E-01 4.63E-01 5.70E-01 6.63E-01 7.51E-01 8.36E-01 9.17E-01 9.90E-01
  7 0.02687  5.29E-03 7.93E-03 4.26E-02 1.61E-01 3.92E-01 5.39E-01 6.33E-01 7.17E-01 7.98E-01 8.78E-01 9.56E-01 1.03E 00
  6 0.02187  5.29E-03 1.05E-02 6.71E-02 2.51E-01 5.20E-01 6.40E-01 7.20E-01 7.93E-01 8.66E-01 9.39E-01 1.01E 00 1.08E 00
  5 0.01625  5.32E-03 1.91E-02 1.23E-01 3.96E-01 6.51E-01 7.44E-01 8.10E-01 8.74E-01 9.39E-01 1.01E 00 1.07E 00 1.14E 00
  4 0.01062  5.44E-03 4.62E-02 3.88E-01 5.67E-01 7.62E-01 8.35E-01 8.91E-01 9.48E-01 1.01E 00 1.07E 00 1.13E 00 1.19E 00
  3 0.00562  6.03E-03 1.29E-01 4.70E-01 6.97E-01 8.39E-01 9.00E-01 9.52E-01 1.00E 00 1.06E 00 1.11E 00 1.17E 00 1.23E 00
  2 0.00156  1.08E-02 3.14E-01 6.07E-01 7.83E-01 8.93E-01 9.47E-01 9.97E-01 1.05E 00 1.10E 00 1.16E 00 1.21E 00 1.26E 00
0      I =    14       15       16       17       18       19       20       21       22       23
       X =  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J    Y
 21 0.06312      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06187  2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 2.55E-02 5.00E-03
 19 0.05937  3.22E-01 3.06E-01 2.81E-01 2.52E-01 2.22E-01 1.93E-01 1.70E-01 1.51E-01 1.53E-01 5.00E-03
 18 0.05594  5.62E-01 5.45E-01 5.15E-01 4.77E-01 4.36E-01 3.96E-01 3.60E-01 3.30E-01 3.36E-01 5.00E-03
 17 0.05344  6.75E-01 6.65E-01 6.40E-01 6.05E-01 5.66E-01 5.26E-01 4.91E-01 4.60E-01 4.67E-01 5.00E-03
 16 0.05078  7.59E-01 7.60E-01 7.42E-01 7.14E-01 6.79E-01 6.43E-01 6.11E-01 5.83E-01 5.88E-01 5.00E-03
 15 0.04812  8.20E-01 8.31E-01 8.22E-01 8.01E-01 7.72E-01 7.41E-01 7.13E-01 6.88E-01 6.91E-01 5.00E-03
 14 0.04562  8.65E-01 8.84E-01 8.82E-01 8.67E-01 8.44E-01 8.18E-01 7.94E-01 7.73E-01 7.73E-01 5.00E-03
 13 0.04328  9.00E-01 9.25E-01 9.29E-01 9.19E-01 9.01E-01 8.80E-01 8.59E-01 8.41E-01 8.38E-01 5.00E-03
 12 0.04094  9.30E-01 9.60E-01 9.69E-01 9.64E-01 9.50E-01 9.33E-01 9.16E-01 9.00E-01 8.96E-01 5.00E-03
 11 0.03719  9.74E-01 1.01E 00 1.02E 00 1.03E 00 1.02E 00 1.00E 00 9.92E-01 9.79E-01 9.74E-01 5.00E-03
 10 0.03437  1.00E 00 1.04E 00 1.06E 00 1.06E 00 1.06E 00 1.05E 00 1.04E 00 1.03E 00 1.02E 00 5.00E-03
  9 0.03219  1.03E 00 1.07E 00 1.09E 00 1.09E 00 1.09E 00 1.08E 00 1.07E 00 1.07E 00 1.06E 00 5.00E-03
  8 0.03031  1.05E 00 1.09E 00 1.11E 00 1.12E 00 1.11E 00 1.11E 00 1.10E 00 1.09E 00 1.09E 00 5.00E-03
  7 0.02687  1.08E 00 1.12E 00 1.14E 00 1.15E 00 1.16E 00 1.15E 00 1.15E 00 1.14E 00 1.14E 00 5.00E-03
  6 0.02187  1.13E 00 1.17E 00 1.19E 00 1.20E 00 1.21E 00 1.21E 00 1.20E 00 1.20E 00 1.20E 00 5.00E-03
  5 0.01625  1.19E 00 1.22E 00 1.25E 00 1.26E 00 1.26E 00 1.26E 00 1.26E 00 1.25E 00 1.26E 00 5.00E-03
  4 0.01062  1.24E 00 1.27E 00 1.29E 00 1.30E 00 1.30E 00 1.30E 00 1.30E 00 1.29E 00 1.31E 00 5.00E-03
  3 0.00562  1.27E 00 1.31E 00 1.32E 00 1.33E 00 1.33E 00 1.32E 00 1.32E 00 1.32E 00 1.34E 00 5.00E-03
  2 0.00156  1.30E 00 1.33E 00 1.34E 00 1.35E 00 1.34E 00 1.34E 00 1.33E 00 1.32E 00 1.35E 00 5.00E-03
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
       X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
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48	0.1889E 00	0.1148E 00	0.1000E 00	0.3598E-01	0.2885E-01	0.4771E 09	0.6490E 01	-0.5407E-03	0.1129E 02	0.1274E 04	0.9761E 03
49	0.1854E 00	0.1123E 00	0.9965E-01	0.3652E-01	0.2880E-01	0.4397E 09	0.6490E 01	-0.6715E-03	0.1130E 02	0.1274E 04	0.9774E 03
50	0.1822E 00	0.1101E 00	0.9918E-01	0.3718E-01	0.2869E-01	0.4042E 09	0.6489E 01	-0.8113E-03	0.1131E 02	0.1274E 04	0.9788E 03
51	0.1791E 00	0.1083E 00	0.9859E-01	0.3777E-01	0.2852E-01	0.3767E 09	0.6489E 01	-0.9596E-03	0.1131E 02	0.1274E 04	0.9803E 03
52	0.1760E 00	0.1064E 00	0.9795E-01	0.3839E-01	0.2832E-01	0.3521E 09	0.6488E 01	-0.1116E-02	0.1132E 02	0.1274E 04	0.9819E 03
53	0.1725E 00	0.1052E 00	0.9737E-01	0.3904E-01	0.2804E-01	0.3300E 09	0.6487E 01	-0.1281E-02	0.1133E 02	0.1274E 04	0.9836E 03
54	0.1693E 00	0.1038E 00	0.9672E-01	0.3969E-01	0.2770E-01	0.3073E 09	0.6486E 01	-0.1455E-02	0.1133E 02	0.1274E 04	0.9855E 03
55	0.1663E 00	0.1023E 00	0.9627E-01	0.4035E-01	0.2731E-01	0.2847E 09	0.6485E 01	-0.1637E-02	0.1134E 02	0.1274E 04	0.9874E 03
56	0.1634E 00	0.1010E 00	0.9578E-01	0.4106E-01	0.2687E-01	0.2622E 09	0.6483E 01	-0.1828E-02	0.1135E 02	0.1274E 04	0.9895E 03
57	0.1609E 00	0.9984E-01	0.9514E-01	0.4172E-01	0.2638E-01	0.2404E 09	0.6481E 01	-0.2026E-02	0.1136E 02	0.1274E 04	0.9918E 03
58	0.1584E 00	0.9860E-01	0.9436E-01	0.4228E-01	0.2586E-01	0.2196E 09	0.6479E 01	-0.2232E-02	0.1136E 02	0.1274E 04	0.9942E 03
59	0.1556E 00	0.9768E-01	0.9347E-01	0.4283E-01	0.2531E-01	0.2025E 09	0.6477E 01	-0.2446E-02	0.1137E 02	0.1274E 04	0.9967E 03
60	0.1529E 00	0.9706E-01	0.9271E-01	0.4334E-01	0.2475E-01	0.1870E 09	0.6474E 01	-0.2667E-02	0.1138E 02	0.1274E 04	0.9994E 03
61	0.1501E 00	0.9657E-01	0.9188E-01	0.4384E-01	0.2420E-01	0.1774E 09	0.6471E 01	-0.2894E-02	0.1139E 02	0.1274E 04	0.1002E 04
62	0.1477E 00	0.9595E-01	0.9127E-01	0.4430E-01	0.2365E-01	0.1675E 09	0.6467E 01	-0.3127E-02	0.1140E 02	0.1274E 04	0.1005E 04
63	0.1457E 00	0.9515E-01	0.9059E-01	0.4471E-01	0.2311E-01	0.1579E 09	0.6464E 01	-0.3366E-02	0.1141E 02	0.1274E 04	0.1009E 04
64	0.1434E 00	0.9451E-01	0.8975E-01	0.4507E-01	0.2256E-01	0.1480E 09	0.6459E 01	-0.3609E-02	0.1142E 02	0.1274E 04	0.1012E 04
65	0.1411E 00	0.9396E-01	0.8877E-01	0.4541E-01	0.2201E-01	0.1384E 09	0.6455E 01	-0.3857E-02	0.1143E 02	0.1275E 04	0.1015E 04
66	0.1389E 00	0.9345E-01	0.8763E-01	0.4574E-01	0.2145E-01	0.1301E 09	0.6450E 01	-0.4107E-02	0.1144E 02	0.1275E 04	0.1019E 04
67	0.1366E 00	0.9303E-01	0.8641E-01	0.4593E-01	0.2090E-01	0.1223E 09	0.6445E 01	-0.4361E-02	0.1145E 02	0.1275E 04	0.1023E 04
68	0.1343E 00	0.9271E-01	0.8515E-01	0.4610E-01	0.2035E-01	0.1151E 09	0.6439E 01	-0.4615E-02	0.1146E 02	0.1275E 04	0.1027E 04
69	0.1326E 00	0.9236E-01	0.8396E-01	0.4628E-01	0.1980E-01	0.1085E 09	0.6434E 01	-0.4869E-02	0.1147E 02	0.1276E 04	0.1031E 04
70	0.1311E 00	0.9194E-01	0.8297E-01	0.4627E-01	0.1925E-01	0.1022E 09	0.6427E 01	-0.5123E-02	0.1149E 02	0.1276E 04	0.1036E 04
71	0.1293E 00	0.9148E-01	0.8187E-01	0.4631E-01	0.1871E-01	0.9568E 08	0.6421E 01	-0.5374E-02	0.1150E 02	0.1276E 04	0.1040E 04
72	0.1273E 00	0.9093E-01	0.8067E-01	0.4624E-01	0.1817E-01	0.9016E 08	0.6414E 01	-0.5621E-02	0.1151E 02	0.1276E 04	0.1045E 04
73	0.1253E 00	0.9023E-01	0.7935E-01	0.4612E-01	0.1764E-01	0.8659E 08	0.6406E 01	-0.5864E-02	0.1153E 02	0.1277E 04	0.1050E 04
74	0.1234E 00	0.8952E-01	0.7791E-01	0.4590E-01	0.1711E-01	0.8291E 08	0.6398E 01	-0.6100E-02	0.1154E 02	0.1277E 04	0.1055E 04
75	0.1216E 00	0.8897E-01	0.7643E-01	0.4568E-01	0.1658E-01	0.7951E 08	0.6390E 01	-0.6330E-02	0.1156E 02	0.1277E 04	0.1061E 04
76	0.1200E 00	0.8854E-01	0.7484E-01	0.4535E-01	0.1607E-01	0.7591E 08	0.6382E 01	-0.6549E-02	0.1158E 02	0.1278E 04	0.1066E 04
77	0.1184E 00	0.8806E-01	0.7320E-01	0.4498E-01	0.1556E-01	0.7230E 08	0.6373E 01	-0.6759E-02	0.1159E 02	0.1278E 04	0.1072E 04
78	0.1168E 00	0.8738E-01	0.7166E-01	0.4454E-01	0.1505E-01	0.6874E 08	0.6364E 01	-0.6956E-02	0.1161E 02	0.1279E 04	0.1077E 04
79	0.1152E 00	0.8654E-01	0.7020E-01	0.4406E-01	0.1456E-01	0.6524E 08	0.6354E 01	-0.7140E-02	0.1163E 02	0.1279E 04	0.1083E 04
80	0.1133E 00	0.8557E-01	0.6871E-01	0.4352E-01	0.1407E-01	0.6151E 08	0.6344E 01	-0.7308E-02	0.1164E 02	0.1279E 04	0.1089E 04
81	0.1112E 00	0.8453E-01	0.6713E-01	0.4287E-01	0.1360E-01	0.5825E 08	0.6334E 01	-0.7461E-02	0.1166E 02	0.1280E 04	0.1095E 04
82	0.1097E 00	0.8335E-01	0.6548E-01	0.4225E-01	0.1313E-01	0.5486E 08	0.6323E 01	-0.7596E-02	0.1168E 02	0.1280E 04	0.1102E 04
83	0.1083E 00	0.8206E-01	0.6385E-01	0.4156E-01	0.1267E-01	0.5175E 08	0.6313E 01	-0.7712E-02	0.1170E 02	0.1281E 04	0.1108E 04
84	0.1068E 00	0.8076E-01	0.6219E-01	0.4079E-01	0.1223E-01	0.4882E 08	0.6302E 01	-0.7810E-02	0.1172E 02	0.1281E 04	0.1114E 04
85	0.1051E 00	0.7945E-01	0.6050E-01	0.4005E-01	0.1180E-01	0.4602E 08	0.6291E 01	-0.7885E-02	0.1174E 02	0.1282E 04	0.1121E 04
86	0.1034E 00	0.7837E-01	0.5879E-01	0.3921E-01	0.1139E-01	0.4371E 08	0.6279E 01	-0.7940E-02	0.1176E 02	0.1282E 04	0.1127E 04
87	0.1017E 00	0.7729E-01	0.5711E-01	0.3833E-01	0.1099E-01	0.4144E 08	0.6268E 01	-0.7972E-02	0.1178E 02	0.1283E 04	0.1134E 04
88	0.9998E-01	0.7603E-01	0.5548E-01	0.3749E-01	0.1061E-01	0.3968E 08	0.6256E 01	-0.7982E-02	0.1180E 02	0.1283E 04	0.1140E 04
89	0.9831E-01	0.7471E-01	0.5391E-01	0.3689E-01	0.1021E-01	0.3848E 08	0.6242E 01	-0.9130E-02	0.1183E 02	0.1284E 04	0.1147E 04
90	0.9346E-01	0.8207E-01	0.5225E-01	0.3592E-01	0.9872E-02	0.3735E 08	0.6228E 01	-0.9396E-02	0.1185E 02	0.1284E 04	0.1154E 04
91	0.9308E-01	0.7857E-01	0.5055E-01	0.3481E-01	0.9566E-02	0.3611E 08	0.6215E 01	-0.8264E-02	0.1187E 02	0.1284E 04	0.1161E 04
92	0.9412E-01	0.6946E-01	0.4903E-01	0.3416E-01	0.9145E-02	0.3275E 08	0.6201E 01	-0.8996E-02	0.1189E 02	0.1285E 04	0.1168E 04
93	0.8830E-01	0.7646E-01	0.4744E-01	0.3288E-01	0.8745E-02	0.3035E 08	0.6187E 01	-0.9052E-02	0.1192E 02	0.1286E 04	0.1175E 04
94	0.8811E-01	0.7240E-01	0.4580E-01	0.3144E-01	0.8383E-02	0.2961E 08	0.6172E 01	-0.8997E-02	0.1194E 02	0.1286E 04	0.1181E 04
95	0.8564E-01	0.7106E-01	0.4416E-01	0.3048E-01	0.8083E-02	0.2977E 08	0.6158E 01	-0.8801E-02	0.1196E 02	0.1287E 04	0.1188E 04
96	0.8400E-01	0.6873E-01	0.4255E-01	0.2942E-01	0.7826E-02	0.2938E 08	0.6144E 01	-0.8572E-02	0.1199E 02	0.1287E 04	0.1194E 04
97	0.8238E-01	0.6676E-01	0.4100E-01	0.2845E-01	0.7591E-02	0.2970E 08	0.6130E 01	-0.8301E-02	0.1201E 02	0.1288E 04	0.1200E 04
98	0.8085E-01	0.6488E-01	0.3950E-01	0.2745E-01	0.7370E-02	0.3004E 08	0.6116E 01	-0.8006E-02	0.1203E 02	0.1289E 04	0.1206E 04
99	0.7920E-01	0.6296E-01	0.3810E-01	0.2650E-01	0.7159E-02	0.3066E 08	0.6102E 01	-0.7685E-02	0.1206E 02	0.1289E 04	0.1212E 04
100	0.7749E-01	0.6093E-01	0.3673E-01	0.2560E-01	0.6943E-02	0.3092E 08	0.6089E 01	-0.7343E-02	0.1208E 02	0.1290E 04	0.1218E 04
101	0.7578E-01	0.5883E-01	0.3539E-01	0.2465E-01	0.6736E-02	0.3127E 08	0.6076E 01	-0.6982E-02	0.1210E 02	0.1290E 04	0.1224E 04

15	0.04812	0.00	0.00	0.00	2.02E-02	2.24E-02	3.86E-02	4.75E-02	4.36E-02	3.64E-02	2.85E-02	2.26E-02	1.73E-02
14	0.04562	0.00	0.00	-5.30E-02	1.28E-02	2.29E-02	4.03E-02	4.63E-02	4.05E-02	3.18E-02	2.29E-02	1.63E-02	1.04E-02
13	0.04328	0.00	0.00	-4.20E-02	-1.30E-03	2.13E-02	3.93E-02	4.32E-02	3.59E-02	2.62E-02	1.69E-02	1.00E-02	3.39E-03
12	0.04094	0.00	0.00	-2.57E-02	-7.86E-03	1.71E-02	3.59E-02	3.81E-02	2.96E-02	1.96E-02	1.00E-02	2.51E-03	-4.30E-03
11	0.03719	0.00	-6.48E-02	-3.09E-02	-1.41E-02	8.20E-03	2.48E-02	2.51E-02	1.64E-02	6.09E-03	-3.09E-03	-1.06E-02	-1.77E-02
10	0.03437	0.00	-5.95E-02	-4.26E-02	-2.29E-02	-7.66E-04	1.12E-02	1.22E-02	3.51E-03	-5.90E-03	-1.46E-02	-2.16E-02	-2.87E-02
9	0.03219	0.00	-5.39E-02	-5.23E-02	-3.08E-02	-1.20E-02	-1.93E-03	7.68E-05	-7.79E-03	-1.64E-02	-2.42E-02	-3.08E-02	-3.74E-02
8	0.03031	0.00	-5.52E-02	-6.13E-02	-4.40E-02	-2.20E-02	-1.31E-02	-1.14E-02	-1.84E-02	-2.61E-02	-3.28E-02	-3.89E-02	-4.52E-02
7	0.02687	0.00	-7.35E-02	-7.76E-02	-6.52E-02	-4.78E-02	-3.69E-02	-3.51E-02	-3.96E-02	-4.50E-02	-4.97E-02	-5.46E-02	-6.00E-02
6	0.02187	0.00	-1.02E-01	-1.05E-01	-9.83E-02	-7.98E-02	-7.44E-02	-7.22E-02	-7.27E-02	-7.37E-02	-7.52E-02	-7.75E-02	-8.12E-02
5	0.01625	0.00	-1.36E-01	-1.41E-01	-1.36E-01	-1.24E-01	-1.18E-01	-1.13E-01	-1.08E-01	-1.05E-01	-1.02E-01	-1.01E-01	-1.03E-01
4	0.01062	0.00	-1.72E-01	-1.82E-01	-1.66E-01	-1.63E-01	-1.55E-01	-1.47E-01	-1.38E-01	-1.30E-01	-1.24E-01	-1.20E-01	-1.20E-01
3	0.00562	0.00	-2.02E-01	-2.05E-01	-1.94E-01	-1.87E-01	-1.78E-01	-1.67E-01	-1.56E-01	-1.45E-01	-1.37E-01	-1.31E-01	-1.30E-01
2	0.00156	0.00	-2.23E-01	-2.14E-01	-2.05E-01	-1.97E-01	-1.87E-01	-1.75E-01	-1.62E-01	-1.51E-01	-1.42E-01	-1.36E-01	-1.33E-01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	5.38E-02	5.91E-02	6.35E-02	6.91E-02	7.56E-02	8.44E-02	9.31E-02	9.98E-02	1.05E-01	1.11E-01	0.00
19	0.05937	4.74E-02	5.11E-02	5.48E-02	6.01E-02	6.62E-02	7.49E-02	8.36E-02	9.01E-02	9.51E-02	1.01E-01	0.00
18	0.05594	3.78E-02	3.96E-02	4.18E-02	4.60E-02	5.11E-02	5.86E-02	6.62E-02	7.22E-02	7.66E-02	8.13E-02	0.00
17	0.05344	3.07E-02	3.10E-02	3.21E-02	3.52E-02	3.93E-02	4.60E-02	5.24E-02	5.71E-02	6.08E-02	6.43E-02	0.00
16	0.05078	2.29E-02	2.15E-02	2.12E-02	2.35E-02	2.65E-02	3.19E-02	3.66E-02	4.02E-02	4.31E-02	4.53E-02	0.00
15	0.04812	1.47E-02	1.17E-02	1.02E-02	1.16E-02	1.33E-02	1.74E-02	2.05E-02	2.29E-02	2.43E-02	2.55E-02	0.00
14	0.04562	6.81E-03	2.17E-03	-3.34E-05	2.49E-04	8.48E-04	3.24E-03	4.83E-03	5.92E-03	6.55E-03	6.47E-03	0.00
13	0.04328	-1.04E-03	-6.86E-03	-1.00E-02	-1.06E-02	-1.10E-02	-9.92E-03	-1.00E-02	-9.99E-03	-1.03E-02	-1.13E-02	0.00
12	0.04094	-9.63E-03	-1.60E-02	-1.98E-02	-2.16E-02	-2.29E-02	-2.33E-02	-2.46E-02	-2.58E-02	-2.69E-02	-2.88E-02	0.00
11	0.03719	-2.39E-02	-3.09E-02	-3.59E-02	-3.88E-02	-4.17E-02	-4.43E-02	-4.81E-02	-5.08E-02	-5.31E-02	-5.62E-02	0.00
10	0.03437	-3.51E-02	-4.25E-02	-4.77E-02	-5.16E-02	-5.56E-02	-6.00E-02	-6.54E-02	-6.92E-02	-7.20E-02	-7.58E-02	0.00
9	0.03219	-4.42E-02	-5.17E-02	-5.70E-02	-6.16E-02	-6.65E-02	-7.19E-02	-7.82E-02	-8.29E-02	-8.65E-02	-9.03E-02	0.00
8	0.03031	-5.21E-02	-5.93E-02	-6.48E-02	-7.02E-02	-7.54E-02	-8.19E-02	-8.89E-02	-9.43E-02	-9.84E-02	-1.02E-01	0.00
7	0.02687	-6.66E-02	-7.35E-02	-7.88E-02	-8.47E-02	-9.09E-02	-9.92E-02	-1.07E-01	-1.14E-01	-1.18E-01	-1.22E-01	0.00
6	0.02187	-8.64E-02	-9.24E-02	-9.73E-02	-1.04E-01	-1.11E-01	-1.21E-01	-1.31E-01	-1.38E-01	-1.43E-01	-1.48E-01	0.00
5	0.01625	-1.06E-01	-1.11E-01	-1.15E-01	-1.22E-01	-1.31E-01	-1.41E-01	-1.52E-01	-1.59E-01	-1.65E-01	-1.71E-01	0.00
4	0.01062	-1.21E-01	-1.25E-01	-1.29E-01	-1.35E-01	-1.45E-01	-1.56E-01	-1.67E-01	-1.75E-01	-1.81E-01	-1.88E-01	0.00
3	0.00562	-1.30E-01	-1.32E-01	-1.36E-01	-1.43E-01	-1.53E-01	-1.64E-01	-1.76E-01	-1.83E-01	-1.89E-01	-1.97E-01	0.00
2	0.00156	-1.33E-01	-1.35E-01	-1.40E-01	-1.46E-01	-1.56E-01	-1.67E-01	-1.79E-01	-1.86E-01	-1.93E-01	-2.00E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- TURBULENCE ENERGY -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	3.52E 00	3.06E 00	2.49E 00	2.11E 00	1.86E 00	1.82E 00	2.17E 00	2.65E 00
19	0.05937	0.00	0.00	0.00	0.00	1.92E 01	1.91E 01	1.47E 01	1.13E 01	8.97E 00	8.61E 00	1.12E 01	1.41E 01
18	0.05594	0.00	0.00	0.00	0.00	2.73E 01	2.10E 01	1.62E 01	1.30E 01	1.14E 01	1.34E 01	1.82E 01	2.18E 01
17	0.05344	0.00	0.00	0.00	9.37E 00	1.67E 01	1.47E 01	1.32E 01	1.24E 01	1.36E 01	1.83E 01	2.37E 01	2.65E 01
16	0.05078	0.00	0.00	0.00	3.11E 01	2.02E 01	1.54E 01	1.34E 01	1.39E 01	1.84E 01	2.48E 01	2.95E 01	3.12E 01
15	0.04812	0.00	0.00	0.00	2.74E 01	1.74E 01	1.42E 01	1.42E 01	1.83E 01	2.55E 01	3.17E 01	3.51E 01	3.54E 01
14	0.04562	0.00	0.00	1.25E 01	1.62E 01	1.49E 01	1.46E 01	1.77E 01	2.50E 01	3.26E 01	3.76E 01	3.96E 01	3.89E 01
13	0.04328	0.00	0.00	3.48E 01	1.83E 01	1.60E 01	1.78E 01	2.34E 01	3.20E 01	3.86E 01	4.22E 01	4.32E 01	4.16E 01
12	0.04094	0.00	0.00	2.47E 01	1.45E 01	1.68E 01	2.18E 01	2.98E 01	3.81E 01	4.34E 01	4.59E 01	4.60E 01	4.38E 01
11	0.03719	0.00	1.65E 01	1.46E 01	1.27E 01	2.03E 01	3.10E 01	3.96E 01	4.56E 01	4.90E 01	5.02E 01	4.94E 01	4.64E 01

```
       X =  1.17352  1.36209  1.57141  1.80376  2.06166  2.34793  2.66569  3.00001  3.33434  3.66866  4.00299
0 J    Y
 11 1.00000  5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01 5.00E-01
 10 0.90000  4.82E-01 4.81E-01 4.80E-01 4.79E-01 4.79E-01 4.79E-01 4.78E-01 4.78E-01 4.78E-01 4.79E-01 4.79E-01
  9 0.80000  4.64E-01 4.61E-01 4.59E-01 4.58E-01 4.57E-01 4.57E-01 4.56E-01 4.56E-01 4.56E-01 4.57E-01 4.57E-01
  8 0.70000  4.46E-01 4.42E-01 4.38E-01 4.36E-01 4.34E-01 4.34E-01 4.33E-01 4.33E-01 4.33E-01 4.34E-01 4.34E-01
  7 0.60000  4.26E-01 4.20E-01 4.15E-01 4.12E-01 4.10E-01 4.09E-01 4.08E-01 4.08E-01 4.08E-01 4.08E-01 4.08E-01
  6 0.50000  4.05E-01 3.97E-01 3.91E-01 3.86E-01 3.83E-01 3.81E-01 3.80E-01 3.80E-01 3.80E-01 3.80E-01 3.80E-01
  5 0.40000  3.81E-01 3.71E-01 3.63E-01 3.57E-01 3.53E-01 3.50E-01 3.48E-01 3.48E-01 3.48E-01 3.48E-01 3.48E-01
  4 0.30000  3.53E-01 3.41E-01 3.31E-01 3.23E-01 3.17E-01 3.13E-01 3.11E-01 3.09E-01 3.09E-01 3.09E-01 3.09E-01
  3 0.20000  3.20E-01 3.04E-01 2.90E-01 2.80E-01 2.73E-01 2.68E-01 2.64E-01 2.62E-01 2.61E-01 2.61E-01 2.61E-01
  2 0.10000  2.74E-01 2.51E-01 2.32E-01 2.18E-01 2.08E-01 2.01E-01 1.96E-01 1.94E-01 1.92E-01 1.92E-01 1.92E-01
  1 0.00000  1.56E-01 4.57E-02     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS PRESSURE            -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9        10       11       12
       X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00 5.04E 05 5.15E 05 4.92E 05 4.86E 05 4.90E 05 4.96E 05 5.01E 05 5.05E 05
 19 0.47500      0.00     0.00     0.00     0.00 4.92E 05 5.07E 05 4.85E 05 4.81E 05 4.85E 05 4.91E 05 4.96E 05 4.98E 05
 18 0.44750      0.00     0.00     0.00     0.00 4.69E 05 4.93E 05 4.74E 05 4.71E 05 4.77E 05 4.82E 05 4.86E 05 4.88E 05
 17 0.42750      0.00     0.00     0.00 4.99E 05 4.65E 05 4.77E 05 4.63E 05 4.64E 05 4.70E 05 4.75E 05 4.78E 05 4.79E 05
 16 0.40625      0.00     0.00     0.00 4.67E 05 4.63E 05 4.59E 05 4.51E 05 4.55E 05 4.62E 05 4.66E 05 4.68E 05 4.68E 05
 15 0.38500      0.00     0.00     0.00 4.27E 05 4.51E 05 4.41E 05 4.38E 05 4.44E 05 4.52E 05 4.56E 05 4.58E 05 4.57E 05
 14 0.36500      0.00     0.00 5.08E 05 4.21E 05 4.32E 05 4.24E 05 4.25E 05 4.34E 05 4.42E 05 4.45E 05 4.47E 05 4.46E 05
 13 0.34625      0.00     0.00 4.65E 05 4.26E 05 4.14E 05 4.08E 05 4.13E 05 4.23E 05 4.31E 05 4.34E 05 4.36E 05 4.36E 05
 12 0.32750      0.00     0.00 4.03E 05 4.14E 05 3.98E 05 3.93E 05 4.00E 05 4.11E 05 4.19E 05 4.22E 05 4.24E 05 4.24E 05
 11 0.29750      0.00 3.83E 05 3.61E 05 3.81E 05 3.70E 05 3.69E 05 3.79E 05 3.90E 05 3.97E 05 4.01E 05 4.04E 05 4.05E 05
 10 0.27500      0.00 3.00E 05 3.48E 05 3.57E 05 3.49E 05 3.51E 05 3.63E 05 3.73E 05 3.80E 05 3.85E 05 3.88E 05 3.91E 05
  9 0.25750      0.00 2.11E 05 3.28E 05 3.38E 05 3.33E 05 3.39E 05 3.49E 05 3.58E 05 3.66E 05 3.71E 05 3.76E 05 3.79E 05
  8 0.24250      0.00 1.77E 05 3.05E 05 3.25E 05 3.21E 05 3.28E 05 3.37E 05 3.46E 05 3.53E 05 3.59E 05 3.65E 05 3.69E 05
  7 0.21500      0.00 1.95E 05 2.76E 05 3.01E 05 2.99E 05 3.07E 05 3.14E 05 3.22E 05 3.30E 05 3.38E 05 3.45E 05 3.52E 05
  6 0.17500      0.00 1.92E 05 2.44E 05 2.64E 05 2.71E 05 2.75E 05 2.81E 05 2.89E 05 2.99E 05 3.08E 05 3.18E 05 3.28E 05
  5 0.13000      0.00 1.65E 05 2.10E 05 2.24E 05 2.31E 05 2.40E 05 2.48E 05 2.56E 05 2.67E 05 2.79E 05 2.92E 05 3.04E 05
  4 0.08500      0.00 1.15E 05 1.71E 05 1.95E 05 2.02E 05 2.12E 05 2.21E 05 2.31E 05 2.43E 05 2.57E 05 2.72E 05 2.86E 05
  3 0.04500      0.00 4.59E 04 1.52E 05 1.71E 05 1.83E 05 1.95E 05 2.05E 05 2.16E 05 2.29E 05 2.44E 05 2.60E 05 2.76E 05
  2 0.01250      0.00     0.00 1.24E 05 1.61E 05 1.76E 05 1.89E 05 2.00E 05 2.11E 05 2.24E 05 2.39E 05 2.56E 05 2.72E 05
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
       X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500  5.08E 05 5.11E 05 5.11E 05 5.11E 05 5.10E 05 5.08E 05 5.05E 05 5.03E 05 5.00E 05 4.97E 05     0.00
 19 0.47500  5.00E 05 5.02E 05 5.02E 05 5.01E 05 4.99E 05 4.98E 05 4.95E 05 4.93E 05 4.91E 05 4.88E 05     0.00
 18 0.44750  4.88E 05 4.88E 05 4.87E 05 4.86E 05 4.84E 05 4.82E 05 4.80E 05 4.78E 05 4.76E 05 4.74E 05     0.00
 17 0.42750  4.78E 05 4.78E 05 4.76E 05 4.75E 05 4.73E 05 4.71E 05 4.69E 05 4.68E 05 4.66E 05 4.64E 05     0.00
 16 0.40625  4.68E 05 4.66E 05 4.65E 05 4.63E 05 4.61E 05 4.60E 05 4.58E 05 4.57E 05 4.55E 05 4.54E 05     0.00
 15 0.38500  4.56E 05 4.55E 05 4.53E 05 4.51E 05 4.50E 05 4.48E 05 4.47E 05 4.46E 05 4.45E 05 4.43E 05     0.00
 14 0.36500  4.45E 05 4.44E 05 4.42E 05 4.41E 05 4.39E 05 4.38E 05 4.37E 05 4.36E 05 4.35E 05 4.34E 05     0.00
 13 0.34625  4.35E 05 4.33E 05 4.32E 05 4.31E 05 4.29E 05 4.28E 05 4.28E 05 4.27E 05 4.26E 05 4.26E 05     0.00
