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Thin-Layer and Full Navier-Stokes Calculations for Turbulent Supersonic Flow Over a Cone at an Angle of Attack

Crawford F. Smith and Steve D. Podleski
Sverdrup Technology, Inc.
Lewis Research Center Group
Brook Park, Ohio

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Nomenclature

CFL	= Courand-Friedrichs-Lewy Number
C_p	$= (P_s - P_\infty)/.7\, P_\infty\, M_\infty^2$
C_{p_c}	$= (C_p - C_{p_0})/(\sin\theta_c)^2$
C_{p_0}	$= C_p$ at $\alpha = 0°$ (inviscid)
H	= Height Above Cone Surface, inches
l	= Cone Length, inches
M	= Local Mach Number
M_∞	= Free-Stream Mach Number
P_s	= Local Static Pressure
P_{s_∞}	= Static Pressure at Upstream Reference Station
P_{t_∞}	= Total Pressure at Upstream Reference Station
T_{t_∞}	= Total Temperature at Upstream Reference Station
u	= Local Axial Velocity
u^+	$= \frac{u}{\sqrt{\tau_w/\rho}}$
V_∞	= Free-Stream Velocity, ft/sec
x	= Axial Distance, inches
y	= Normal Distance from Surface
y^+	$= y\,\frac{\sqrt{\tau_w/\rho}}{\nu}$
α	= Angle of Attack
ν	= Viscosity
ω	= Flow Angle Relative to Conical Ray
ϕ	= Circumferential Angular Position
ρ	= Density
τ_w	= Wall Shear Stress
θ_c	= Cone Half Angle

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Crawford F. Smith and Steve D. Podleski
Sverdrup Technology, Inc.
Lewis Research Center Group
Brook Park, Ohio 44142

Summary

The proper use of a computational fluid dynamics code requires a good understanding of the particular code being applied. In this report the application of CFL3D, a thin-layer Navier-Stokes code, is compared with the results obtained from PARC3D, a full Navier-Stokes code. In order to gain an understanding of the use of this code, a simple problem was chosen in which several key features of the code could be exercised. The problem chosen is a cone in supersonic flow at an angle of attack. The issues of grid resolution, grid blocking, and multigridding with CFL3D are explored. The use of multigridding resulted in a significant reduction in the computational time required to solve the problem. Solutions obtained are compared with the results using the full Navier-Stokes equations solver PARC3D. The results obtained with the CFL3D code compared well with the PARC3D solutions.

1.0 Introduction

The analysis of the flow in an aircraft inlet, such as the F-18 inlet, at subsonic speeds and high angles of attack requires the inclusion of the external flow about the forebody, Leading Edge Extension (LEX), and wing in order to account for upstream disturbances such as flow separation and shed vortices which might be entrained by the inlet flow.

The numerical solution of this problem is very difficult and requires large amounts of computational time. For adequate geometry resolution, grid blocking is necessary. The use of multigridding can sometimes significantly decrease the amount of computational time required to obtain a converged solution. In addition, proper grid resolution is needed to capture the details of a very complex flow field.

A computational fluid dynamics (CFD) code that has been used to address the problem of forebodies at high angles of attack is the CFL3D code [Ref. 1]. This code has been developed at the NASA Langley Research Center and solves the thin-layer Navier-Stokes (TLNS) equations. Due to these forebody applications, this code appears to have the capability to address the problem of determining the flow field within an inlet of an aircraft at high angles of attack. This code also has multigrid capabilities.

In order to gain some experience in the use and understanding of the code, a simple problem is chosen, which is the prediction of the flow about a cone in supersonic flow at an angle of attack. This configuration was chosen because the geometry of a cone is simple and a detailed data base is available which includes off-body measurements of velocity and flow angles. Although the interest is in predicting subsonic, vortical flows, the physics of the vortex development is the same for subsonic and supersonic flows. In addition, the use of multigridding to accelerate the rate of convergence of the numerical solutions is examined using CFL3D (Version 2.1). The solutions obtained are compared with the PARC3D code (NASA Lewis Version, Ref. 2) which solves the full Navier-Stokes (FNS) equations. Solutions were obtained using a Cray Y-MP computer with compiler version 4.0.3.

This report is divided into several sections. A brief description of the experiment and data is presented, followed by a discussion of the CFL3D and PARC3D codes as well as the computational grids and boundary conditions. The results obtained with the CFL3D code are presented for coarse and fine grids (one-block and three-block grids respectively), along with a discussion of the performance of the multigrid algorithms. The results obtained with the PARC3D code using the same grids are compared with the CFL3D results. The report ends by presenting some conclusions.

2.0 Description of the Data

For comparison with the numerical results, Rainbird obtained useful data of surface static pressures [Ref. 3] for a cone with an 18.0 inch base and a 12.5° half angle. The off-body data, which includes the Mach number and flow angle profiles was obtained by personal communications with Rainbird, are compared with the numerical results. To the best of the knowledge of the authors the full details of this data set have not been published. However, data for the present case and several others are contained in Appendix A. Permission to publish the data in this report was granted by the Director General of the Institute for Aerospace Research, Ottawa, Canada. Rainbird [Ref. 3] indicates that no boundary layer trip was used due to the high free-stream turbulence present in the wind tunnel. He assumes that transition occurs very close to the cone apex (less than 10% of the cone length).

A 3-hole probe was used to survey the flow field. The probe was kept turned into the local mean flow direction and thus enabled measurements of local flow angle and pitot pressures. Surveys were conducted at an axial position of 85% cone length. The upstream Mach number was 1.8, the angle of attack was 15.75° and the flow was turbulent. A diagram illustrating this test is shown in Figure 1.

3.0 Numerical Modeling

3.1 CFL3D Code

The CFL3D code [Ref. 1] solves the thin-layer Navier-Stokes equations using upwind differencing with a total variation diminishing (TVD) scheme and employs the Baldwin-Lomax turbulence model [Ref. 4]. The TVD scheme eliminates oscillations due to dispersion errors introduced by the higher order terms in the upwind differences by shutting off these higher order terms in regions of large flow oscillations. Various options are available for TVD schemes, flux vector-differencing, and upwinding accuracy. The options recommended below provided the best results and are used in the solutions presented in this report. These options include the min-mod flux limiter for the TVD scheme, the Roe flux difference splitting scheme and third order accurate upwinding. The three-factor approximate factorization scheme is used to obtain a block tridiagonal system of equations. For the Roe scheme, the equations are diagonalized to obtain a scalar tridiagonal system of equations that yields a more efficient solver. A conservative scheme is employed to transfer information between grid blocks [Ref. 5] and multigridding is also available to accelerate the convergence of the solution [Ref. 6].

3.2 PARC3D Code

The PARC3D code [Ref. 2] solves the full three-dimensional Reynolds-averaged Navier-Stokes equations in strong conservation form using the Beam and Warming approximate factorization scheme, to obtain a block tridiagonal system of equations. Pulliam's scalar pentadiagonal transformation provides for an efficient solver. Like CFL3D, the code uses the Baldwin-Lomax turbulence model [Ref. 4]. Its implicit scheme uses central differencing with artificial dissipation to eliminate oscillations in the solution associated with the use of central differences. Trilinear interpolation [Ref. 7] is used to transfer information at the grid block interfaces when a multiblock grid is used.

3.3 Grid

The effects of grid refinement on the numerical solution were explored using two different grids. The grids were algebraically generated with the INGRID3D code [Ref. 8], and clustered near the surface using hyperbolic stretching functions.

The first grid shown in Figure 2 had dimensions of $29 \times 37 \times 61$ points in the streamwise, circumferential, and radial directions, respectively. The first axial station is located ahead of the cone due to concerns about locating the inflow boundary on the cone. The typical value for y^+ for the first off-surface grid point is approximately 8. The grid is spaced uniformly in the circumferential direction at 5° intervals and is packed towards the apex of the cone.

The second grid, not shown due to resolution problems in reproducing the plot, consisted of three blocks with dimensions of $33 \times 73 \times 73$, $33 \times 41 \times 73$, and 33 $\times$ 41 $\times$ 33 in the streamwise, circumferential, and radial directions for Blocks 1, 2 and 3, respectively. The grid block numbering is shown in Figure 3a. For this grid, the first axial station was located at the cone apex and results obtained were not affected by placing the first point at the cone apex. The use of three grid blocks was chosen in order to resolve the leeward side vortex using Block 1, which was much denser than Blocks 2 or 3. Grid blocks 2 and 3 have a grid distribution similar to that of the single block grid. A value of 1 was obtained for the typical y^+ for the first grid point off the surface in Block one; in Block 2 the value was 8. The grid is spaced equally at 1° increments in Block 1 and was packed towards the Block 1 interface for Block 2. Note that for use in CFL3D, the grids are face-to-face while for PARC3D, the grids overlap in order to accommodate the linear interpolation scheme used at the grid block interfaces. These interfaces are non-contiguous for both codes.

3.4 Boundary Conditions

The upstream and outer radial boundary conditions are held fixed at supersonic free-stream conditions. The flow properties are extrapolated for supersonic flow at the downstream exit. At the surface, no-slip, isothermal conditions are specified. Slip wall boundary conditions are used along the planes of symmetry. These boundary conditions are illustrated in Figure 3a and 3b.

Isothermal conditions were used because the experiment used a blow-down wind tunnel in which the surface temperature variation was less than 5° Fahrenheit with a run duration of 20 to 30 seconds. Calculations made using adiabatic conditions produced the same Mach number and flow angle profiles as the calculations made with isothermal wall conditions.

4.0 Results

In this section several major results will be discussed. The first will deal with the effects of grid resolution using CFL3D, and the second the use of multi-gridding with CFL3D will then be discussed. Following this dicussion of multi-gridding, comparisons of PARC3D solutions with those obtained with CFL3D will be presented.

All of the results reported are derived from PLOT3D format files, which use node-centered data. Since the CFL3D code is a finite volume code, the flow field is determined at the cell centers of the computational grid and not at the grid nodes, as with finite difference codes such as PARC3D. The PLOT3D flow and grid files were obtained from the CFL3D code by averaging the adjacent cell centers of the grid and using these values at the grid nodes.