 12 0.32750  4.24E 05 4.23E 05 4.22E 05 4.21E 05 4.20E 05 4.19E 05 4.19E 05 4.19E 05 4.18E 05 4.18E 05     0.00
 11 0.29750  4.06E 05 4.06E 05 4.06E 05 4.05E 05 4.05E 05 4.05E 05 4.05E 05 4.06E 05 4.06E 05 4.06E 05     0.00
 10 0.27500  3.92E 05 3.93E 05 3.94E 05 3.94E 05 3.95E 05 3.95E 05 3.96E 05 3.97E 05 3.97E 05 3.98E 05     0.00
  9 0.25750  3.82E 05 3.84E 05 3.85E 05 3.86E 05 3.87E 05 3.88E 05 3.89E 05 3.90E 05 3.91E 05 3.92E 05     0.00
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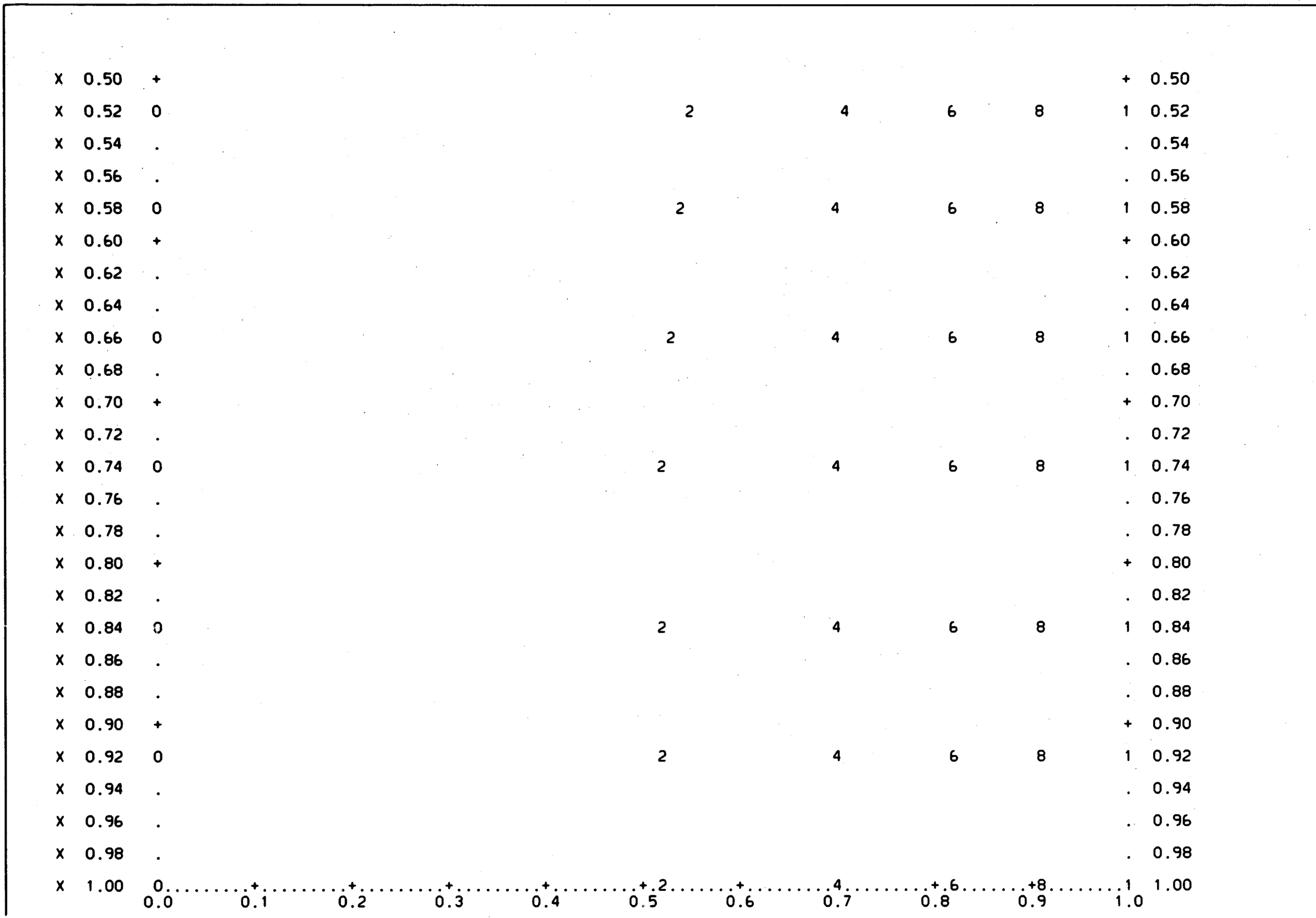
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6
8
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0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.94E 01	1.96E 01	1.97E 01	1.98E 01	2.00E 01	2.08E 01	2.23E 01	2.41E 01
19	0.05937	0.00	0.00	0.00	0.00	2.01E 01	2.01E 01	2.02E 01	2.05E 01	2.10E 01	2.20E 01	2.35E 01	2.52E 01
18	0.05594	0.00	0.00	0.00	0.00	2.08E 01	2.05E 01	2.06E 01	2.09E 01	2.17E 01	2.29E 01	2.42E 01	2.56E 01
17	0.05344	0.00	0.00	0.00	2.30E 01	2.17E 01	2.12E 01	2.12E 01	2.16E 01	2.25E 01	2.36E 01	2.47E 01	2.57E 01
16	0.05078	0.00	0.00	0.00	2.38E 01	2.22E 01	2.15E 01	2.17E 01	2.25E 01	2.35E 01	2.44E 01	2.51E 01	2.57E 01
15	0.04812	0.00	0.00	0.00	2.48E 01	2.25E 01	2.18E 01	2.23E 01	2.34E 01	2.45E 01	2.51E 01	2.54E 01	2.57E 01
14	0.04562	0.00	0.00	2.97E 01	2.60E 01	2.27E 01	2.20E 01	2.30E 01	2.43E 01	2.52E 01	2.56E 01	2.56E 01	2.55E 01
13	0.04328	0.00	0.00	3.08E 01	2.59E 01	2.23E 01	2.21E 01	2.36E 01	2.51E 01	2.58E 01	2.59E 01	2.56E 01	2.53E 01
12	0.04094	0.00	0.00	3.22E 01	2.58E 01	2.20E 01	2.23E 01	2.43E 01	2.57E 01	2.62E 01	2.60E 01	2.55E 01	2.49E 01
11	0.03719	0.00	4.27E 01	3.44E 01	2.56E 01	2.17E 01	2.28E 01	2.51E 01	2.62E 01	2.63E 01	2.58E 01	2.49E 01	2.41E 01
10	0.03437	0.00	4.49E 01	3.41E 01	2.44E 01	2.10E 01	2.31E 01	2.52E 01	2.61E 01	2.59E 01	2.52E 01	2.42E 01	2.32E 01
9	0.03219	0.00	4.77E 01	3.40E 01	2.36E 01	2.09E 01	2.32E 01	2.50E 01	2.57E 01	2.54E 01	2.46E 01	2.35E 01	2.24E 01
8	0.03031	6.43E 01	5.07E 01	3.36E 01	2.29E 01	2.08E 01	2.30E 01	2.46E 01	2.51E 01	2.47E 01	2.38E 01	2.28E 01	2.16E 01
7	0.02687	6.43E 01	4.95E 01	3.19E 01	2.17E 01	2.05E 01	2.22E 01	2.33E 01	2.36E 01	2.31E 01	2.22E 01	2.11E 01	2.00E 01
6	0.02187	6.43E 01	4.70E 01	2.86E 01	1.96E 01	1.92E 01	1.98E 01	2.03E 01	2.04E 01	2.00E 01	1.92E 01	1.82E 01	1.71E 01
5	0.01625	6.43E 01	4.30E 01	2.37E 01	1.54E 01	1.59E 01	1.58E 01	1.59E 01	1.58E 01	1.55E 01	1.49E 01	1.42E 01	1.33E 01
4	0.01062	6.43E 01	3.74E 01	1.66E 01	1.17E 01	1.13E 01	1.09E 01	1.07E 01	1.07E 01	1.05E 01	1.01E 01	9.59E 00	8.96E 00
3	0.00562	6.43E 01	2.88E 01	6.22E 00	6.58E 00	6.24E 00	5.95E 00	5.82E 00	5.78E 00	5.69E 00	5.50E 00	5.21E 00	4.87E 00
2	0.00156	6.43E 01	8.00E 00	1.73E 00	1.83E 00	1.73E 00	1.65E 00	1.62E 00	1.60E 00	1.58E 00	1.53E 00	1.45E 00	1.35E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.58E 01	2.70E 01	2.77E 01	2.80E 01	2.78E 01	2.74E 01	2.67E 01	2.60E 01	2.52E 01	2.49E 01	0.00
19	0.05937	2.67E 01	2.78E 01	2.84E 01	2.87E 01	2.87E 01	2.85E 01	2.82E 01	2.78E 01	2.73E 01	2.68E 01	0.00
18	0.05594	2.67E 01	2.75E 01	2.79E 01	2.81E 01	2.81E 01	2.79E 01	2.76E 01	2.72E 01	2.68E 01	2.64E 01	0.00
17	0.05344	2.65E 01	2.71E 01	2.74E 01	2.74E 01	2.73E 01	2.71E 01	2.67E 01	2.64E 01	2.60E 01	2.56E 01	0.00
16	0.05078	2.62E 01	2.65E 01	2.66E 01	2.66E 01	2.64E 01	2.61E 01	2.57E 01	2.54E 01	2.50E 01	2.45E 01	0.00
15	0.04812	2.59E 01	2.59E 01	2.59E 01	2.57E 01	2.54E 01	2.50E 01	2.46E 01	2.42E 01	2.38E 01	2.34E 01	0.00
14	0.04562	2.54E 01	2.53E 01	2.50E 01	2.47E 01	2.44E 01	2.40E 01	2.35E 01	2.31E 01	2.27E 01	2.23E 01	0.00
13	0.04328	2.50E 01	2.46E 01	2.42E 01	2.38E 01	2.34E 01	2.29E 01	2.25E 01	2.21E 01	2.16E 01	2.12E 01	0.00
12	0.04094	2.44E 01	2.39E 01	2.33E 01	2.28E 01	2.24E 01	2.19E 01	2.14E 01	2.10E 01	2.05E 01	2.01E 01	0.00
11	0.03719	2.33E 01	2.25E 01	2.18E 01	2.12E 01	2.06E 01	2.01E 01	1.96E 01	1.92E 01	1.88E 01	1.84E 01	0.00
10	0.03437	2.22E 01	2.14E 01	2.06E 01	1.99E 01	1.93E 01	1.88E 01	1.82E 01	1.78E 01	1.74E 01	1.70E 01	0.00
9	0.03219	2.14E 01	2.04E 01	1.96E 01	1.88E 01	1.82E 01	1.77E 01	1.72E 01	1.67E 01	1.63E 01	1.60E 01	0.00
8	0.03031	2.05E 01	1.95E 01	1.87E 01	1.79E 01	1.73E 01	1.67E 01	1.62E 01	1.58E 01	1.54E 01	1.50E 01	0.00
7	0.02687	1.88E 01	1.78E 01	1.69E 01	1.61E 01	1.55E 01	1.50E 01	1.45E 01	1.41E 01	1.37E 01	1.34E 01	0.00
6	0.02187	1.60E 01	1.50E 01	1.41E 01	1.34E 01	1.28E 01	1.23E 01	1.19E 01	1.15E 01	1.12E 01	1.09E 01	0.00
5	0.01625	1.23E 01	1.15E 01	1.08E 01	1.02E 01	9.68E 00	9.27E 00	8.92E 00	8.63E 00	8.37E 00	8.15E 00	0.00
4	0.01062	8.32E 00	7.72E 00	7.20E 00	6.77E 00	6.42E 00	6.13E 00	5.89E 00	5.69E 00	5.51E 00	5.36E 00	0.00
3	0.00562	4.51E 00	4.17E 00	3.88E 00	3.64E 00	3.45E 00	3.29E 00	3.16E 00	3.05E 00	2.95E 00	2.87E 00	0.00
2	0.00156	1.25E 00	1.16E 00	1.08E 00	1.01E 00	9.58E-01	9.14E-01	8.77E-01	8.47E-01	8.20E-01	7.97E-01	0.00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- PRESSURE -*

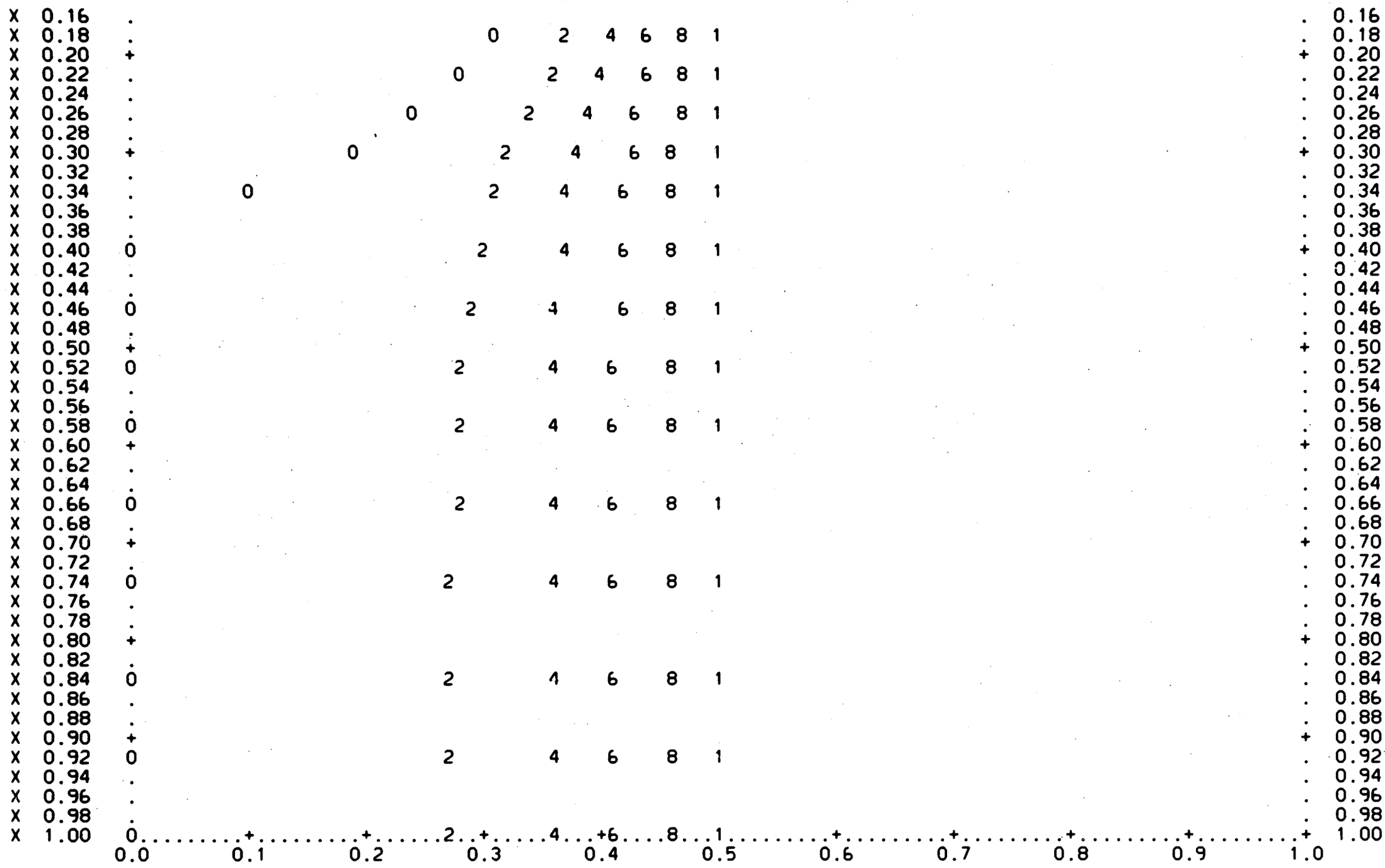
0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0 J	Y												
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	1.60E 03	1.64E 03	1.58E 03	1.57E 03	1.59E 03	1.61E 03	1.63E 03	1.64E 03

18	0.43750	0.00	0.00	0.00	0.00	3.43E-01	1.02E-01	3.54E-03	-2.45E-02	-2.55E-02	-2.05E-02	-1.55E-02	-1.12E-02
17	0.41687	0.00	0.00	0.00	2.12E-01	3.37E-01	1.09E-01	-6.14E-03	-3.87E-02	-3.78E-02	-2.91E-02	-2.13E-02	-1.52E-02
16	0.39562	0.00	0.00	0.00	4.14E-01	3.52E-01	1.11E-01	-1.83E-02	-5.35E-02	-4.92E-02	-3.67E-02	-2.66E-02	-1.90E-02
15	0.37500	0.00	0.00	0.00	6.23E-01	3.62E-01	1.01E-01	-3.37E-02	-6.60E-02	-5.74E-02	-4.22E-02	-3.08E-02	-2.22E-02
14	0.35562	0.00	0.00	2.85E-01	5.90E-01	3.49E-01	8.06E-02	-4.86E-02	-7.39E-02	-6.19E-02	-4.57E-02	-3.38E-02	-2.48E-02
13	0.33687	0.00	0.00	5.10E-01	5.95E-01	3.30E-01	5.84E-02	-5.91E-02	-7.73E-02	-6.37E-02	-4.76E-02	-3.59E-02	-2.68E-02
12	0.31250	0.00	0.00	7.92E-01	6.11E-01	2.93E-01	2.58E-02	-6.69E-02	-7.66E-02	-6.32E-02	-4.86E-02	-3.79E-02	-2.90E-02
11	0.28625	0.00	3.59E-01	7.90E-01	5.99E-01	2.19E-01	-5.87E-03	-6.36E-02	-6.98E-02	-5.93E-02	-4.77E-02	-3.85E-02	-3.02E-02
10	0.26625	0.00	5.95E-01	8.30E-01	5.75E-01	1.56E-01	-1.95E-02	-5.76E-02	-6.29E-02	-5.53E-02	-4.61E-02	-3.82E-02	-3.05E-02
9	0.25000	0.00	8.06E-01	8.56E-01	5.41E-01	1.07E-01	-2.52E-02	-5.18E-02	-5.68E-02	-5.15E-02	-4.43E-02	-3.76E-02	-3.05E-02
8	0.22875	0.00	7.83E-01	8.60E-01	4.77E-01	4.99E-02	-2.90E-02	-4.38E-02	-4.86E-02	-4.63E-02	-4.17E-02	-3.64E-02	-3.00E-02
7	0.19500	0.00	7.75E-01	8.32E-01	3.34E-01	-1.84E-02	-2.91E-02	-3.21E-02	-3.64E-02	-3.78E-02	-3.66E-02	-3.34E-02	-2.83E-02
6	0.15250	0.00	7.84E-01	7.32E-01	8.49E-02	-2.97E-02	-2.51E-02	-2.16E-02	-2.40E-02	-2.76E-02	-2.91E-02	-2.79E-02	-2.43E-02
5	0.10750	0.00	7.82E-01	4.67E-01	-5.81E-02	-3.30E-02	-2.00E-02	-1.40E-02	-1.46E-02	-1.80E-02	-2.05E-02	-2.07E-02	-1.83E-02
4	0.06500	0.00	6.97E-01	7.36E-02	-2.82E-02	-2.25E-02	-1.32E-02	-8.26E-03	-8.06E-03	-1.03E-02	-1.23E-02	-1.29E-02	-1.15E-02
3	0.02875	0.00	3.85E-01	-3.51E-02	-1.45E-02	-1.05E-02	-6.07E-03	-3.64E-03	-3.43E-03	-4.47E-03	-5.43E-03	-5.74E-03	-5.19E-03
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0 J	Y											
21	0.50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.48500	-1.54E-03	-8.61E-04	-3.98E-04	-1.51E-04	-4.58E-05	-1.90E-05	5.50E-06	1.60E-05	6.69E-05	1.16E-06	0.00
19	0.46125	-4.35E-03	-2.44E-03	-1.16E-03	-4.52E-04	-1.07E-04	3.00E-05	1.34E-04	1.86E-04	2.34E-04	1.31E-06	0.00
18	0.43750	-7.34E-03	-4.22E-03	-2.14E-03	-9.51E-04	-3.37E-04	-5.33E-05	1.56E-04	2.66E-04	3.33E-04	1.31E-06	0.00
17	0.41687	-9.98E-03	-5.86E-03	-3.10E-03	-1.49E-03	-6.30E-04	-2.04E-04	1.07E-04	2.74E-04	3.77E-04	1.61E-06	0.00
16	0.39562	-1.26E-02	-7.57E-03	-4.17E-03	-2.13E-03	-1.01E-03	-4.24E-04	1.97E-07	2.31E-04	3.84E-04	2.25E-06	0.00
15	0.37500	-1.50E-02	-9.19E-03	-5.22E-03	-2.80E-03	-1.43E-03	-6.81E-04	-1.42E-04	1.55E-04	3.64E-04	3.09E-06	0.00
14	0.35562	-1.70E-02	-1.06E-02	-6.20E-03	-3.44E-03	-1.84E-03	-9.42E-04	-2.96E-04	6.35E-05	3.28E-04	3.91E-06	0.00
13	0.33687	-1.87E-02	-1.19E-02	-7.10E-03	-4.04E-03	-2.24E-03	-1.20E-03	-4.55E-04	-3.54E-05	2.82E-04	4.58E-06	0.00
12	0.31250	-2.06E-02	-1.34E-02	-8.19E-03	-4.80E-03	-2.74E-03	-1.54E-03	-6.65E-04	-1.71E-04	2.14E-04	5.10E-06	0.00
11	0.28625	-2.19E-02	-1.46E-02	-9.09E-03	-5.45E-03	-3.20E-03	-1.84E-03	-8.68E-04	-3.08E-04	1.36E-04	4.82E-06	0.00
10	0.26625	-2.25E-02	-1.52E-02	-9.61E-03	-5.85E-03	-3.48E-03	-2.04E-03	-1.00E-03	-4.00E-04	7.91E-05	4.08E-06	0.00
9	0.25000	-2.27E-02	-1.55E-02	-9.91E-03	-6.09E-03	-3.67E-03	-2.17E-03	-1.09E-03	-4.66E-04	3.60E-05	3.22E-06	0.00
8	0.22875	-2.27E-02	-1.57E-02	-1.02E-02	-6.33E-03	-3.85E-03	-2.30E-03	-1.19E-03	-5.41E-04	-1.65E-05	2.00E-06	0.00
7	0.19500	-2.18E-02	-1.54E-02	-1.01E-02	-6.41E-03	-3.95E-03	-2.39E-03	-1.28E-03	-6.15E-04	-8.24E-05	4.17E-07	0.00
6	0.15250	-1.91E-02	-1.37E-02	-9.22E-03	-5.92E-03	-3.68E-03	-2.25E-03	-1.23E-03	-6.19E-04	-1.26E-04	-6.15E-07	0.00
5	0.10750	-1.47E-02	-1.07E-02	-7.26E-03	-4.72E-03	-2.95E-03	-1.81E-03	-1.01E-03	-5.20E-04	-1.27E-04	-7.76E-07	0.00
4	0.06500	-9.31E-03	-6.84E-03	-4.68E-03	-3.07E-03	-1.92E-03	-1.18E-03	-6.63E-04	-3.47E-04	-9.21E-05	-4.49E-07	0.00
3	0.02875	-4.20E-03	-3.10E-03	-2.13E-03	-1.40E-03	-8.77E-04	-5.39E-04	-3.04E-04	-1.60E-04	-4.41E-05	-1.47E-07	0.00
2	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- DIMENSIONLESS W VELOCITY -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0	I =	1	2	3	4	5	6	7	8	9	10	11	12
	X =	-0.03148	0.03148	0.09443	0.16430	0.24187	0.32796	0.42352	0.52960	0.64735	0.77804	0.92311	1.08415
0 J	Y												
21	0.50500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500	0.00	0.00	0.00	0.00	6.48E-01	6.52E-01	6.55E-01	6.59E-01	6.67E-01	6.93E-01	7.43E-01	8.05E-01
19	0.47500	0.00	0.00	0.00	0.00	6.70E-01	6.70E-01	6.75E-01	6.83E-01	6.99E-01	7.32E-01	7.84E-01	8.40E-01
18	0.44750	0.00	0.00	0.00	0.00	6.92E-01	6.83E-01	6.86E-01	6.98E-01	7.22E-01	7.62E-01	8.08E-01	8.52E-01
17	0.42750	0.00	0.00	0.00	7.67E-01	7.25E-01	7.05E-01	7.05E-01	7.19E-01	7.50E-01	7.87E-01	8.23E-01	8.56E-01
16	0.40625	0.00	0.00	0.00	7.93E-01	7.38E-01	7.18E-01	7.25E-01	7.49E-01	7.83E-01	8.14E-01	8.37E-01	8.58E-01
15	0.38500	0.00	0.00	0.00	8.26E-01	7.50E-01	7.27E-01	7.45E-01	7.81E-01	8.15E-01	8.37E-01	8.48E-01	8.56E-01
14	0.36500	0.00	0.00	9.91E-01	8.68E-01	7.57E-01	7.33E-01	7.67E-01	8.11E-01	8.42E-01	8.54E-01	8.54E-01	8.51E-01



DIMENSIONLESS STREAMLINE PLOT

1X-AXIS IS XI

Y-AXES ARE	00	02	04	06	08	10
SYMBOL	0	2	4	6	8	1
MAXIMUM VALUES	0.376E 02	0.405E 02	0.429E 02	0.452E 02	0.475E 02	0.500E 02

COMPUTED INLET MEAN AXIAL VELOCITY = 30.0000

COMPUTED INLET MASS FLOW RATE = 0.01774

U VELOCITY

J	Y	I = 1	2	3	4	5	6	7	8	9	10	11	12
	X =	0.00000	0.00000	0.00787	0.01617	0.02539	0.03561	0.04697	0.05957	0.07356	0.08909	0.10632	0.12545
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	0.00	7.66E 00	1.40E 01	1.49E 01	1.40E 01	1.30E 01	1.21E 01	1.13E 01
19	0.05937	0.00	0.00	0.00	0.00	0.00	1.22E 01	1.66E 01	1.68E 01	1.55E 01	1.42E 01	1.29E 01	1.19E 01
18	0.05594	0.00	0.00	0.00	0.00	0.00	1.71E 01	1.94E 01	1.85E 01	1.66E 01	1.47E 01	1.31E 01	1.20E 01
17	0.05344	0.00	0.00	0.00	0.00	2.36E 01	2.10E 01	2.07E 01	1.87E 01	1.64E 01	1.43E 01	1.29E 01	1.18E 01
16	0.05078	0.00	0.00	0.00	0.00	2.10E 01	2.06E 01	1.95E 01	1.73E 01	1.51E 01	1.35E 01	1.23E 01	1.14E 01
15	0.04812	0.00	0.00	0.00	0.00	2.15E 01	2.00E 01	1.72E 01	1.48E 01	1.32E 01	1.22E 01	1.15E 01	1.08E 01
14	0.04562	0.00	0.00	0.00	3.24E 01	2.36E 01	1.82E 01	1.39E 01	1.18E 01	1.11E 01	1.08E 01	1.05E 01	1.01E 01
13	0.04328	0.00	0.00	0.00	2.44E 01	2.00E 01	1.39E 01	9.92E 00	8.90E 00	9.14E 00	9.45E 00	9.49E 00	9.33E 00
12	0.04094	0.00	0.00	0.00	2.14E 01	1.74E 01	1.00E 01	6.15E 00	6.18E 00	7.25E 00	8.05E 00	8.41E 00	8.47E 00
11	0.03719	0.00	0.00	2.97E 01	2.16E 01	1.37E 01	3.35E 00	9.73E-01	2.53E 00	4.44E 00	5.77E 00	6.52E 00	6.92E 00
10	0.03437	0.00	0.00	2.10E 01	1.76E 01	7.68E 00	-1.16E 00	-1.79E 00	2.96E-01	2.48E 00	4.05E 00	5.05E 00	5.68E 00
9	0.03219	0.00	0.00	1.99E 01	1.55E 01	3.31E 00	-3.55E 00	-3.42E 00	-1.21E 00	1.05E 00	2.73E 00	3.88E 00	4.68E 00
8	0.03031	0.00	3.00E 01	2.16E 01	1.37E 01	7.61E-01	-5.02E 00	-4.56E 00	-2.38E 00	-1.26E-01	1.62E 00	2.88E 00	3.82E 00
7	0.02687	0.00	3.00E 01	2.20E 01	1.07E 01	-3.73E 00	-6.84E 00	-6.14E 00	-4.23E 00	-2.13E 00	-3.55E-01	1.07E 00	2.24E 00
6	0.02187	0.00	3.00E 01	2.07E 01	4.38E 00	-8.25E 00	-8.53E 00	-7.81E 00	-6.44E 00	-4.72E 00	-3.01E 00	-1.42E 00	3.08E-02
5	0.01625	0.00	3.00E 01	1.62E 01	-6.76E 00	-1.05E 01	-1.00E 01	-9.30E 00	-8.37E 00	-7.09E 00	-5.54E 00	-3.84E 00	-2.15E 00
4	0.01062	0.00	3.00E 01	5.54E 00	-1.52E 01	-1.27E 01	-1.13E 01	-1.05E 01	-9.76E 00	-8.79E 00	-7.41E 00	-5.68E 00	-3.82E 00
3	0.00562	0.00	3.00E 01	-1.21E 01	-1.60E 01	-1.38E 01	-1.21E 01	-1.12E 01	-1.05E 01	-9.70E 00	-8.43E 00	-6.71E 00	-4.76E 00
2	0.00156	0.00	3.00E 01	-2.35E 01	-1.70E 01	-1.43E 01	-1.24E 01	-1.14E 01	-1.08E 01	-1.00E 01	-8.79E 00	-7.08E 00	-5.11E 00
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J	Y	I = 13	14	15	16	17	18	19	20	21	22	23
	X =	0.14669	0.17026	0.19643	0.22547	0.25771	0.29349	0.33321	0.37500	0.41679	0.45858	0.50037
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	1.07E 01	1.03E 01	1.01E 01	1.00E 01	1.00E 01	1.00E 01	1.01E 01	1.01E 01	1.01E 01	1.02E 01	1.02E 01
19	0.05937	1.11E 01	1.07E 01	1.04E 01	1.03E 01	1.02E 01	1.03E 01	1.03E 01	1.04E 01	1.05E 01	1.06E 01	1.06E 01
18	0.05594	1.12E 01	1.06E 01	1.03E 01	1.01E 01	9.99E 00	9.94E 00	9.93E 00	9.95E 00	9.99E 00	1.00E 01	1.00E 01
17	0.05344	1.10E 01	1.05E 01	1.01E 01	9.87E 00	9.71E 00	9.62E 00	9.56E 00	9.54E 00	9.55E 00	9.56E 00	9.56E 00
16	0.05078	1.07E 01	1.02E 01	9.81E 00	9.54E 00	9.35E 00	9.22E 00	9.14E 00	9.09E 00	9.06E 00	9.06E 00	9.06E 00
15	0.04812	1.03E 01	9.79E 00	9.42E 00	9.15E 00	8.94E 00	8.80E 00	8.69E 00	8.62E 00	8.58E 00	8.56E 00	8.56E 00
14	0.04562	9.69E 00	9.31E 00	8.98E 00	8.72E 00	8.52E 00	8.37E 00	8.25E 00	8.18E 00	8.12E 00	8.09E 00	8.09E 00
13	0.04328	9.07E 00	8.78E 00	8.51E 00	8.28E 00	8.09E 00	7.95E 00	7.84E 00	7.76E 00	7.70E 00	7.66E 00	7.66E 00
12	0.04094	8.37E 00	8.19E 00	7.99E 00	7.80E 00	7.64E 00	7.51E 00	7.41E 00	7.33E 00	7.28E 00	7.24E 00	7.24E 00
11	0.03719	7.09E 00	7.12E 00	7.07E 00	6.98E 00	6.88E 00	6.80E 00	6.72E 00	6.66E 00	6.61E 00	6.57E 00	6.57E 00
10	0.03437	6.06E 00	6.26E 00	6.33E 00	6.33E 00	6.30E 00	6.25E 00	6.21E 00	6.17E 00	6.12E 00	6.09E 00	6.09E 00
9	0.03219	5.23E 00	5.56E 00	5.74E 00	5.81E 00	5.84E 00	5.83E 00	5.82E 00	5.79E 00	5.76E 00	5.73E 00	5.73E 00
8	0.03031	4.50E 00	4.95E 00	5.22E 00	5.37E 00	5.45E 00	5.48E 00	5.49E 00	5.48E 00	5.46E 00	5.43E 00	5.43E 00
7	0.02687	3.17E 00	3.84E 00	4.29E 00	4.57E 00	4.75E 00	4.85E 00	4.91E 00	4.93E 00	4.93E 00	4.91E 00	4.91E 00
6	0.02187	1.28E 00	2.25E 00	2.96E 00	3.46E 00	3.78E 00	4.00E 00	4.14E 00	4.21E 00	4.23E 00	4.22E 00	4.22E 00
5	0.01625	-6.01E-01	6.79E-01	1.66E 00	2.36E 00	2.85E 00	3.18E 00	3.40E 00	3.52E 00	3.58E 00	3.58E 00	3.58E 00
4	0.01062	-2.05E 00	-5.37E-01	6.48E-01	1.52E 00	2.14E 00	2.57E 00	2.86E 00	3.02E 00	3.10E 00	3.11E 00	3.11E 00

0 J	Y												
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.68E 01	1.54E 01	1.42E 01	1.32E 01	1.25E 01	1.21E 01	1.24E 01	1.38E 01
19	0.47500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	2.77E 02	2.75E 02	2.31E 02	1.93E 02	1.63E 02	1.48E 02	2.00E 02	3.26E 02
18	0.44750	1.00E 00	1.00E 00	1.00E 00	1.00E 00	3.18E 02	2.52E 02	2.23E 02	2.04E 02	1.91E 02	2.22E 02	4.21E 02	6.98E 02
17	0.42750	1.00E 00	1.00E 00	1.00E 00	4.95E 01	1.43E 02	1.49E 02	1.60E 02	1.71E 02	1.88E 02	3.09E 02	6.19E 02	9.29E 02
16	0.40625	1.00E 00	1.00E 00	1.00E 00	3.05E 02	1.94E 02	1.57E 02	1.49E 02	1.57E 02	2.19E 02	4.74E 02	8.38E 02	1.14E 03
15	0.38500	1.00E 00	1.00E 00	1.00E 00	2.83E 02	1.49E 02	1.28E 02	1.29E 02	1.61E 02	3.38E 02	6.92E 02	1.05E 03	1.33E 03
14	0.36500	1.00E 00	1.00E 00	5.52E 01	1.09E 02	1.04E 02	1.13E 02	1.33E 02	2.34E 02	5.35E 02	9.03E 02	1.23E 03	1.48E 03
13	0.34625	1.00E 00	1.00E 00	2.93E 02	1.29E 02	1.03E 02	1.26E 02	1.82E 02	3.89E 02	7.39E 02	1.08E 03	1.38E 03	1.61E 03
12	0.32750	1.00E 00	1.00E 00	2.64E 02	8.98E 01	9.54E 01	1.48E 02	2.77E 02	5.80E 02	9.32E 02	1.25E 03	1.52E 03	1.72E 03
11	0.29750	1.00E 00	9.81E 01	8.71E 01	5.49E 01	9.91E 01	2.12E 02	5.20E 02	8.93E 02	1.21E 03	1.48E 03	1.71E 03	1.89E 03
10	0.27500	1.00E 00	3.77E 02	8.54E 01	4.57E 01	1.25E 02	3.61E 02	7.37E 02	1.08E 03	1.37E 03	1.62E 03	1.83E 03	2.00E 03
9	0.25750	1.00E 00	3.89E 02	3.83E 01	3.60E 01	1.63E 02	4.80E 02	8.88E 02	1.20E 03	1.47E 03	1.72E 03	1.92E 03	2.07E 03
8	0.24250	1.00E 00	7.00E 00	6.61E 00	3.59E 01	2.16E 02	5.96E 02	1.00E 03	1.30E 03	1.56E 03	1.79E 03	1.99E 03	2.13E 03
7	0.21500	1.00E 00	6.98E 00	7.65E 00	5.57E 01	3.20E 02	8.41E 02	1.19E 03	1.46E 03	1.70E 03	1.91E 03	2.09E 03	2.22E 03
6	0.17500	1.00E 00	7.00E 00	1.12E 01	1.12E 02	6.13E 02	1.13E 03	1.42E 03	1.66E 03	1.87E 03	2.06E 03	2.22E 03	2.33E 03
5	0.13000	1.00E 00	7.05E 00	2.57E 01	2.86E 02	8.60E 02	1.40E 03	1.64E 03	1.84E 03	2.03E 03	2.20E 03	2.34E 03	2.43E 03
4	0.08500	1.00E 00	7.28E 00	9.17E 01	1.12E 03	1.20E 03	1.62E 03	1.81E 03	1.98E 03	2.15E 03	2.30E 03	2.43E 03	2.51E 03
3	0.04500	1.00E 00	8.36E 00	3.94E 02	1.19E 03	1.47E 03	1.77E 03	1.93E 03	2.09E 03	2.24E 03	2.39E 03	2.50E 03	2.57E 03
2	0.01250	1.00E 00	1.83E 01	8.25E 02	1.47E 03	1.65E 03	1.88E 03	2.02E 03	2.18E 03	2.33E 03	2.47E 03	2.58E 03	2.64E 03
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00

0	I =	13	14	15	16	17	18	19	20	21	22	23
	X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015

0 J	Y												
21	0.50500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
20	0.49500	1.50E 01	1.53E 01	1.50E 01	1.45E 01	1.39E 01	1.34E 01	1.29E 01	1.25E 01	1.22E 01	1.21E 01	1.00E 00	
19	0.47500	4.00E 02	4.03E 02	3.66E 02	3.11E 02	2.53E 02	2.00E 02	1.56E 02	1.25E 02	1.02E 02	1.04E 02	1.00E 00	
18	0.44750	8.42E 02	8.48E 02	7.78E 02	6.75E 02	5.65E 02	4.62E 02	3.75E 02	3.07E 02	2.56E 02	2.68E 02	1.00E 00	
17	0.42750	1.09E 03	1.10E 03	1.02E 03	8.97E 02	7.64E 02	6.38E 02	5.31E 02	4.46E 02	3.80E 02	4.01E 02	1.00E 00	
16	0.40625	1.30E 03	1.32E 03	1.23E 03	1.10E 03	9.48E 02	8.05E 02	6.82E 02	5.84E 02	5.08E 02	5.35E 02	1.00E 00	
15	0.38500	1.48E 03	1.49E 03	1.40E 03	1.26E 03	1.10E 03	9.50E 02	8.16E 02	7.09E 02	6.24E 02	6.57E 02	1.00E 00	
14	0.36500	1.62E 03	1.63E 03	1.54E 03	1.40E 03	1.23E 03	1.07E 03	9.26E 02	8.13E 02	7.22E 02	7.57E 02	1.00E 00	
13	0.34625	1.73E 03	1.74E 03	1.65E 03	1.50E 03	1.33E 03	1.16E 03	1.02E 03	8.99E 02	8.04E 02	8.39E 02	1.00E 00	
12	0.32750	1.84E 03	1.84E 03	1.75E 03	1.60E 03	1.42E 03	1.25E 03	1.10E 03	9.75E 02	8.76E 02	9.11E 02	1.00E 00	
11	0.29750	1.99E 03	1.98E 03	1.88E 03	1.72E 03	1.54E 03	1.36E 03	1.21E 03	1.08E 03	9.75E 02	1.01E 03	1.00E 00	
10	0.27500	2.08E 03	2.06E 03	1.96E 03	1.80E 03	1.62E 03	1.44E 03	1.28E 03	1.14E 03	1.04E 03	1.07E 03	1.00E 00	
9	0.25750	2.15E 03	2.12E 03	2.01E 03	1.85E 03	1.67E 03	1.49E 03	1.32E 03	1.19E 03	1.08E 03	1.11E 03	1.00E 00	
8	0.24250	2.20E 03	2.17E 03	2.06E 03	1.89E 03	1.71E 03	1.52E 03	1.36E 03	1.22E 03	1.11E 03	1.14E 03	1.00E 00	
7	0.21500	2.28E 03	2.24E 03	2.12E 03	1.96E 03	1.77E 03	1.58E 03	1.42E 03	1.28E 03	1.17E 03	1.18E 03	1.00E 00	
6	0.17500	2.38E 03	2.33E 03	2.21E 03	2.03E 03	1.84E 03	1.65E 03	1.48E 03	1.34E 03	1.23E 03	1.23E 03	1.00E 00	
5	0.13000	2.46E 03	2.41E 03	2.28E 03	2.10E 03	1.91E 03	1.71E 03	1.54E 03	1.40E 03	1.28E 03	1.28E 03	1.00E 00	
4	0.08500	2.53E 03	2.48E 03	2.34E 03	2.15E 03	1.95E 03	1.76E 03	1.58E 03	1.44E 03	1.31E 03	1.30E 03	1.00E 00	
3	0.04500	2.58E 03	2.52E 03	2.38E 03	2.19E 03	1.99E 03	1.79E 03	1.61E 03	1.46E 03	1.33E 03	1.32E 03	1.00E 00	
2	0.01250	2.65E 03	2.57E 03	2.43E 03	2.22E 03	2.01E 03	1.81E 03	1.62E 03	1.47E 03	1.34E 03	1.34E 03	1.00E 00	
1	-0.01250	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	

I	X/D	S.S.COEFF.
2	3.148E-02	7.048E-03
3	9.443E-02	4.811E-03

102	0.7407E-01	0.5673E-01	0.3406E-01	0.2392E-01	0.6566E-02	0.3297E 08	0.6062E 01	-0.7397E-02	0.1213E 02	0.1291E 04	0.1229E 04
103	0.7042E-01	0.6130E-01	0.3273E-01	0.2307E-01	0.6422E-02	0.3501E 08	0.6048E 01	-0.7133E-02	0.1215E 02	0.1292E 04	0.1235E 04
104	0.6957E-01	0.5800E-01	0.3139E-01	0.2199E-01	0.6297E-02	0.3616E 08	0.6036E 01	-0.6062E-02	0.1217E 02	0.1292E 04	0.1240E 04
105	0.6938E-01	0.4971E-01	0.3015E-01	0.2127E-01	0.6160E-02	0.3778E 08	0.6023E 01	-0.6062E-02	0.1219E 02	0.1293E 04	0.1245E 04
106	0.6566E-01	0.5396E-01	0.2892E-01	0.2047E-01	0.6005E-02	0.3789E 08	0.6011E 01	-0.5586E-02	0.1222E 02	0.1294E 04	0.1250E 04
107	0.6493E-01	0.5029E-01	0.2784E-01	0.1938E-01	0.5847E-02	0.3918E 08	0.5999E 01	-0.5130E-02	0.1224E 02	0.1294E 04	0.1255E 04
108	0.6272E-01	0.4871E-01	0.2683E-01	0.1864E-01	0.5706E-02	0.4083E 08	0.5989E 01	-0.4559E-02	0.1226E 02	0.1295E 04	0.1260E 04
109	0.6121E-01	0.4628E-01	0.2586E-01	0.1784E-01	0.5586E-02	0.4153E 08	0.5979E 01	-0.4008E-02	0.1228E 02	0.1296E 04	0.1264E 04
110	0.5970E-01	0.4403E-01	0.2492E-01	0.1705E-01	0.5472E-02	0.4209E 08	0.5969E 01	-0.3438E-02	0.1230E 02	0.1296E 04	0.1268E 04
111	0.5840E-01	0.4172E-01	0.2398E-01	0.1631E-01	0.5365E-02	0.4294E 08	0.5961E 01	-0.2882E-02	0.1232E 02	0.1297E 04	0.1272E 04
112	0.5703E-01	0.3946E-01	0.2310E-01	0.1560E-01	0.5246E-02	0.4342E 08	0.5953E 01	-0.2332E-02	0.1233E 02	0.1298E 04	0.1276E 04
113	0.5572E-01	0.3726E-01	0.2227E-01	0.1494E-01	0.5115E-02	0.4393E 08	0.5947E 01	-0.1799E-02	0.1235E 02	0.1298E 04	0.1280E 04
114	0.5446E-01	0.3506E-01	0.2151E-01	0.1428E-01	0.4975E-02	0.4465E 08	0.5940E 01	-0.1279E-02	0.1237E 02	0.1299E 04	0.1284E 04
115	0.5330E-01	0.3291E-01	0.2086E-01	0.1359E-01	0.4842E-02	0.4488E 08	0.5935E 01	-0.7765E-03	0.1239E 02	0.1300E 04	0.1287E 04
116	0.5222E-01	0.3086E-01	0.2025E-01	0.1302E-01	0.4722E-02	0.4548E 08	0.5931E 01	-0.2930E-03	0.1240E 02	0.1300E 04	0.1290E 04
117	0.5131E-01	0.2907E-01	0.1968E-01	0.1241E-01	0.4609E-02	0.4595E 08	0.5927E 01	0.1701E-03	0.1242E 02	0.1301E 04	0.1293E 04
118	0.5054E-01	0.2737E-01	0.1912E-01	0.1183E-01	0.4504E-02	0.4655E 08	0.5924E 01	0.6124E-03	0.1243E 02	0.1302E 04	0.1296E 04
119	0.4979E-01	0.2571E-01	0.1861E-01	0.1133E-01	0.4394E-02	0.4690E 08	0.5922E 01	0.1033E-02	0.1245E 02	0.1302E 04	0.1299E 04
120	0.4900E-01	0.2408E-01	0.1811E-01	0.1083E-01	0.4277E-02	0.4726E 08	0.5920E 01	0.1430E-02	0.1246E 02	0.1303E 04	0.1302E 04
121	0.4832E-01	0.2249E-01	0.1768E-01	0.1034E-01	0.4156E-02	0.4745E 08	0.5919E 01	0.1804E-02	0.1247E 02	0.1304E 04	0.1304E 04
122	0.4774E-01	0.2096E-01	0.1733E-01	0.9857E-02	0.4040E-02	0.4759E 08	0.5919E 01	0.2155E-02	0.1249E 02	0.1304E 04	0.1307E 04
123	0.4717E-01	0.1951E-01	0.1699E-01	0.9474E-02	0.3929E-02	0.4784E 08	0.5919E 01	0.2481E-02	0.1250E 02	0.1305E 04	0.1309E 04
124	0.4663E-01	0.1814E-01	0.1668E-01	0.9046E-02	0.3828E-02	0.4808E 08	0.5920E 01	0.2784E-02	0.1251E 02	0.1305E 04	0.1311E 04
125	0.4627E-01	0.1685E-01	0.1641E-01	0.8635E-02	0.3681E-02	0.4486E 08	0.5922E 01	0.3059E-02	0.1252E 02	0.1306E 04	0.1313E 04
126	0.4588E-01	0.1576E-01	0.1615E-01	0.8314E-02	0.3551E-02	0.4405E 08	0.5924E 01	0.3312E-02	0.1253E 02	0.1307E 04	0.1315E 04
127	0.4544E-01	0.1472E-01	0.1593E-01	0.8029E-02	0.3439E-02	0.4455E 08	0.5926E 01	0.3544E-02	0.1254E 02	0.1307E 04	0.1317E 04
128	0.4500E-01	0.1374E-01	0.1574E-01	0.7709E-02	0.3335E-02	0.4496E 08	0.5929E 01	0.3754E-02	0.1255E 02	0.1308E 04	0.1318E 04
129	0.4456E-01	0.1282E-01	0.1559E-01	0.7452E-02	0.3237E-02	0.4546E 08	0.5932E 01	0.3946E-02	0.1256E 02	0.1308E 04	0.1320E 04
130	0.4407E-01	0.1200E-01	0.1545E-01	0.7228E-02	0.3145E-02	0.4554E 08	0.5936E 01	0.4116E-02	0.1257E 02	0.1309E 04	0.1321E 04
131	0.4354E-01	0.1135E-01	0.1533E-01	0.6943E-02	0.3062E-02	0.4559E 08	0.5940E 01	0.4266E-02	0.1258E 02	0.1309E 04	0.1322E 04
132	0.4300E-01	0.1081E-01	0.1522E-01	0.6754E-02	0.2988E-02	0.4601E 08	0.5945E 01	0.4397E-02	0.1259E 02	0.1310E 04	0.1323E 04
133	0.4245E-01	0.1041E-01	0.1513E-01	0.6576E-02	0.2919E-02	0.4622E 08	0.5950E 01	0.4509E-02	0.1259E 02	0.1310E 04	0.1324E 04
134	0.4187E-01	0.1012E-01	0.1509E-01	0.6396E-02	0.2853E-02	0.4606E 08	0.5955E 01	0.4602E-02	0.1260E 02	0.1311E 04	0.1325E 04
135	0.4126E-01	0.9971E-02	0.1507E-01	0.6256E-02	0.2795E-02	0.4615E 08	0.5960E 01	0.4676E-02	0.1261E 02	0.1311E 04	0.1326E 04
136	0.4063E-01	0.9977E-02	0.1506E-01	0.6076E-02	0.2737E-02	0.4635E 08	0.5966E 01	0.4733E-02	0.1262E 02	0.1312E 04	0.1327E 04
137	0.3999E-01	0.1003E-01	0.1509E-01	0.5984E-02	0.2681E-02	0.4621E 08	0.5972E 01	0.4773E-02	0.1262E 02	0.1313E 04	0.1328E 04
138	0.3933E-01	0.1013E-01	0.1514E-01	0.5856E-02	0.2631E-02	0.4620E 08	0.5978E 01	0.4797E-02	0.1263E 02	0.1313E 04	0.1329E 04
139	0.3865E-01	0.1021E-01	0.1523E-01	0.5736E-02	0.2585E-02	0.4612E 08	0.5984E 01	0.4805E-02	0.1264E 02	0.1313E 04	0.1329E 04
140	0.3794E-01	0.1031E-01	0.1533E-01	0.5659E-02	0.2542E-02	0.4612E 08	0.5990E 01	0.4799E-02	0.1264E 02	0.1314E 04	0.1330E 04
141	0.3724E-01	0.1042E-01	0.1544E-01	0.5579E-02	0.2506E-02	0.4618E 08	0.5997E 01	0.4779E-02	0.1265E 02	0.1314E 04	0.1330E 04
142	0.3652E-01	0.1052E-01	0.1554E-01	0.5523E-02	0.2473E-02	0.4621E 08	0.6003E 01	0.4747E-02	0.1266E 02	0.1315E 04	0.1331E 04
143	0.3579E-01	0.1063E-01	0.1564E-01	0.5469E-02	0.2446E-02	0.4613E 08	0.6010E 01	0.4702E-02	0.1266E 02	0.1315E 04	0.1331E 04
144	0.3507E-01	0.1070E-01	0.1575E-01	0.5404E-02	0.2425E-02	0.4580E 08	0.6016E 01	0.4646E-02	0.1267E 02	0.1316E 04	0.1332E 04
145	0.3434E-01	0.1077E-01	0.1585E-01	0.5377E-02	0.2404E-02	0.4565E 08	0.6023E 01	0.4580E-02	0.1267E 02	0.1316E 04	0.1332E 04
146	0.3362E-01	0.1080E-01	0.1595E-01	0.5324E-02	0.2382E-02	0.4583E 08	0.6029E 01	0.4504E-02	0.1268E 02	0.1317E 04	0.1332E 04
147	0.3289E-01	0.1083E-01	0.1605E-01	0.5329E-02	0.2359E-02	0.4569E 08	0.6036E 01	0.4420E-02	0.1268E 02	0.1317E 04	0.1333E 04
148	0.3217E-01	0.1084E-01	0.1614E-01	0.5332E-02	0.2335E-02	0.4572E 08	0.6043E 01	0.4327E-02	0.1269E 02	0.1318E 04	0.1333E 04
149	0.3145E-01	0.1083E-01	0.1623E-01	0.5292E-02	0.2311E-02	0.4559E 08	0.6049E 01	0.4228E-02	0.1269E 02	0.1318E 04	0.1333E 04
150	0.3074E-01	0.1082E-01	0.1632E-01	0.5277E-02	0.2284E-02	0.4544E 08	0.6055E 01	0.4123E-02	0.1270E 02	0.1319E 04	0.1333E 04
151	0.3004E-01	0.1081E-01	0.1640E-01	0.5273E-02	0.2255E-02	0.4525E 08	0.6062E 01	0.4011E-02	0.1270E 02	0.1319E 04	0.1333E 04
152	0.2934E-01	0.1078E-01	0.1647E-01	0.5298E-02	0.2227E-02	0.4477E 08	0.6068E 01	0.3895E-02	0.1271E 02	0.1319E 04	0.1334E 04
153	0.2866E-01	0.1072E-01	0.1654E-01	0.5273E-02	0.2199E-02	0.4501E 08	0.6074E 01	0.3774E-02	0.1271E 02	0.1320E 04	0.1334E 04
154	0.2799E-01	0.1066E-01	0.1660E-01	0.5281E-02	0.2177E-02	0.4463E 08	0.6080E 01	0.3650E-02	0.1272E 02	0.1320E 04	0.1334E 04
155	0.2734E-01	0.1056E-01	0.1666E-01	0.5279E-02	0.2164E-02	0.4466E 08	0.6086E 01	0.3523E-02	0.1272E 02	0.1321E 04	0.1334E 04

10	0.03437	0.00	4.43E 01	1.55E 01	1.40E 01	2.71E 01	3.74E 01	4.36E 01	4.83E 01	5.11E 01	5.19E 01	5.08E 01	4.75E 01		
9	0.03219	0.00	3.77E 01	1.01E 01	1.53E 01	3.38E 01	4.00E 01	4.49E 01	4.91E 01	5.17E 01	5.25E 01	5.13E 01	4.80E 01		
8	0.03031	2.70E 01	9.00E 00	5.79E 00	1.80E 01	3.93E 01	4.09E 01	4.51E 01	4.91E 01	5.17E 01	5.26E 01	5.14E 01	4.81E 01		
7	0.02687	2.70E 01	9.00E 00	7.25E 00	2.43E 01	4.71E 01	4.13E 01	4.47E 01	4.84E 01	5.11E 01	5.21E 01	5.11E 01	4.79E 01		
6	0.02187	2.70E 01	9.07E 00	1.11E 01	3.84E 01	4.71E 01	4.09E 01	4.33E 01	4.66E 01	4.94E 01	5.06E 01	4.97E 01	4.68E 01		
5	0.01625	2.70E 01	9.38E 00	2.14E 01	6.27E 01	4.15E 01	3.98E 01	4.15E 01	4.43E 01	4.69E 01	4.81E 01	4.75E 01	4.48E 01		
4	0.01062	2.70E 01	1.07E 01	4.82E 01	4.04E 01	3.83E 01	3.85E 01	3.99E 01	4.22E 01	4.45E 01	4.57E 01	4.52E 01	4.28E 01		
3	0.00562	2.70E 01	1.62E 01	1.12E 02	3.73E 01	3.72E 01	3.77E 01	3.90E 01	4.11E 01	4.31E 01	4.43E 01	4.38E 01	4.16E 01		
2	0.00156	2.70E 01	3.46E 01	8.30E 01	3.76E 01	3.69E 01	3.76E 01	3.88E 01	4.08E 01	4.28E 01	4.39E 01	4.34E 01	4.12E 01		
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

0 I = 13 14 15 16 17 18 19 20 21 22 23

X = 0.15786 0.18266 0.21019 0.24075 0.27467 0.31232 0.35411 0.39590 0.43769 0.47948 0.52127

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	2.87E 00	2.83E 00	2.64E 00	2.42E 00	2.21E 00	2.03E 00	1.89E 00	1.77E 00	1.68E 00	1.66E 00	2.70E 01
19	0.05937	1.51E 01	1.41E 01	1.22E 01	1.01E 01	8.16E 00	6.50E 00	5.23E 00	4.32E 00	3.67E 00	3.91E 00	2.70E 01
18	0.05594	2.22E 01	2.03E 01	1.74E 01	1.42E 01	1.14E 01	8.97E 00	7.13E 00	5.79E 00	4.81E 00	5.36E 00	2.70E 01
17	0.05344	2.61E 01	2.35E 01	1.99E 01	1.62E 01	1.29E 01	1.02E 01	8.09E 00	6.57E 00	5.46E 00	6.23E 00	2.70E 01
16	0.05078	2.98E 01	2.64E 01	2.21E 01	1.79E 01	1.43E 01	1.12E 01	8.94E 00	7.27E 00	6.05E 00	7.01E 00	2.70E 01
15	0.04812	3.30E 01	2.88E 01	2.40E 01	1.94E 01	1.54E 01	1.21E 01	9.64E 00	7.86E 00	6.56E 00	7.66E 00	2.70E 01
14	0.04562	3.56E 01	3.08E 01	2.55E 01	2.05E 01	1.63E 01	1.28E 01	1.02E 01	8.32E 00	6.96E 00	8.15E 00	2.70E 01
13	0.04328	3.77E 01	3.24E 01	2.67E 01	2.14E 01	1.69E 01	1.33E 01	1.06E 01	8.69E 00	7.28E 00	8.51E 00	2.70E 01
12	0.04094	3.94E 01	3.36E 01	2.77E 01	2.22E 01	1.75E 01	1.38E 01	1.10E 01	9.01E 00	7.55E 00	8.79E 00	2.70E 01
11	0.03719	4.14E 01	3.52E 01	2.88E 01	2.31E 01	1.82E 01	1.44E 01	1.15E 01	9.39E 00	7.89E 00	9.08E 00	2.70E 01
10	0.03437	4.23E 01	3.59E 01	2.94E 01	2.35E 01	1.86E 01	1.46E 01	1.17E 01	9.60E 00	8.07E 00	9.19E 00	2.70E 01
9	0.03219	4.26E 01	3.62E 01	2.96E 01	2.37E 01	1.87E 01	1.48E 01	1.18E 01	9.71E 00	8.16E 00	9.21E 00	2.70E 01
8	0.03031	4.28E 01	3.63E 01	2.97E 01	2.38E 01	1.88E 01	1.49E 01	1.19E 01	9.77E 00	8.22E 00	9.20E 00	2.70E 01
7	0.02687	4.27E 01	3.62E 01	2.97E 01	2.38E 01	1.89E 01	1.49E 01	1.20E 01	9.83E 00	8.27E 00	9.10E 00	2.70E 01
6	0.02187	4.18E 01	3.56E 01	2.93E 01	2.35E 01	1.87E 01	1.48E 01	1.19E 01	9.80E 00	8.25E 00	8.84E 00	2.70E 01
5	0.01625	4.03E 01	3.46E 01	2.85E 01	2.29E 01	1.83E 01	1.46E 01	1.18E 01	9.68E 00	8.15E 00	8.48E 00	2.70E 01
4	0.01062	3.87E 01	3.34E 01	2.77E 01	2.24E 01	1.79E 01	1.43E 01	1.16E 01	9.55E 00	8.04E 00	8.15E 00	2.70E 01
3	0.00562	3.77E 01	3.27E 01	2.72E 01	2.20E 01	1.77E 01	1.42E 01	1.15E 01	9.47E 00	7.98E 00	7.97E 00	2.70E 01
2	0.00156	3.74E 01	3.25E 01	2.71E 01	2.19E 01	1.77E 01	1.42E 01	1.15E 01	9.50E 00	8.01E 00	7.96E 00	2.70E 01
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*- TURBULENCE DISSIPATION -*

0 I = 1 2 3 4 5 6 7 8 9 10 11 12

X = -0.00393 0.00393 0.01180 0.02054 0.03023 0.04099 0.05294 0.06620 0.08092 0.09726 0.11539 0.13552

0 J	Y											
21	0.06312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187	0.00	0.00	0.00	0.00	4.15E 03	3.37E 03	2.47E 03	1.92E 03	1.59E 03	1.54E 03	2.01E 03	2.71E 03
19	0.05937	0.00	0.00	0.00	0.00	6.81E 03	6.49E 03	4.53E 03	3.15E 03	2.26E 03	1.89E 03	2.13E 03	2.62E 03
18	0.05594	0.00	0.00	0.00	0.00	1.15E 04	8.17E 03	5.49E 03	3.79E 03	2.81E 03	2.57E 03	2.85E 03	3.09E 03
17	0.05344	0.00	0.00	0.00	9.01E 03	8.87E 03	6.14E 03	4.52E 03	3.57E 03	3.18E 03	3.36E 03	3.61E 03	3.60E 03
16	0.05078	0.00	0.00	0.00	1.56E 04	9.15E 03	5.97E 03	4.41E 03	3.87E 03	4.09E 03	4.48E 03	4.53E 03	4.20E 03
15	0.04812	0.00	0.00	0.00	1.29E 04	8.22E 03	5.61E 03	4.56E 03	4.77E 03	5.46E 03	5.72E 03	5.43E 03	4.77E 03
14	0.04562	0.00	0.00	1.39E 04	1.11E 04	7.88E 03	5.83E 03	5.38E 03	6.18E 03	6.85E 03	6.78E 03	6.16E 03	5.24E 03
13	0.04328	0.00	0.00	2.04E 04	1.13E 04	8.27E 03	6.62E 03	6.61E 03	7.58E 03	7.96E 03	7.55E 03	6.68E 03	5.57E 03
12	0.04094	0.00	0.00	1.23E 04	1.00E 04	8.93E 03	7.70E 03	7.90E 03	8.69E 03	8.73E 03	8.07E 03	7.04E 03	5.81E 03
11	0.03719	0.00	1.41E 04	1.42E 04	1.14E 04	1.10E 04	1.01E 04	9.62E 03	9.79E 03	9.38E 03	8.49E 03	7.33E 03	6.01E 03
10	0.03437	0.00	2.94E 04	1.77E 04	1.38E 04	1.41E 04	1.08E 04	9.80E 03	9.77E 03	9.32E 03	8.45E 03	7.31E 03	6.01E 03
9	0.03219	0.00	2.31E 04	1.87E 04	1.63E 04	1.64E 04	1.03E 04	9.42E 03	9.42E 03	9.04E 03	8.26E 03	7.19E 03	5.93E 03
8	0.03031	4.49E 05	8.14E 04	2.35E 04	1.92E 04	1.77E 04	9.53E 03	8.87E 03	8.95E 03	8.68E 03	8.01E 03	7.02E 03	5.81E 03
7	0.02687	4.49E 05	8.14E 04	2.68E 04	2.34E 04	1.81E 04	8.11E 03	7.83E 03	8.03E 03	7.94E 03	7.46E 03	6.63E 03	5.54E 03
6	0.02187	4.49E 05	8.18E 04	3.32E 04	3.13E 04	1.17E 04	6.64E 03	6.53E 03	6.78E 03	6.85E 03	6.58E 03	5.95E 03	5.05E 03

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  8 0.24250  3.73E 05 3.76E 05 3.78E 05 3.79E 05 3.81E 05 3.82E 05 3.84E 05 3.85E 05 3.86E 05 3.87E 05     0.00
  7 0.21500  3.57E 05 3.62E 05 3.65E 05 3.68E 05 3.70E 05 3.72E 05 3.74E 05 3.76E 05 3.78E 05 3.79E 05     0.00
  6 0.17500  3.36E 05 3.43E 05 3.48E 05 3.52E 05 3.56E 05 3.59E 05 3.62E 05 3.65E 05 3.67E 05 3.69E 05     0.00
  5 0.13000  3.15E 05 3.25E 05 3.32E 05 3.38E 05 3.43E 05 3.48E 05 3.51E 05 3.54E 05 3.57E 05 3.60E 05     0.00
  4 0.08500  3.00E 05 3.11E 05 3.20E 05 3.28E 05 3.34E 05 3.39E 05 3.43E 05 3.47E 05 3.50E 05 3.54E 05     0.00
  3 0.04500  2.91E 05 3.03E 05 3.14E 05 3.22E 05 3.29E 05 3.34E 05 3.39E 05 3.43E 05 3.47E 05 3.50E 05     0.00
  2 0.01250  2.88E 05 3.01E 05 3.11E 05 3.20E 05 3.27E 05 3.33E 05 3.38E 05 3.42E 05 3.45E 05 3.49E 05     0.00
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-           DIMENSIONLESS TURBULENCE ENERGY       -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0      I =     1        2        3        4        5        6        7        8        9       10       11       12
     X = -0.03148  0.03148  0.09443  0.16430  0.24187  0.32796  0.42352  0.52960  0.64735  0.77804  0.92311  1.08415
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500      0.00     0.00     0.00     0.00 3.91E-03 3.40E-03 2.77E-03 2.34E-03 2.07E-03 2.02E-03 2.41E-03 2.94E-03
 19 0.47500      0.00     0.00     0.00     0.00 2.13E-02 2.12E-02 1.63E-02 1.25E-02 9.97E-03 9.57E-03 1.24E-02 1.57E-02
 18 0.44750      0.00     0.00     0.00     0.00 3.03E-02 2.33E-02 1.81E-02 1.45E-02 1.27E-02 1.49E-02 2.03E-02 2.42E-02
 17 0.42750      0.00     0.00     0.00 1.04E-02 1.86E-02 1.63E-02 1.47E-02 1.38E-02 1.51E-02 2.04E-02 2.63E-02 2.94E-02
 16 0.40625      0.00     0.00     0.00 3.46E-02 2.24E-02 1.71E-02 1.49E-02 1.55E-02 2.04E-02 2.76E-02 3.28E-02 3.47E-02
 15 0.38500      0.00     0.00     0.00 3.05E-02 1.94E-02 1.58E-02 1.58E-02 2.03E-02 2.83E-02 3.52E-02 3.90E-02 3.94E-02
 14 0.36500      0.00     0.00 1.39E-02 1.80E-02 1.66E-02 1.63E-02 1.96E-02 2.78E-02 3.63E-02 4.18E-02 4.40E-02 4.32E-02
 13 0.34625      0.00     0.00 3.86E-02 2.03E-02 1.78E-02 1.98E-02 2.60E-02 3.55E-02 4.29E-02 4.69E-02 4.80E-02 4.62E-02
 12 0.32750      0.00     0.00 2.75E-02 1.62E-02 1.87E-02 2.42E-02 3.31E-02 4.23E-02 4.82E-02 5.10E-02 5.11E-02 4.86E-02
 11 0.29750      0.00 1.84E-02 1.62E-02 1.42E-02 2.25E-02 3.45E-02 4.40E-02 5.07E-02 5.44E-02 5.58E-02 5.48E-02 5.15E-02
 10 0.27500      0.00 4.92E-02 1.72E-02 1.55E-02 3.01E-02 4.16E-02 4.85E-02 5.37E-02 5.67E-02 5.77E-02 5.64E-02 5.28E-02
  9 0.25750      0.00 4.19E-02 1.13E-02 1.70E-02 3.76E-02 4.44E-02 4.99E-02 5.45E-02 5.74E-02 5.83E-02 5.70E-02 5.33E-02
  8 0.24250  3.00E-02 1.00E-02 6.43E-03 2.00E-02 4.36E-02 4.55E-02 5.01E-02 5.45E-02 5.75E-02 5.84E-02 5.72E-02 5.35E-02
  7 0.21500  3.00E-02 1.00E-02 8.06E-03 2.70E-02 5.23E-02 4.59E-02 4.97E-02 5.38E-02 5.68E-02 5.79E-02 5.68E-02 5.32E-02
  6 0.17500  3.00E-02 1.01E-02 1.24E-02 4.26E-02 5.23E-02 4.54E-02 4.81E-02 5.18E-02 5.48E-02 5.62E-02 5.53E-02 5.20E-02
  5 0.13000  3.00E-02 1.04E-02 2.38E-02 6.97E-02 4.61E-02 4.43E-02 4.61E-02 4.92E-02 5.21E-02 5.35E-02 5.27E-02 4.98E-02
  4 0.08500  3.00E-02 1.18E-02 5.36E-02 4.49E-02 4.26E-02 4.28E-02 4.44E-02 4.69E-02 4.95E-02 5.08E-02 5.02E-02 4.76E-02
  3 0.04500  3.00E-02 1.80E-02 1.25E-01 4.15E-02 4.14E-02 4.19E-02 4.33E-02 4.56E-02 4.79E-02 4.92E-02 4.87E-02 4.62E-02
  2 0.01250  3.00E-02 3.84E-02 9.22E-02 4.18E-02 4.10E-02 4.17E-02 4.31E-02 4.54E-02 4.75E-02 4.87E-02 4.82E-02 4.58E-02
  1-0.01250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0      I =    13       14       15       16       17       18       19       20       21       22       23
     X =  1.26289  1.46130  1.68153  1.92598  2.19733  2.49852  2.83285  3.16718  3.50150  3.83583  4.17015
0 J    Y
 21 0.50500      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.49500  3.19E-03 3.14E-03 2.94E-03 2.69E-03 2.46E-03 2.26E-03 2.10E-03 1.97E-03 1.87E-03 1.84E-03 3.00E-02
 19 0.47500  1.67E-02 1.57E-02 1.36E-02 1.12E-02 9.06E-03 7.22E-03 5.81E-03 4.80E-03 4.08E-03 4.35E-03 3.00E-02
 18 0.44750  2.47E-02 2.26E-02 1.93E-02 1.58E-02 1.26E-02 9.96E-03 7.92E-03 6.43E-03 5.34E-03 5.96E-03 3.00E-02
 17 0.42750  2.90E-02 2.61E-02 2.21E-02 1.80E-02 1.43E-02 1.13E-02 8.99E-03 7.30E-03 6.06E-03 6.92E-03 3.00E-02
 16 0.40625  3.31E-02 2.93E-02 2.46E-02 1.99E-02 1.58E-02 1.25E-02 9.93E-03 8.08E-03 6.72E-03 7.79E-03 3.00E-02
 15 0.38500  3.67E-02 3.21E-02 2.67E-02 2.15E-02 1.71E-02 1.35E-02 1.07E-02 8.73E-03 7.29E-03 8.51E-03 3.00E-02
 14 0.36500  3.96E-02 3.42E-02 2.83E-02 2.28E-02 1.81E-02 1.42E-02 1.13E-02 9.25E-03 7.74E-03 9.05E-03 3.00E-02
 13 0.34625  4.19E-02 3.60E-02 2.96E-02 2.38E-02 1.88E-02 1.48E-02 1.18E-02 9.66E-03 8.09E-03 9.46E-03 3.00E-02
 12 0.32750  4.37E-02 3.74E-02 3.07E-02 2.46E-02 1.95E-02 1.53E-02 1.22E-02 1.00E-02 8.39E-03 9.77E-03 3.00E-02
 11 0.29750  4.60E-02 3.91E-02 3.20E-02 2.56E-02 2.02E-02 1.60E-02 1.27E-02 1.04E-02 8.76E-03 1.01E-02 3.00E-02
 10 0.27500  4.70E-02 3.99E-02 3.26E-02 2.61E-02 2.06E-02 1.63E-02 1.30E-02 1.07E-02 8.96E-03 1.02E-02 3.00E-02
  9 0.25750  4.74E-02 4.02E-02 3.29E-02 2.63E-02 2.08E-02 1.64E-02 1.32E-02 1.08E-02 9.07E-03 1.02E-02 3.00E-02
  8 0.24250  4.75E-02 4.03E-02 3.30E-02 2.64E-02 2.09E-02 1.65E-02 1.32E-02 1.09E-02 9.13E-03 1.02E-02 3.00E-02
  7 0.21500  4.74E-02 4.03E-02 3.30E-02 2.64E-02 2.10E-02 1.66E-02 1.33E-02 1.09E-02 9.19E-03 1.01E-02 3.00E-02
  6 0.17500  4.65E-02 3.96E-02 3.25E-02 2.61E-02 2.08E-02 1.65E-02 1.32E-02 1.09E-02 9.16E-03 9.82E-03 3.00E-02
  5 0.13000  4.48E-02 3.84E-02 3.16E-02 2.55E-02 2.04E-02 1.62E-02 1.31E-02 1.08E-02 9.06E-03 9.42E-03 3.00E-02
  4 0.08500  4.30E-02 3.71E-02 3.07E-02 2.48E-02 1.99E-02 1.59E-02 1.29E-02 1.06E-02 8.93E-03 9.06E-03 3.00E-02
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DIMENSIONLESS STREAMLINE PLOT

OITER NO	ABSOLUTE RESIDUAL SOURCE SUMS UMON	VMON	WMON	MASS	TKIN	DISP	FIELD VALUES AT MONITORING LOCATION(22, 8) U	V	W	P	D
1	0.1299E-01	0.8470E-02	0.2004E 00	0.3716E-02	0.8115E-02	0.6533E 10	0.6213E 01	0.3374E-03	0.1299E 02	0.1338E 04	0.1340E 04
2	0.1291E-01	0.2144E 00	0.1718E 00	0.2378E-01	0.1343E-01	0.1067E 11	0.6214E 01	0.3394E-03	0.1299E 02	0.1582E 04	0.1340E 04
3	0.1090E 00	0.3111E 00	0.1541E 00	0.3639E-01	0.1699E-01	0.1256E 11	0.6214E 01	0.1352E-03	0.1300E 02	0.1813E 04	0.1340E 04
4	0.2877E 00	0.2815E 00	0.1422E 00	0.2393E-01	0.1835E-01	0.1096E 11	0.6215E 01	0.7560E-04	0.1300E 02	0.1770E 04	0.1340E 04
5	0.3010E 00	0.3016E 00	0.1351E 00	0.2578E-01	0.1936E-01	0.8045E 10	0.6215E 01	0.6783E-04	0.1301E 02	0.1713E 04	0.1340E 04
6	0.3303E 00	0.3062E 00	0.1315E 00	0.2873E-01	0.2093E-01	0.7944E 10	0.6215E 01	0.6644E-04	0.1301E 02	0.1650E 04	0.1341E 04
7	0.3441E 00	0.3111E 00	0.1299E 00	0.2921E-01	0.2164E-01	0.7656E 10	0.6215E 01	0.6721E-04	0.1301E 02	0.1593E 04	0.1341E 04
8	0.3512E 00	0.3138E 00	0.1285E 00	0.2945E-01	0.2190E-01	0.7814E 10	0.6216E 01	0.6937E-04	0.1302E 02	0.1547E 04	0.1341E 04
9	0.3557E 00	0.3149E 00	0.1268E 00	0.2996E-01	0.2205E-01	0.7236E 10	0.6216E 01	0.7198E-04	0.1302E 02	0.1510E 04	0.1341E 04
10	0.3577E 00	0.3160E 00	0.1251E 00	0.3073E-01	0.2234E-01	0.6368E 10	0.6216E 01	0.7594E-04	0.1303E 02	0.1482E 04	0.1341E 04
11	0.3614E 00	0.3157E 00	0.1243E 00	0.3132E-01	0.2277E-01	0.5563E 10	0.6216E 01	0.8011E-04	0.1303E 02	0.1463E 04	0.1341E 04
12	0.3636E 00	0.3123E 00	0.1237E 00	0.3236E-01	0.2329E-01	0.5280E 10	0.6217E 01	0.8425E-04	0.1304E 02	0.1450E 04	0.1341E 04
13	0.3669E 00	0.3079E 00	0.1228E 00	0.3357E-01	0.2402E-01	0.5081E 10	0.6217E 01	0.8914E-04	0.1304E 02	0.1442E 04	0.1341E 04
14	0.3701E 00	0.3036E 00	0.1227E 00	0.3488E-01	0.2495E-01	0.4936E 10	0.6217E 01	0.9592E-04	0.1304E 02	0.1438E 04	0.1341E 04
15	0.3734E 00	0.2973E 00	0.1226E 00	0.3619E-01	0.2588E-01	0.4821E 10	0.6218E 01	0.1031E-03	0.1305E 02	0.1437E 04	0.1342E 04
16	0.3757E 00	0.2911E 00	0.1228E 00	0.3752E-01	0.2699E-01	0.4721E 10	0.6218E 01	0.1104E-03	0.1305E 02	0.1437E 04	0.1342E 04
17	0.3775E 00	0.2853E 00	0.1231E 00	0.3942E-01	0.2831E-01	0.4625E 10	0.6218E 01	0.1184E-03	0.1306E 02	0.1439E 04	0.1342E 04
18	0.3792E 00	0.2781E 00	0.1232E 00	0.4026E-01	0.2944E-01	0.4528E 10	0.6219E 01	0.1266E-03	0.1306E 02	0.1441E 04	0.1342E 04
19	0.3792E 00	0.2713E 00	0.1233E 00	0.4003E-01	0.3027E-01	0.4428E 10	0.6219E 01	0.1340E-03	0.1307E 02	0.1445E 04	0.1342E 04
20	0.3782E 00	0.2651E 00	0.1234E 00	0.3976E-01	0.3085E-01	0.4323E 10	0.6219E 01	0.1423E-03	0.1307E 02	0.1449E 04	0.1342E 04
21	0.3769E 00	0.2598E 00	0.1233E 00	0.3939E-01	0.3124E-01	0.4213E 10	0.6220E 01	0.1501E-03	0.1308E 02	0.1453E 04	0.1343E 04
22	0.3745E 00	0.2548E 00	0.1230E 00	0.3887E-01	0.3173E-01	0.4098E 10	0.6220E 01	0.1574E-03	0.1308E 02	0.1458E 04	0.1343E 04
23	0.3718E 00	0.2515E 00	0.1225E 00	0.3832E-01	0.3192E-01	0.3978E 10	0.6221E 01	0.1641E-03	0.1308E 02	0.1462E 04	0.1343E 04
24	0.3697E 00	0.2490E 00	0.1221E 00	0.3823E-01	0.3198E-01	0.3851E 10	0.6221E 01	0.1713E-03	0.1309E 02	0.1466E 04	0.1343E 04
25	0.3673E 00	0.2456E 00	0.1215E 00	0.3779E-01	0.3203E-01	0.3728E 10	0.6221E 01	0.1768E-03	0.1309E 02	0.1470E 04	0.1344E 04
26	0.3638E 00	0.2416E 00	0.1209E 00	0.3713E-01	0.3202E-01	0.3597E 10	0.6222E 01	0.1830E-03	0.1310E 02	0.1474E 04	0.1344E 04
27	0.3606E 00	0.2382E 00	0.1202E 00	0.3639E-01	0.3211E-01	0.3455E 10	0.6222E 01	0.1881E-03	0.1310E 02	0.1478E 04	0.1344E 04
28	0.3577E 00	0.2352E 00	0.1194E 00	0.3570E-01	0.3220E-01	0.3300E 10	0.6223E 01	0.1922E-03	0.1311E 02	0.1481E 04	0.1344E 04
29	0.3550E 00	0.2318E 00	0.1187E 00	0.3476E-01	0.3240E-01	0.3135E 10	0.6223E 01	0.1947E-03	0.1311E 02	0.1484E 04	0.1345E 04
30	0.3508E 00	0.2274E 00	0.1179E 00	0.3474E-01	0.3271E-01	0.2962E 10	0.6224E 01	0.1954E-03	0.1312E 02	0.1486E 04	0.1345E 04
31	0.3461E 00	0.2223E 00	0.1171E 00	0.3480E-01	0.3307E-01	0.2785E 10	0.6224E 01	0.1938E-03	0.1312E 02	0.1489E 04	0.1345E 04
32	0.3421E 00	0.2180E 00	0.1161E 00	0.3499E-01	0.3363E-01	0.2624E 10	0.6225E 01	0.1877E-03	0.1313E 02	0.1490E 04	0.1346E 04
33	0.3377E 00	0.2151E 00	0.1151E 00	0.3527E-01	0.3425E-01	0.2458E 10	0.6225E 01	0.1785E-03	0.1313E 02	0.1492E 04	0.1346E 04
34	0.3328E 00	0.2126E 00	0.1141E 00	0.3563E-01	0.3497E-01	0.2303E 10	0.6226E 01	0.1646E-03	0.1313E 02	0.1493E 04	0.1346E 04
35	0.3276E 00	0.2093E 00	0.1132E 00	0.3605E-01	0.3588E-01	0.2171E 10	0.6226E 01	0.1439E-03	0.1314E 02	0.1494E 04	0.1347E 04
36	0.3213E 00	0.2062E 00	0.1122E 00	0.3666E-01	0.3684E-01	0.2035E 10	0.6227E 01	0.1175E-03	0.1314E 02	0.1495E 04	0.1347E 04
37	0.3160E 00	0.2026E 00	0.1113E 00	0.3723E-01	0.3774E-01	0.1912E 10	0.6227E 01	0.8184E-04	0.1315E 02	0.1495E 04	0.1348E 04
38	0.3107E 00	0.1994E 00	0.1105E 00	0.3783E-01	0.3872E-01	0.1785E 10	0.6228E 01	0.3849E-04	0.1315E 02	0.1496E 04	0.1349E 04
39	0.3047E 00	0.1966E 00	0.1097E 00	0.3850E-01	0.3970E-01	0.1651E 10	0.6228E 01	-0.1525E-04	0.1316E 02	0.1496E 04	0.1349E 04
40	0.2985E 00	0.1934E 00	0.1090E 00	0.3923E-01	0.4060E-01	0.1512E 10	0.6228E 01	-0.8022E-04	0.1316E 02	0.1497E 04	0.1350E 04
41	0.2917E 00	0.1897E 00	0.1083E 00	0.3985E-01	0.4141E-01	0.1378E 10	0.6229E 01	-0.1531E-03	0.1317E 02	0.1497E 04	0.1351E 04
42	0.2859E 00	0.1837E 00	0.1078E 00	0.4011E-01	0.4217E-01	0.1245E 10	0.6229E 01	-0.2337E-03	0.1317E 02	0.1497E 04	0.1352E 04
43	0.2798E 00	0.1784E 00	0.1075E 00	0.4066E-01	0.4279E-01	0.1111E 10	0.6229E 01	-0.3234E-03	0.1318E 02	0.1497E 04	0.1353E 04
44	0.2741E 00	0.1735E 00	0.1071E 00	0.4126E-01	0.4338E-01	0.9839E 09	0.6229E 01	-0.4230E-03	0.1318E 02	0.1497E 04	0.1354E 04
45	0.2689E 00	0.1691E 00	0.1066E 00	0.4201E-01	0.4391E-01	0.9449E 09	0.6229E 01	-0.5315E-03	0.1319E 02	0.1497E 04	0.1355E 04
46	0.2643E 00	0.1651E 00	0.1062E 00	0.4280E-01	0.4430E-01	0.9010E 09	0.6228E 01	-0.6504E-03	0.1319E 02	0.1497E 04	0.1356E 04
47	0.2600E 00	0.1610E 00	0.1059E 00	0.4361E-01	0.4459E-01	0.8505E 09	0.6228E 01	-0.7792E-03	0.1320E 02	0.1497E 04	0.1358E 04
48	0.2557E 00	0.1569E 00	0.1056E 00	0.4448E-01	0.4478E-01	0.8144E 09	0.6227E 01	-0.9197E-03	0.1320E 02	0.1497E 04	0.1359E 04

19	0.05937	0.00	0.00	0.00	0.00	1.56E 03	1.61E 03	1.56E 03	1.55E 03	1.57E 03	1.59E 03	1.60E 03	1.61E 03	
18	0.05594	0.00	0.00	0.00	0.00	1.48E 03	1.57E 03	1.51E 03	1.52E 03	1.54E 03	1.55E 03	1.56E 03	1.57E 03	
17	0.05344	0.00	0.00	0.00	1.57E 03	1.46E 03	1.51E 03	1.48E 03	1.49E 03	1.51E 03	1.53E 03	1.53E 03	1.53E 03	
16	0.05078	0.00	0.00	0.00	1.45E 03	1.45E 03	1.44E 03	1.43E 03	1.45E 03	1.48E 03	1.49E 03	1.49E 03	1.49E 03	
15	0.04812	0.00	0.00	0.00	1.30E 03	1.40E 03	1.38E 03	1.38E 03	1.42E 03	1.44E 03	1.45E 03	1.45E 03	1.45E 03	
14	0.04562	0.00	0.00	1.68E 03	1.29E 03	1.33E 03	1.31E 03	1.33E 03	1.37E 03	1.40E 03	1.41E 03	1.41E 03	1.41E 03	
13	0.04328	0.00	0.00	1.51E 03	1.32E 03	1.26E 03	1.25E 03	1.29E 03	1.33E 03	1.36E 03	1.37E 03	1.37E 03	1.36E 03	
12	0.04094	0.00	0.00	1.27E 03	1.28E 03	1.20E 03	1.20E 03	1.24E 03	1.29E 03	1.31E 03	1.32E 03	1.32E 03	1.32E 03	
11	0.03719	0.00	1.43E 03	1.15E 03	1.16E 03	1.10E 03	1.11E 03	1.16E 03	1.20E 03	1.23E 03	1.24E 03	1.25E 03	1.25E 03	
10	0.03437	0.00	1.11E 03	1.12E 03	1.07E 03	1.03E 03	1.05E 03	1.10E 03	1.14E 03	1.16E 03	1.18E 03	1.19E 03	1.20E 03	
9	0.03219	0.00	7.84E 02	1.05E 03	1.01E 03	9.79E 02	1.01E 03	1.05E 03	1.08E 03	1.11E 03	1.13E 03	1.15E 03	1.16E 03	
8	0.03031	0.00	6.43E 02	9.70E 02	9.64E 02	9.39E 02	9.68E 02	1.00E 03	1.04E 03	1.06E 03	1.09E 03	1.11E 03	1.12E 03	
7	0.02687	0.00	6.58E 02	8.63E 02	8.81E 02	8.73E 02	8.91E 02	9.19E 02	9.50E 02	9.81E 02	1.01E 03	1.04E 03	1.06E 03	
6	0.02187	0.00	6.08E 02	7.39E 02	7.50E 02	7.62E 02	7.80E 02	8.02E 02	8.30E 02	8.65E 02	9.02E 02	9.39E 02	9.72E 02	
5	0.01625	0.00	4.97E 02	6.07E 02	6.41E 02	6.47E 02	6.65E 02	6.85E 02	7.14E 02	7.52E 02	7.97E 02	8.45E 02	8.89E 02	
4	0.01062	0.00	3.37E 02	4.79E 02	5.02E 02	5.46E 02	5.72E 02	5.96E 02	6.26E 02	6.67E 02	7.17E 02	7.73E 02	8.26E 02	
3	0.00562	0.00	1.17E 02	4.14E 02	4.40E 02	4.85E 02	5.18E 02	5.45E 02	5.76E 02	6.18E 02	6.72E 02	7.31E 02	7.90E 02	
2	0.00156	0.00	0.00	3.39E 02	4.12E 02	4.62E 02	4.97E 02	5.25E 02	5.57E 02	6.00E 02	6.55E 02	7.16E 02	7.77E 02	
1	-0.00156	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	0.15786	0.18266	0.21019	0.24075	0.27467	0.31232	0.35411	0.39590	0.43769	0.47948	0.52127
0	J	Y											
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		1.65E 03	1.65E 03	1.65E 03	1.65E 03	1.64E 03	1.63E 03	1.62E 03	1.61E 03	1.60E 03	1.59E 03	0.00
19	0.05937		1.62E 03	1.62E 03	1.62E 03	1.61E 03	1.60E 03	1.59E 03	1.59E 03	1.58E 03	1.57E 03	1.56E 03	0.00
18	0.05594		1.57E 03	1.56E 03	1.56E 03	1.55E 03	1.54E 03	1.54E 03	1.53E 03	1.52E 03	1.51E 03	1.51E 03	0.00
17	0.05344		1.53E 03	1.52E 03	1.52E 03	1.51E 03	1.50E 03	1.50E 03	1.49E 03	1.48E 03	1.48E 03	1.47E 03	0.00
16	0.05078		1.48E 03	1.48E 03	1.47E 03	1.46E 03	1.46E 03	1.45E 03	1.45E 03	1.44E 03	1.43E 03	1.43E 03	0.00
15	0.04812		1.44E 03	1.43E 03	1.43E 03	1.42E 03	1.41E 03	1.41E 03	1.40E 03	1.40E 03	1.40E 03	1.39E 03	0.00
14	0.04562		1.40E 03	1.39E 03	1.39E 03	1.38E 03	1.37E 03	1.37E 03	1.37E 03	1.36E 03	1.36E 03	1.36E 03	0.00
13	0.04328		1.36E 03	1.35E 03	1.35E 03	1.34E 03	1.34E 03	1.34E 03	1.33E 03	1.33E 03	1.33E 03	1.33E 03	0.00
12	0.04094		1.32E 03	1.31E 03	1.31E 03	1.31E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	1.30E 03	0.00
11	0.03719		1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.25E 03	1.26E 03	1.26E 03	0.00
10	0.03437		1.20E 03	1.20E 03	1.21E 03	1.21E 03	1.21E 03	1.22E 03	1.22E 03	1.22E 03	1.22E 03	1.23E 03	0.00
9	0.03219		1.16E 03	1.17E 03	1.17E 03	1.18E 03	1.18E 03	1.19E 03	1.19E 03	1.20E 03	1.20E 03	1.21E 03	0.00
8	0.03031		1.13E 03	1.14E 03	1.15E 03	1.15E 03	1.16E 03	1.17E 03	1.17E 03	1.18E 03	1.18E 03	1.19E 03	0.00
7	0.02687		1.08E 03	1.09E 03	1.10E 03	1.11E 03	1.12E 03	1.13E 03	1.14E 03	1.15E 03	1.15E 03	1.16E 03	0.00
6	0.02187		1.00E 03	1.02E 03	1.04E 03	1.06E 03	1.07E 03	1.08E 03	1.10E 03	1.11E 03	1.11E 03	1.12E 03	0.00
5	0.01625		9.28E 02	9.61E 02	9.87E 02	1.01E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	1.08E 03	1.09E 03	0.00
4	0.01062		8.74E 02	9.14E 02	9.46E 02	9.72E 02	9.94E 02	1.01E 03	1.03E 03	1.04E 03	1.06E 03	1.07E 03	0.00
3	0.00562		8.43E 02	8.87E 02	9.23E 02	9.52E 02	9.76E 02	9.96E 02	1.01E 03	1.03E 03	1.04E 03	1.05E 03	0.00
2	0.00156		8.31E 02	8.77E 02	9.15E 02	9.45E 02	9.69E 02	9.90E 02	1.01E 03	1.02E 03	1.04E 03	1.05E 03	0.00
1	-0.00156		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- PRESSURE -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	-0.00393	0.00393	0.01180	0.02054	0.03023	0.04099	0.05294	0.06620	0.08092	0.09726	0.11539	0.13552
0	J	Y												
21	0.06312		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.06187		0.00	0.00	0.00	0.00	6.25E-02	5.22E-02	9.60E-02	1.06E-01	1.01E-01	9.70E-02	9.97E-02	1.07E-01
19	0.05937		0.00	0.00	0.00	0.00	7.09E-02	5.39E-02	9.49E-02	1.03E-01	9.69E-02	9.17E-02	9.13E-02	9.48E-02
18	0.05594		0.00	0.00	0.00	0.00	9.24E-02	6.05E-02	9.53E-02	9.88E-02	9.09E-02	8.30E-02	7.82E-02	7.67E-02
17	0.05344		0.00	0.00	0.00	-7.79E-05	8.29E-02	7.25E-02	9.70E-02	9.57E-02	8.57E-02	7.54E-02	6.79E-02	6.32E-02
16	0.05078		0.00	0.00	0.00	2.64E-02	6.68E-02	8.24E-02	9.80E-02	9.15E-02	7.88E-02	6.63E-02	5.58E-02	4.85E-02
15	0.04812		0.00	0.00	0.00	5.83E-02	6.26E-02	8.76E-02	9.62E-02	8.56E-02	6.97E-02	5.53E-02	4.21E-02	3.32E-02

13	0.34625	0.00	0.00	1.03E 00	8.64E-01	7.45E-01	7.36E-01	7.88E-01	8.37E-01	8.61E-01	8.64E-01	8.55E-01	8.43E-01
12	0.32750	0.00	0.00	1.07E 00	8.61E-01	7.35E-01	7.42E-01	8.10E-01	8.57E-01	8.73E-01	8.67E-01	8.50E-01	8.31E-01
11	0.29750	0.00	1.42E 00	1.15E 00	8.53E-01	7.22E-01	7.60E-01	8.37E-01	8.74E-01	8.77E-01	8.59E-01	8.31E-01	8.03E-01
10	0.27500	0.00	1.50E 00	1.14E 00	8.15E-01	7.02E-01	7.71E-01	8.41E-01	8.69E-01	8.64E-01	8.40E-01	8.07E-01	7.73E-01
9	0.25750	0.00	1.59E 00	1.13E 00	7.87E-01	6.96E-01	7.72E-01	8.34E-01	8.55E-01	8.46E-01	8.18E-01	7.83E-01	7.46E-01
8	0.24250	2.14E 00	1.69E 00	1.12E 00	7.62E-01	6.92E-01	7.67E-01	8.20E-01	8.36E-01	8.24E-01	7.95E-01	7.58E-01	7.20E-01
7	0.21500	2.14E 00	1.65E 00	1.06E 00	7.23E-01	6.84E-01	7.40E-01	7.76E-01	7.85E-01	7.71E-01	7.41E-01	7.04E-01	6.65E-01
6	0.17500	2.14E 00	1.57E 00	9.54E-01	6.54E-01	6.40E-01	6.62E-01	6.76E-01	6.79E-01	6.66E-01	6.39E-01	6.06E-01	5.69E-01
5	0.13000	2.14E 00	1.43E 00	7.91E-01	5.12E-01	5.32E-01	5.28E-01	5.29E-01	5.28E-01	5.18E-01	4.98E-01	4.72E-01	4.42E-01
4	0.08500	2.14E 00	1.25E 00	5.54E-01	3.89E-01	3.75E-01	3.63E-01	3.58E-01	3.56E-01	3.50E-01	3.37E-01	3.20E-01	2.99E-01
3	0.04500	2.14E 00	9.60E-01	2.07E-01	2.19E-01	2.08E-01	1.98E-01	1.94E-01	1.93E-01	1.90E-01	1.83E-01	1.74E-01	1.62E-01
2	0.01250	2.14E 00	2.67E-01	5.76E-02	6.09E-02	5.77E-02	5.51E-02	5.39E-02	5.35E-02	5.27E-02	5.09E-02	4.83E-02	4.50E-02
1	-0.01250	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.26289	1.46130	1.68153	1.92598	2.19733	2.49852	2.83285	3.16718	3.50150	3.83583	4.17015
0	J	Y											
21	0.50500		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.49500		8.60E-01	9.01E-01	9.24E-01	9.32E-01	9.27E-01	9.12E-01	8.90E-01	8.66E-01	8.41E-01	8.29E-01	0.00
19	0.47500		8.89E-01	9.26E-01	9.48E-01	9.58E-01	9.58E-01	9.51E-01	9.39E-01	9.25E-01	9.10E-01	8.94E-01	0.00
18	0.44750		8.89E-01	9.16E-01	9.32E-01	9.38E-01	9.36E-01	9.29E-01	9.19E-01	9.07E-01	8.94E-01	8.79E-01	0.00
17	0.42750		8.83E-01	9.02E-01	9.12E-01	9.14E-01	9.11E-01	9.03E-01	8.92E-01	8.80E-01	8.67E-01	8.52E-01	0.00
16	0.40625		8.74E-01	8.85E-01	8.88E-01	8.86E-01	8.79E-01	8.70E-01	8.58E-01	8.45E-01	8.32E-01	8.18E-01	0.00
15	0.38500		8.62E-01	8.64E-01	8.62E-01	8.55E-01	8.46E-01	8.34E-01	8.21E-01	8.08E-01	7.94E-01	7.80E-01	0.00
14	0.36500		8.48E-01	8.43E-01	8.35E-01	8.24E-01	8.12E-01	7.99E-01	7.85E-01	7.71E-01	7.57E-01	7.43E-01	0.00
13	0.34625		8.32E-01	8.20E-01	8.07E-01	7.94E-01	7.79E-01	7.64E-01	7.49E-01	7.35E-01	7.21E-01	7.07E-01	0.00
12	0.32750		8.13E-01	7.95E-01	7.78E-01	7.61E-01	7.45E-01	7.29E-01	7.13E-01	6.99E-01	6.85E-01	6.71E-01	0.00
11	0.29750		7.75E-01	7.50E-01	7.28E-01	7.07E-01	6.88E-01	6.71E-01	6.54E-01	6.39E-01	6.25E-01	6.12E-01	0.00
10	0.27500		7.41E-01	7.12E-01	6.86E-01	6.63E-01	6.43E-01	6.25E-01	6.08E-01	5.93E-01	5.80E-01	5.67E-01	0.00
9	0.25750		7.12E-01	6.80E-01	6.52E-01	6.28E-01	6.07E-01	5.89E-01	5.72E-01	5.57E-01	5.44E-01	5.32E-01	0.00
8	0.24250		6.84E-01	6.51E-01	6.22E-01	5.97E-01	5.76E-01	5.57E-01	5.41E-01	5.27E-01	5.13E-01	5.01E-01	0.00
7	0.21500		6.27E-01	5.93E-01	5.63E-01	5.38E-01	5.17E-01	4.99E-01	4.80E-01	4.69E-01	4.57E-01	4.46E-01	0.00
6	0.17500		5.33E-01	5.00E-01	4.71E-01	4.47E-01	4.28E-01	4.11E-01	3.97E-01	3.85E-01	3.74E-01	3.64E-01	0.00
5	0.13000		4.12E-01	3.83E-01	3.59E-01	3.39E-01	3.23E-01	3.09E-01	2.97E-01	2.88E-01	2.79E-01	2.72E-01	0.00
4	0.08500		2.77E-01	2.57E-01	2.40E-01	2.26E-01	2.14E-01	2.04E-01	1.96E-01	1.90E-01	1.84E-01	1.79E-01	0.00
3	0.04500		1.50E-01	1.39E-01	1.29E-01	1.21E-01	1.15E-01	1.10E-01	1.05E-01	1.02E-01	9.84E-02	9.57E-02	0.00
2	0.01250		4.17E-02	3.86E-02	3.59E-02	3.37E-02	3.19E-02	3.05E-02	2.92E-02	2.82E-02	2.73E-02	2.66E-02	0.00
1	-0.01250		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0*- DIMENSIONLESS STREAMLINE COORDS -*

0		I =	1	2	3	4	5	6	7	8	9	10	11	12
		X =	0.00000	0.00000	0.06295	0.12937	0.20308	0.28491	0.37574	0.47656	0.58847	0.71269	0.85058	1.00363
0	J	Y												
11	1.00000		0.00	2.50E-01	3.12E-01	3.75E-01	4.37E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01	5.00E-01
10	0.90000		0.00	2.37E-01	3.12E-01	3.75E-01	4.27E-01	4.79E-01	4.87E-01	4.87E-01	4.87E-01	4.86E-01	4.84E-01	4.83E-01
9	0.80000		0.00	2.23E-01	2.84E-01	3.55E-01	4.16E-01	4.64E-01	4.74E-01	4.75E-01	4.74E-01	4.71E-01	4.69E-01	4.67E-01
8	0.70000		0.00	2.09E-01	2.68E-01	3.44E-01	4.06E-01	4.49E-01	4.63E-01	4.64E-01	4.61E-01	4.58E-01	4.54E-01	4.50E-01
7	0.60000		0.00	1.93E-01	2.50E-01	3.30E-01	3.93E-01	4.37E-01	4.51E-01	4.52E-01	4.49E-01	4.43E-01	4.38E-01	4.32E-01
6	0.50000		0.00	1.77E-01	2.31E-01	3.15E-01	3.81E-01	4.25E-01	4.40E-01	4.40E-01	4.36E-01	4.29E-01	4.21E-01	4.13E-01
5	0.40000		0.00	1.57E-01	2.12E-01	2.99E-01	3.69E-01	4.13E-01	4.29E-01	4.29E-01	4.22E-01	4.13E-01	4.02E-01	3.92E-01
4	0.30000		0.00	1.36E-01	1.91E-01	2.82E-01	3.56E-01	4.01E-01	4.17E-01	4.16E-01	4.08E-01	3.95E-01	3.81E-01	3.68E-01
3	0.20000		0.00	1.10E-01	1.67E-01	2.62E-01	3.42E-01	3.89E-01	4.05E-01	4.03E-01	3.91E-01	3.74E-01	3.57E-01	3.40E-01
2	0.10000		0.00	7.75E-02	1.37E-01	2.37E-01	3.25E-01	3.75E-01	3.92E-01	3.87E-01	3.71E-01	3.49E-01	3.26E-01	3.03E-01
1	0.00000		0.00	0.00	8.62E-02	2.05E-01	3.05E-01	3.60E-01	3.76E-01	3.69E-01	3.45E-01	3.12E-01	2.79E-01	2.40E-01

0		I =	13	14	15	16	17	18	19	20	21	22	23
		X =	1.17352	1.36209	1.57141	1.80376	2.06166	2.34793	2.66569	3.00001	3.33434	3.66866	4.00299

RADIAL POSITION 2R/D

```
0          0.0       0.1       0.2       0.3       0.4       0.5       0.6       0.7       0.8       0.9       1.0
 X  0.00   0.....+.....+.2.....+4.....6+....8....1.....+.....+.....+.....+.....+..... 0.00
 X  0.02   .              0              2         4         6    8    1                        . 0.02
 X  0.04   .                             0              2         4    6    8    1           . 0.04
 X  0.06   .                                                  0         2    4    6    8    1 . 0.06
 X  0.08   .                                                       0         2    4    6    8  1 0.08
 X  0.10   +                                                            0         2    4    6  8 1 0.10
 X  0.12   .                                                            0         2    4    6  8 1 0.12
 X  0.14   .                                                                 0         2    4  6 8 1 0.14
 X  0.16   .                                                                                      . 0.16
 X  0.18   .                                                       0              2         4  6 8 1 0.18
 X  0.20   +                                                                                      + 0.20
 X  0.22   .                                                                 0              2  4 6 8 1 0.22
 X  0.24   .                                                                                      . 0.24
 X  0.26   .                                             0                        2         4  6 8 1 0.26
 X  0.28   .                                                                                      . 0.28
 X  0.30   +                                                       0                   2    4  6 8 1 0.30
 X  0.32   .                                                                                      . 0.32
 X  0.34   .                                       0                        2         4    6  8 1 0.34
 X  0.36   .                                                                                      . 0.36
 X  0.38   .                                                                                      . 0.38
 X  0.40   0                                                            2              4    6  8 1 0.40
 X  0.42   .                                                                                      . 0.42
 X  0.44   .                                                                                      . 0.44
 X  0.46   0                                                       2              4         6  8 1 0.46
 X  0.48   .                                                                                      . 0.48
```

```
  3 0.00562 -2.87E 00-1.23E 00 7.88E-02 1.05E 00 1.74E 00 2.23E 00 2.55E 00 2.74E 00 2.83E 00 2.85E 00 2.85E 00
  2 0.00156 -3.17E 00-1.48E 00-1.29E-01 8.78E-01 1.60E 00 2.10E 00 2.44E 00 2.64E 00 2.73E 00 2.76E 00 2.76E 00
  1-0.00156      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0                                                  V   VELOCITY
0       I =     1        2        3        4        5        6        7        8        9       10       11       12
        X = -0.00393  0.00393  0.01180  0.02054  0.03023  0.04099  0.05294  0.06620  0.08092  0.09726  0.11539  0.13552
0 J     Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062      0.00     0.00     0.00     0.00 1.43E 00 1.07E 00 1.26E-01-1.21E-01-1.24E-01-9.54E-02-7.78E-02-5.71E-02
 19 0.05766      0.00     0.00     0.00     0.00 5.13E 00 2.29E 00 1.82E-01-3.92E-01-4.01E-01-3.19E-01-2.44E-01-1.69E-01
 18 0.05469      0.00     0.00     0.00     0.00 1.05E 01 3.03E 00-3.19E-02-8.28E-01-7.97E-01-6.05E-01-4.37E-01-2.95E-01
 17 0.05211      0.00     0.00     0.00 6.76E 00 1.04E 01 3.10E 00-4.35E-01-1.32E 00-1.18E 00-8.60E-01-6.04E-01-4.06E-01
 16 0.04945      0.00     0.00     0.00 1.33E 01 1.08E 01 3.01E 00-9.24E-01-1.82E 00-1.54E 00-1.09E 00-7.62E-01-5.17E-01
 15 0.04687      0.00     0.00     0.00 2.03E 01 1.10E 01 2.53E 00-1.49E 00-2.23E 00-1.79E 00-1.26E 00-8.93E-01-6.15E-01
 14 0.04445      0.00     0.00 9.71E 00 1.90E 01 1.03E 01 1.74E 00-1.98E 00-2.47E 00-1.94E 00-1.38E 00-9.92E-01-6.98E-01
 13 0.04211      0.00     0.00 1.73E 01 1.89E 01 9.41E 00 9.95E-01-2.28E 00-2.57E 00-2.00E 00-1.45E 00-1.07E 00-7.66E-01
 12 0.03906      0.00     0.00 2.68E 01 1.90E 01 7.86E 00-5.21E-03-2.45E 00-2.53E 00-1.99E 00-1.50E 00-1.14E 00-8.41E-01
 11 0.03578      0.00 1.29E 01 2.60E 01 1.78E 01 5.12E 00-7.24E-01-2.25E 00-2.29E 00-1.88E 00-1.48E 00-1.17E 00-8.89E-01
 10 0.03328      0.00 2.08E 01 2.68E 01 1.63E 01 3.26E 00-9.23E-01-1.99E 00-2.06E 00-1.76E 00-1.45E 00-1.18E 00-9.09E-01
  9 0.03125      0.00 2.75E 01 2.74E 01 1.46E 01 2.07E 00-9.60E-01-1.76E 00-1.85E 00-1.64E 00-1.40E 00-1.17E 00-9.15E-01
  8 0.02859      0.00 2.71E 01 2.73E 01 1.21E 01 6.90E-01-9.38E-01-1.44E 00-1.58E 00-1.48E 00-1.33E 00-1.14E 00-9.10E-01
  7 0.02437      0.00 2.71E 01 2.59E 01 6.99E 00-5.82E-01-8.20E-01-9.91E-01-1.17E 00-1.22E 00-1.17E 00-1.06E 00-8.69E-01
  6 0.01906      0.00 2.75E 01 2.12E 01 6.46E-01-9.09E-01-6.66E-01-6.09E-01-7.46E-01-8.91E-01-9.44E-01-8.93E-01-7.55E-01
  5 0.01344      0.00 2.71E 01 1.12E 01-1.81E 00-9.80E-01-5.25E-01-3.64E-01-4.36E-01-5.81E-01-6.70E-01-6.66E-01-5.76E-01
  4 0.00812      0.00 2.29E 01 9.47E-01-1.02E 00-6.93E-01-3.50E-01-2.04E-01-2.33E-01-3.32E-01-4.03E-01-4.15E-01-3.64E-01
  3 0.00359      0.00 1.22E 01-1.40E 00-5.26E-01-3.29E-01-1.62E-01-8.85E-02-9.77E-02-1.43E-01-1.78E-01-1.86E-01-1.64E-01
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0       I =    13       14       15       16       17       18       19       20       21       22       23