As a preliminary check on the functionality of the CFL3D code and to ensure proper problem simulation, a laminar case was studied. The free-steam conditions were the same as for the turbulent cases ($M_\infty = 1.8$, $\alpha = 15.75°$). The residuals associated with this solution dropped 6 orders of magnitude in 17,000 iterations and continued to drop. The flow field exhibited a much larger cross-flow separation than the turbulent calculations, which is consistent for laminar flows.

Two criteria were used to evaluate the convergence of the turbulent solutions which are presented in this report. The first criterion was when the residuals reached a constant level, which is typical behavior for turbulent solutions. A plot of the density residuals for a constant CFL number of 1 and then a CFL number adjusted from 5 to 1 are shown in Figure 4. The residual values reaching a constant level for a CFL number of 1 are shown in Figure 4a. A rapid drop and rise in the residuals for the CFL number of 5, seen in Figure 4a, is due to the code failing to update local time steps after each iteration until the solution is restarted. This behavior is not apparent for a CFL number of 1, (see Figure 4a), but may be attributable to the solution nearing stability limits at the higher CFL number. It did not, however, appear to have an adverse effect on the final results. The other criterion was when the change in the boundary layer profiles in the vortex region reached a minimum. However, truly steady solutions within the vortex region were not obtained. Further discussion of convergence issues are presented in the section dealing with multigrid solutions.

4.1 CFL3D Grid Studies

In Figure 5, Mach number contours are presented in the plane of symmetry. The single and 3-Block grid solutions are very similar. The shock may be slightly sharper (closer contours) in the 3-Block grid results due to a few more points added in the radial direction. There is a small expansion fan along the leeward side of the cone. Mach number contours in the cross-plane are shown in Figures 6a and 6b. Again, the shock appears slightly sharper in the 3-Block grid solution. However, there is a dramatic change in resolution of the leeward side vortex as can be seen in the enlarged views of this region shown in Figures 6c and 6d. The single block grid does not indicate the vortex presence with the exception of a rapidly thickening boundary layer. In contrast, 3-Block grid resolved the vortex very well with a distinct region of recirculating flow.

The circumferential positions around the cone are defined as 0° on the windward side and 180° along the leeward side. Mach number profiles for several circumferential stations are shown Figure 7. These are taken at 85% of the cone length. Along the windward side of the cone, (0° to 90°), the single grid and 3-Block grid solutions agree very well with each other and the data. In this region the boundary layers are very thin and well-behaved. Along the leeward side of the cone the boundary layers begin to thicken and separate in the cross-flow direction at approximately 155°.

As can be seen, the 3-Block grid solutions provide much better agreement with the data than the single block grid. In particular, at 170°, the vortex is only resolved with the 3-Block grid. It should be noted that the increase in the number of grid points solely in this region (block 1) did not improve this result very much and this result is not presented. The reduction of the y^+ value of the first grid point from 8 to 1 in Block 1 was necessary to provide the results shown at 170°. The predicted Mach number profile in the vortex region for 170° (shown in Figure 8) indicates improved comparison with the data after the solution was iterated an additional 10,000 times. The remaining discrepancies between the predictions and data may be due to the turbulence model not accounting for the vortical flow adequately. This may also be a contributing factor to the discrepancies between the predicted and measured Mach number profiles at 180°.

The flow angles are defined in Figure 9, and those predicted with the single and 3-Block grids are compared with data in Figure 10. From the windward plane of symmetry (0°) to 145°, both solutions provided similar results. However, in the vortical region from 155°, the 3-Block grid provides improved comparisons with the data.

Surface static pressures at 85% of cone length calculated with both grids are compared with data in Figure 11. Very little improvement is shown with the 3-Block grid along the windward side of the cone although both grids provided good results along the leeward side of the cone. Increasing the number of grid points and density of the grid in the radial direction provided for some improved shock resolution but offered little improvement in the surface static pressure calculations. The good agreement along the leeward side of the cone may indicate that inadequate shock resolution on the windward side of the cone is the contributing factor in the discrepancies. Some of the discrepancies are due to using the difference of two static pressure coefficients in obtaining the coefficients presented. Decreasing the y^+ value for the first off-body grid point in Block 2 may improve these results. Although, since the boundary layer profiles are in very good agreement with the data, there may be no further improvement.

Rainbird noted that there was an error in the surface static pressure measurements due to the windward boundary layer thickness being only twice the diameter of the static pressure holes (personal communications). This error diminishes as the boundary layer thickens along the leeward side of the cone. He indicated that the correction to the surface static pressure data was never implemented because the error was a function of the constantly varying boundary layer thickness. This error would account for a small amount of the discrepancy between the calculated and measured surface static pressures along the windward side of the cone. Rainbird also indicated that the model alignment error was within .1°, therefore, misalignment of the model is probably not an issue.

One check on the grid dependency of a solution is to compare the velocity profiles in unseparated regions with the Law of the Wall. The single and 3-Block grid results are shown in Figure 12. Significant improvements were made in the comparisons with the fine grid. The discrepancies in the 0° station can be attributed to the value of 11 for the y^+ of the first off-body point, which places it out of the viscous sublayer (linear region), making accurate wall shear stress calculations impossible. The grid clustering near the wall was not changed in Block 2 from the clustering used with the single block grid.

4.2 CFL3D Multigrid Studies

Multigridding is a process in which solutions obtained on successively coarser grids are used to accelerate the convergence rate for the highest level or finest grid. Each successive lower grid has one-half the number of points as the next higher level grid. Large scale flow features are developed very rapidly with the coarse or lower level grids, while small scale or finer details are resolved with the highest level or finest grid because the effectiveness of multigridding is problem-dependent; the results reported may not be directly applicable to another problem. The results reported in this section are for a single block grid.

The convergence histories for several multigrid and single grid (non-multigrid) schemes are presented in Figure 13, which shows the density residual. All of these curves terminate at iterations or cycles where the solution was judged to be converged. Further iterations or cycles, not shown on the plots, did not reduce the residual levels further. One criteria used for convergence was when the residual histories reached the same constant levels. Another criteria used to determine convergence was when the Mach number profiles about the cone exhibited minimal or no change with additional iterations. This convergence criteria is illustrated in the selected Mach number profiles shown in Figure 14. As can be seen, solutions obtained with all of the schemes used are virtually identical with the exception at $\phi = 170°$. At this location, the possible unsteadiness of the vortex may not allow for a truly steady-state solution. Therefore, the point where minimum changes in this profile occurred was used as the convergence criteria in this region. All solutions were run for 100 iterations in the laminar mode prior to running with turbulence.

The convergence histories of two single grid (non-multigrid schemes) are shown in Figures 13a and 13b. One of these grid schemes used a constant CFL number of 1 (Figure 13a). The other one used a CFL number of 5 for 2700 iterations and then a CFL number of 1 for an additional 1300 iterations (Figure 13b). As can be seen, the use of a high CFL number for the initial calculations reduced the number of iterations required for a converged solution from 8400 iterations to 4000 iterations. The lower CFL number allows the residuals to drop approximately 1.5 orders of magnitude from the level obtained with a CFL number of 5. The solution obtained when the residual history became constant for a CFL number of 5 is identical to the solution obtained when the CFL number was reduced to 1, as shown in Figure 15a. However, the solution obtained after

4600 iterations with a constant CFL number of 1 is different for the converged solution obtained after 8400 iterations, as shown in Figure 15b.

The residual histories for two three-level multigrid cycles are shown in Figures 13c and 13d. A single three-level V-cycle consists of obtaining solutions on two successively coarser grids and then using the corrections obtained from the coarse grids to update the solutions on successively finer grids up to the highest level. Each three-level W-cycle consists of obtaining solutions on two successively coarser grids, using the corrections obtained on the coarse grids to update the solution one grid level up, and then return down one grid level. Following these coarse grid solutions, the solutions are updated on successively finer grids up to the highest level.

The V-cycle was first run with a CFL number of 5 for 700 iterations and then with a CFL number of 1 for an additional 600 iterations. As can be seen from Figure 15c, the solution obtained when the residual history became constant for a CFL number of 5 is the same as that obtained after reducing the CFL number to 1 and iterating until the residuals become constant again. The number of multigrid cycles required to obtain a converged answer was 1300, as compared with the much larger number of iterations required using the single grids. The W-cycle was run with a CFL number of 3 and a converged solution was obtained with 700 multigrid cycles. This W-cycle result represents approximately half the number of cycles required by the V-cycle to obtain the same level of residual drop.

4.2.1 Multigrid Results: Single Block Grid

When examining code performance, several factors which are shown in Table 1 must be examined. One important factor is the computational speed in terms of CPU time per cycle per point. As can be seen in Table 1, the single grid (non-multigrid) scheme provides approximately twice the computational speed of either multigrid scheme. This difference is due to the additional solutions required in each multigrid cycle. However, the actual computational time required by these various schemes differed widely. The W-cycle multigrid scheme required the least amount of computational time to reach the same level of convergence as all of the other schemes. In general the multigrid schemes proved to be very effective at reducing computational time for this particular problem. Part of this effectiveness may be attributable to the fact that the flow had only small regions containing three-dimensional effects, specifically the leeward side vortex which occupies a very small portion of the flow field.

4.2.2 Multigrid Results: 3-Block Grid

The use of multigridding with a three-block grid was also investigated and the results are discussed in this section. In order to reduce CPU time the number of grid points in the three-block grid was reduced to approximately one-half of the original number of points. The computational speed is summarized in Table 2. As can be seen, the three block grid required significantly more CPU time per cycle per point when used in the multigrid mode than the one block grid results (shown in Table 1). This increase is attributed to the need to transfer information from one block to another in the three-block grid. The convergence criteria used for this study was the same as that used for the one-block grid multigrid study. Although the multigrid scheme was more costly per cycle, the overall time required to obtain a converged solution was reduced significantly from the time required for the non-multigrid solution. This result is similar to the results obtained using a one-block grid.