        X =  0.15786  0.18266  0.21019  0.24075  0.27467  0.31232  0.35411  0.39590  0.43769  0.47948  0.52127
0 J     Y
 21 0.06250      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
 20 0.06062 -3.31E-02-1.45E-02-3.98E-03 5.74E-04 1.84E-03 1.44E-03 1.59E-03 1.49E-03 2.80E-03 1.09E-05     0.00
 19 0.05766 -9.87E-02-4.66E-02-1.63E-02-1.56E-03 4.47E-03 5.86E-03 7.59E-03 8.08E-03 8.40E-03-1.26E-05     0.00
 18 0.05469 -1.75E-01-8.94E-02-3.83E-02-1.18E-02 5.06E-04 5.24E-03 9.57E-03 1.14E-02 1.18E-02-3.73E-05     0.00
 17 0.05211 -2.46E-01-1.32E-01-6.24E-02-2.51E-02-6.53E-03 1.82E-03 8.87E-03 1.21E-02 1.35E-02-4.84E-05     0.00
 16 0.04945 -3.20E-01-1.79E-01-9.11E-02-4.23E-02-1.68E-02-4.10E-03 6.12E-03 1.12E-02 1.39E-02-4.82E-05     0.00
 15 0.04687 -3.90E-01-2.26E-01-1.21E-01-6.13E-02-2.87E-02-1.14E-02 2.09E-03 9.00E-03 1.35E-02-3.92E-05     0.00
 14 0.04445 -4.52E-01-2.69E-01-1.50E-01-8.02E-02-4.09E-02-1.92E-02-2.47E-03 6.29E-03 1.25E-02-2.70E-05     0.00
 13 0.04211 -5.06E-01-3.09E-01-1.78E-01-9.87E-02-5.31E-02-2.70E-02-7.26E-03 3.31E-03 1.12E-02-1.60E-05     0.00
 12 0.03906 -5.70E-01-3.57E-01-2.12E-01-1.22E-01-6.88E-02-3.72E-02-1.37E-02-8.25E-04 9.16E-03-7.58E-06     0.00
 11 0.03578 -6.18E-01-3.97E-01-2.42E-01-1.44E-01-8.34E-02-4.69E-02-2.01E-02-5.08E-03 6.72E-03-1.50E-05     0.00
 10 0.03328 -6.42E-01-4.20E-01-2.60E-01-1.57E-01-9.27E-02-5.32E-02-2.43E-02-8.01E-03 4.90E-03-3.08E-05     0.00
  9 0.03125 -6.54E-01-4.33E-01-2.72E-01-1.66E-01-9.89E-02-5.74E-02-2.73E-02-1.01E-02 3.49E-03-4.88E-05     0.00
  8 0.02859 -6.62E-01-4.44E-01-2.83E-01-1.74E-01-1.06E-01-6.20E-02-3.06E-02-1.25E-02 1.74E-03-7.35E-05     0.00
  7 0.02437 -6.46E-01-4.43E-01-2.87E-01-1.80E-01-1.10E-01-6.55E-02-3.37E-02-1.51E-02-5.64E-04-1.02E-04     0.00
  6 0.01906 -5.75E-01-4.02E-01-2.65E-01-1.68E-01-1.04E-01-6.25E-02-3.32E-02-1.59E-02-2.33E-03-1.09E-04     0.00
  5 0.01344 -4.46E-01-3.16E-01-2.11E-01-1.35E-01-8.46E-02-5.09E-02-2.75E-02-1.36E-02-2.81E-03-8.83E-05     0.00
  4 0.00812 -2.85E-01-2.04E-01-1.37E-01-8.81E-02-5.54E-02-3.34E-02-1.82E-02-9.17E-03-2.18E-03-5.43E-05     0.00
  3 0.00359 -1.29E-01-9.25E-02-6.23E-02-4.02E-02-2.53E-02-1.53E-02-8.38E-03-4.24E-03-1.07E-03-2.31E-05     0.00
  2 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
  1 0.00000      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
0*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*
0                                                  W VELOCITY
0       I =     1        2        3        4        5        6        7        8        9       10       11       12
```

```
0000100•.PA 99
0000200•.NF
0000300•.NJ
0000320•.BL %
0000330•.PM PREFIX /      /
0000335•.PM TOP
0000336•.PM MARGIN
0000340•.HM OFF
0000360•.LL 80
0000370•.TS A0 B1
0000380•.BS Y2 Z2
0000400•       C     SUBROUTINE CONTRO                                                0000100
0000500•       C                                                                      0000200
0000600•       CA**********************************************************************0000300
0000700•       C                                                                      0000400
0000800•       C                                                                      0000500
0000900•       C     A COMPUTER PROGRAM FOR TURBULENT, SWIRLING, RECIRCULATING,       0000600
0001000•       C     FLOW IN COMBUSTOR GEOMETRIES                                     0000700
0001100•       C                                                                      0000800
0001200•       C     VERSION OF APRIL, 1981                                           0000900
0001300•       C                                                                      0001000
0001400•       C     D L RHODE & D G LILLEY                                           0001100
0001500•       C     MECHANICAL AND AEROSPACE ENGINEERING                             0001200
0001600•       C     OKLAHOMA STATE UNIVERSITY                                        0001300
0001700•       C     STILLWATER, OK     74078                                         0001400
0001800•       C                                                                      0001500
0001900•       C                                                                      0001600
0002000•       CA**********************************************************************0001700
0002100•       CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0001800
0002200•       C                                                                      0001900
0002300•            DIMENSION HEDU(9), HEDV(9), HEDW(9), HEDP(9), HEDT(9), HEDK(9),   0002000
0002400•           *HEDD(9), HEDM(9), HEDL(9), VANB(7),SWNB(7),HEDSF(9),HEDSL(9),     0002100
0002500•           #HEDDU(9),HEDDV(9),HEDDW(9),                                       0002200
0002600•           #HEDDP(9),HEDDK(9),HEDDSL(9),HEDDVS(9)                             0002300
0002700•            DIMENSION YAXES(10),SYMB L(10)                                    0002400
0002800•            COMMON                                                            0002500
0002900•           1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)              0002600
0003000•           1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)              0002700
0003100•           */WVEL/ RESORW, NSWPW, URFW                                        0002800
0003200•           1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF           0002900
0003300•           1/TEN/RESORK,NSWPK,URFK                                            0003000
0003400•           1/TDIS/RESORE,NSWPD,URFE                                           0003100
0003500•           */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0003200
0003600•           *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),        0003300
0003700•           *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0003400
0003800•           #,VISTAR(48,24)                                                    0003500
0003900•           1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)              0003600
0004000•           1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),     0003700
0004100•           1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                 0003800
0004200•           #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),       0003900
0004300•           #YND(24),YVND(24)                                                  0004000
0004400•            COMMON                                                            0004100
0004500•           1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)          0004200
0004600•           1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                             0004300
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0037100•            URFW=.6                                                                  0036800
0037200•            URFK=.7                                                                  0036900
0037300•            URFE=.7                                                                  0037000
0037400•            URFVIS=.7                                                                0037100
0037500•            IF(LFS .LT. 3) GO TO 430                                                 0037200
0037600•          425 CONTINUE                                                               0037300
0037700•        C---------INCREASE UNDERRELAXATION FACTORS AS CONVERGENCE NEARS              0037400
0037800•            URFU=.15+(FLOAT(NITER))*((.35-.15)/40.)                                  0037500
0037900•            IF(URFU .GT. .35) URFU=.35                                               0037600
0038000•            URFV=.20+(FLOAT(NITER))*((.25-.20)/40.)                                  0037700
0038100•            IF(URFV .GT. .25) URFV=.25                                               0037800
0038200•            URFW=.50+(FLOAT(NITER))*((.60-.50)/40.)                                  0037900
0038300•            IF(URFW .GT. .60) URFW=.60                                               0038000
0038400•            URFK=.70                                                                 0038100
0038500•            URFE=.70                                                                 0038200
0038600•            URFVIS=.70                                                               0038300
0038700•            IF((RESORV .LT. .08) .AND. (RESORU .LT. .10)) URFU=.40                   0038400
0038800•            IF((RESORV .LT. .06) .AND. (RESORU .LT. .08)) URFU=.45                   0038500
0038900•            IF((RESORK .LT. .10E-1) .AND. (RESORE .LT. .10E+10)) URFE=.75            0038600
0039000•            IF((RESORK .LT. .4E-2) .AND. (RESORE .LT. .5E+9)) URFE=.80               0038700
0039100•            IF(RESORU .LT. SORMAX) URFU=.20                                          0038800
0039200•            IF(RESORV .LT. SORMAX) URFV=.20                                          0038900
0039300•            IF(RESORW .LT. SORMAX) URFW=.25                                          0039000
0039400•            IF(RESORK .LT. .10E-2) URFK=.60                                          0039100
0039500•            IF(RESORE .LT. .10E+8) URFE=.55                                          0039200
0039600•          430 CONTINUE                                                               0039300
0039700•        C---------UPDATE MAIN DEPENDENT VARIABLES                                   0039400
0039800•            IF(INCALU) CALL CALCU                                                    0039500
0039900•            IF(INCALV) CALL CALCV                                                    0039600
0040000•            IF(INCALP) CALL CALCP                                                    0039700
0040100•            IF(INCALW) CALL CALCW                                                    0039800
0040200•            IF(INCALK) CALL CALCTE                                                   0039900
0040300•            IF(INCALD) CALL CALCED                                                   0040000
0040400•        C---------UPDATE FLUID PROPERITIES                                          0040100
0040500•            IF(INPRO) CALL PROPS                                                     0040200
0040600•        C---------INTERMEDIATE OUTPUT                                               0040300
0040700•            RESORM=RESORM/FLOWIN                                                     0040400
0040800•            RESORU=RESORU/XMOMIN                                                     0040500
0040900•            RESORV=RESORV/XMOMIN                                                     0040600
0041000•            RESORW=RESORW/WMOMIN                                                     0040700
0041100•            RESORK=RESORK/(.5*FLOWIN*UMEAN*UMEAN)                                    0040800
0041200•            IF(NITER .NE. IPRINT) GO TO 301                                          0040900
0041300•            IPRINT=IPRINT+1                                                          0041000
0041400•            WRITE(6,311) NITER,RESORU,RESORV,RESORW,RESORM,RESORK,                   0041100
0041500•           *RESORE,U(IMON,JMON),V(IMON,JMON),W(IMON,JMON),P(IMON,NJM1),              0041200
0041600•           *ED(IMON,NJM1)                                                           0041300
0041700•            IF(NITER .NE. JPRINT) GO TO 301                                          0041400
0041800•            IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                       0041500
0041900•            IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                       0041600
0042000•            IF(INCALW) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,W,HEDW)                        0041700
0042100•            IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)                        0041800
0042200•            IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                       0041900
0042300•            JPRINT=JPRINT+25                                                         0042000
0042400•            WRITE(6,310) IMON,JMON                                                   0042100
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0074900•          1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                0074600
0075000•          */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),     0074700
0075100•          *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),            0074800
0075200•          *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)    0074900
0075300•          #,VISTAR(48,24)                                                        0075000
0075400•          1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                  0075100
0075500•          1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),         0075200
0075600•          1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                    0075300
0075700•          #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),           0075400
0075800•          #YND(24),YVND(24)                                                      0075500
0075900•           COMMON                                                                0075600
0076000•          1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)              0075700
0076100•          1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),    0075800
0076200•          1       SP(48,24)                                                      0075900
0076300•          1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                 0076000
0076400•          2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1     0076100
0076500•      C                                                                          0076200
0076600•      CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1  0076300
0076700•      C                                                                          0076400
0076800•            DO 100 I=3,NIM1                                                      0076500
0076900•            DO 101 J=2,NJM1                                                      0076600
0077000•      C---------COMPUTE AREAS AND VOLUME                                        0076700
0077100•            AREAN=RV(J+1)*SEWU(I)                                                0076800
0077200•            AREAS=RV(J)*SEWU(I)                                                  0076900
0077300•            AREAEW=RCV(J)*SNS(J)                                                 0077000
0077400•            VOL=RCV(J)*SEWU(I)*SNS(J)                                            0077100
0077500•      C---------CALCULATE CONVECTION COEFFICIENTS                               0077200
0077600•            GN=0.5*(DEN(I,J+1)+DEN(I,J))*V(I,J+1)                                0077300
0077700•            GNW=0.5*(DEN(I-1,J)+DEN(I-1,J+1))*V(I-1,J+1)                         0077400
0077800•            GS=0.5*(DEN(I,J-1)+DEN(I,J))*V(I,J)                                  0077500
0077900•            GSW=0.5*(DEN(I-1,J)+DEN(I-1,J-1))*V(I-1,J)                           0077600
0078000•            GE=DEN(I,J)*(U(I+1,J)*(1.0-WFE(I))+U(I,J)*WFE(I))                    0077700
0078100•            GW=DEN(I-1,J)*(U(I-1,J)*(1.0-WFW(I))+U(I,J)*WFW(I))                  0077800
0078200•            CN=0.5*(GN+GNW)*AREAN                                                0077900
0078300•            CS=0.5*(GS+GSW)*AREAS                                                0078000
0078400•            CE=GE*AREAEW                                                         0078100
0078500•            CW=GW*AREAEW                                                         0078200
0078600•      C---------CALCULATE DIFFUSION COEFFICIENTS                                0078300
0078700•            VISN=0.25*(VIS(I,J)+VIS(I,J+1)+VIS(I-1,J)+VIS(I-1,J+1))              0078400
0078800•            VISS=0.25*(VIS(I,J)+VIS(I,J-1)+VIS(I-1,J)+VIS(I-1,J-1))              0078500
0078900•            DN=VISN*AREAN/DYNP(J)                                                0078600
0079000•            DS=VISS*AREAS/DYPS(J)                                                0078700
0079100•            DE=VIS(I,J)*AREAEW/DXEPU(I)                                          0078800
0079200•            DW=VIS(I-1,J)*AREAEW/DXPWU(I)                                        0078900
0079300•      C---------CALCULATE COEFFICIENTS OF SOURCE TERMS                          0079000
0079400•            SMP=CN-CS+CE-CW                                                      0079100
0079500•            CP=AMAX1(0.0,SMP)                                                    0079200
0079600•            CPO=CP                                                               0079300
0079700•      C---------ASSEMBLE MAIN COEFFICIENTS                                     0079400
0079800•            AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                 0079500
0079900•            AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                 0079600
0080000•            DE=AMAX1(DE,-WFE(I)*CE,(1.0-WFE(I))*CE)                              0079700
0080100•            DW=AMAX1(DW,WFW(I)*CW,-(1.0-WFW(I))*CW)                              0079800
0080200•            AE(I,J)=DE-(1.0-WFE(I))*CE                                           0079900
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0112700•            AS(I,J)=DENS*AREAS*DV(I,J)                                          0112400
0112800•            AE(I,J)=DENE*AREAEW*DU(I+1,J)                                       0112500
0112900•            AW(I,J)=DENW*AREAEW*DU(I,J)                                         0112600
0113000•          C---------CALCULATE SOURCE TERMS                                      0112700
0113100•            CN=DENN*V(I,J+1)*AREAN                                              0112800
0113200•            CS=DENS*V(I,J)*AREAS                                                0112900
0113300•            CE=DENE*U(I+1,J)*AREAEW                                             0113000
0113400•            CW=DENW*U(I,J)*AREAEW                                               0113100
0113500•            SMP=CN-CS+CE-CW                                                     0113200
0113600•            SP(I,J)=0.0                                                         0113300
0113700•            SU(I,J)=-SMP                                                        0113400
0113800•          C---------COMPUTE SUM OF ABSOLUTE MASS SOURCES                       0113500
0113900•            RESORM=RESORM+ABS(SMP)                                              0113600
0114000•          101 CONTINUE                                                          0113700
0114100•          100 CONTINUE                                                          0113800
0114200•          C                                                                     0113900
0114300•          CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2 0114000
0114400•          C                                                                     0114100
0114500•            CALL PROMOD (4)                                                     0114200
0114600•          C                                                                     0114300
0114700•          CHAPTER  3  3  3  3  3  FINAL COEFFICIENT ASSEMBLY  3  3  3  3  3  3  3 0114400
0114800•          C                                                                     0114500
0114900•            DO 300 I=2,NIM1                                                     0114600
0115000•            DO 301 J=2,NJM1                                                     0114700
0115100•          301 AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                   0114800
0115200•          300 CONTINUE                                                          0114900
0115300•          C                                                                     0115000
0115400•          CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4 0115100
0115500•          C                                                                     0115200
0115600•            DO 400 N=1,NSWPP                                                    0115300
0115700•          400 CALL LISOLV(2,2,NI,JMAX,IT,JT,PP,4)                             0115400
0115800•          C                                                                     0115500
0115900•          CHAPTER  5  5  5  5  CORRECT VELOCITIES AND PRESSURE  5  5  5  5  5  5  0115600
0116000•          C                                                                     0115700
0116100•          C---------VELOCITIES                                                 0115800
0116200•            DO 503 I=2,NIM1                                                     0115900
0116300•            JJ=JMAX(I)                                                          0116000
0116400•            DO 501 J=3,JJ                                                       0116100
0116500•            V(I,J)=V(I,J)+DV(I,J)*(PP(I,J-1)-PP(I,J))                           0116200
0116600•          501 CONTINUE                                                          0116300
0116700•            JJ=JMAX(I-1)                                                        0116400
0116800•            DO 502 J=2,JJ                                                       0116500
0116900•            IF(I .NE. 2) U(I,J)=U(I,J)+DU(I,J)*(PP(I-1,J)-PP(I,J))             0116600
0117000•          502 CONTINUE                                                          0116700
0117100•          503 CONTINUE                                                          0116800
0117200•          C---------PRESSURES (WITH PROVISION FOR UNDER-RELAXATION)            0116900
0117300•            PPREF=PP(IPREF,JPREF)                                               0117000
0117400•            DO 506 I=2,NIM1                                                     0117100
0117500•            JJ=JMAX(I)                                                          0117200
0117600•            DO 508 J=2,JJ                                                       0117300
0117700•            P(I,J)=P(I,J)+URFP*(PP(I,J)-PPREF)                                  0117400
0117800•          C---------PP IS ZEROED AT TOP OF CHAPTER 3, MAIN                     0117500
0117900•          508 CONTINUE                                                          0117600
0118000•          506 CONTINUE                                                          0117700
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0150500•            1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                    0150200
0150600•            2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1         0150300
0150700•            1/SUSP/SUKD(48,24),SPKD(48,24)                                            0150400
0150800•            1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),       0150500
0150900•            1      SP(48,24)                                                          0150600
0151000•            1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                       0150700
0151100•            1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                           0150800
0151200•             IF(NCHAP .EQ. 2) GO TO 1150                                              0150900
0151300•             IF(JSTEP .EQ. NJM1) GO TO 1150                                           0151000
0151400•          C---------OUT OF RANGE VALUES                                               0151100
0151500•             DO 1100 I=2,NI                                                           0151200
0151600•             IF(JMAX(I) .EQ. NJM1) GO TO 1150                                         0151300
0151700•             JJ=JMAXP1(I)                                                             0151400
0151800•             DO 1100 J=JJ,NJM1                                                        0151500
0151900•           1100 SP(I,J)=-GREAT                                                        0151600
0152000•           1150 CONTINUE                                                              0151700
0152100•             GO TO (1,2,3,4,5,6,7,8),NCHAP                                            0151800
0152200•          C                                                                           0151900
0152300•          C                                                                           0152000
0152400•          C                                                                           0152100
0152500•          CHAPTER  1  1  1  1  1  1  1  1  PROPERTIES  1  1  1  1  1  1  1  1  1     0152200
0152600•          C                                                                           0152300
0152700•              1 CONTINUE                                                              0152400
0152800•          C---------NO MODIFICATIONS FOR THIS PROBLEM                                0152500
0152900•             RETURN                                                                   0152600
0153000•          C                                                                           0152700
0153100•          CHAPTER  2  2  2  2  2  2  2  2  U MOMENTUM  2  2  2  2  2  2  2  2  2     0152800
0153200•          C                                                                           0152900
0153300•              2 CONTINUE                                                              0153000
0153400•          C---------OUT OF RANGE VALUES                                               0153100
0153500•             IF(JSTEP .EQ. NJM1) GO TO 202                                            0153200
0153600•             DO 200 I=3,NI                                                            0153300
0153700•             IF(JMAX(I-1) .EQ. NJM1) GO TO 202                                        0153400
0153800•             JJ=JMAXP1(I-1)                                                           0153500
0153900•             DO 200 J=JJ,NJM1                                                         0153600
0154000•             SP(I,J)=-GREAT                                                           0153700
0154100•           200 CONTINUE                                                               0153800
0154200•           202 CONTINUE                                                               0153900
0154300•          C---------TOP WALL                                                         0154000
0154400•             CDTERM=CMU**0.25                                                         0154100
0154500•             DO 210 I=3,NIM1                                                          0154200
0154600•             J=JMAX(I-1)                                                              0154300
0154700•             YP=YV(J+1)-Y(J)                                                          0154400
0154800•             SQRTK=SQRT(0.5*(TE(I,J)+TE(I-1,J)))                                      0154500
0154900•             DENU=0.5*(DEN(I,J)+DEN(I-1,J))                                           0154600
0155000•             YPLUSA=0.5*(YPLUSN(I)+YPLUSN(I-1))                                       0154700
0155100•             IF(YPLUSA.LE.11.63)     GO  TO  211                                      0154800
0155200•             TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)                          0154900
0155300•             GO  TO  212                                                              0155000
0155400•           211 TMULT=VISCOS/YP                                                        0155100
0155500•           212 CONTINUE                                                               0155200
0155600•           205 SP(I,J)=SP(I,J)-TMULT*SEWU(I)*RV(J+1)                                  0155300
0155700•             IF(JMAX(I-1) .NE. JMAX(I)) SP(I,J)=SP(I,J)/2.                            0155400
0155800•           210 AN(I,J)=0.                                                             0155500
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0188300•          730 CONTINUE                                                                  0188000
0188400•              DO 740 I=1,NIM1                                                           0188100
0188500•              XUDPLT(I)=XUND(I+1)                                                       0188200
0188600•          740 CONTINUE                                                                  0188300
0188700•          745 NPTS=NIM1                                                                 0188400
0188800•              RETURN                                                                    0188500
0188900•              END                                                                       0188600
0189000•        C                                                                               0188700
0189100•        C                                                                               0188800
0189200•              SUBROUTINE PLOT  (X,IDIM,IMAX,XAXIS,Y,JDIM,JMAX,YAXES,SYMB L,LA)          0188900
0189300•        CA*****************************************************************************0189000
0189400•        C                                                                               0189100
0189500•        C  SUBROUTINE FOR PLOTTING J CURVES OF Y(J,I) AGAINST X(I).                     0189200
0189600•        C                                                                               0189300
0189700•        C  X AND Y ARE ASSUMED TO BE IN ANY RANGE EXCEPT THAT NEGATIVE VALUES  *        0189400
0189800•        C   ARE PLOTTED AS ZERO.                                              *        0189500
0189900•        C  X AND Y ARE SCALED TO THE RANGE 0. TO 1. BY DIVISION BY THE MAXIMA, *        0189600
0190000•        C   WHICH ARE ALSO PRINTED.                                                    0189700
0190100•        C  IDIM IS THE VARIABLE DIMENSION FOR X.                                      0189800
0190200•        C  IMAX IS THE NUMBER OF X VALUES.                                            0189900
0190300•        C  XAXIS STORES THE NAME OF THE X-AXIS.                                       0190000
0190400•        C  JDIM IS THE VARIABLE DIMENSION FOR Y.                                      0190100
0190500•        C  JMAX IS THE NUMBER OF CURVES TO BE PLOTTED, (UP TO 10).                    0190200
0190600•        C  THE ARRAY YAXES(J) STORES THE NAMES OF THE CURVES.                         0190300
0190700•        C  THE ARRAY SYMBOL(J) STORES THE SINGLE CHARACTERS USED FOR PLOTTING. *      0190400
0190800•        C                                                                               0190500
0190900•        CA*****************************************************************************0190600
0191000•              DIMENSION X(IDIM),Y(JDIM,IDIM),YAXES(JDIM),SYMB L(JDIM),                  0190700
0191100•             1 A(101),YMAX(10)                                                          0190800
0191200•              DATA  DOT,CROSS,BLANK/1H.,1H+,1H /                                        0190900
0191300•        C---------SCALING X ARRAY TO THE RANGE 0 TO 50                                 0191000
0191400•              XMAX=1.E-30                                                               0191100
0191500•              DO 1 I=1,IMAX                                                             0191200
0191600•               IF(X(I).GT.XMAX) XMAX=X(I)                                               0191300
0191700•            1 CONTINUE                                                                  0191400
0191800•              DO 2 I=1,IMAX                                                             0191500
0191900•              X(I)=X(I)/XMAX*50.                                                        0191600
0192000•               IF(X(I).LT.0.) X(I)=0.                                                   0191700
0192100•            2 CONTINUE                                                                  0191800
0192200•        C---------SCALING Y ARRAY TO THE RANGE 0 TO 100                                0191900
0192300•              DO 3 J=1,JMAX                                                             0192000
0192400•              YMAX(J)=1.E-30                                                            0192100
0192500•              DO 4 I=1,IMAX                                                             0192200
0192600•               IF(Y(J,I).GT.YMAX(J)) YMAX(J)=Y(J,I)                                     0192300
0192700•            4 CONTINUE                                                                  0192400
0192800•              DO 3 I=1,IMAX                                                             0192500
0192900•        C        NO Y  SCALING                                                        0192600
0193000•              Y(J,I)=Y(J,I)*100.0                                                       0192700
0193100•              IF(LA.EQ.1) Y(J,I)=0.02*Y(J,I)                                            0192800
0193200•               IF(Y(J,I).LT.0.) Y(J,I)=0.                                               0192900
0193300•            3 CONTINUE                                                                  0193000
0193400•        C---------IDENTIFYING THE VARIOUS CURVES TO BE PLOTTED                         0193100
0193500•              WRITE(6,103) XAXIS                                                        0193200
0193600•              WRITE(6,100) (YAXES(I),I=1,JMAX)                                          0193300
```

```
0004700•          2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1   0004400
0004800•          1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                 0004500
0004900•          1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                     0004600
0005000•          1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24), 0004700
0005100•          1      SP(48,24)                                                    0004800
0005200•          1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT           0004900
0005300•           LOGICAL INCALU,INCALV,INCALW,INCALP,INPRO,INCALK,INCALD,INCALM,    0005000
0005400•          *INCALA,INCALB,INCALS,INPLOT,IWRITE,NONDIM,IREAD,INLET,             0005100
0005500•          *INITAL,IFINE                                                       0005200
0005600•        C---------ALL PRIMARY USER INPUTS ARE LOCATED HERE                     0005300
0005700•           DATA VANB /0.,45.,55.,60.,65.,68.,70./                           0005400
0005800•          #,SWNB/0.,.5,1.0,1.25,1.50,1.75,2.0/                              0005500
0005900•           DATA  XAXIS /3HXI /                                              0005600
0006000•           DATA YAXES /3H 00,3H 02,3H 04,3H 06,3H 08,3H 10,                 0005700
0006100•          #3H 06,3H 07,3H 08,3H 09/                                         0005800
0006200•           DATA SYMB L /1H0,1H2,1H4,1H6,1H8,1H1,1H6,1H7,1H8,1H9/            0005900
0006300•        C---------DELETE UNDERFLOW ERROR MESSAGES, CALL TRAPS WHEN USING WATFIV 0006000
0006400•        C---------CALL TRAPS(1,1,4000)                                      0006100
0006500•           CALL ERRSET(208,256,-1,1,0,0)                                    0006200
0006600•        C---------SET INPLOT=.TRUE. ONLY FOR STREAMLINE LINE-PRINTER PLOT   0006300
0006700•           INPLOT=.TRUE.                                                    0006400
0006800•        C---------SET IWRITE=.TRUE. ONLY FOR WRITING SOLN. ON DATA FILES     0006500
0006900•           IWRITE=.FALSE.                                                   0006600
0007000•        C---------SET NONDIM=.TRUE. ONLY FOR PRINTING DIMENSIONLESS SOLN.   0006700
0007100•           NONDIM=.TRUE.                                                    0006800
0007200•        C---------SET IREAD=.TRUE. ONLY FOR READING INITIAL GUESS OF SOLN.  0006900
0007300•        C---------     FROM DATA FILES                                     0007000
0007400•           IREAD=.FALSE.                                                    0007100
0007500•        C---------SET INITAL=.TRUE. ONLY FOR PRINTING INITIAL GUESS OF SOLN. 0007200
0007600•           INITAL=.TRUE.                                                    0007300
0007700•        C---------SET IFINE=.TRUE. ONLY FOR FINE GRID IN X-DIRECTION       0007400
0007800•           IFINE=.FALSE.                                                    0007500
0007900•           IF(.NOT. IREAD) GO TO 150                                        0007600
0008000•           READ(12) X                                                       0007700
0008100•           READ(12) Y                                                       0007800
0008200•         150 CONTINUE                                                       0007900
0008300•           NSTLN=11                                                         0008000
0008400•           NPLTLN=6                                                         0008100
0008500•           MAXLN=10                                                         0008200
0008600•           NITER=0                                                          0008300
0008700•           JPRINT=NITER+300                                                 0008400
0008800•           IPRINT=NITER+1                                                   0008500
0008900•           LFS=1                                                            0008600
0009000•           LFSMAX=7                                                         0008700
0009100•           NSBR=0                                                           0008800
0009200•           MAXIT=NITER+200                                                  0008900
0009300•        C---------SEE STATEMENT 304 FOR MAXIT SPEC. FOR FURTHER SWIRL CASES 0009000
0009400•           DENSIT=1.211                                                     0009100
0009500•           IT=48                                                            0009200
0009600•           JT=24                                                            0009300
0009700•           GREAT=1.E30                                                      0009400
0009800•           NSWPU=4                                                          0009500
0009900•           NSWPV=3                                                          0009600
0010000•           NSWPW=3                                                          0009700
```

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      301 CONTINUE                                                          0042200
C---------TERMINATION TESTS                                                0042300
      SORCE=AMAX1(RESORM,RESORU,RESORV,RESORW,RESORK)                       0042400
      IF(NITER.GE.MAXIT) GO TO 302                                          0042500
      303 IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) GO TO 302                 0042600
      IF(SORCE.GT.SORMAX .OR. NITER .LT. 20) GO TO 300                      0042700
      302 CONTINUE                                                          0042800
      IF(NITER .GE. 150 .AND. SORCE .GE. 3.0) WRITE(6,960)                  0042900
C                                                                           0043000
CHAPTER  4  4  4  4  4  4  FINAL OPERATIONS AND OUTPUT  4  4  4  4  4  4   0043100
C                                                                           0043200
      440 CONTINUE                                                          0043300
C---------NONDIMENSIONALIZE PROBLEM SOLN.                                  0043400
      IF(.NOT. NONDIM) GO TO 700                                            0043500
      DO 600 I=1,NI                                                         0043600
      DO 600 J=1,NJ                                                         0043700
      USTAR(I,J)=U(I,J)/UIN                                                 0043800