4.3 CFL3D Comparisons with PARC3D

One concern in using CFL3D is that the code solves the thin-layer Navier-Stokes equations. In this approximation, the derivatives parallel to a surface are ignored and therefore regions where there are significant streamwise gradients, such as flow reversal, may not be modelled adequately. In order to study the flow in this region, the PARC3D code, which solves the full Navier-Stokes equations was used to obtain solutions for this cone with the same grids that CFL3D used.

The computed Mach number profiles obtained with CFL3D and PARC3D using the coarse grid (single block grid) are shown with the data in Figure 16. The two solutions are identical with the exception of $\phi = 180°$. It is not clear what is causing these discrepancies at this location. In addition, the flow angles predicted by the two codes agree well with each other and are shown in Figure 17. The surface static pressure distributions predicted by CFL3D and PARC3D also agree well with each other, as can be seen in Figure 18. For this particular case, the thin-layer approximations used in CFL3D do not appear to influence the computed results.

The performance of the two codes for this problem is shown in Table 3. The CFL3D code requires approximately 64% more memory than PARC3D. The values of the PARC3D storage requirements for thin-layer and full Navier-Stokes solutions are instantaneous values displayed during program execution. Ideally, the storage requirements are the same. The PARC3D code carries all arrays, regardless of solution mode. The CFL3D code was about 50% faster than PARC3D in terms of CPU time per iteration per point. However, the actual CPU time required to obtain a converged answer is difficult to state since the time required depends on the manner in which the problem is solved. For example, running with a large initial CFL number can increase the rate of convergence. Another factor affecting the convergence time required, is running in the laminar mode for a few hundred iterations, which can reduce the amount of computational time significantly. Therefore, several calculations would have to be made with each code in order to determine the optimum approach to solving this particular problem. However, preliminary comparisons indicate that the CFL3D code, when run in the single grid mode, required approximately 42% less computational time than PARC3D.

The performance comparisons for the PARC3D and CFL3D codes using the three-block grid are shown in Table 4. The PARC3D memory requirements remained about the same, while the CFL3D memory requirement reduced 27% as compared to the one-block grid. Overall, the CFL3D code required 15% more memory per point than PARC3D using the three-block grid. One advantage of PARC3D is that it uses only one grid block in core memory at a time, whereas CFL3D keeps all grid blocks in core memory. Therefore, by using additional grid blocks, the core memory required by PARC3D can remain constant as the number of grid points increases which is not the case with CFL3D. In addition, the speed of the codes remained approximately the same as the single block grid case and the ratio of total CPU time required for a converged solution using CFL3D to PARC3D was similar to the single block grid case. The extra grid points in Block 1 of the PARC3D grid are for the required one grid cell overlap which is not needed with the CFL3D code.

It should be noted that since these comparisons were made, the Cray Y-MP compiler was updated to version 5.0.2.1. For reasons unknown, the speed of the PARC3D computations increased approximately 20%. No significant changes in the speed of CFL3D were noted.

Solutions were also obtained with the PARC3D code using the same fine grid (3- block) that was used with the CFL3D code. The Mach number and flow angle profiles are shown in Figures 19 and 20, respectively. The results obtained with the two codes are in excellent agreement with each other. The only significant discrepancies occur in the vortex region ($\phi = 155°$, $170°$). Because the length scales used for the Baldwin-Lomax turbulence models in each code are almost identical throughout this region, differences in the turbulence models are not likely an issue. Differences in the solutions may be attributable to the varying amounts of numerical dissipation present in the solutions. The surface static pressure distributions obtained with the two codes (shown in Figure 21) are in excellent agreement with each other. The discrepancies between the predictions and data have been discussed in a previous section.

In the process of matching of the turbulence model length scales in the two codes, it was found that the search for a length scale was critical to predicting the proper location of the vortex. This effect is illustrated in Figure 22 using the PARC3D results. The Mach number profile in Figure 22(a) is the result of restricting the search for a length scale to the edge of the undisturbed boundary layer. This distance happens to correspond to the center of the vortex since the vortex is not much larger than the boundary layer. The profile indicates that the predicted vortex position is not the same as the actual position since the predicted Mach number profile is different from the experimental profile. The Mach number profile shown in Figure 22b is the result of restricting the length scale search to the lower edge of the vortex region. This last comparison of the predicted profile to the experimental profile improved with this additional restriction. The restriction to the lower edge of the vortex eliminated the contribution of streamwise vorticity to the turbulent viscosity calculations which are due to the vortex. Only the transverse component attributable to the attached boundary layer was included in the calculation. This result is consistent with the original formulation of the Baldwin-Lomax turbulence model.

The search distance of the turbulent length scale used by the CFL3D code is obtained by using the first 64% of the grid points from a surface. The percentage of the number of grid points is fixed within the turbulence model subroutines and cannot be adjusted by user inputs, as is available in the PARC3D code.

5.0 Conclusions

A major accomplishment of this study was to gain some experience in the use of the CFL3D code. The use of block grids and multigridding in analyzing the flow about the Rainbird cone has been explored successfully and the application of these techniques to a complicated configuration such as the F-18 inlet, forebody, LEX, and wing should be reasonable.

The grid studies indicate that significant improvements in the prediction of details in the flow field can be made by proper selection of grid density and proximity to the surface. A major gain in the agreement of the boundary layer in the vortical flow region was obtained by placing the first grid point off the surface in this region to a distance within a y^+ value of 1. Outside of this cross-flow separation region, improvements were made by increasing the number of grid points without decreasing the distance for the first off-body grid point.

Despite improvements in the boundary layer profiles with increased grid resolution, the predictions of the windward surface static pressure distribution did not improve. A small portion of the discrepancies may be due to experimental errors attributed to the similarity of the windward boundary layer thickness to the diameters of the static pressure holes.

The use of multigridding indicated a significant reduction in the required computational time for this problem. However, the effectiveness of multigridding is problem-dependent. The use of multigridding with multiple grid blocks also showed a significant reduction in CPU time.

The CFL3D results compared well with PARC3D, indicating that for this problem, the thin-layer approximation is adequate. Further studies with larger recirculating flow regions may be necessary to evaluate properly the range in which the thin-layer approximation is valid. This study indicates that with proper grid resolution, flow field details may be resolved with an algebraic turbulence model and may not require the use of higher order turbulence models. In addition, the use of proper length scales in the algebraic turbulence model is critical to obtaining a good prediction of the vortical flow region.

6.0 Acknowledgement

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COMPUTATIONAL SPEED
(10^{-6} second/cycle/point)

Single Grid (Non-multigrid): 16.9

Multi-grid (V-cycle, 3 levels): 29.7

Multi-grid (W-cycle, 3 levels): 33.6

MULTIGRID CONVERGENCE STATISTICS

Scheme	CFL	Iterations/Cycles	CPU (hours)
Single Grid	1	8400	5.8
Single Grid	5, 1	4000	2.8
Multi-grid, V-cycle	5, 1	1300	1.8
Multi-grid, W-cycle	3	700	1.1

Grid: 149,650 points

Table 1. Performance Summary for Single-Block Grid

COMPUTATIONAL SPEED
(10^{-6} second/cycle/point)

Single Grid	19.2
W-Cycle (Multigrid)	45.1

CONVERGENCE (3-Block Grid)

	Iterations/Cycles	CPU (hours)
Single Grid	4100	2.97
W-Cycle (Multigrid)	600	1.02

3-Block Grid Size: 136,059 points

Table 2. Statistics for Multigrid Scheme with 3-Block Grid

PARC PERFORMANCE

	TLNS	FNS
Grid Dimensions	29 X 37 X 61	29 X 37 X 61
Storage (Words/point)	$\sim$ 33.3	$\sim$ 31.3
CPU (10^{-6} second/iteration/point)	23	26
Residual Drop (Orders of Magnitude)	4	4
CPU Time (Hours)	3.1	3.5

CFL3D PERFORMANCE

Grid Dimensions	29 X 37 X 61
Storage (Words/point)	53.6
CPU (10^{-6} second/iteration/point)	18
Residual Drop (Orders of Magnitude)	4
CPU Time (Hours)	1.8

Table 3. Solution Statistics for Cray Y-MP Computer (Single-Block Grid)

PARC PERFORMANCE

Grid Dimensions	33 X 74 X 74, 33 X 41 X 73, 33 X 41 X 33
Storage (Words/Point)	33.9
CPU (10^{-6} second/iteration/point)	25
Residual Drop (Orders of Magnitude)	4
CPU Time (Hours)	$\sim$ 22
Grid Points	324,126

CFL3D PERFORMANCE

Grid Dimensions	33 X 73 X 73, 33 X 41 X 73, 33 X 41 X 33
Storage (Words/Point)	39.1
CPU (10^{-6} second/iteration/point)	18.2
Residual Drop (Orders of Magnitude)	4
CPU Time (Hours)	$\sim$ 12
Grid Points	319,275

Table 4. Solution Statistics for Cray Y-MP Computer (3-Block Grid)