      VSTAR(I,J)=V(I,J)/UIN                                                 0043900
      WSTAR(I,J)=W(I,J)/UIN                                                 0044000
      PSTAR(I,J)=P(I,J)/(DENSIT*(UIN**2)/2.)                                0044100
      TESTAR(I,J)=TE(I,J)/(UIN*UIN)                                         0044200
      SP(I,J)=0.0                                                           0044300
      IF(ED(I,J) .GT. 1.E-15) SP(I,J)=TE(I,J)**1.5/ED(I,J)/RLARGE           0044400
      VISTAR(I,J)=VIS(I,J)/VISCOS                                           0044500
      600 CONTINUE                                                          0044600
      700 CONTINUE                                                          0044700
      IF(INCALS) CALL STRMFN                                                0044800
      WRITE(6,312)                                                          0044900
      WRITE(6,410) LFS,NSBR,SWNB(LFS),VANB(LFS),SWRLNO,UMEAN,FLOWIN         0045000
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                    0045100
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                    0045200
      IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, X, Y, W, HEDW)            0045300
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,P,HEDP)                     0045400
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,PP,HEDP)                    0045500
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)                    0045600
      IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                    0045700
      IF(INCALS) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,STFN,HEDSF)                0045800
      IF(INCALS) CALL PRINT(1,1,NI,NSTLN,IT,JT,XU,STVAL,YSTLN,HEDSL)        0045900
      IF(.NOT. NONDIM) GO TO 750                                            0046000
      IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XUND,YND,USTAR,HEDDU)           0046100
      IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YVND,VSTAR,HEDDV)           0046200
      IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, XND, YND,WSTAR,HEDDW)     0046300
      IF(INCALS) CALL PRINT(1,1,NI,NSTLN,IT,JT,XUND,STVAL,YSTLND,HEDDSL)    0046400
      IF(INCALP) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,PSTAR,HEDDP)            0046500
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,TESTAR,HEDDK)           0046600
      IF(INCALK) CALL PRINT(2,2,NI,NJ,IT,JT,X,Y,SP,HEDL)                    0046700
      IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,XND,YND,VISTAR,HEDDVS)          0046800
      750 CONTINUE                                                          0046900
      IF(.NOT. IWRITE) GO TO 702                                            0047000
      WRITE(11) U                                                           0047100
      WRITE(11) V                                                           0047200
      WRITE(11) W                                                           0047300
      WRITE(11) P                                                           0047400
      WRITE(11) TE                                                          0047500
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0080300•            AW(I,J)=DW+(1.-WFW(I))*CW                                          0080000
0080400•            DU(I,J)=AREAEW                                                     0080100
0080500•            DUDXE=(U(I+1,J)-U(I,J))/DXEPU(I)                                   0080200
0080600•            DUDXW=(U(I,J)-U(I-1,J))/DXPWU(I)                                   0080300
0080700•            SORCE1=(DUDXE*VIS(I,J)-DUDXW*VIS(I-1,J))/SEWU(I)                   0080400
0080800•            DVDXN=(V(I,J+1)-V(I-1,J+1))/SEWU(I)                                0080500
0080900•            DVDXS=(V(I,J)-V(I-1,J))/SEWU(I)                                    0080600
0081000•            SORCE2=(RV(J+1)*VISN*DVDXN-RV(J)*VISS*DVDXS)/(RCV(J)*DYNPV(J))     0080700
0081100•            SU(I,J)=CP0*U(I,J)+DU(I,J)*(P(I-1,J)-P(I,J))                       0080800
0081200•            SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                                0080900
0081300•            SP(I,J)=-CP                                                        0081000
0081400•          101 CONTINUE                                                         0081100
0081500•          100 CONTINUE                                                         0081200
0081600•        C                                                                      0081300
0081700•        CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2 0081400
0081800•        C                                                                      0081500
0081900•            CALL PROMOD (2)                                                    0081600
0082000•        C                                                                      0081700
0082100•        CHAPTER  3  FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION  3  3  0081800
0082200•        C                                                                      0081900
0082300•            RESORU=0.0                                                         0082000
0082400•            DO 300 I=3,NIM1                                                    0082100
0082500•            DO 301 J=2,NJM1                                                    0082200
0082600•            AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                    0082300
0082700•            DU(I,J)=DU(I,J)/AP(I,J)                                            0082400
0082800•            RESOR=AN(I,J)*U(I,J+1)+AS(I,J)*U(I,J-1)+AE(I,J)*U(I+1,J)           0082500
0082900•           1     +AW(I,J)*U(I-1,J)-AP(I,J)*U(I,J)+SU(I,J)                      0082600
0083000•            VOL=RCV(J)*SEWU(I)*SNS(J)                                          0082700
0083100•            SORVOL=GREAT*VOL                                                   0082800
0083200•            IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                     0082900
0083300•            RESORU=RESORU+ABS(RESOR)                                           0083000
0083400•        C---------UNDER-RELAXATION                                             0083100
0083500•            AP(I,J)=AP(I,J)/URFU                                               0083200
0083600•            SU(I,J)=SU(I,J)+(1.-URFU)*AP(I,J)*U(I,J)                           0083300
0083700•            DU(I,J)=DU(I,J)*URFU                                               0083400
0083800•          301 CONTINUE                                                         0083500
0083900•          300 CONTINUE                                                         0083600
0084000•        C                                                                      0083700
0084100•        CHAPTER  4  4  4  SOLUTION OF DIFFERENCE EQUATION  4  4  4  4  4  4  4 0083800
0084200•        C                                                                      0083900
0084300•            DO 400 N=1,NSWPU                                                   0084000
0084400•          400 CALL LISOLV(3,2,NI,JMAX,IT,JT,U,2)                               0084100
0084500•            RETURN                                                             0084200
0084600•            END                                                                0084300
0084700•        C                                                                      0084400
0084800•        C-------------------------------------------------------------         0084500
0084900•        C                                                                      0084600
0085000•            SUBROUTINE CALCV                                                   0084700
0085100•        CA*************************************************************** 0084800
0085200•        C                                                                      0084900
0085300•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0085000
0085400•        C                                                                      0085100
0085500•            COMMON                                                             0085200
0085600•           1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)               0085300
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0118100•              RETURN                                                                  0117800
0118200•              END                                                                     0117900
0118300•        C                                                                             0118000
0118400•        C-------------------------------------------------------------------          0118100
0118500•        C                                                                             0118200
0118600•              SUBROUTINE CALCTE                                                       0118300
0118700•        CA*************************************************************************** 0118400
0118800•        C                                                                             0118500
0118900•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0        0118600
0119000•        C                                                                             0118700
0119100•              COMMON                                                                  0118800
0119200•             1/TEN/RESORK,NSWPK,URFK                                                  0118900
0119300•             */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),      0119000
0119400•             *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),              0119100
0119500•             *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)      0119200
0119600•             #,VISTAR(48,24)                                                          0119300
0119700•             1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                    0119400
0119800•             1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),           0119500
0119900•             1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                      0119600
0120000•             #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),             0119700
0120100•             #YND(24),YVND(24)                                                        0119800
0120200•              COMMON                                                                  0119900
0120300•             1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                0120000
0120400•             1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),      0120100
0120500•             1       SP(48,24)                                                        0120200
0120600•             1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                      0120300
0120700•             1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                          0120400
0120800•             1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                   0120500
0120900•             2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1        0120600
0121000•             1/SUSP/SUKD(48,24),SPKD(48,24)                                           0120700
0121100•        C                                                                             0120800
0121200•        CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1        0120900
0121300•        C                                                                             0121000
0121400•              PRTE=1.0                                                                0121100
0121500•              DO 100 I=2,NIM1                                                         0121200
0121600•              DO 101 J=2,NJM1                                                         0121300
0121700•        C---------COMPUTE AREAS AND VOLUME                                           0121400
0121800•              AREAN=RV(J+1)*SEW(I)                                                    0121500
0121900•              AREAS=RV(J)*SEW(I)                                                      0121600
0122000•              AREAEW=RCV(J)*SNS(J)                                                    0121700
0122100•              VOL=RCV(J)*SNS(J)*SEW(I)                                                0121800
0122200•        C---------CALCULATE CONVECTION COEFFICIENTS                                  0121900
0122300•              GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+                                     0122000
0122400•              GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                     0122100
0122500•              GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                                   0122200
0122600•              GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                     0122300
0122700•              CN=GN*AREAN                                                             0122400
0122800•              CS=GS*AREAS                                                             0122500
0122900•              CE=GE*AREAEW                                                            0122600
0123000•              CW=GW*AREAEW                                                            0122700
0123100•        C---------CALCULATE DIFFUSION COEFFICIENTS                                   0122800
0123200•              GAMN=0.5*(VIS(I,J)+VIS(I,J+1))/PRTE                                     0122900
0123300•              GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRTE                                     0123000
0123400•              GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRTE                                     0123100
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0155900•        C---------SIDE WALL                                                    0155600
0156000•              IF(JSTEP .EQ. NJM1) GO TO 214                                    0155700
0156100•              DO 225 I=3,NIM1                                                  0155800
0156200•              IF(JMAX(I-2) .GE. JMAX(I-1)) GO TO 225                           0155900
0156300•              JJ=JMAXP1(I-2)                                                   0156000
0156400•              JI=JMAX(I-1)                                                     0156100
0156500•              DO 220 J=JJ,JI                                                   0156200
0156600•              AW(I,J)=0.                                                       0156300
0156700•          220 CONTINUE                                                         0156400
0156800•          225 CONTINUE                                                         0156500
0156900•        C---------SYMMETRY  AXIS                                               0156600
0157000•          214 CONTINUE                                                         0156700
0157100•              DO 203 I=1,NI                                                    0156800
0157200•          203 AS(I,2)=0.                                                       0156900
0157300•        C---------OUTLET                                                       0157000
0157400•              ARDENT=0.0                                                       0157100
0157500•              FLOW=0.0                                                         0157200
0157600•              DO 209 J=2,NJM1                                                  0157300
0157700•              ARDEN=0.50*(DEN(NIM1,J)+DEN(NIM1-1,J))*RCV(J)*SNS(J)             0157400
0157800•              ARDENT=ARDENT+ARDEN                                              0157500
0157900•          209 FLOW=FLOW+ARDEN*U(NIM1,J)                                        0157600
0158000•              UINC=(FLOWIN-FLOW)/ARDENT                                        0157700
0158100•              DO  215  J=2,NJM1                                                0157800
0158200•          215 U(NI,J)=U(NIM1,J)+UINC                                           0157900
0158300•              RETURN                                                           0158000
0158400•        C                                                                      0158100
0158500•        CHAPTER  3  3  3  3  3  3  3  3  V MOMENTUM  3  3  3  3  3  3  3  3  3  0158200
0158600•        C                                                                      0158300
0158700•            3 CONTINUE                                                         0158400
0158800•        C---------SIDE WALL                                                    0158500
0158900•              IF(JSTEP .EQ. NJM1) GO TO 314                                    0158600
0159000•              CDTERM=CMU**0.25                                                 0158700
0159100•              DO 325 I=2,NIM1                                                  0158800
0159200•              IF(JMAX(I-1) .GE. JMAX(I)) GO TO 325                             0158900
0159300•              JJ=JMAXP1(I-1)                                                   0159000
0159400•              JI=JMAX(I)                                                       0159100
0159500•              DO 320 J=JJ,JI                                                   0159200
0159600•              XP=X(I)-XU(I)                                                    0159300
0159700•              SQRTK=SQRT(0.5*(TE(I,J)+TE(I,J-1)))                              0159400
0159800•              DENV=0.5*(DEN(I,J)+DEN(I,J-1))                                   0159500
0159900•              XPLUSA=0.5*(XPLUSW(J)+XPLUSW(J-1))                               0159600
0160000•              IF(XPLUSA.LE.11.63)     GO  TO  311                              0159700
0160100•              TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)                  0159800
0160200•              GO  TO  312                                                      0159900
0160300•          311 TMULT=VISCOS/XP                                                  0160000
0160400•          312 CONTINUE                                                         0160100
0160500•          305 SP(I,J)=SP(I,J)-TMULT*SNSV(J)*RV(J)                              0160200
0160600•              IF(J .EQ. JMAXP1(I-1)) SP(I,J)=SP(I,J)/2.                        0160300
0160700•          310 AW(I,J)=0.0                                                      0160400
0160800•          320 CONTINUE                                                         0160500
0160900•          325 CONTINUE                                                         0160600
0161000•        C---------TOP WALL                                                     0160700
0161100•          314 CONTINUE                                                         0160800
0161200•              DO 313 I=2,NIM1                                                  0160900
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0193700•            WRITE(6,106) (SYMB L(I),I=1,JMAX)                                  0193400
0193800•            WRITE(6,102) (YMAX(I),I=1,JMAX)                                    0193500
0193900•            DO 5 I=1,11                                                        0193600
0194000•          5  A(I)=0.1*      (I-1)                                              0193700
0194100•            IF(LA .EQ. 1) WRITE(6,120)                                         0193800
0194200•            IF(LA .EQ. 0) WRITE(6,115)                                         0193900
0194300•            WRITE(6,101) (A(I),I=1,11)                                         0194000
0194400•       C---------MAIN LOOP.  EACH PASS PRODUCES AN X-CONSTANT LINE.            0194100
0194500•            DO 40 II=1,51                                                      0194200
0194600•            I=II                                                               0194300
0194700•            IF(I.EQ.1.OR.I.EQ.51) GO TO 32                                     0194400
0194800•            GO TO 33                                                           0194500
0194900•       C---------ALLOCATE . OR + AS MARKER ON THE Y-AXIS                       0194600
0195000•         32 DO 30 K=1,101                                                     0194700
0195100•         30 A(K)=DOT                                                          0194800
0195200•            DO 31 K=11,101,10                                                  0194900
0195300•         31 A(K)=CROSS                                                        0195000
0195400•       C---------ALLOCATE . OR + MARK ON THE X-AXIS, ALSO THE APPROPRIATE     0195100
0195500•       C---------      X VALUE                                               0195200
0195600•         33 A(1)=DOT                                                          0195300
0195700•            A(101)=DOT                                                         0195400
0195800•            K=I-1                                                              0195500
0195900•         46 K=K-5                                                            0195600
0196000•            IF(K)48,47,46                                                      0195700
0196100•         47 A(1)=CROSS                                                        0195800
0196200•            A(101)=CROSS                                                       0195900
0196300•         48 XL=0.02*      (I-1)                                              0196000
0196400•       C---------CHECK IF ANY Y( X(I) ) VALUE LIES ON THIS X-CONSTANT LINE   0196100
0196500•       C---------IF YES GO TO 41, OTHERWISE GO TO 42                         0196200
0196600•            DO 43 K=1,IMAX                                                     0196300
0196700•            IFIX=X(K)+1.5                                                      0196400
0196800•            IF(IFIX-I)43,41,43                                                 0196500
0196900•       C---------LOCATE  Y(  X(I)  )                                         0196600
0197000•         41 DO 44 J=1,JMAX                                                    0196700
0197100•            NY=Y(J,K)+1.5                                                      0196800
0197200•            A(NY)=SYMB L(J)                                                    0196900
0197300•         44 CONTINUE                                                         0197000
0197400•            GO TO 42                                                           0197100
0197500•         43 CONTINUE                                                         0197200
0197600•       C---------PRINT X-CONSTANT LINE                                       0197300
0197700•         42  CONTINUE                                                       0197400
0197800•            IF(LA.EQ.1) GO TO 51                                               0197500
0197900•            WRITE(6,105) XL,(A(K),K=1,101),XL                                  0197600
0198000•            GO TO 52                                                           0197700
0198100•         51  WRITE(6,107) XL,(A(K),K=1,101),XL                               0197800
0198200•         52  CONTINUE                                                        0197900
0198300•       C---------PUTTING BLANKS INTO X-CONSTANT LINE                         0198000
0198400•            DO 49 K=1,101                                                      0198100
0198500•         49 A(K)=BLANK                                                       0198200
0198600•         40 CONTINUE                                                         0198300
0198700•            DO 50 I=1,11                                                       0198400
0198800•         50 A(I)=.1*      (I-1)                                              0198500
0198900•            WRITE(6,104)(A(I),I=1,11)                                          0198600
0199000•            WRITE(6,130)                                                       0198700
```

```
0010100•            NSWPP=5                                                                  0009800
0010200•            NSWPK=3                                                                  0009900
0010300•            NSWPD=3                                                                  0010000
0010400•            READ(5,10) HEDU,HEDV,HEDW,HEDP,HEDT,HEDK,HEDD,HEDM,HEDL,                 0010100
0010500•           $HEDSF,HEDSL,HEDDU,HEDDV,HEDDW,HEDDP,HEDDK,HEDDSL,HEDDVS                  0010200
0010600•         010 FORMAT(9A4)                                                            0010300
0010700•       C                                                                            0010400
0010800•       CHAPTER  1  1  1  1  1  PARAMETERS AND CONTROL INDICES  1  1  1  1  1  1     0010500
0010900•       C                                                                            0010600
0011000•       C---------GRID                                                               0010700
0011100•            ISTEP=2                                                                 0010800
0011200•            JSTEP=8                                                                 0010900
0011300•            INDCOS=2                                                                0011000
0011400•            NJ=21                                                                   0011100
0011500•            NJM1=NJ-1                                                               0011200
0011600•            ISTP1=ISTEP+1                                                           0011300
0011700•            ISTM1=ISTEP-1                                                           0011400
0011800•            JSTP1=JSTEP+1                                                           0011500
0011900•            JSTM1=JSTEP-1                                                           0011600
0012000•            RLARGE=.0625                                                            0011700
0012100•            ALTOT=.375                                                              0011800
0012200•            IF(IFINE) GO TO 120                                                     0011900
0012300•       C---------COARSE MESH GRID LINES IN X-DIRECTION                               0012000
0012400•            NI=20                                                                   0012100
0012500•            NIM1=NI-1                                                               0012200
0012600•            EPSX=1.11                                                               0012300
0012700•            IF(EPSX-1.)  13,12,13                                                   0012400
0012800•       13   SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5                  0012500
0012900•            GO TO 15                                                                0012600
0013000•       12   CONTINUE                                                                0012700
0013100•            SUMX=NIM1-1                                                             0012800
0013200•       15   DX=ALTOT/SUMX                                                           0012900
0013300•            X(1)=-.5*DX                                                             0013000
0013400•            X(2)=-X(1)                                                              0013100
0013500•            DO  100  I=3,NIM1                                                       0013200
0013600•            X(I)=X(I-1)+DX                                                          0013300
0013700•          100 DX=EPSX*DX                                                            0013400
0013800•            X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))                                         0013500
0013900•            X(21)=X(20)+(X(20)-X(19))                                               0013600
0014000•            X(22)=X(21)+(X(20)-X(19))                                               0013700
0014100•            X(23)=X(22)+(X(20)-X(19))                                               0013800
0014200•            NI=23                                                                   0013900
0014300•            NIM1=NI-1                                                               0014000
0014400•            ALTOT=(X(22)+X(23))/2.                                                  0014100
0014500•            AL1=0.5*(X(ISTEP)+X(ISTM1))                                             0014200
0014600•            AL2=ALTOT-AL1                                                           0014300
0014700•       C---------FINE MESH GRID LINES IN X-DIRECTION                               0014400
0014800•            IF(.NOT. IFINE) GO TO 130                                               0014500
0014900•          120 NI=30                                                                 0014600
0015000•            NIM1=NI-1                                                               0014700
0015100•            EPSX=1.102                                                              0014800
0015200•            IF(EPSX-1.)  17,16,17                                                   0014900
0015300•       17   SUMX=0.5*EPSX**(NI-4)+(EPSX**(NI-3)-1.)/(EPSX-1.)+0.5                  0015000
0015400•            GO TO 18                                                                0015100
```

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0047900•            WRITE(11) ED                                                    0047600
0048000•            WRITE(11) VIS                                                   0047700
0048100•            WRITE(11) STFN                                                  0047800
0048200•            WRITE(14) YSTLND                                                0047900
0048300•          702 CONTINUE                                                      0048000
0048400•        C---------CALCULATION OF SHEAR-STRESS COEFFICIENT ALONG LARGE DUCT WALL  0048100
0048500•            WRITE(6,402)                                                    0048200
0048600•            DO  401  I=2,NIM1                                               0048300
0048700•            SSC=ABS(TAUN(I))/(.5*DENSIT*UIN*UIN)                            0048400
0048800•            WRITE(6,403) I,XND(I),SSC                                       0048500
0048900•          401 CONTINUE                                                      0048600
0049000•            WRITE(6,312)                                                    0048700
0049100•        C---------PLOT DIMENSIONLESS STREAMLINES                           0048800
0049200•            LARGE=0                                                         0048900
0049300•            IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,  0049000
0049400•           #MAXLN,NPLTLN,YAXES,SYMB L,LARGE)                                0049100
0049500•            LARGE=1                                                         0049200
0049600•            IF(INPLOT .AND. INCALS) CALL PLOT (XUDPLT,IT,NPTS,XAXIS,YSLPLT,  0049300
0049700•           #MAXLN,NPLTLN,YAXES,SYMB L,LARGE)                                0049400
0049800•        C---------RESET INITIAL CONDITIONS FOR ANOTHER SWIRL CASE           0049500
0049900•            IF(LFS .GE. LFSMAX) GO TO 409                                   0049600
0050000•            LFS=LFS+1                                                       0049700
0050100•            NITER=0                                                         0049800
0050200•            JPRINT=NITER+300                                                0049900
0050300•            IPRINT=NITER+1                                                  0050000
0050400•          304 IF(LFS .GE. 3) MAXIT=NITER+200                                0050100
0050500•            IF(NSBR .EQ. 0) GO TO 405                                       0050200
0050600•            WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN                           0050300
0050700•            DO 406 J=2,JSTEP                                                0050400
0050800•          406 W(1,J)=WINST*R(J)/R(JSTEP)                                    0050500
0050900•            GO TO 408                                                       0050600
0051000•          405 WIN=UIN*TAN(VANB(LFS)*3.14159/180.)                           0050700
0051100•            DO 407 J=2,JSTEP                                                0050800
0051200•          407 W(1,J)=WIN                                                    0050900
0051300•          408 FLOWIN=0.                                                     0051000
0051400•            ARDEN=0.                                                        0051100
0051500•            ARDENT=0.                                                       0051200
0051600•            XMONIN=0.                                                       0051300
0051700•            ANGMOM=0.                                                       0051400
0051800•            WMONIN=0.                                                       0051500
0051900•        C---------READ INITIAL GUESS OF NEXT SWIRL PROBLEM FROM            0051600
0052000•        C---------PREVIOUS SOLN. OF SIMILAR PROBLEM                        0051700
0052100•            IF(.NOT. IREAD) GO TO 445                                       0051800
0052200•            READ(12) U                                                      0051900
0052300•            READ(12) V                                                      0052000
0052400•            READ(12) W                                                      0052100
0052500•            READ(12) P                                                      0052200
0052600•            READ(12) TE                                                     0052300
0052700•            READ(12) ED                                                     0052400
0052800•            READ(12) VIS                                                    0052500
0052900•            READ(12) STFN                                                   0052600
0053000•          445 CONTINUE                                                      0052700
0053100•            DO  490  J=2,JSTEP                                              0052800
0053200•            ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)                     0052900
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0085700•          1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                          0085400
0085800•          1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                       0085500
0085900•          */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),            0085600
0086000•          *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),                    0085700
0086100•          *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)            0085800
0086200•          #,VISTAR(48,24)                                                                0085900
0086300•          1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                          0086000
0086400•          1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),                 0086100
0086500•          1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                            0086200
0086600•          #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),                   0086300
0086700•          #YND(24),YVND(24)                                                              0086400
0086800•           COMMON                                                                        0086500
0086900•          1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                      0086600
0087000•          1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),            0086700
0087100•          1       SP(48,24)                                                              0086800
0087200•          1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                         0086900
0087300•          2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1             0087000
0087400•        C                                                                                0087100
0087500•        CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1        0087200
0087600•        C                                                                                0087300
0087700•              DO 100 I=2,NIM1                                                            0087400
0087800•              DO 101 J=3,NJM1                                                            0087500
0087900•        C---------COMPUTE AREAS AND VOLUME                                              0087600
0088000•              AREAN=R(J)*SEW(I)                                                          0087700
0088100•              AREAS=R(J-1)*SEW(I)                                                        0087800
0088200•              AREAEW=RV(J)*SNSV(J)                                                       0087900
0088300•              VOL=RV(J)*SEW(I)*SNSV(J)                                                   0088000
0088400•        C---------CALCULATE CONVECTION COEFFICIENTS                                     0088100
0088500•              GN=DEN(I,J)*(V(I,J+1)*(1.0-WFN(J))+V(I,J)*WFN(J))                          0088200
0088600•              GS=DEN(I,J-1)*(V(I,J-1)*(1.0-WFS(J))+V(I,J)*WFS(J))                        0088300
0088700•              GE=0.5*(DEN(I+1,J)+DEN(I,J))*U(I+1,J)                                      0088400
0088800•              GSE=0.5*(DEN(I,J-1)+DEN(I+1,J-1))*U(I+1,J-1)                               0088500
0088900•              GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                        0088600
0089000•              GSW=0.5*(DEN(I,J-1)+DEN(I-1,J-1))*U(I,J-1)                                 0088700
0089100•              CN=GN*AREAN                                                                0088800
0089200•              CS=GS*AREAS                                                                0088900
0089300•              CE=0.5*(GE+GSE)*AREAEW                                                     0089000
0089400•              CW=0.5*(GW+GSW)*AREAEW                                                     0089100
0089500•        C---------CALCULATE DIFFUSION COEFFICIENTS                                      0089200
0089600•              VISE=0.25*(VIS(I,J)+VIS(I+1,J)+VIS(I,J-1)+VIS(I+1,J-1))                    0089300
0089700•              VISW=0.25*(VIS(I,J)+VIS(I-1,J)+VIS(I,J-1)+VIS(I-1,J-1))                    0089400
0089800•              DN=VIS(I,J)*AREAN/DYNPV(J)                                                 0089500
0089900•              DS=VIS(I,J-1)*AREAS/DYPSV(J)                                               0089600
0090000•              DE=VISE*AREAEW/DXEP(I)                                                     0089700
0090100•              DW=VISW*AREAEW/DXPW(I)                                                     0089800
0090200•        C---------CALCULATE COEFFICIENTS OF SOURCE TERMS                                0089900
0090300•              SMP=CN-CS+CE-CW                                                            0090000
0090400•              CP=AMAX1(0.0,SMP)                                                          0090100
0090500•              CPO=CP                                                                     0090200
0090600•        C---------ASSEMBLE MAIN COEFFICIENTS                                           0090300
0090700•              DN=AMAX1(DN,-WFN(J)*CN,(1.0-WFN(J))*CN)                                    0090400
0090800•              DS=AMAX1(DS,WFS(J)*CS,-(1.0-WFS(J))*CS)                                    0090500
0090900•              AN(I,J)=DN-(1.0-WFN(J))*CN                                                 0090600
0091000•              AS(I,J)=DS+(1.0-WFS(J))*CS                                                 0090700