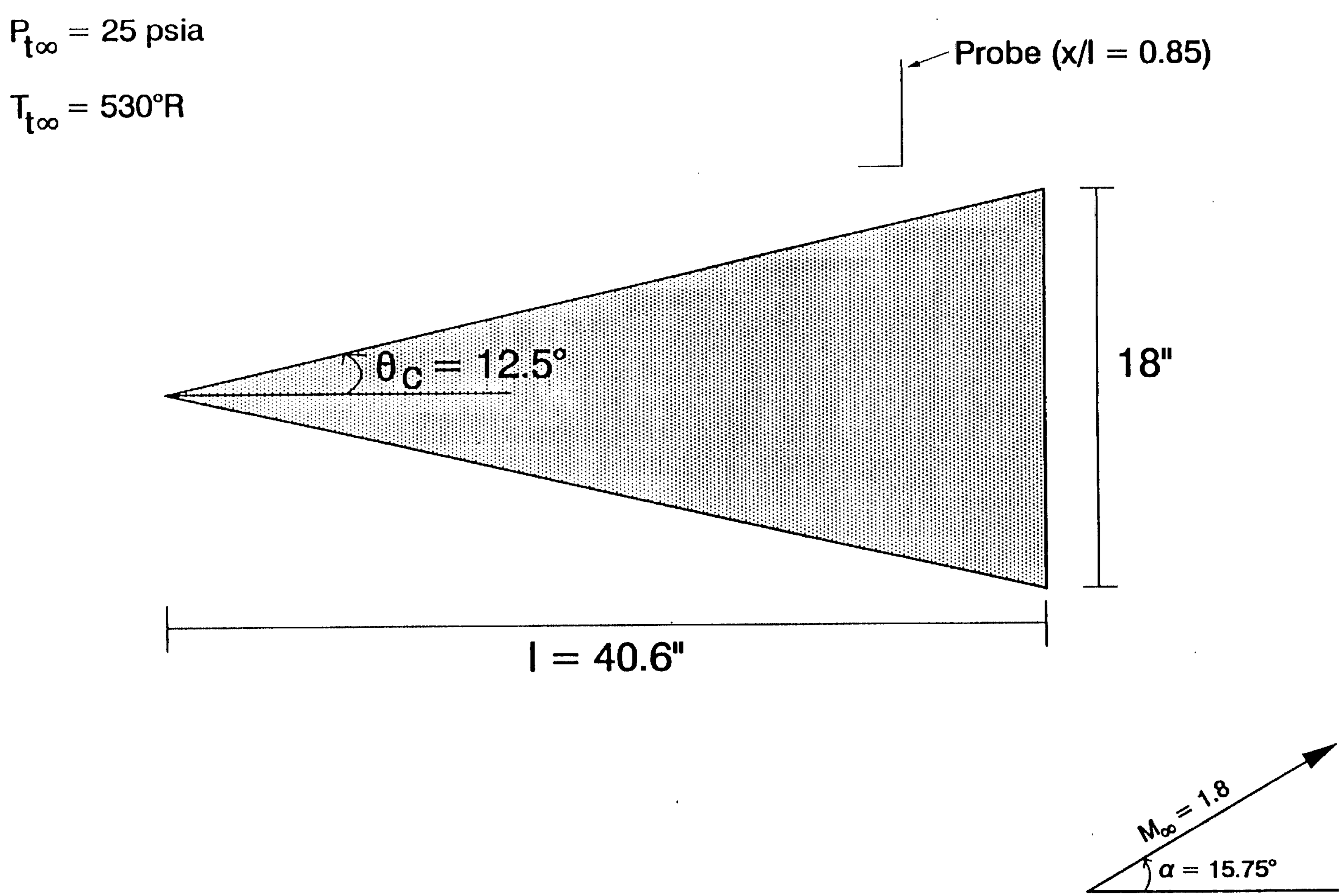
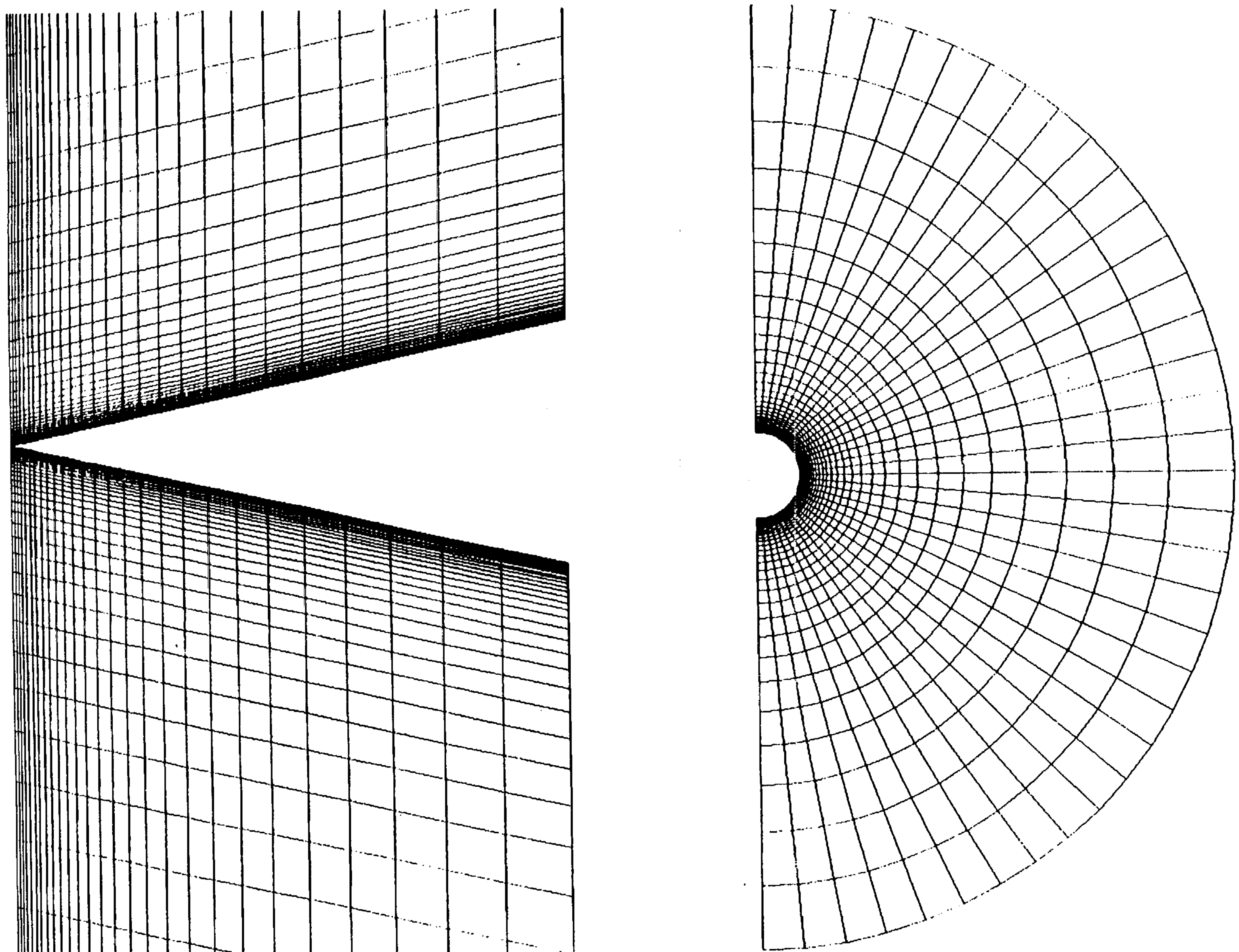
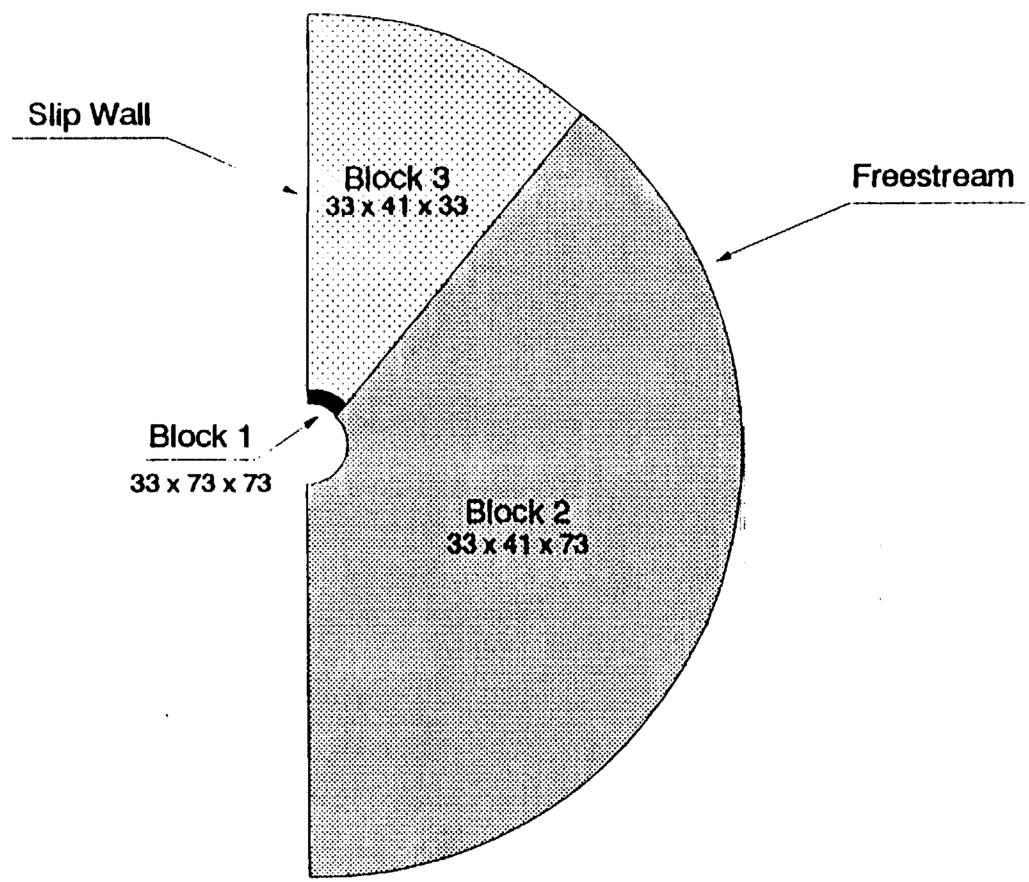


Figure 1. Schematic diagram of experiment


2a. Streamwise View

2b. Cross-Streamwise View

Figure 2. Course Grid



Note: Single Grid for Coarse Grid Solution

Figure 3a. Grid Block Boundaries (Cross-Stream View)