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0123500•              GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRTE                                    0123200
0123600•              DN=GAMN*AREAN/DYNP(J)                                                  0123300
0123700•              DS=GAMS*AREAS/DYPS(J)                                                  0123400
0123800•              DE=GAME*AREAEW/DXEP(I)                                                 0123500
0123900•               DW=GAMW*AREAEW/DXPW(I)                                                0123600
0124000•            C---------SOURCE TERMS                                                   0123700
0124100•              SMP=CN-CS+CE-CW                                                        0123800
0124200•              CP=AMAX1(0.0,SMP)                                                      0123900
0124300•              CPO=CP                                                                 0124000
0124400•              DUDX=(U(I+1,J)-U(I,J))/SEW(I)                                          0124100
0124500•              DVDY=(V(I,J+1)-V(I,J))/SNS(J)                                          0124200
0124600•              DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+       0124300
0124700•             1U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                        0124400
0124800•              DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V(     0124500
0124900•             1I-1,J)+V(I-1,J+1))/4.)/SEW(I)                                          0124600
0125000•              DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))-W(I,J)/R(J)                 0124700
0125100•              DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))                             0124800
0125200•              GEN(I,J)=(2.*(DUDX**2+DVDY**2)+(DUDY+DVDX)**2)*VIS(I,J)                0124900
0125300•              IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*(DWDY**2+DWDX**2)         0125000
0125400•              IF(RV(J) .EQ. 0.) GO TO 110                                            0125100
0125500•              VDR=V(I,J)/RV(J)                                                       0125200
0125600•              IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*.5*                       0125300
0125700•             #(VDR+V(I,J+1)/RV(J+1))**2                                              0125400
0125800•              GO TO 120                                                              0125500
0125900•            110 IF(INDCOS .EQ. 2) GEN(I,J)=GEN(I,J)+VIS(I,J)*                        0125600
0126000•               #0.5*(V(I,J+1)/RV(J+1))**2                                          0125700
0126100•            120 CONTINUE                                                           0125800
0126200•            C---------ASSEMBLE MAIN COEFFICIENTS                                    0125900
0126300•              AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                   0126000
0126400•              AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                   0126100
0126500•              AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                                   0126200
0126600•              AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                                   0126300
0126700•              SU(I,J)=CPO*TE(I,J)                                                    0126400
0126800•              SUKD(I,J)=SU(I,J)                                                      0126500
0126900•              SU(I,J)=SU(I,J)+GEN(I,J)*VOL                                           0126600
0127000•              SP(I,J)=-CP                                                            0126700
0127100•              SPKD(I,J)=SP(I,J)                                                      0126800
0127200•              SP(I,J)=SP(I,J)-CD*CMU*DEN(I,J)**2*TE(I,J)*VOL/VIS(I,J)                0126900
0127300•            101 CONTINUE                                                           0127000
0127400•            100 CONTINUE                                                           0127100
0127500•            C                                                                      0127200
0127600•            CHAPTER  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2     0127300
0127700•            C                                                                      0127400
0127800•              CALL PROMOD (6)                                                      0127500
0127900•            C                                                                      0127600
0128000•            CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3  0127700
0128100•            C                                                                      0127800
0128200•              RESORK=0.0                                                           0127900
0128300•              DO 300 I=2,NIM1                                                      0128000
0128400•              DO 301 J=2,NJM1                                                      0128100
0128500•              AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                      0128200
0128600•              RESOR=AN(I,J)*TE(I,J+1)+AS(I,J)*TE(I,J-1)+AE(I,J)*TE(I+1,J)          0128300
0128700•             1       +AW(I,J)*TE(I-1,J)-AP(I,J)*TE(I,J)+SU(I,J)                    0128400
0128800•              VOL=RCV(J)*SNS(J)*SEW(I)                                             0128500
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0161300•            J=JMAX(I)                                                    0161000
0161400•          313 AN(I,J)=0.                                                 0161100
0161500•            RETURN                                                       0161200
0161600•          C                                                              0161300
0161700•          CHAPTER  4  4  4  4  4  4  PRESSURE CORRECTION  4  4  4  4  4  4  4  4   0161400
0161800•          C                                                              0161500
0161900•            4 CONTINUE                                                   0161600
0162000•          C---------SIDE WALL                                            0161700
0162100•            IF(JSTEP .EQ. NJM1) GO TO 414                                0161800
0162200•            DO 412 I=2,NIM1                                              0161900
0162300•            IF(JMAX(I-1) .GE. JMAX(I)) GO TO 412                         0162000
0162400•            JJ=JMAXP1(I-1)                                               0162100
0162500•            JI=JMAX(I)                                                   0162200
0162600•            DO 410 J=JJ,JI                                               0162300
0162700•            AW(I,J)=0.                                                   0162400
0162800•          410 CONTINUE                                                   0162500
0162900•          412 CONTINUE                                                   0162600
0163000•          C---------TOP WALL                                             0162700
0163100•          414 CONTINUE                                                   0162800
0163200•            DO 402 I=2,NIM1                                              0162900
0163300•            J=JMAX(I)                                                    0163000
0163400•          402 AN(I,J)=0.0                                                0163100
0163500•          C---------SYMMETRY AXIS                                        0163200
0163600•            DO 420 I=2,NIM1                                              0163300
0163700•            AS(I,2)=0.0                                                  0163400
0163800•          420 CONTINUE                                                   0163500
0163900•          C---------OUTLET                                              0163600
0164000•            DO 440 J=2,NJM1                                              0163700
0164100•            AE(NIM1,J)=0.0                                               0163800
0164200•          440 CONTINUE                                                   0163900
0164300•            RETURN                                                       0164000
0164400•          C                                                              0164100
0164500•          CHAPTER  5  5  5  5  5  5  5  THERMAL ENERGY  5  5  5  5  5  5  5  5  5   0164200
0164600•          C                                                              0164300
0164700•            5 CONTINUE                                                   0164400
0164800•          C---------NO MODIFICATIONS FOR THIS PROBLEM                     0164500
0164900•            RETURN                                                       0164600
0165000•          C                                                              0164700
0165100•          CHAPTER  6  6  6  6  6  TURBULENT KINETIC ENERGY  6  6  6  6  6  6  6  6   0164800
0165200•          C                                                              0164900
0165300•          C                                                              0165000
0165400•            6 CONTINUE                                                   0165100
0165500•          C---------TOP WALL                                             0165200
0165600•            CDTERM=CMU**0.25                                             0165300
0165700•            DO 610 I=2,NIM1                                              0165400
0165800•            J=JMAX(I)                                                    0165500
0165900•            DWDY=(W(I,J+1)-W(I,J-1))/(DYNP(J)+DYPS(J))                   0165600
0166000•            UAVG=U(I,J)*WFE(I)+(1.-WFE(I))*U(I+1,J)                      0165700
0166100•            UEFF=SQRT(UAVG*UAVG + W(I,J)*W(I,J))                         0165800
0166200•            YP=YV(J+1)-Y(J)                                              0165900
0166300•            DENU=DEN(I,J)                                                0166000
0166400•            SQRTK=SQRT(TE(I,J))                                          0166100
0166500•            VOL=RCV(J)*SNS(J)*SEW(I)                                     0166200
0166600•            YPLUSN(I)=DENU*SQRTK*CDTERM*YP/VISCOS                        0166300
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0199100•          RETURN                                                                0198800
0199200•      100 FORMAT(11H Y-AXES ARE,5X,10(1X,A10))                                  0198900
0199300•      101 FORMAT(1HO,2X,11F10.1)                                                0199000
0199400•      102 FORMAT(15H MAXIMUM VALUES,  10E11.3)                                  0199100
0199500•      103 FORMAT(11H1X-AXIS IS ,A3)                                             0199200
0199600•      104 FORMAT(3X,11F10.1)                                                    0199300
0199700•      105 FORMAT(2H X,F6.2,3X,101A1,F6.2)                                       0199400
0199800•      106 FORMAT(7H SYMBOL,11X,10(1X,A10))                                      0199500
0199900•      107 FORMAT(/2H X,F6.2,3X,101A1,F6.2)                                      0199600
0200000•      115 FORMAT(//,T50,'RADIAL POSITION R/D',/)                                0199700
0200100•      120 FORMAT(//,T50,'RADIAL POSITION 2R/D',/)                               0199800
0200200•      130 FORMAT(///,T45,'DIMENSIONLESS STREAMLINE PLOT')                       0199900
0200300•          RETURN                                                                0200000
0200400•          END                                                                   0200100
0200500•                     U   VELOCITY                                               0200600
0200600•                     V   VELOCITY                                               0200700
0200700•                       W VELOCITY                                               0200800
0200800•                    PRESSURE                                                    0200900
0200900•                  TEMPERATURE                                                   0201000
0201000•                 TURBULENCE  ENERGY                                           0201100
0201100•               TURBULENCE  DISSIPATION                                        0201200
0201200•                     VISCOSITY                                                0201300
0201300•          DIMENSIONLESS LENGTH SCALE                                          0201400
0201400•          DIMENSIONLESS STREAM FUNCTION                                       0201500
0201500•        RADIAL COORDINATE OF STREAMLINES                                      0201600
0201600•         DIMENSIONLESS U VELOCITY                                             0201700
0201700•        DIMENSIONLESS V VELOCITY                                              0201800
0201800•        DIMENSIONLESS W VELOCITY                                              0201900
0201900•        DIMENSIONLESS PRESSURE                                                0202000
0202000•        DIMENSIONLESS TURBULENCE ENERGY                                       0202100
0202100•        DIMENSIONLESS STREAMLINE COORDS                                       0202200
0202200•         DIMENSIONLESS EFF. VISCOSITY                                         0202300
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0015500•        16     CONTINUE                                                  0015200
0015600•               SUMX=NIM1-1                                               0015300
0015700•        18     DX=ALTOT/SUMX                                             0015400
0015800•               X(1)=-.5*DX                                               0015500
0015900•               X(2)=-X(1)                                                0015600
0016000•               DO  170  I=3,NIM1                                         0015700
0016100•               X(I)=X(I-1)+DX                                            0015800
0016200•         170 DX=EPSX*DX                                                  0015900
0016300•               X(NI)=X(NIM1)+(X(NIM1)-X(NI-2))                           0016000
0016400•               DO 180 L=31,35                                            0016100
0016500•         180 X(L)=X(L-1)+(X(NI)-X(NIM1))                                 0016200
0016600•               NI=35                                                     0016300
0016700•               NIM1=NI-1                                                 0016400
0016800•               ALTOT=(X(NIM1)+X(NI))/2.                                  0016500
0016900•               AL1=0.5*(X(ISTEP)+X(ISTM1))                               0016600
0017000•               AL2=ALTOT-AL1                                             0016700
0017100•        C---------SPECIFY RADIAL HEIGHT(NO. OF J-CELLS) OF COMBUSTOR     0016800
0017200•        C---------     WALL FOR EACH I GRID LINE                          0016900
0017300•         130 CONTINUE                                                    0017000
0017400•               JMAX(1)=JSTEP                                             0017100
0017500•               JMAXP1(1)=JMAX(1)+1                                       0017200
0017600•               DO 160 I=2,NI                                             0017300
0017700•               JMAX(I)=JMAX(I-1)+3                                       0017400
0017800•               IF(JMAX(I-1) .EQ. NJM1) JMAX(I)=JMAX(I-1)                 0017500
0017900•         160 JMAXP1(I)=JMAX(I)+1                                         0017600
0018000•        C---------GRID LINES IN Y-DIRECTION                             0017700
0018100•               Y(1)=-1.5625E-3                                           0017800
0018200•               Y(2)=1.5625E-3                                            0017900
0018300•               Y(3)=5.625E-3                                             0018000
0018400•               Y(4)=1.0625E-2                                            0018100
0018500•               Y(5)=1.625E-2                                             0018200
0018600•               Y(6)=2.1875E-2                                            0018300
0018700•               Y(7)=2.6875E-2                                            0018400
0018800•               Y(8)=3.03125E-2                                           0018500
0018900•               Y(9)=3.21875E-2                                           0018600
0019000•               Y(10)=3.4375E-2                                           0018700
0019100•               Y(11)=3.71875E-2                                          0018800
0019200•               Y(12)=4.09375E-2                                          0018900
0019300•               Y(13)=4.328125E-2                                         0019000
0019400•               Y(14)=4.5625E-2                                           0019100
0019500•               Y(15)=4.8125E-2                                           0019200
0019600•               Y(16)=5.078125E-2                                         0019300
0019700•               Y(17)=5.34375E-2                                          0019400
0019800•               Y(18)=5.59375E-2                                          0019500
0019900•               Y(19)=5.9375E-2                                           0019600
0020000•               Y(20)=6.1875E-2                                           0019700
0020100•               Y(21)=6.3125E-2                                           0019800
0020200•               RSMALL=0.5*(Y(JSTEP)+Y(JSTP1))                            0019900
0020300•        C---------DEPENDENT VARIABLE SELECTION                           0020000
0020400•               INCALU=.TRUE.                                             0020100
0020500•               INCALV=.TRUE.                                             0020200
0020600•               INCALW=.TRUE.                                             0020300
0020700•               INCALP=.TRUE.                                             0020400
0020800•               INCALK=.TRUE.                                             0020500
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0053300•            XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)                                    0053000
0053400•            WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)                                    0053100
0053500•            ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)                               0053200
0053600•            ARDENT=ARDENT+ARDEN                                                  0053300
0053700•          490 FLOWIN=FLOWIN+ARDEN*U(2,J)                                         0053400
0053800•            UMEAN=FLOWIN/ARDENT                                                  0053500
0053900•            SWRLNO=ANGMOM/(XMONIN*RSMALL)                                        0053600
0054000•            IF(W(1,JSTEP) .EQ. 0.) WMONIN=1.                                     0053700
0054100•            WRITE(6,310) IMON,JMON                                               0053800
0054200•            GO TO 300                                                            0053900
0054300•          409 CONTINUE                                                           0054000
0054400•            STOP                                                                 0054100
0054500•        C---------FORMAT STATEMENTS                                             0054200
0054600•          211 FORMAT(1H1,T37,'AXISYMMETRIC,ISOTHERMAL, GT COMBUSTOR FLOWFIELD SI 0054300
0054700•             #MULATION',//,T35,'USING THE STAIRSTEP APPROXIMATION FOR THE SLOPIN 0054400
0054800•             #G EXPANSION WALL',//,T53,'AND THE K-E TURBULENCE MODEL')           0054500
0054900•          225 FORMAT(////,T40,'EXPANSION ANGLE(DEG.) =',T77,1PE13.3)            0054600
0055000•          230 FORMAT(//,T40,'NUMBER OF STAIRSTEPS =',T81,I1)                    0054700
0055100•          235 FORMAT (//,T40,'INLET RADIUS(M) =',T77,1PE13.3)                   0054800
0055200•          240 FORMAT(//,T40,'COMBUSTOR RADIUS(M) =',T77,1PE13.3)                0054900
0055300•          245 FORMAT(//,T40,'COMBUSTOR LENGTH(M) =',T77,1PE13.3)                0055000
0055400•          250 FORMAT(//,T40,'INLET REYNOLDS NO.(USING DIAM.) =',T77,1PE13.3)    0055100
0055500•          255 FORMAT(//,T40,'LAMINAR VISCOSITY(KG/M/SEC) =',T77,1PE13.3)        0055200
0055600•          260 FORMAT(//,T40,'DENSITY(KG/CU. M) =',T77,1PE13.3,////)             0055300
0055700•          310 FORMAT(13HOITER    I---,  9X,29HABSOLUTE RESIDUAL SOURCE SUMS,9X, 0055400
0055800•             111H---I    I---,37H FIELD VALUES AT MONITORING LOCATION(,I2,1H,,I2, 0055500
0055900•             *6H) ---I/14H  NO       UMON,7X,'VMON',7X,'WMON',7X,'MASS',7X,     0055600
0056000•             *'TKIN'                                                            0055700
0056100•             3,7X,4HDISP,9X,1HU,9X,1HV,10X,1HW,10X,1HP,10X,1HD/)                0055800
0056200•          311 FORMAT (2X,I4,11E11.4)                                            0055900
0056300•          312 FORMAT (1HO,59(2H- ))                                             0056000
0056400•          402 FORMAT(///9X,1HI,5X,3HX/D,5X,10HS.S.COEFF.)                       0056100
0056500•          403 FORMAT(/5X,I5,2(1PE11.3))                                         0056200
0056600•          410 FORMAT(//23H SWIRL CASE WITH LFS  =,I3/                           0056300
0056700•             1         23H              AND NSBR =,I3//                        0056400
0056800•             163H CORRESPONDS IF NSBR = 1 TO SWIRL GENERATOR WITH SWIRL NUMBER = 0056500
0056900•             1,F10.3//37H OR IF NSBR = 0 TO SWIRL VANE ANGLE =,F10.3//,         0056600
0057000•             11X,' COMPUTED INLET SWIRL NUMBER =',F10.4//,                      0056700
0057100•             11X,' COMPUTED INLET MEAN AXIAL VELOCITY =',F10.4//,               0056800
0057200•             11X,' COMPUTED INLET MASS FLOW RATE =',F10.5////)                  0056900
0057300•          950 FORMAT(10X,6F10.5,/,10X,6F10.5,/,10X,4F10.5)                      0057000
0057400•          960 FORMAT(15X,'  THE SOLN. IS NOT CONVERGING')                       0057100
0057500•            END                                                                 0057200
0057600•        C                                                                       0057300
0057700•        C-------------------------------------------------------------------    0057400
0057800•        C                                                                       0057500
0057900•              SUBROUTINE INIT                                                   0057600
0058000•        CA**************************************************************** 0057700
0058100•        C                                                                       0057800
0058200•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0057900
0058300•        C                                                                       0058000
0058400•              COMMON                                                            0058100
0058500•             1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)              0058200
0058600•             1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)              0058300
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0091100•              AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                                    0090800
0091200•              AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                                    0090900
0091300•              DV(I,J)=0.5*(AREAN+AREAS)                                               0091000
0091400•              DUDYE=(U(I+1,J)-U(I+1,J-1))/SNSV(J)                                     0091100
0091500•              DUDYW=(U(I,J)-U(I,J-1))/SNSV(J)                                         0091200
0091600•              SORCE1=(DUDYE*VISE-DUDYW*VISW)/DXEPU(I)                                 0091300
0091700•              DVDYN=(V(I,J+1)-V(I,J))/DYNPV(J)                                        0091400
0091800•              DVDYS=(V(I,J)-V(I,J-1))/DYPSV(J)                                        0091500
0091900•              SORCE2=(VIS(I,J)*RCV(J)*DVDYN-VIS(I,J-1)*RCV(J-1)*DVDYS)                0091600
0092000•             #   /(RV(J)*SNSV(J))                                                    0091700
0092100•              SU(I,J)=CPO*V(I,J)+DV(I,J)*(P(I,J-1)-P(I,J))                            0091800
0092200•              SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                                     0091900
0092300•              SP(I,J)=-CP                                                             0092000
0092400•              IF(INDCOS .EQ. 1) GO TO 101                                             0092100
0092500•              SU(I,J)=SU(I,J)+VOL*((DEN(I,J)+DEN(I,J-1))*(W(I,J)+W(I,J-1)             0092200
0092600•             #)**2)/(8.*RV(J))                                                        0092300
0092700•              SP(I,J)=SP(I,J)-(VIS(I,J)+VIS(I,J-1))*VOL/RV(J)**2                      0092400
0092800•            101 CONTINUE                                                              0092500
0092900•            100 CONTINUE                                                              0092600
0093000•          C                                                                           0092700
0093100•          CHAPTER  2  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2  2   0092800
0093200•          C                                                                           0092900
0093300•                CALL PROMOD (3)                                                       0093000
0093400•          C                                                                           0093100
0093500•          CHAPTER  3  FINAL COEFF. ASSEMBLY AND RESIDUAL SOURCE CALCULATION  3  3    0093200
0093600•          C                                                                           0093300
0093700•                RESORV=0.0                                                            0093400
0093800•                DO 300 I=2,NIM1                                                       0093500
0093900•                DO 301 J=3,NJM1                                                       0093600
0094000•                AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                       0093700
0094100•                DV(I,J)=DV(I,J)/AP(I,J)                                               0093800
0094200•                RESOR=AN(I,J)*V(I,J+1)+AS(I,J)*V(I,J-1)+AE(I,J)*V(I+1,J)              0093900
0094300•               1      +AW(I,J)*V(I-1,J)-AP(I,J)*V(I,J)+SU(I,J)                       0094000
0094400•                VOL=RV(J)*SEW(I)*SNSV(J)                                              0094100
0094500•                SORVOL=GREAT*VOL                                                      0094200
0094600•                IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                        0094300
0094700•                RESORV=RESORV+ABS(RESOR)                                              0094400
0094800•          C---------UNDER-RELAXATION                                                 0094500
0094900•                AP(I,J)=AP(I,J)/URFV                                                  0094600
0095000•                SU(I,J)=SU(I,J)+(1.-URFV)*AP(I,J)*V(I,J)                              0094700
0095100•                DV(I,J)=DV(I,J)*URFV                                                  0094800
0095200•              301 CONTINUE                                                            0094900
0095300•              300 CONTINUE                                                            0095000
0095400•          C                                                                           0095100
0095500•          CHAPTER  4  4  4  SOLUTION OF DIFFERENCE EQUATION  4  4  4  4  4  4  4     0095200
0095600•          C                                                                           0095300
0095700•                DO 400 N=1,NSWPV                                                      0095400
0095800•              400 CALL LISOLV(2,3,NI,JMAX,IT,JT,V,3)                                  0095500
0095900•                RETURN                                                                0095600
0096000•                END                                                                   0095700
0096100•          C                                                                           0095800
0096200•          C-------------------------------------------------------------------      0095900
0096300•          C                                                                           0096000
0096400•                SUBROUTINE CALCW                                                      0096100
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0128900•              SORVOL=GREAT*VOL                                                    0128600
0129000•              IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                      0128700
0129100•              RESORK=RESORK+ABS(RESOR)                                            0128800
0129200•        C---------UNDER-RELAXATION                                                0128900
0129300•              AP(I,J)=AP(I,J)/URFK                                                0129000
0129400•              SU(I,J)=SU(I,J)+(1.-URFK)*AP(I,J)*TE(I,J)                           0129100
0129500•          301 CONTINUE                                                            0129200
0129600•          300 CONTINUE                                                            0129300
0129700•        C                                                                         0129400
0129800•        CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4   0129500
0129900•        C                                                                         0129600
0130000•              DO 400 N=1,NSWPK                                                    0129700
0130100•          400 CALL LISOLV(2,2,NI,JMAX,IT,JT,TE,6)                                 0129800
0130200•              RETURN                                                              0129900
0130300•              END                                                                 0130000
0130400•        C                                                                         0130100
0130500•        C-------------------------------------------------------------           0130200
0130600•        C                                                                         0130300
0130700•              SUBROUTINE CALCED                                                   0130400
0130800•        CA*************************************************************************0130500
0130900•        C                                                                         0130600
0131000•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0    0130700
0131100•        C                                                                         0130800
0131200•              COMMON                                                              0130900
0131300•             1/TDIS/RESORE,NSWPD,URFE                                             0131000
0131400•             1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                0131100
0131500•             1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),       0131200
0131600•             1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                  0131300
0131700•             #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),         0131400
0131800•             #YND(24),YVND(24)                                                    0131500
0131900•             1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)            0131600
0132000•             1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),  0131700
0132100•             1       SP(48,24)                                                    0131800
0132200•             */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),  0131900
0132300•             *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),          0132000
0132400•             *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)  0132100
0132500•             #,VISTAR(48,24)                                                      0132200
0132600•              COMMON                                                              0132300
0132700•             1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                  0132400
0132800•             1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                      0132500
0132900•             1/SUSP/SUKD(48,24),SPKD(48,24)                                       0132600
0133000•             1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                               0132700
0133100•             2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1    0132800
0133200•        C                                                                         0132900
0133300•        CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1     0133000
0133400•        C                                                                         0133100
0133500•              DO 100 I=2,NIM1                                                     0133200
0133600•              JJ=JMAX(I)                                                          0133300
0133700•              DO 101 J=2,JJ                                                       0133400
0133800•        C---------COMPUTE AREAS AND VOLUME                                       0133500
0133900•              AREAN=RV(J+1)*SEW(I)                                                0133600
0134000•              AREAS=RV(J)*SEW(I)                                                  0133700
0134100•              AREAEW=RCV(J)*SNS(J)                                                0133800
0134200•              VOL=RCV(J)*SNS(J)*SEW(I)                                            0133900
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0166700•            IF(YPLUSN(I) .LE. 11.63) GO TO 608                                  0166400
0166800•            TMULT=DENU*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSN(I))                  0166500
0166900•            TAUN(I)=-TMULT*UEFF                                                 0166600
0167000•            DITERM=DEN(I,J)*(CMU**.75)*SQRTK*ALOG(ELOG*YPLUSN(I))/(CAPPA*YP)    0166700
0167100•            GO TO 609                                                           0166800
0167200•          608 TAURX=-VISCOS*UAVG/YP                                             0166900
0167300•            TAURW=VISCOS*(-W(I,J)/YP - W(I,J)/Y(J))                             0167000
0167400•            TAUN(I)=SQRT(TAURX**2+TAURW**2)                                     0167100
0167500•            DITERM=DEN(I,J)*(CMU**.75)*SQRTK*YPLUSN(I)/YP                       0167200
0167600•          609 DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+U( 0167300
0167700•             4I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                   0167400
0167800•            GENCOU=TAUN(I)**2/VIS(I,J)                                          0167500
0167900•            GENRES=GEN(I,J)-VIS(I,J)*(DUDY**2+(DWDY-W(I,J)/Y(J))**2)            0167600
0168000•            GEN(I,J)=GENRES+GENCOU                                              0167700
0168100•            SU(I,J)=GEN(I,J)*VOL+SUKD(I,J)                                      0167800
0168200•            SP(I,J)=-DITERM*VOL+SPKD(I,J)                                       0167900
0168300•            AN(I,J)=0.0                                                         0168000
0168400•          610 CONTINUE                                                          0168100
0168500•            TAUN(NI)=TAUN(NIM1)                                                 0168200
0168600•        C---------SIDE WALL                                                     0168300
0168700•            IF(JSTEP .EQ. NJM1) GO TO 614                                       0168400
0168800•            DO 625 I=2,NIM1                                                     0168500
0168900•            IF(JMAX(I-1) .GE. JMAX(I)) GO TO 625                                0168600
0169000•            JJ=JMAXP1(I-1)                                                      0168700
0169100•            JI=JMAX(I)                                                          0168800
0169200•            DO 620 J=JJ,JI                                                      0168900
0169300•            DWDX=(W(I+1,J)-W(I-1,J))/(DXPW(I)+DXEP(I))                          0169000
0169400•            VAVG=V(I,J)*WFN(J)+(1.-WFN(J))*V(I,J+1)                             0169100
0169500•            VEFF=SQRT(VAVG*VAVG + W(I,J)*W(I,J))                                0169200
0169600•            XP=X(I)-XU(I)                                                       0169300
0169700•            DENV=DEN(I,J)                                                       0169400
0169800•            SQRTK=SQRT(TE(I,J))                                                 0169500
0169900•            VOL=RCV(J)*SNS(J)*SEW(I)                                            0169600
0170000•            XPLUSW(J)=DENV*SQRTK*CDTERM*XP/VISCOS                               0169700
0170100•            IF(XPLUSW(J) .LE. 11.63) GO TO 621                                  0169800
0170200•            TMULT=DENV*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSW(J))                  0169900
0170300•            TAUW(J)=-TMULT*VEFF                                                 0170000
0170400•            DITERM=DEN(I,J)*(CMU**.75)*SQRTK*ALOG(ELOG*XPLUSW(J))/(CAPPA*XP)    0170100
0170500•            GO TO 622                                                           0170200
0170600•          621 TAUXR=VISCOS*VAVG/XP                                              0170300
0170700•            TAUXW=VISCOS*W(I,J)/XP                                              0170400
0170800•            TAUW(J)=SQRT(TAUXR**2+TAUXW**2)                                     0170500
0170900•            DITERM=DEN(I,J)*(CMU**.75)*SQRTK*XPLUSW(J)/XP                       0170600
0171000•          622 DVDX=((V(I,J)+V(I,J+1)+V(I+1,J)+V(I+1,J+1))/4.-(V(I,J)+V(I,J+1)+V( 0170700
0171100•             3I-1,J)+V(I-1,J+1))/4.)/SEW(I)                                   0170800
0171200•            GENCOU=TAUW(J)**2/VIS(I,J)                                          0170900
0171300•            GENRES=GEN(I,J)-VIS(I,J)*(DVDX**2+DWDX**2)                          0171000
0171400•            GEN(I,J)=GENRES+GENCOU                                              0171100
0171500•            SU(I,J)=SU(I,J)+SUKD(I,J)+GEN(I,J)*VOL                              0171200
0171600•            SP(I,J)=SP(I,J)+SPKD(I,J)-DITERM*VOL                                0171300
0171700•            AW(I,J)=0.0                                                         0171400
0171800•          620 CONTINUE                                                          0171500
0171900•          625 CONTINUE                                                          0171600
0172000•            TAUW(NJ)=TAUW(NJM1)                                                 0171700
```

```
0020900•              INCALD=.TRUE.                                                    0020600
0021000•              INPRO=.TRUE.                                                     0020700
0021100•              INCALS=.TRUE.                                                    0020800
0021200•        C---------FLUID PROPERTIES                                             0020900
0021300•        C---------TURBULENCE CONSTANTS                                         0021000
0021400•              CMU=0.09                                                         0021100