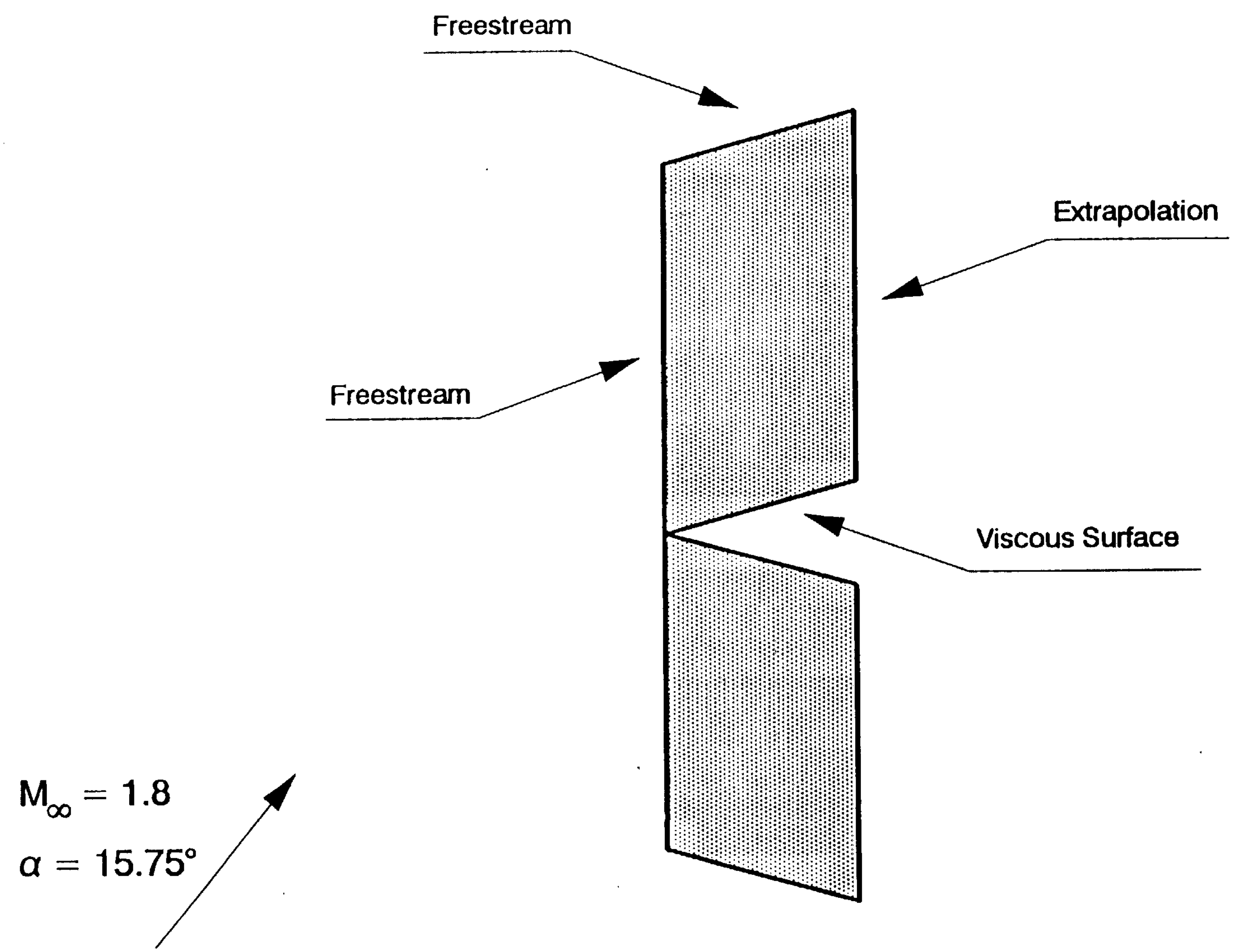
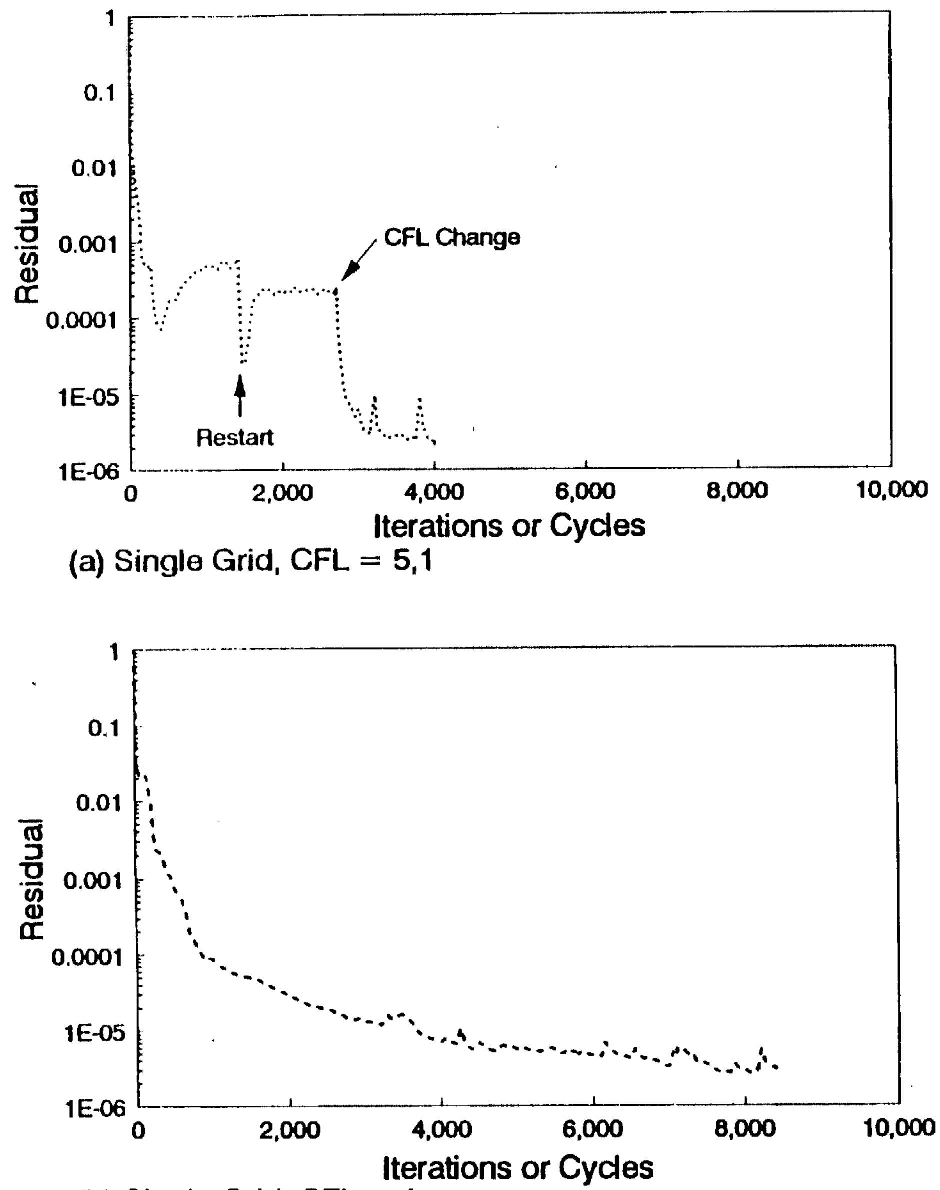


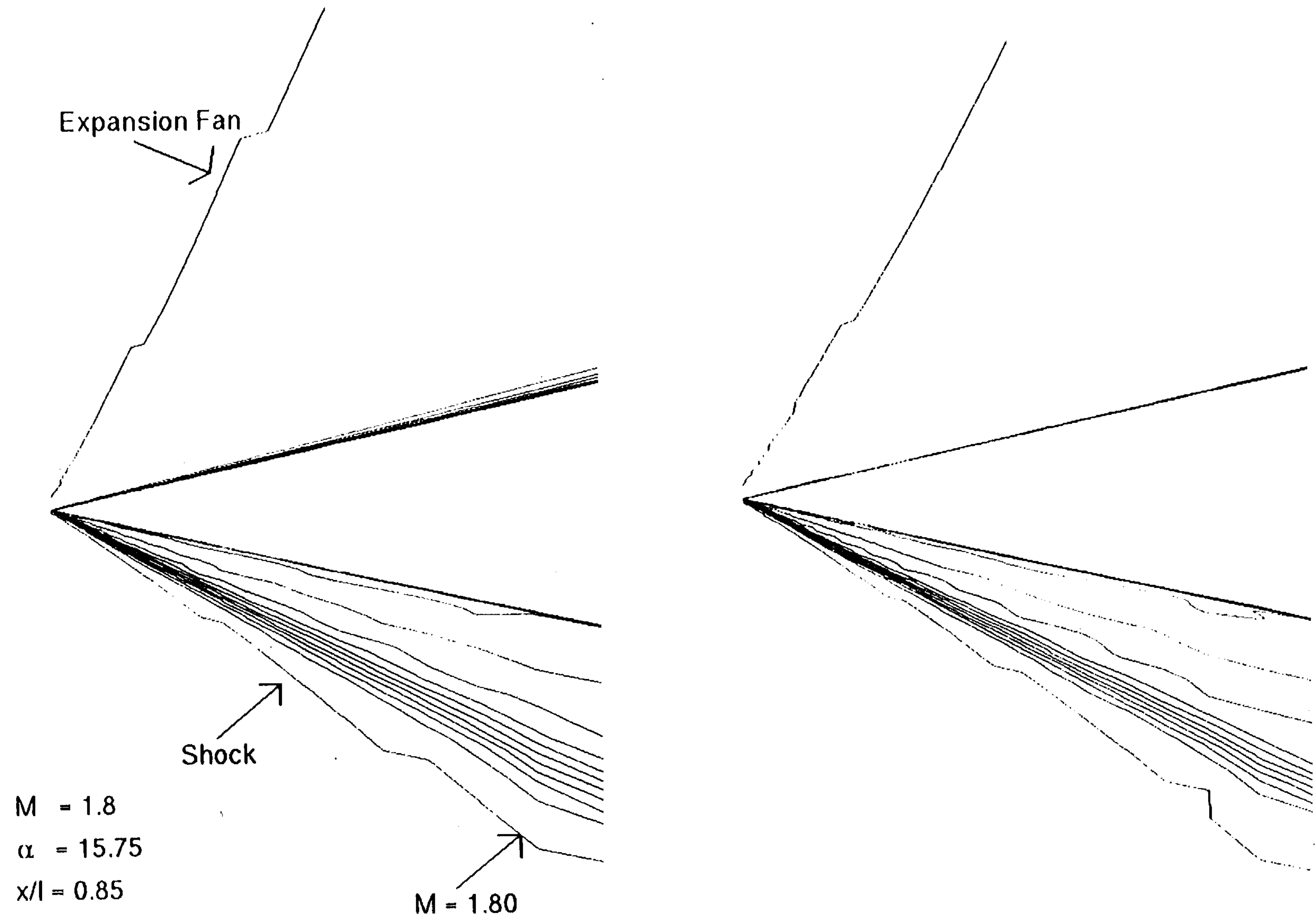
Figure 3b. Boundary Conditions (Streamwise View)



(a) Single Grid, CFL = 5,1

(b) Single Grid, CFL = 1

Figure 4. Convergence Histories

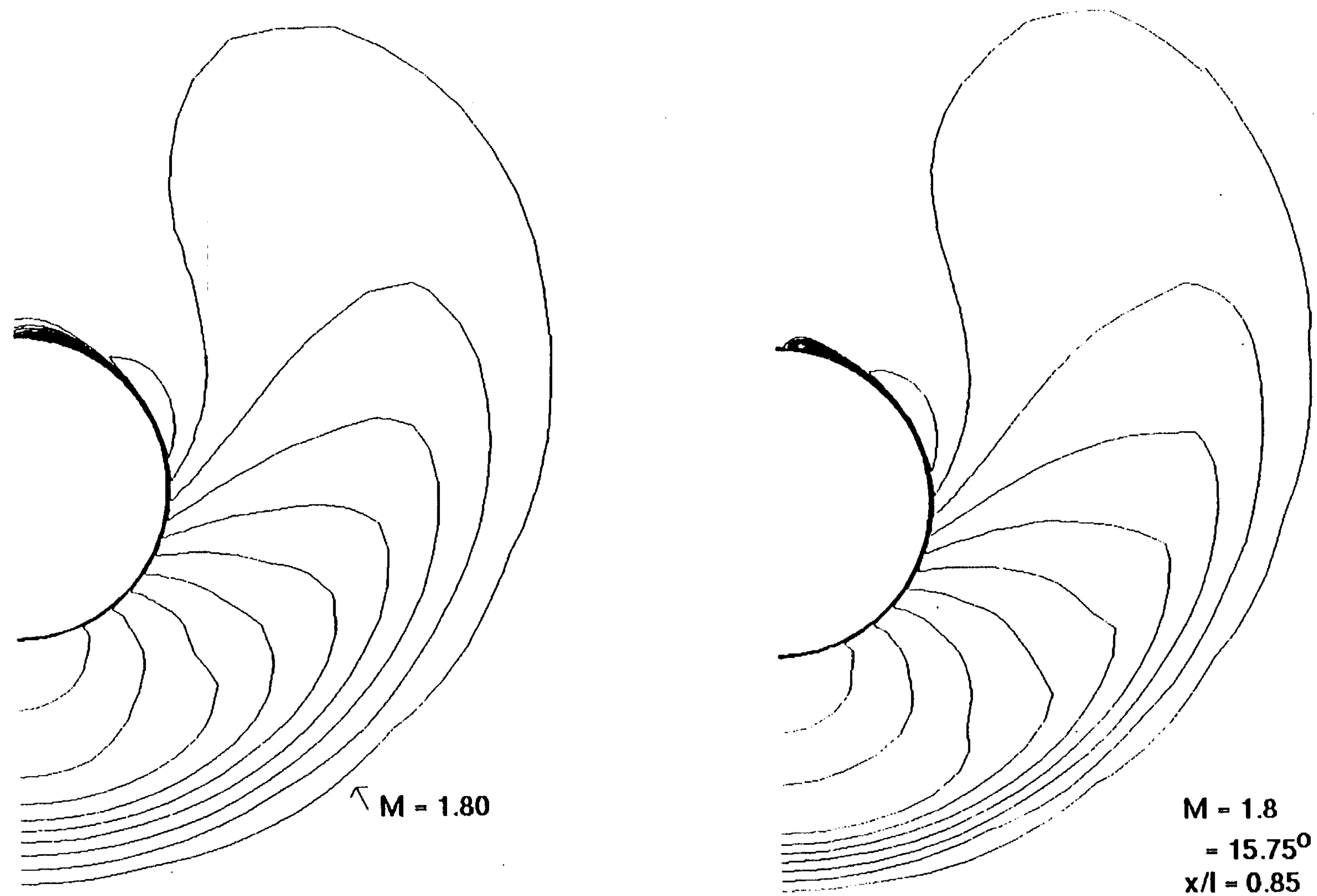


Note: Contour Increment = 0.05

5a. Single Block Grid

5b. 3 Block Grid

Figure 5. Mach Number Contours – Streamwise View

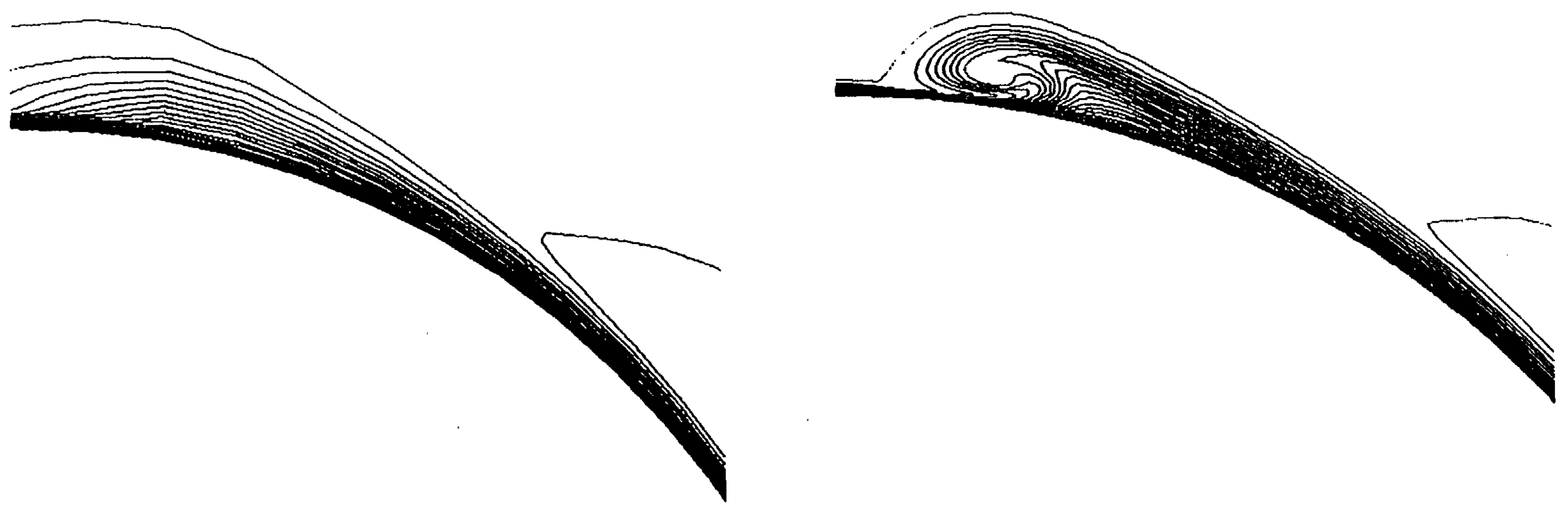


Note: Contour Increment = 0.05

6a. Single Block Grid

6b. 3 Block Grid

Figure 6. Mach Number Contours – Cross-Streamwise View