0021500•              CD=1.00                                                          0021200
0021600•              C1=1.44                                                          0021300
0021700•              C2=1.92                                                          0021400
0021800•              CAPPA=.4187                                                      0021500
0021900•              ELOG=9.793                                                       0021600
0022000•              PRED=CAPPA*CAPPA/(C2-C1)/(CMU**.5)                               0021700
0022100•              PRTE=1.0                                                         0021800
0022200•        C---------BOUNDARY VALUES                                              0021900
0022300•              UIN=30.                                                          0022000
0022400•              ULARGE=UIN*(RSMALL/RLARGE)**2                                    0022100
0022500•              TURBIN=.03                                                       0022200
0022600•              TEIN=TURBIN*UIN**2                                               0022300
0022700•              ALAMDA=0.005                                                     0022400
0022800•              EDIN=TEIN**1.5/(ALAMDA*RLARGE)                                   0022500
0022900•              VISCOS=1.8E-5                                                    0022600
0023000•        C---------PRESSURE CALCULATION                                         0022700
0023100•              IPREF=2                                                          0022800
0023200•              JPREF=2                                                          0022900
0023300•        C---------PROGRAM CONTROL AND MONITOR                                  0023000
0023400•              IMON=NIM1                                                        0023100
0023500•              JMON=8                                                           0023200
0023600•              SORMAX=.004                                                      0023300
0023700•        C                                                                      0023400
0023800•        CHAPTER  2  2  2  2  2  2  INITIAL OPERATIONS  2  2  2  2  2  2  2  2  2 0023500
0023900•              CALL INIT                                                        0023600
0024000•        C---------NONDIMENSIONALIZE X & Y VARIABLES FOR NONDIMENSIONAL OUTPUT    0023700
0024100•              DO 50 I=1,NI                                                     0023800
0024200•              XND(I)=X(I)/(2.*RLARGE)                                          0023900
0024300•           50 XUND(I)=XU(I)/(2.*RLARGE)                                        0024000
0024400•              DO 60 J=1,NJ                                                     0024100
0024500•              YND(J)=Y(J)/(2.*RLARGE)                                          0024200
0024600•           60 YVND(J)=YV(J)/(2.*RLARGE)                                        0024300
0024700•        C---------INITIALISE VARIABLE FIELDS                                   0024400
0024800•              FLOWIN=0.0                                                       0024500
0024900•              ARDEN=0.0                                                        0024600
0025000•              ARDENT=0.                                                        0024700
0025100•              XMONIN=0.                                                        0024800
0025200•              WMONIN=0.0                                                       0024900
0025300•              ANGMOM=0.                                                        0025000
0025400•        C                                                                      0025100
0025500•        C---------INLET SWIRL VELOCITY PROFILE                                 0025200
0025600•        C                                                                      0025300
0025700•        C---------W,  USE SOLID BODY ROTATION MODEL                            0025400
0025800•              WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*UIN                            0025500
0025900•              DO 206 J=2,JSTEP                                                 0025600
0026000•            206 W(1,J)=WINST*R(J)/R(JSTEP)                                     0025700
0026100•        C---------NSBR=0  -  FLAT SWIRL VELOCITY PROFILE FROM SWIRL VANES      0025800
0026200•        C---------NSBR=1  -  SOLID BODY ROTATION FROM SWIRL GENERATOR         0025900
```

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0058700•          */WVEL/ RESORW, NSWPW, URFW                                                    0058400
0058800•          1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                       0058500
0058900•          */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),            0058600
0059000•          *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),                    0058700
0059100•          *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)            0058800
0059200•          #,VISTAR(48,24)                                                                0058900
0059300•          1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                          0059000
0059400•          1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),                 0059100
0059500•          1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                            0059200
0059600•          #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),                   0059300
0059700•          #YND(24),YVND(24)                                                              0059400
0059800•           COMMON                                                                        0059500
0059900•          1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                      0059600
0060000•          1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                         0059700
0060100•          2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1             0059800
0060200•          1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                            0059900
0060300•          1/WALLF/YPLUSN(43),XPLUSW(24),TAUN(48),TAUW(24)                                0060000
0060400•          1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),            0060100
0060500•          1       SP(48,24)                                                              0060200
0060600•          1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT                      0060300
0060700•     C                                                                                   0060400
0060800•     CHAPTER  1  1  1  1  1  CALCULATE GEOMETRICAL QUANTITIES  1  1  1  1  1             0060500
0060900•     C                                                                                   0060600
0061000•           DO 100 J=1,NJ                                                                 0060700
0061100•           R(J)=Y(J)                                                                     0060800
0061200•       100 IF(INDCOS.EQ.1)R(J)=1.0                                                       0060900
0061300•           DXPW(1)=0.0                                                                   0061000
0061400•           DXEP(NI)=0.0                                                                  0061100
0061500•           DO 101 I=1,NIM1                                                               0061200
0061600•           DXEP(I)=X(I+1)-X(I)                                                           0061300
0061700•       101 DXPW(I+1)=DXEP(I)                                                             0061400
0061800•           DYPS(1)=0.0                                                                   0061500
0061900•           DYNP(NJ)=0.0                                                                  0061600
0062000•           DO 102 J=1,NJM1                                                               0061700
0062100•           DYNP(J)=Y(J+1)-Y(J)                                                           0061800
0062200•       102 DYPS(J+1)=DYNP(J)                                                             0061900
0062300•           SEW(1)=0.0                                                                    0062000
0062400•           SEW(NI)=0.0                                                                   0062100
0062500•           DO 103 I=2,NIM1                                                               0062200
0062600•       103 SEW(I)=0.5*(DXEP(I)+DXPW(I))                                                  0062300
0062700•           SNS(1)=0.0                                                                    0062400
0062800•           SNS(NJ)=0.0                                                                   0062500
0062900•           DO 104 J=2,NJM1                                                               0062600
0063000•       104 SNS(J)=0.5*(DYNP(J)+DYPS(J))                                                  0062700
0063100•           XU(1)=0.0                                                                     0062800
0063200•           DO 105 I=2,NI                                                                 0062900
0063300•       105 XU(I)=0.5*(X(I)+X(I-1))                                                       0063000
0063400•           DXPWU(1)=0.0                                                                  0063100
0063500•           DXPWU(2)=0.0                                                                  0063200
0063600•           DXEPU(1)=0.0                                                                  0063300
0063700•           DXEPU(NI)=0.0                                                                 0063400
0063800•           DO 106 I=2,NIM1                                                               0063500
0063900•           DXEPU(I)=XU(I+1)-XU(I)                                                        0063600
0064000•       106 DXPWU(I+1)=DXEPU(I)                                                           0063700
```

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0096500•      CA*************************************************************************** 0096200
0096600•      C                                                                             0096300
0096700•      CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0       0096400
0096800•      C                                                                             0096500
0096900•            COMMON                                                                  0096600
0097000•           1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)                    0096700
0097100•           1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                    0096800
0097200•           */WVEL/ RESORW, NSWPW, URFW                                              0096900
0097300•           1/TEN/RESORK,NSWPK,URFK                                                  0097000
0097400•           1/TDIS/RESORE,NSWPD,URFE                                                 0097100
0097500•           */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),      0097200
0097600•           *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),              0097300
0097700•           *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)      0097400
0097800•           #,VISTAR(48,24)                                                          0097500
0097900•           1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                    0097600
0098000•           1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),           0097700
0098100•           1      SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                       0097800
0098200•           #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),             0097900
0098300•           #YND(24),YVND(24)                                                        0098000
0098400•            COMMON                                                                  0098100
0098500•           1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                0098200
0098600•           1/KASE  T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                  0098300
0098700•           2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1        0098400
0098800•           1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE                      0098500
0098900•           1/WALLF/YPLUSN(48),XPLUSW(24),TAUN(48),TAUW(24)                          0098600
0099000•           1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),      0098700
0099100•           1      SP(48,24)                                                         0098800
0099200•      C---------IF NO SWIRL, RETURN TO MAIN                                         0098900
0099300•            IF(W(1,3) .LE. 0.) GO TO 500                                            0099000
0099400•      C                                                                             0099100
0099500•      CHAPTER 1 1 1 1 1 1 1 1 ASSEMBLY OF COEFFICIENTS 1 1 1 1 1 1 1 1              0099200
0099600•      C                                                                             0099300
0099700•            DO 100  I=2, NIM1                                                       0099400
0099800•            DO 101  J=2, NJM1                                                       0099500
0099900•      C                                                                             0099600
0100000•      C      COMPUTE AREAS AND VOLUME                                               0099700
0100100•      C                                                                             0099800
0100200•            AREAN=RV(J+1)*SEW(I)                                                    0099900
0100300•            AREAS=RV(J)*SEW(I)                                                      0100000
0100400•            AREAEW=RCV(J)*SNS(J)                                                    0100100
0100500•            VOL=RCV(J)*SNS(J)*SEW(I)                                                0100200
0100600•      C                                                                             0100300
0100700•      C---------CALCULATE CONVECTION COEFFICIENTS                                   0100400
0100800•      C                                                                             0100500
0100900•            GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)                                   0100600
0101000•            GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                     0100700
0101100•            GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                                   0100800
0101200•            GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                     0100900
0101300•            CN=GN*AREAN                                                             0101000
0101400•            CS=GS*AREAS                                                             0101100
0101500•            CE=GE*AREAEW                                                            0101200
0101600•            CW=GW*AREAEW                                                            0101300
0101700•      C                                                                             0101400
0101800•      C---------CALCULATE DIFFUSION COEFFICIENTS                                    0101500
```

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0134300•        C---------CALCULATE CONVECTION COEFFICIENTS                                0134000
0134400•              GN=0.5*(DEN(I,J)+DEN(I,J+1))*V(I,J+1)                               0134100
0134500•              GS=0.5*(DEN(I,J)+DEN(I,J-1))*V(I,J)                                 0134200
0134600•              GE=0.5*(DEN(I,J)+DEN(I+1,J))*U(I+1,J)                               0134300
0134700•              GW=0.5*(DEN(I,J)+DEN(I-1,J))*U(I,J)                                 0134400
0134800•              CN=GN*AREAN                                                         0134500
0134900•              CS=GS*AREAS                                                         0134600
0135000•              CE=GE*AREAEW                                                        0134700
0135100•              CW=GW*AREAEW                                                        0134800
0135200•        C---------CALCULATE DIFFUSION COEFFICIENTS                               0134900
0135300•              GAMN=0.5*(VIS(I,J)+VIS(I,J-1))/PRED                                 0135000
0135400•              GAMS=0.5*(VIS(I,J)+VIS(I,J-1))/PRED                                 0135100
0135500•              GAME=0.5*(VIS(I,J)+VIS(I+1,J))/PRED                                 0135200
0135600•              GAMW=0.5*(VIS(I,J)+VIS(I-1,J))/PRED                                 0135300
0135700•              DN=GAMN*AREAN/DYNP(J)                                               0135400
0135800•              DS=GAMS*AREAS/DYPS(J)                                               0135500
0135900•              DE=GAME*AREAEW/DXEP(I)                                              0135600
0136000•               DW=GAMW*AREAEW/DXPW(I)                                             0135700
0136100•        C---------SOURCE TERMS                                                   0135800
0136200•              SMP=CN-CS+CE-CW                                                     0135900
0136300•              CP=AMAX1(0.0,SMP)                                                   0136000
0136400•              CPO=CP                                                              0136100
0136500•        C---------ASSEMBLE MAIN COEFFICIENTS                                     0136200
0136600•              AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                                0136300
0136700•              AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                                0136400
0136800•              AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                                0136500
0136900•              AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                                0136600
0137000•              SU(I,J)=CPO*ED(I,J)                                                 0136700
0137100•              SUKD(I,J)=SU(I,J)                                                   0136800
0137200•              SU(I,J)=SU(I,J)+C1*CMU*GEN(I,J)*VOL*DEN(I,J)*TE(I,J)/VIS(I,J)       0136900
0137300•              SP(I,J)=-CP                                                         0137000
0137400•              SPKD(I,J)=SP(I,J)                                                   0137100
0137500•              SP(I,J)=SP(I,J)-C2*DEN(I,J)*ED(I,J)*VOL/TE(I,J)                     0137200
0137600•            101 CONTINUE                                                          0137300
0137700•            100 CONTINUE                                                          0137400
0137800•        C                                                                         0137500
0137900•        CHAPTER  2  2  2  2  2  2  PROBLEM MODIFICATIONS  2  2  2  2  2  2       0137600
0138000•        C                                                                         0137700
0138100•              CALL PROMOD (7)                                                     0137800
0138200•        C                                                                         0137900
0138300•        CHAPTER 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION 3   0138000
0138400•        C                                                                         0138100
0138500•              RESORE=0.0                                                          0138200
0138600•              DO 300 I=2,NIM1                                                     0138300
0138700•              DO 301 J=2,NJM1                                                     0138400
0138800•              AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)                     0138500
0138900•              RESOR=AN(I,J)*ED(I,J+1)+AS(I,J)*ED(I,J-1)+AE(I,J)*ED(I+1,J)         0138600
0139000•             1      +AW(I,J)*ED(I-1,J)-AP(I,J)*ED(I,J)+SU(I,J)                   0138700
0139100•              VOL=RCV(J)*SNS(J)*SEW(I)                                            0138800
0139200•              SORVOL=GREAT*VOL                                                    0138900
0139300•              IF(-SP(I,J).GT.0.5*SORVOL)  RESOR=RESOR/SORVOL                      0139000
0139400•              RESORE=RESORE+ABS(RESOR)                                            0139100
0139500•        C---------UNDER-RELAXATION                                               0139200
0139600•              AP(I,J)=AP(I,J)/URFE                                                0139300
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0172100•        C---------SYMMETRY AXIS                                                                  0171800
0172200•          614 CONTINUE                                                                           0171900
0172300•              J=2                                                                                0172000
0172400•              DO 630 I=2,NIM1                                                                    0172100
0172500•              DUDY=((U(I,J)+U(I+1,J)+U(I,J+1)+U(I+1,J+1))/4.-(U(I,J)+U(I+1,J)+                   0172200
0172600•             3U(I,J-1)+U(I+1,J-1))/4.)/SNS(J)                                                    0172300
0172700•              VOL=RCV(J)*SNS(J)*SEW(I)                                                           0172400
0172800•              GEN(I,J)=GEN(I,J)-VIS(I,J)*DUDY**2                                                 0172500
0172900•              SU(I,J)=SUKD(I,J)+GEN(I,J)*VOL                                                     0172600
0173000•          630 AS(I,2)=0.0                                                                        0172700
0173100•        C---------OUTLET                                                                         0172800
0173200•              DO 640 J=2,NJM1                                                                    0172900
0173300•              AE(NIM1,J)=0.0                                                                     0173000
0173400•          640 CONTINUE                                                                           0173100
0173500•              RETURN                                                                             0173200
0173600•        C                                                                                        0173300
0173700•        CHAPTER  7  7  7  7  7  7  7  7  DISSIPATION  7  7  7  7  7  7  7  7  7                  0173400
0173800•        C                                                                                        0173500
0173900•            7 CONTINUE                                                                           0173600
0174000•        C---------TOP WALL                                                                       0173700
0174100•              DO 710 I=2,NIM1                                                                    0173800
0174200•              J=JMAX(I)                                                                          0173900
0174300•              YP=YV(J+1)-Y(J)                                                                    0174000
0174400•              TERM=(CMU**.75)/(CAPPA*YP)                                                         0174100
0174500•              SU(I,J)=GREAT*TERM*TE(I,J)**1.5                                                    0174200
0174600•          710 SP(I,J)=-GREAT                                                                     0174300
0174700•        C---------SIDE WALL                                                                      0174400
0174800•              IF(JSTEP .EQ. NJM1) GO TO 714                                                      0174500
0174900•              DO 725 I=2,NIM1                                                                    0174600
0175000•              IF(JMAX(I-1) .GE. JMAX(I)) GO TO 725                                               0174700
0175100•              JJ=JMAXP1(I-1)                                                                     0174800
0175200•              JI=JMAX(I)                                                                         0174900
0175300•              DO 720 J=JJ,JI                                                                     0175000
0175400•              IF(J .EQ. JMAX(I)) GO TO 720                                                       0175100
0175500•              XP=X(I)-XU(I)                                                                      0175200
0175600•              TERM=(CMU**.75)/(CAPPA*XP)                                                         0175300
0175700•              SU(I,J)=GREAT*TERM*TE(I,J)**1.5                                                    0175400
0175800•              SP(I,J)=-GREAT                                                                     0175500
0175900•          720 CONTINUE                                                                           0175600
0176000•          725 CONTINUE                                                                           0175700
0176100•        C---------SYMMETRY  AXIS                                                                 0175800
0176200•          714 CONTINUE                                                                           0175900
0176300•              DO  730  I=2,NIM1                                                                  0176000
0176400•          730 AS(I,2)=0.0                                                                        0176100
0176500•        C---------OUTLET                                                                         0176200
0176600•              DO 740 J=2,NJM1                                                                    0176300
0176700•              AE(NIM1,J)=0.0                                                                     0176400
0176800•          740 CONTINUE                                                                           0176500
0176900•              RETURN                                                                             0176600
0177000•        C                                                                                        0176700
0177100•        CHAPTER 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8  0176800
0177200•        C     SWIRL VELOCITY                                                                     0176900
0177300•        C                                                                                        0177000
0177400•            8 CONTINUE                                                                           0177100
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0026300•              IF(NSBR .EQ. 1) GO TO 208                                  0026000
0026400•        C---------W, FLAT PROFILE                                        0026100
0026500•              WIN=UIN*TAN(VANB(LFS)*3.14159/180.)                        0026200
0026600•              DO 207 J=2,JSTEP                                           0026300
0026700•            207 W(1,J)=WIN                                               0026400
0026800•            208 CONTINUE                                                 0026500
0026900•        C---------INITIALIZE U-,TE-,ED-, & W-FIELDS                      0026600
0027000•              DO  200  J=2,JSTEP                                         0026700
0027100•              U(2,J)=UIN                                                 0026800
0027200•              TE(1,J)=TEIN                                               0026900
0027300•              ED(1,J)=EDIN                                               0027000
0027400•              ARDEN=0.5*(DEN(1,J)+DEN(2,J))*RCV(J)*SNS(J)                0027100
0027500•              XMONIN=XMONIN+ARDEN*U(2,J)*U(2,J)                          0027200
0027600•              WMONIN=WMONIN+ARDEN*U(2,J)*W(1,J)                          0027300
0027700•              ANGMOM=ANGMOM+ARDEN*U(2,J)*W(1,J)*R(J)                     0027400
0027800•              ARDENT=ARDENT+ARDEN                                        0027500
0027900•            200 FLOWIN=FLOWIN+ARDEN*U(2,J)                               0027600
0028000•              UMEAN=FLOWIN/ARDENT                                        0027700
0028100•              SWRLNO=ANGMOM/(XMONIN*RSMALL)                              0027800
0028200•              IF(W(1,JSTEP) .EQ. 0.) WMONIN=1.                           0027900
0028300•              DO  202  I=2,NI                                            0028000
0028400•              IJ=JMAXP1(I-1)                                             0028100
0028500•              FACTOR=(YV(JSTP1)*RV(JSTP1))/(YV(IJ)*RV(IJ))               0028200
0028600•              JJ=JMAX(I-1)                                               0028300
0028700•              DO  202  J=2,JJ                                            0028400
0028800•              U(I,J)=UIN*FACTOR                                          0028500
0028900•        202   CONTINUE                                                   0028600
0029000•        C                                                                0028700
0029100•              IF(NSBR .EQ. 0) GO TO 219                                  0028800
0029200•              DO 209 I=2,NI                                              0028900
0029300•              JJ=JMAX(I)                                                 0029000
0029400•              DO 209 J=2,JJ                                              0029100
0029500•              WINST=2.*SWNB(LFS)/(1.+SWNB(LFS))*U(I,2)                   0029200
0029600•              W(I,J)=WINST*R(J)/R(JJ)                                    0029300
0029700•              TE(I,J)=TEIN                                               0029400
0029800•              ED(I,J)=EDIN                                               0029500
0029900•            209 CONTINUE                                                 0029600
0030000•              GO TO 221                                                  0029700
0030100•        C                                                                0029800
0030200•        219   CONTINUE                                                   0029900
0030300•              DO 220 I=2,NI                                              0030000
0030400•              JJ=JMAX(I)                                                 0030100
0030500•              DO 220 J=2,JJ                                              0030200
0030600•              TE(I,J)=TEIN                                               0030300
0030700•              ED(I,J)=EDIN                                               0030400
0030800•            220 CONTINUE                                                 0030500
0030900•        C                                                                0030600
0031000•            221 CONTINUE                                                 0030700
0031100•              DO  203  I=2,NIM1                                          0030800
0031200•            203 YPLUSN(I)=11.0                                           0030900
0031300•              DO  204  J=JSTEP,NJ                                        0031000
0031400•              XPLUSW(J)=11.0                                             0031100
0031500•            204 IF(J.EQ.JSTEP) XPLUSW(J)= 0.0                            0031200
0031600•              URFVIS=.7                                                  0031300
```

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0064100•            SEWU(1)=0.0                                                    0063800
0064200•            DO 107 I=2,NI                                                  0063900
0064300•          107 SEWU(I)=X(I)-X(I-1)                                          0064000
0064400•        C---------U-VELOCITIES WEIGHTING FACTORS                          0064100
0064500•            DO 111  I=2,NIM1                                               0064200
0064600•            WFE(I)=SEWU(I+1)/(SEWU(I+1)+SEWU(I))                           0064300
0064700•            IF(I .LE. 2) GO TO 111                                         0064400
0064800•            WFW(I)=SEWU(I-1)/(SEWU(I-1)+SEWU(I))                           0064500
0064900•          111 CONTINUE                                                     0064600
0065000•            YV(1)=0.0                                                      0064700
0065100•            RV(1)=0.0                                                      0064800
0065200•            DO 108 J=2,NJ                                                  0064900
0065300•            RV(J)=0.5*(R(J)+R(J-1))                                        0065000
0065400•          108 YV(J)=0.5*(Y(J)+Y(J-1))                                      0065100
0065500•            RCV(1)=R(1)                                                    0065200
0065600•            RCV(NJ)=R(NJ)                                                  0065300
0065700•            DO 113 J=2,NJM1                                                0065400
0065800•          113 RCV(J)=0.5*(RV(J+1)+RV(J))                                   0065500
0065900•            DYPSV(1)=0.0                                                   0065600
0066000•            DYPSV(2)=0.0                                                   0065700
0066100•            DYNPV(NJ)=0.0                                                  0065800
0066200•            DO 109 J=2,NJM1                                                0065900
0066300•            DYNPV(J)=YV(J+1)-YV(J)                                         0066000
0066400•          109 DYPSV(J+1)=DYNPV(J)                                          0066100
0066500•            SNSV(1)=0.0                                                    0066200
0066600•            DO 110 J=2,NJ                                                  0066300
0066700•          110 SNSV(J)=Y(J)-Y(J-1)                                          0066400
0066800•        C---------V-VELOCITIES WEIGHTING FACTORS                          0066500
0066900•            DO 112 J=3,NJM1                                                0066600
0067000•            WFN(J)=SNSV(J+1)/(SNSV(J+1)+SNSV(J))                           0066700
0067100•            WFS(J)=SNSV(J-1)/(SNSV(J-1)+SNSV(J))                           0066800
0067200•          112 CONTINUE                                                     0066900
0067300•        C                                                                  0067000
0067400•        CHAPTER  2  2  2  2  2  2  SET VARIABLES TO ZERO  2  2  2  2  2  2  0067100
0067500•        C                                                                  0067200
0067600•            DO 200 I=1,NI                                                  0067300
0067700•            TAUN(I)=1.0                                                    0067400
0067800•            DO 200 J=1,NJ                                                  0067500
0067900•            TAUW(J)=1.0                                                    0067600
0068000•            U(I,J)=0.0                                                     0067700
0068100•            V(I,J)=0.0                                                     0067800
0068200•            W(I,J)=0.                                                      0067900
0068300•            P(I,J)=0.0                                                     0068000
0068400•            PP(I,J)=0.0                                                    0068100
0068500•            TE(I,J)=0.0                                                    0068200
0068600•            ED(I,J)=0.0                                                    0068300
0068700•            DEN(I,J)=DENSIT                                                0068400
0068800•            VIS(I,J)=VISCOS                                                0068500
0068900•            DU(I,J)=0.0                                                    0068600
0069000•            DV(I,J)=0.0                                                    0068700
0069100•            SU(I,J)=0.0                                                    0068800
0069200•            SP(I,J)=0.0                                                    0068900
0069300•            STFN(I,J)=0.                                                   0069000
0069400•        200 CONTINUE                                                       0069100
```

```
0101900•        C                                                                0101600
0102000•              VISN=0.5*(VIS(I,J)+VIS(I,J+1))                             0101700
0102100•              VISS=0.5*(VIS(I,J)+VIS(I,J-1))                             0101800
0102200•              VISE=0.5*(VIS(I,J)+VIS(I+1,J))                             0101900
0102300•              VISW=0.5*(VIS(I,J)+VIS(I-1,J))                             0102000
0102400•              DN=VISN*AREAN/DYNP(J)                                      0102100
0102500•              DS=VISS*AREAS/DYPS(J)                                      0102200
0102600•              DE=VISE*AREAEW/DXEP(I)                                     0102300
0102700•              DW=VISW*AREAEW/DXPW(I)                                     0102400
0102800•        C                                                                0102500
0102900•        C---------SOURCE TERMS                                           0102600
0103000•        C                                                                0102700
0103100•              SMP=CN-CS+CE-CW                                            0102800
0103200•              CP=AMAX1(0., SMP)                                          0102900
0103300•              CPO=CP                                                     0103000
0103400•        C                                                                0103100
0103500•        C---------ASSEMBLE MAIN COEFFICIENTS                             0103200
0103600•        C                                                                0103300
0103700•              AN(I,J)=AMAX1(ABS(0.5*CN),DN)-0.5*CN                       0103400
0103800•              AS(I,J)=AMAX1(ABS(0.5*CS),DS)+0.5*CS                       0103500
0103900•              AE(I,J)=AMAX1(ABS(0.5*CE),DE)-0.5*CE                       0103600
0104000•              AW(I,J)=AMAX1(ABS(0.5*CW),DW)+0.5*CW                       0103700
0104100•              DV=0.5*(AREAN+AREAS)                                       0103800
0104200•              VAVG=0.5* (V(I,J+1)+V(I,J))                                0103900
0104300•              SU(I,J)=CPO*W(I,J)                                         0104000
0104400•              IF(INDCOS .EQ. 1) GO TO 101                                0104100
0104500•              SORCE1=-DEN(I,J)*VAVG*W(I,J) /RCV(J)                       0104200
0104600•              SORCE2=-(VISN*RV(J+1)-VISS*RV(J)) *W(I,J)/(DYNPV(J)*       0104300
0104700•             #RCV(J)*RCV(J))                                             0104400
0104800•              SU(I,J)=SU(I,J)+(SORCE1+SORCE2)*VOL                        0104500
0104900•              SP(I,J)=-CP                                                0104600
0105000•          101 CONTINUE                                                   0104700
0105100•        100   CONTINUE                                                   0104800
0105200•        C                                                                0104900
0105300•        CHAPTER 2 2 2 2 2 2 PROBLEM MODIFICATIONS 2 2 2 2 2 2 2 2 2 2 2  0105000
0105400•        C                                                                0105100
0105500•              CALL PROMOD (8)                                            0105200