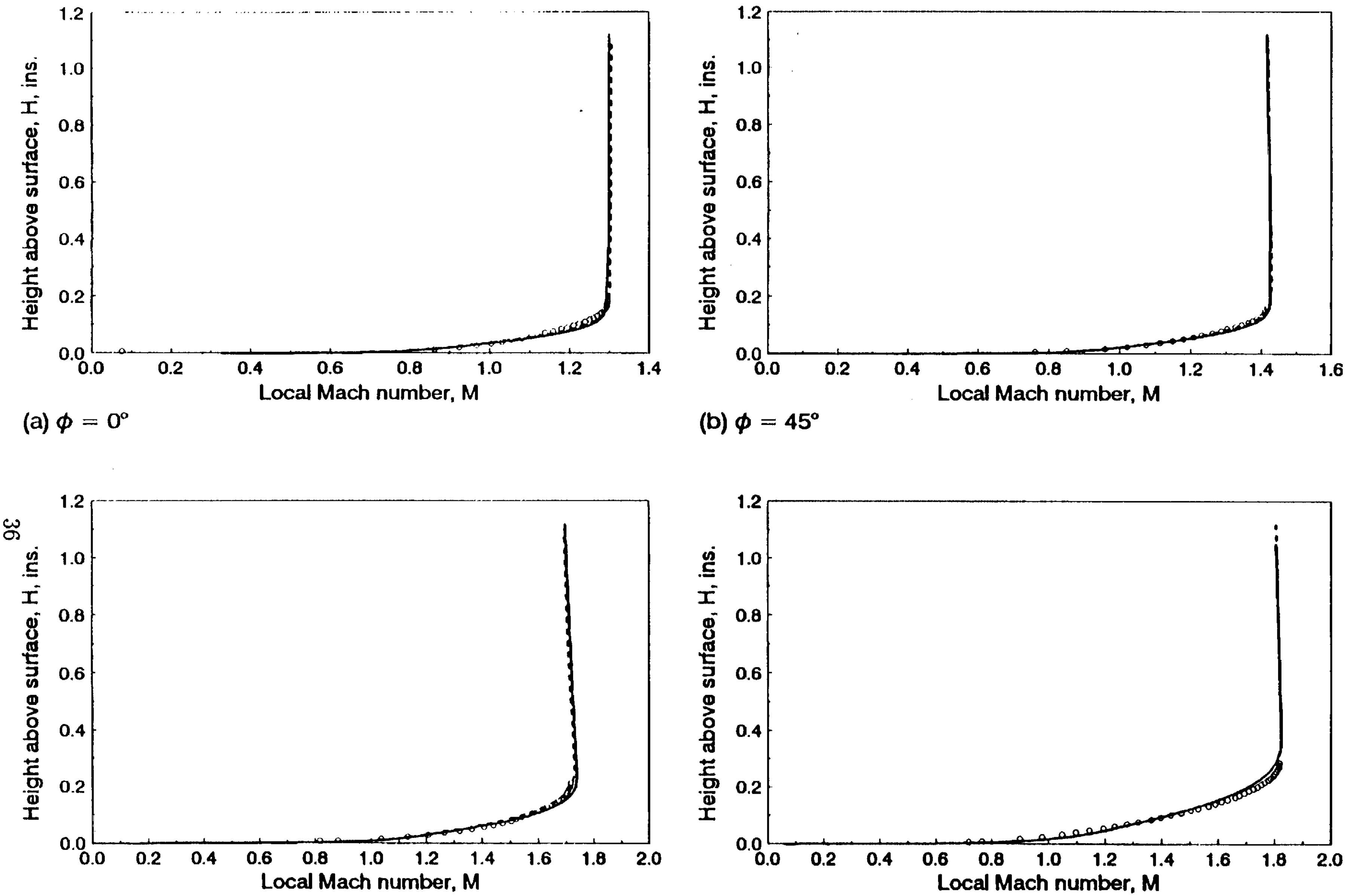


M = 1.8
α = 15.75°
x/l = 0.85

6c. Single Block Grid

6d. 3 Block Grid

Figure 6. Mach Number Contours – Cross–Streamwise View Close–Up



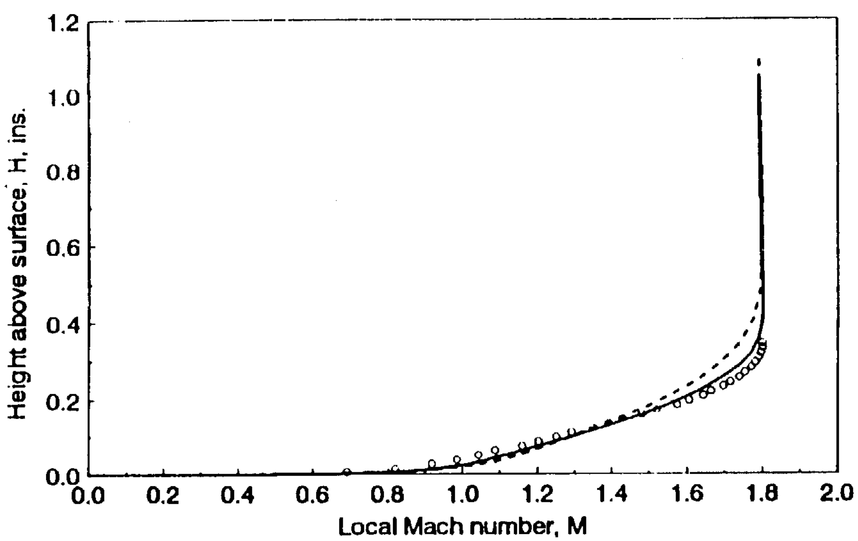
(a) $\phi = 0°$

(b) $\phi = 45°$

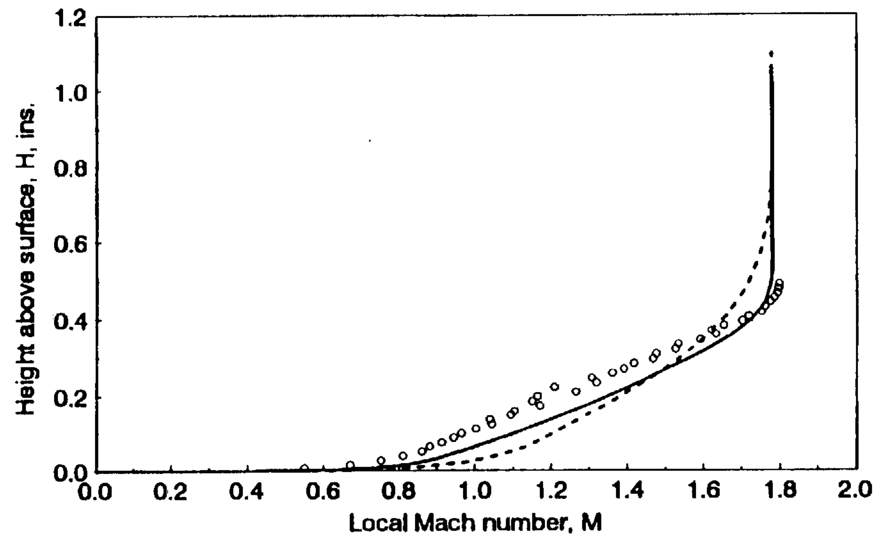
(c) $\phi = 90°$

(d) $\phi = 135°$

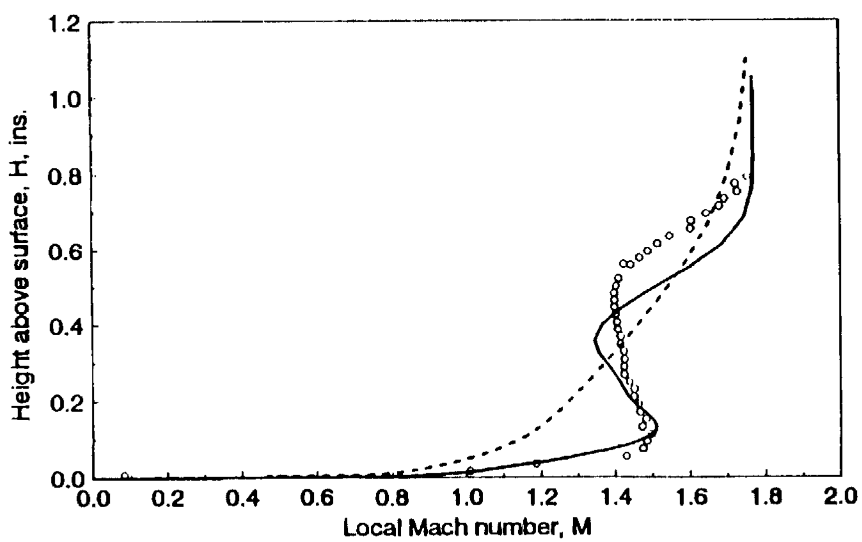
Figure 7. Mach Number Profiles (x/l = 0.85)