0105600•        C                                                                0105300
0105700•        CHAPTER 3 3 FINAL COEFFICIENT ASSEMBLY AND RESIDUAL SOURCE CALCULATION  0105400
0105800•        C                                                                0105500
0105900•              RESORW=0.                                                  0105600
0106000•              DO 300  I=2, NIM1                                          0105700
0106100•              DO 301  J=2,NJM1                                           0105800
0106200•              AP(I,J)=AN(I,J)+AS(I,J)+AE(I,J)+AW(I,J)-SP(I,J)            0105900
0106300•              RESOR=AN(I,J)*W(I,J+1)+AS(I,J)*W(I,J-1)+AE(I,J)*W(I+1,J)   0106000
0106400•             *  +AW(I,J)*W(I-1,J)-AP(I,J)*W(I,J)+SU(I,J)                 0106100
0106500•              VOL=RCV(J)*SNS(J)*SEW(I)                                   0106200
0106600•              SORVOL=GREAT*VOL                                           0106300
0106700•              IF(-SP(I,J) .GT. 0.5*SORVOL) RESOR=RESOR/SORVOL            0106400
0106800•              IF(J .LE. 2) RESOR=0.                                      0106500
0106900•              RESORW=RESORW+ABS(RESOR)                                   0106600
0107000•        C                                                                0106700
0107100•        C---------UNDER RELAXATION                                       0106800
0107200•        C                                                                0106900
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0139700•            SU(I,J)=SU(I,J)+(1.-URFE)*AP(I,J)*ED(I,J)                                  0139400
0139800•          301 CONTINUE                                                                 0139500
0139900•          300 CONTINUE                                                                 0139600
0140000•        C                                                                              0139700
0140100•        CHAPTER  4  4  4  4  4  SOLUTION OF DIFFERENCE EQUATIONS  4  4  4  4  4       0139800
0140200•        C                                                                              0139900
0140300•            DO 400 N=1,NSWPD                                                           0140000
0140400•          400 CALL LISOLV(2,2,NI,JMAX,IT,JT,ED,7)                                      0140100
0140500•            RETURN                                                                     0140200
0140600•            END                                                                        0140300
0140700•        C                                                                              0140400
0140800•        C--------------------------------------------------------------              0140500
0140900•        C                                                                              0140600
0141000•            SUBROUTINE LISOLV(ISTART,JSTART,NI,JMAX,IT,JT,PHI,NCHAP)                   0140700
0141100•        CA*************************************************************************** 0140800
0141200•        C                                                                              0140900
0141300•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0        0141000
0141400•        C                                                                              0141100
0141500•            DIMENSION PHI(IT,JT),A(48),B(48),C(48),D(48),JMAX(IT)                      0141200
0141600•            COMMON                                                                     0141300
0141700•           1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),         0141400
0141800•           1      SP(48,24)                                                           0141500
0141900•           1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                     0141600
0142000•           2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1         0141700
0142100•            JSM1=JSTART-1                                                             0141800
0142200•            NIM1=NI-1                                                                 0141900
0142300•            A(JSM1)=0.0                                                               0142000
0142400•        C---------COMMENCE W-E SWEEP                                                  0142100
0142500•            DO 100 I=ISTART,NIM1                                                      0142200
0142600•            C(JSM1)=PHI(I,JSM1)                                                       0142300
0142700•        C---------COMMENCE S-N TRAVERSE                                               0142400
0142800•            JI=JMAX(I)                                                                0142500
0142900•            IF(NCHAP .EQ. 2) JI=JMAX(I-1)                                             0142600
0143000•            DO 101 J=JSTART,JI                                                        0142700
0143100•        C---------ASSEMBLE TDMA COEFFICIENTS                                        0142800
0143200•            A(J)=AN(I,J)                                                              0142900
0143300•            B(J)=AS(I,J)                                                              0143000
0143400•            C(J)=AE(I,J)*PHI(I+1,J)+AW(I,J)*PHI(I-1,J)+SU(I,J)                        0143100
0143500•            D(J)=AP(I,J)                                                              0143200
0143600•        C---------CALCULATE COEFFICIENTS OF RECURRENCE FORMULA                       0143300
0143700•            TERM=1./(D(J)-B(J)*A(J-1))                                                0143400
0143800•            A(J)=A(J)*TERM                                                            0143500
0143900•            C(J)=(C(J)+B(J)*C(J-1))*TERM                                              0143600
0144000•          101 CONTINUE                                                                0143700
0144100•        C---------OBTAIN NEW PHI'S                                                   0143800
0144200•            DO 102 JJ=JSTART,JI                                                       0143900
0144300•            J=JI+1+JSM1-JJ                                                            0144000
0144400•          102 PHI(I,J)=A(J)*PHI(I,J+1)+C(J)                                           0144100
0144500•          100 CONTINUE                                                                0144200
0144600•            RETURN                                                                    0144300
0144700•            END                                                                       0144400
0144800•        C                                                                             0144500
0144900•        C--------------------------------------------------------------              0144600
0145000•        C                                                                             0144700
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0177500•      C---------TOP WALL                                                                0177200
0177600•            CDTERM=CMU**0.25                                                            0177300
0177700•            DO 810 I=2,NIM1                                                             0177400
0177800•            J=JMAX(I)                                                                   0177500
0177900•            YP=YV(J+1)-Y(J)                                                             0177600
0178000•            SQRTK=SQRT(TE(I,J))                                                         0177700
0178100•            DENW=DEN(I,J)                                                               0177800
0178200•            YPLUSA=YPLUSN(I)                                                            0177900
0178300•            IF(YPLUSA .LE. 11.63) GO TO 811                                             0178000
0178400•            TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*YPLUSA)-VIS(I,J)/R(J)               0178100
0178500•            GO TO 812                                                                   0178200
0178600•          811 TMULT=VISCOS/YP                                                           0178300
0178700•          812 SP(I,J)=SP(I,J)-TMULT*SEW(I)*RV(J+1)                                      0178400
0178800•            AN(I,J)=0.0                                                                 0178500
0178900•          810 CONTINUE                                                                  0178600
0179000•      C---------SIDE WALL                                                               0178700
0179100•            IF(JSTEP .EQ. NJM1) GO TO 814                                               0178800
0179200•            DO 855 I=2,NIM1                                                             0178900
0179300•            IF(JMAX(I-1) .GE. JMAX(I)) GO TO 855                                        0179000
0179400•            JJ=JMAXP1(I-1)                                                              0179100
0179500•            JI=JMAX(I)                                                                  0179200
0179600•            DO 850 J=JJ,JI                                                              0179300
0179700•            XP=X(I)-XU(I)                                                               0179400
0179800•            SQRTK=SQRT(TE(I,J))                                                         0179500
0179900•            DENW=DEN(I,J)                                                               0179600
0180000•            XPLUSA=XPLUSW(J)                                                            0179700
0180100•            IF(XPLUSA .LE. 11.63) GO TO 851                                             0179800
0180200•            TMULT=DENW*CDTERM*SQRTK*CAPPA/ALOG(ELOG*XPLUSA)                             0179900
0180300•            GO TO 852                                                                   0180000
0180400•      851   TMULT=VISCOS/XP                                                             0180100
0180500•          852 SP(I,J)=SP(I,J)-TMULT*SNS(J)*RCV(J)                                       0180200
0180600•            AW(I,J)=0.                                                                  0180300
0180700•          850 CONTINUE                                                                  0180400
0180800•          855 CONTINUE                                                                  0180500
0180900•      C---------SYMMETRY AXIS                                                           0180600
0181000•          814 CONTINUE                                                                  0180700
0181100•      C---------FIX W FOR SOLID BODY ROTATION AT J=2 USING W AT J=3                     0180800
0181200•            DO 860 I=2,NIM1                                                             0180900
0181300•            TERM=W(I,3)*R(2)/R(3)                                                       0181000
0181400•            SU(I,2)=GREAT*TERM                                                          0181100
0181500•          860 SP(I,2)=-GREAT                                                            0181200
0181600•      C---------OUTLET                                                                 0181300
0181700•            DO 870  J=2,NJM1                                                            0181400
0181800•      870   AE(NIM1,J)=0.                                                               0181500
0181900•            RETURN                                                                      0181600
0182000•            END                                                                         0181700
0182100•      C                                                                                 0181800
0182200•      C-----------------------------------------------------------------               0181900
0182300•      C                                                                                 0182000
0182400•            SUBROUTINE STRMFN                                                           0182100
0182500•      CA*****************************************************************************  0182200
0182600•      C                                                                                 0182300
0182700•      CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0            0182400
0182800•      C                                                                                 0182500
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0031700•            CALL PROPS                                                                0031400
0031800•          C---------INITIAL OUTPUT                                                    0031500
0031900•            WRITE(6,211)                                                            0031600
0032000•            IK=JMAXP1(ISTEP)                                                        0031700
0032100•            YSLOPE=YV(IK)-YV(JSTP1)                                                 0031800
0032200•            IF(JMAX(ISTEP) .LT. NJM1) ALPHA=ATAN(YSLOPE/SEWU(2))*180./3.14159       0031900
0032300•            IF((JSTEP .LT. NJM1) .AND. (JMAX(ISTEP) .EQ. NJM1)) ALPHA=90.           0032000
0032400•            WRITE(6,225) ALPHA                                                      0032100
0032500•            WRITE(6,235) RSMALL                                                     0032200
0032600•            WRITE(6,240) RLARGE                                                     0032300
0032700•            WRITE(6,245) ALTOT                                                      0032400
0032800•            RE=UIN*RSMALL*2.0*DENSIT/VISCOS                                         0032500
0032900•            WRITE(6,250) RE                                                         0032600
0033000•            WRITE(6,255) VISCOS                                                     0032700
0033100•            RSDRL=RSMALL/RLARGE                                                     0032800
0033200•            WRITE(6,260) DENSIT                                                     0032900
0033300•          295 CONTINUE                                                              0033000
0033400•            IF(.NOT. IWRITE) GO TO 297                                              0033100
0033500•            WRITE(11) X                                                             0033200
0033600•            WRITE(11) Y                                                             0033300
0033700•            WRITE(14) XUND                                                          0033400
0033800•          297 CONTINUE                                                              0033500
0033900•            IF(.NOT. IREAD) GO TO 298                                               0033600
0034000•            READ(12) U                                                              0033700
0034100•            READ(12) V                                                              0033800
0034200•            READ(12) W                                                              0033900
0034300•            READ(12) P                                                              0034000
0034400•            READ(12) TE                                                             0034100
0034500•            READ(12) ED                                                             0034200
0034600•            READ(12) VIS                                                            0034300
0034700•            READ(12) STFN                                                           0034400
0034800•          298 CONTINUE                                                              0034500
0034900•            IF(.NOT. INITAL) GO TO 299                                              0034600
0035000•            IF(INCALU) CALL PRINT(1,1,NI,NJ,IT,JT,XU,Y,U,HEDU)                      0034700
0035100•            IF(INCALV) CALL PRINT(1,1,NI,NJ,IT,JT,X,YV,V,HEDV)                      0034800
0035200•            IF(INCALW) CALL PRINT(1, 1, NI, NJ, IT, JT, X, Y, W, HEDW)              0034900
0035300•            IF(INCALK) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,TE,HEDK)                      0035000
0035400•            IF(INCALD) CALL PRINT(1,1,NI,NJ,IT,JT,X,Y,ED,HEDD)                      0035100
0035500•          299 CONTINUE                                                              0035200
0035600•            RESORU=.005                                                             0035300
0035700•            URFP=1.                                                                 0035400
0035800•            RESORV=.005                                                             0035500
0035900•            RESORW=.005                                                             0035600
0036000•          C                                                                         0035700
0036100•          CHAPTER  3  3  3  3  3  3  3  ITERATION LOOP  3  3  3  3  3  3  3  3  3   0035800
0036200•          C                                                                         0035900
0036300•            WRITE(6,310) IMON,JMON                                                  0036000
0036400•          300 NITER=NITER+1                                                         0036100
0036500•            DO 330 I=2,NIM1                                                         0036200
0036600•            DO 330 J=2,NJM1                                                         0036300
0036700•          330 PP(I,J)=0.                                                            0036400
0036800•            IF(LFS .GE. 3) GO TO 425                                                0036500
0036900•            URFU=.5                                                                 0036600
0037000•            URFV=.5                                                                 0036700
```

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0069500•            DO 300 I=1,NI                                                    0069200
0069600•            DO 300 J=1,NSTLN                                                 0069300
0069700•            YSTLN(I,J)=0.                                                    0069400
0069800•            YSTLND(I,J)=0.                                                   0069500
0069900•            STVAL(J)=0.                                                      0069600
0070000•          300 CONTINUE                                                       0069700
0070100•            DO 400 N=1,NPLTLN                                                0069800
0070200•            DO 400 I=1,NI                                                    0069900
0070300•            YSLPLT(N,I)=0.                                                   0070000
0070400•          400 CONTINUE                                                       0070100
0070500•            RETURN                                                           0070200
0070600•            END                                                              0070300
0070700•          C                                                                  0070400
0070800•          C------------------------------------------------------------      0070500
0070900•          C                                                                  0070600
0071000•                SUBROUTINE PROPS                                           0070700
0071100•          CA*************************************************************** 0070800
0071200•          C                                                                  0070900
0071300•          CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0   0071000
0071400•          C                                                                  0071100
0071500•                COMMON                                                     0071200
0071600•               1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)   0071300
0071700•               */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0071400
0071800•               *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),  0071500
0071900•               *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0071600
0072000•               #,VISTAR(48,24)                                             0071700
0072100•               1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)       0071800
0072200•               1/TURB/GEN(48,24),CD,CMU,C1,C2,CAPPA,ELOG,PRED,PRTE         0071900
0072300•          C                                                                  0072000
0072400•          CHAPTER   1   1   1   VISCOSITY   1   1   1                      0072100
0072500•          C                                                                  0072200
0072600•                DO 100 I=2,NIM1                                            0072300
0072700•                DO 100 J=2,NJM1                                            0072400
0072800•                VISOLD=VIS(I,J)                                            0072500
0072900•                IF(ED(I,J).EQ.0.) GO TO 102                                0072600
0073000•                VIS(I,J)=DEN(I,J)*TE(I,J)**2*CMU/ED(I,J)+VISCOS            0072700
0073100•                GO  TO  101                                                0072800
0073200•            102 VIS(I,J)=VISCOS                                            0072900
0073300•          C---------UNDER-RELAX VISCOSITY                                  0073000
0073400•          101   VIS(I,J)=URFVIS*VIS(I,J)+(1.-URFVIS)*VISOLD               0073100
0073500•            100 CONTINUE                                                   0073200
0073600•                RETURN                                                     0073300
0073700•                END                                                        0073400
0073800•          C                                                                  0073500
0073900•          C------------------------------------------------------------      0073600
0074000•          C                                                                  0073700
0074100•                SUBROUTINE CALCU                                           0073800
0074200•          CA*************************************************************** 0073900
0074300•          C                                                                  0074000
0074400•          CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0   0074100
0074500•          C                                                                  0074200
0074600•                COMMON                                                     0074300
0074700•               1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)       0074400
0074800•               1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)       0074500
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```
0107300•              AP(I,J)=AP(I,J)/URFW                                                    0107000
0107400•              SU(I,J)=SU(I,J)+(1.-URFW)*AP(I,J)*W(I,J)                                0107100
0107500•        301   CONTINUE                                                                0107200
0107600•        300   CONTINUE                                                                0107300
0107700•        C                                                                             0107400
0107800•        CHAPTER 4 4 4 SOLUTION OF DIFFERENCE EQUATIONS 4 4 4 4 4 4 4 4              0107500
0107900•        C                                                                             0107600
0108000•              DO 400  N=1, NSWPW                                                      0107700
0108100•        400   CALL LISOLV(2, 2, NI, JMAX, IT, JT, W,8)                                0107800
0108200•          500 CONTINUE                                                                0107900
0108300•              RETURN                                                                  0108000
0108400•              END                                                                     0108100
0108500•        C                                                                             0108200
0108600•        C-------------------------------------------------------------               0108300
0108700•        C                                                                             0108400
0108800•              SUBROUTINE CALCP                                                        0108500
0108900•        CA*****************************************************************           0108600
0109000•        C                                                                             0108700
0109100•        CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0       0108800
0109200•        C                                                                             0108900
0109300•              COMMON                                                                  0109000
0109400•             1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF                 0109100
0109500•             */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),      0109200
0109600•             *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),              0109300
0109700•             *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)      0109400
0109800•             #,VISTAR(48,24)                                                          0109500
0109900•             1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                    0109600
0110000•             1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),           0109700
0110100•             1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                      0109800
0110200•             #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),             0109900
0110300•             #YND(24),YVND(24)                                                        0110000
0110400•              COMMON                                                                  0110100
0110500•             1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)                0110200
0110600•             1/COEF/AP(48,24),AN(48,24),AS(48,24),AE(48,24),AW(48,24),SU(48,24),      0110300
0110700•             1       SP(48,24)                                                        0110400
0110800•             1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                   0110500
0110900•             2        RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1       0110600
0111000•              RESORM=0.0                                                              0110700
0111100•        C                                                                             0110800
0111200•        CHAPTER  1  1  1  1  1  1  ASSEMBLY OF COEFFICIENTS  1  1  1  1  1  1  1     0110900
0111300•        C                                                                             0111000
0111400•              DO 100 I=2,NIM1                                                         0111100
0111500•              DO 101 J=2,NJM1                                                         0111200
0111600•        C---------COMPUTE AREAS AND VOLUME                                           0111300
0111700•              AREAN=RV(J+1)*SEW(I)                                                    0111400
0111800•              AREAS=RV(J)*SEW(I)                                                      0111500
0111900•              AREAEW=RCV(J)*SNS(J)                                                    0111600
0112000•              VOL=RCV(J)*SNS(J)*SEW(I)                                                0111700
0112100•        C---------CALCULATE COEFFICIENTS                                            0111800
0112200•              DENN=0.5*(DEN(I,J)+DEN(I,J+1))                                          0111900
0112300•              DENS=0.5*(DEN(I,J)+DEN(I,J-1))                                          0112000
0112400•              DENE=0.5*(DEN(I,J)+DEN(I+1,J))                                          0112100
0112500•              DENW=0.5*(DEN(I,J)+DEN(I-1,J))                                          0112200
0112600•              AN(I,J)=DENN*AREAN*DV(I,J+1)                                            0112300
```

```
0145100•          SUBROUTINE PRINT(ISTART,JSTART,NI,NJ,IT,JT,X,Y,PHI,HEAD)          0144800
0145200•      CA*****************************************************************  0144900
0145300•      C                                                                    0145000
0145400•          DIMENSION PHI(IT,JT),X(IT),Y(JT),HEAD(9),STORE(48)               0145100
0145500•          ISKIP=1                                                          0145200
0145600•          JSKIP=1                                                          0145300
0145700•          WRITE(6,110)HEAD                                                 0145400
0145800•          ISTA=ISTART-12                                                   0145500
0145900•        100 CONTINUE                                                       0145600
0146000•          ISTA=ISTA+12                                                     0145700
0146100•          IEND=ISTA+11                                                     0145800
0146200•          IF(NI.LT.IEND)IEND=NI                                            0145900
0146300•          WRITE(6,111)(I,I=ISTA,IEND,ISKIP)                                0146000
0146400•          WRITE(6,114)(X(I),I=ISTA,IEND,ISKIP)                             0146100
0146500•          WRITE(6,112)                                                     0146200
0146600•          DO 101 JJ=JSTART,NJ,JSKIP                                        0146300
0146700•          J=JSTART+NJ-JJ                                                   0146400
0146800•          DO 120 I=ISTA,IEND                                               0146500
0146900•          A=PHI(I,J)                                                       0146600
0147000•          IF(ABS(A).LT.1.E-20) A=0.0                                       0146700
0147100•      120 STORE(I)=A                                                       0146800
0147200•        101 WRITE(6,113)J,Y(J),(STORE(I),I=ISTA,IEND,ISKIP)                0146900
0147300•          IF(IEND.LT.NI)GO TO 100                                          0147000
0147400•          RETURN                                                           0147100
0147500•        110 FORMAT(1HO,17(2H*-),7X,9A4,7X,17(2H-*))                        0147200
0147600•        111 FORMAT(1HO,13H       I =     ,I2,11I9)                         0147300
0147700•        112 FORMAT(8HO J     Y)                                            0147400
0147800•        113 FORMAT(I3,0PF8.5,1X,1P12E9.2)                                  0147500
0147900•        114 FORMAT(11H        X = ,F8.5,11F9.5)                            0147600
0148000•          END                                                              0147700
0148100•      C                                                                    0147800
0148200•      C--------------------------------------------------------------      0147900
0148300•      C                                                                    0148000
0148400•          SUBROUTINE PROMOD (NCHAP)                                        0148100
0148500•      CA*****************************************************************  0148200
0148600•      C                                                                    0148300
0148700•      CHAPTER  0  0  0  0  0  0  0  0  PRELIMINARIES  0  0  0  0  0  0  0  0  0148400
0148800•      C                                                                    0148500
0148900•           COMMON                                                          0148600
0149000•          1/UVEL/RESORU,NSWPU,URFU,DXEPU(48),DXPWU(48),SEWU(48)            0148700
0149100•          1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)            0148800
0149200•          */WVEL/ RESORW, NSWPW, URFW                                      0148900
0149300•          */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24), 0149000
0149400•          *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),      0149100
0149500•          *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24) 0149200
0149600•          #,VISTAR(48,24)                                                  0149300
0149700•          1/PCOR/RESORM,NSWPP,URFP,DU(48,24),DV(48,24),IPREF,JPREF         0149400
0149800•          1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)           0149500
0149900•          1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),   0149600
0150000•          1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),              0149700
0150100•          #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),     0149800
0150200•          #YND(24),YVND(24)                                                0149900
0150300•           COMMON                                                          0150000
0150400•          1/FLUPR/URFVIS,VISCOS,DENSIT,PRANDT,DEN(48,24),VIS(48,24)        0150100
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0182900•              COMMON                                                                  0182600
0183000•             1/VVEL/RESORV,NSWPV,URFV,DYNPV(24),DYPSV(24),SNSV(24)                    0182700
0183100•             */VAR/U(48,24), V(48,24), W(48,24), P(48,24), PP(48,24), TE(48,24),      0182800
0183200•             *ED(48,24),STFN(48,24),YSTLN(48,24),STVAL(24),USTAR(48,24),              0182900
0183300•             *VSTAR(48,24),WSTAR(48,24),PSTAR(48,24),TESTAR(48,24),YSTLND(48,24)      0183000
0183400•             #,VISTAR(48,24)                                                          0183100
0183500•             1/ALL/IT,JT,NI,NJ,NIM1,NJM1,GREAT,JMAX(48),JMAXP1(48)                    0183200
0183600•             1/GEOM/INDCOS,X(48),Y(24),DXEP(48),DXPW(48),DYNP(24),DYPS(24),           0183300
0183700•             1       SNS(24),SEW(48),XU(48),YV(24),R(24),RV(24),                      0183400
0183800•             #  WFN(24),WFS(24),WFE(48),WFW(48),RCV(24),XND(48),XUND(48),             0183500
0183900•             #YND(24),YVND(24)                                                        0183600
0184000•             1/KASE T1/UIN,TEIN,EDIN,FLOWIN,ALAMDA,                                   0183700
0184100•             2       RSMALL,RLARGE,AL1,AL2,JSTEP,ISTEP,JSTP1,JSTM1,ISTP1,ISTM1        0183800
0184200•             1/PLOTT/NSTLN,NPLTLN,NPTS,YSLPLT(10,48),XUDPLT(48),INPLOT                 0183900
0184300•              LOGICAL INPLOT                                                          0184000
0184400•       C                                                                             0184100
0184500•       CHAPTER 1 1 1 1 1 CALCULATE STREAM FCN BASED ON VOLUMETRIC FLOW               0184200
0184600•       C                                                                             0184300
0184700•       C                                                                             0184400
0184800•             Q=UIN*(RSMALL**2)/2.                                                    0184500
0184900•             DO 400 I=2,NI                                                           0184600
0185000•             IF(JMAX(I-1) .LT. 5) GO TO 400                                          0184700
0185100•             STFN(I,2)=(Y(2)*R(2)*U(I,2)*.5)/Q                                       0184800
0185200•             JJ=JMAX(I-1)                                                            0184900
0185300•             DO 200 J=3,JJ                                                           0185000
0185400•             STFN(I,J)=STFN(I,J-1)+SNSV(J)*(R(J-1)*U(I,J-1)+R(J)*U(I,J))*.5/Q        0185100
0185500•         200 CONTINUE                                                                0185200
0185600•         400 CONTINUE                                                                0185300
0185700•       C                                                                             0185400
0185800•             DO 800 I=2,NI                                                           0185500
0185900•             IJ=JMAXP1(I-1)                                                          0185600
0186000•             DO 700 K=1,NSTLN                                                        0185700
0186100•             AK=K-1                                                                  0185800
0186200•             STVAL(K)=AK*.1                                                          0185900
0186300•             JJ=JMAX(I-1)                                                            0186000
0186400•             DO 600 J=2,JJ                                                           0186100
0186500•             IF(STFN(I,J) .GE. STVAL(K)) GO TO 650                                   0186200
0186600•         600 CONTINUE                                                                0186300
0186700•             YSTLN(I,K)=RV(IJ)                                                       0186400
0186800•             GO TO 670                                                               0186500
0186900•         650 IF(J .EQ. 2) YSTLN(I,K)=0.0                                             0186600
0187000•             IF(J .EQ. 2) GO TO 670                                                  0186700
0187100•             SLOPE=(STVAL(K)-STFN(I,J-1))/(STFN(I,J)-STFN(I,J-1))                    0186800
0187200•             YSTLN(I,K)=Y(J-1)+SLOPE*(Y(J)-Y(J-1))                                   0186900
0187300•         670 CONTINUE                                                                0187000
0187400•             YSTLND(I,K)=YSTLN(I,K)/(2.*RLARGE)                                      0187100
0187500•         700 CONTINUE                                                                0187200
0187600•         800 CONTINUE                                                                0187300
0187700•             IF(.NOT. INPLOT) GO TO 745                                              0187400
0187800•             N=0                                                                     0187500
0187900•             DO 730 K=1,11,2                                                         0187600
0188000•             N=N+1                                                                   0187700
0188100•             DO 730 I=1,NIM1                                                         0187800
0188200•             YSLPLT(N,I)=YSTLND(I+1,K)                                               0187900
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15. Supplementary Notes

Final report. Project Manager, Cecil J. Marek, Aerothermodynamics and Fuels Division, NASA Lewis Research Center, Cleveland, Ohio 44135. The microfiche supplement at the back of this report contains the output obtained for a sample computation.

16. Abstract

A primitive pressure-velocity variable finite difference computer code has been developed to predict swirling recirculating inert turbulent flows in axisymmetric combustors in general, and for application to a specific idealized combustion chamber with sudden or gradual expansion. The technique involves a staggered grid system for axial and radial velocities, a line relaxation procedure for efficient solution of the equations, a two-equation k-ϵ turbulence model, a stairstep boundary representation of the expansion flow, and realistic accommodation of swirl effects. This report is a user's manual and deals with the computational problem, showing how the mathematical basis and computational scheme may be translated into a computer program. A flow chart, Fortran 4 listing, notes about various subroutines and a user's guide are supplied as an aid to prospective users of the code.

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