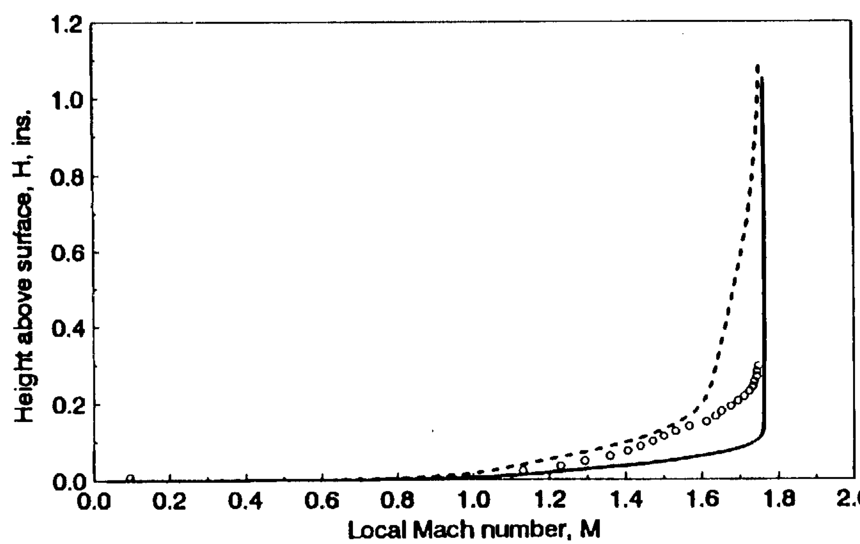
(e) ϕ = 145°



(f) ϕ = 155°



(g) ϕ = 170°



(h) ϕ = 180°

Figure 7. Concluded

CFL3D, 3-BLOCK GRID
CFL3D, SINGLE BLOCK
TEST DATA

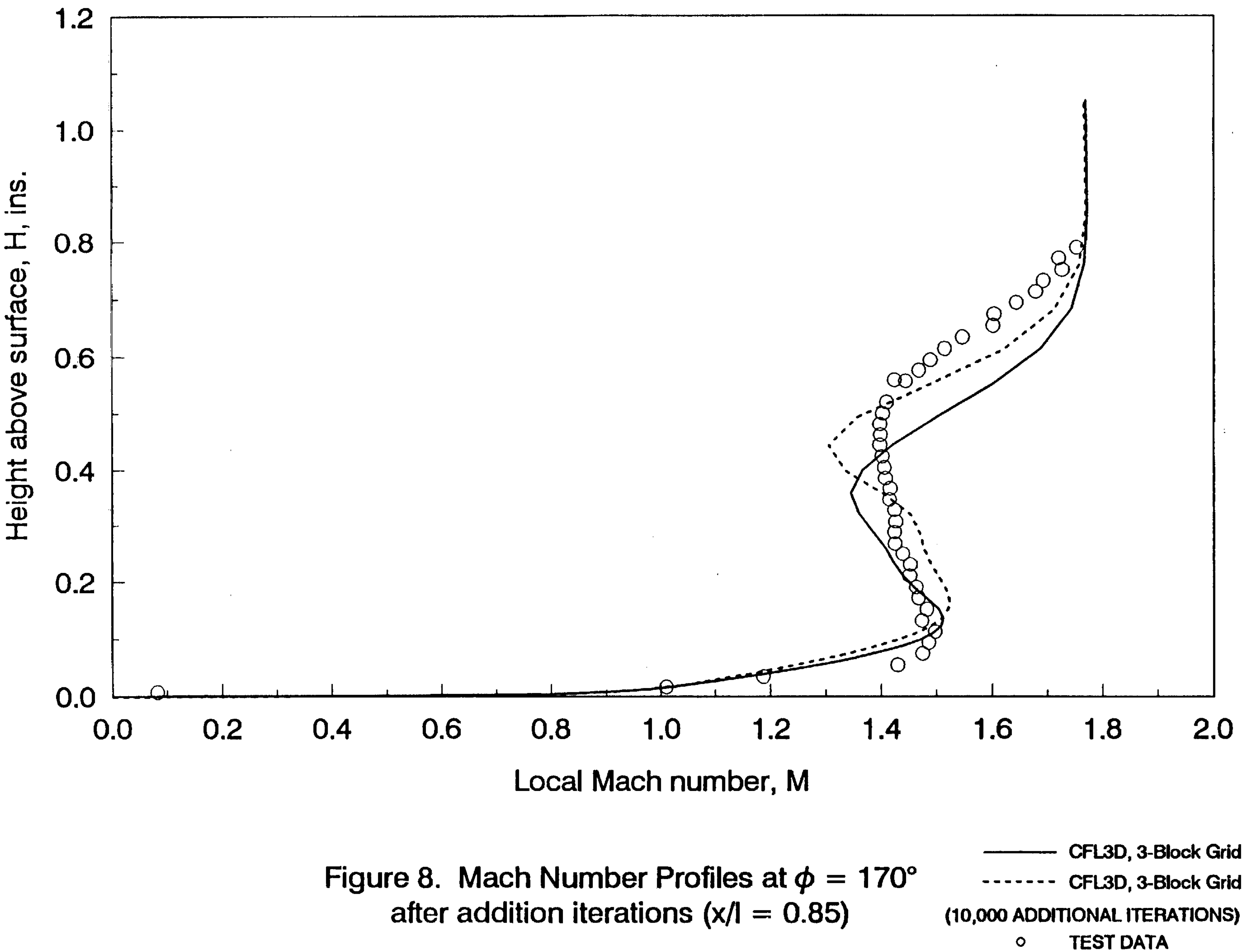


Figure 8. Mach Number Profiles at ϕ = 170°
after addition iterations (x/l = 0.85)

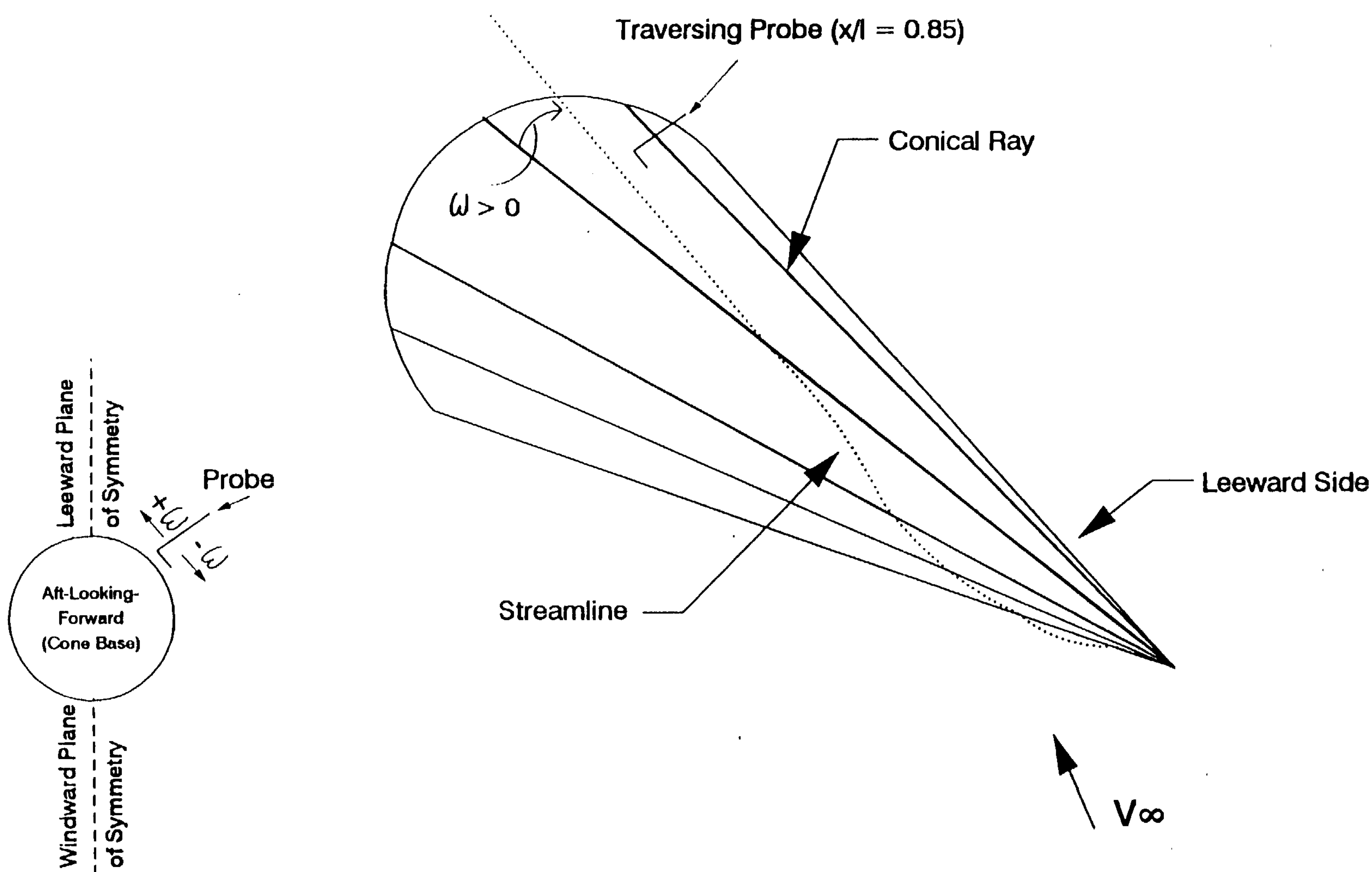
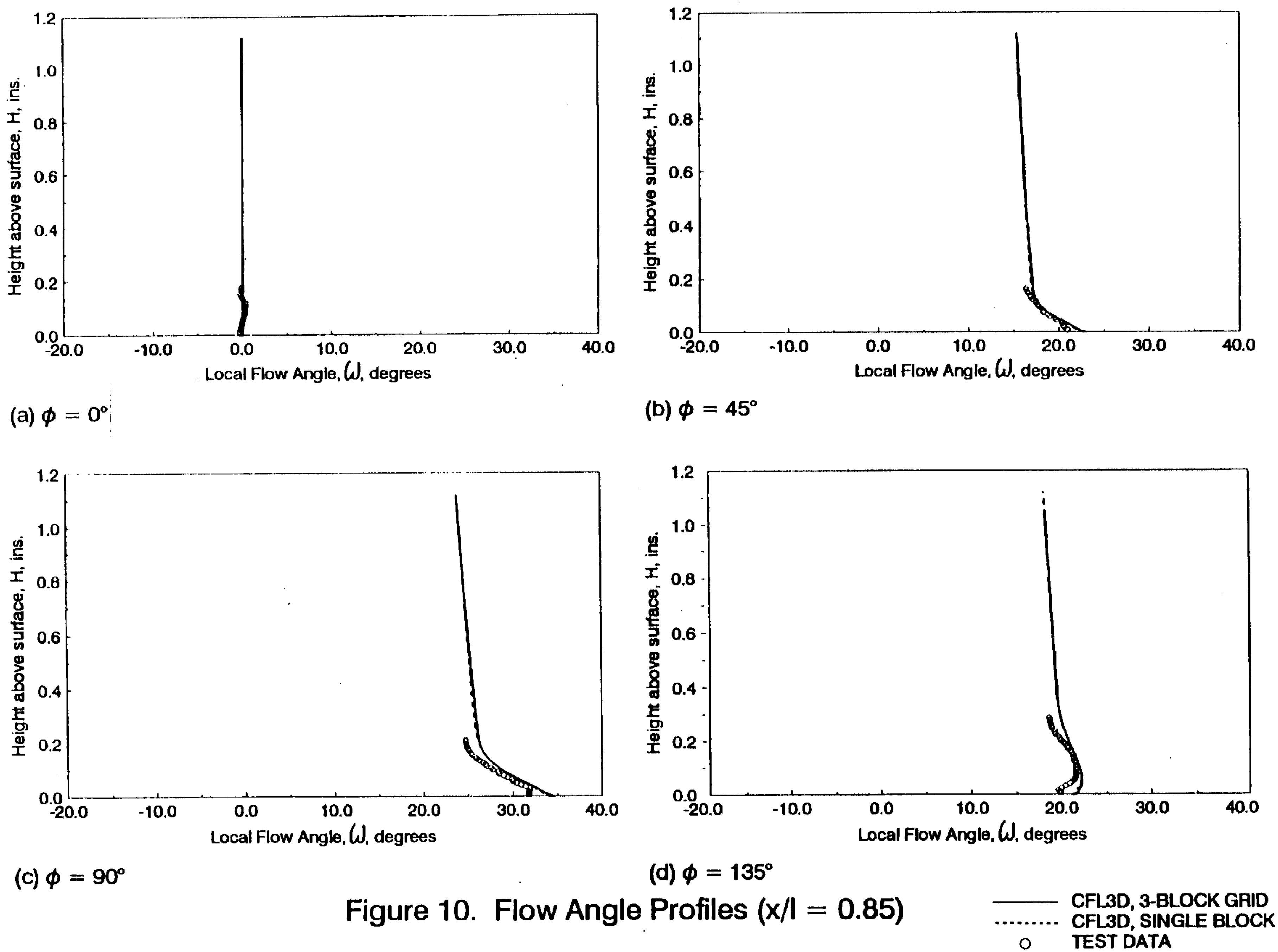


Figure 9. Flow Angle Definition



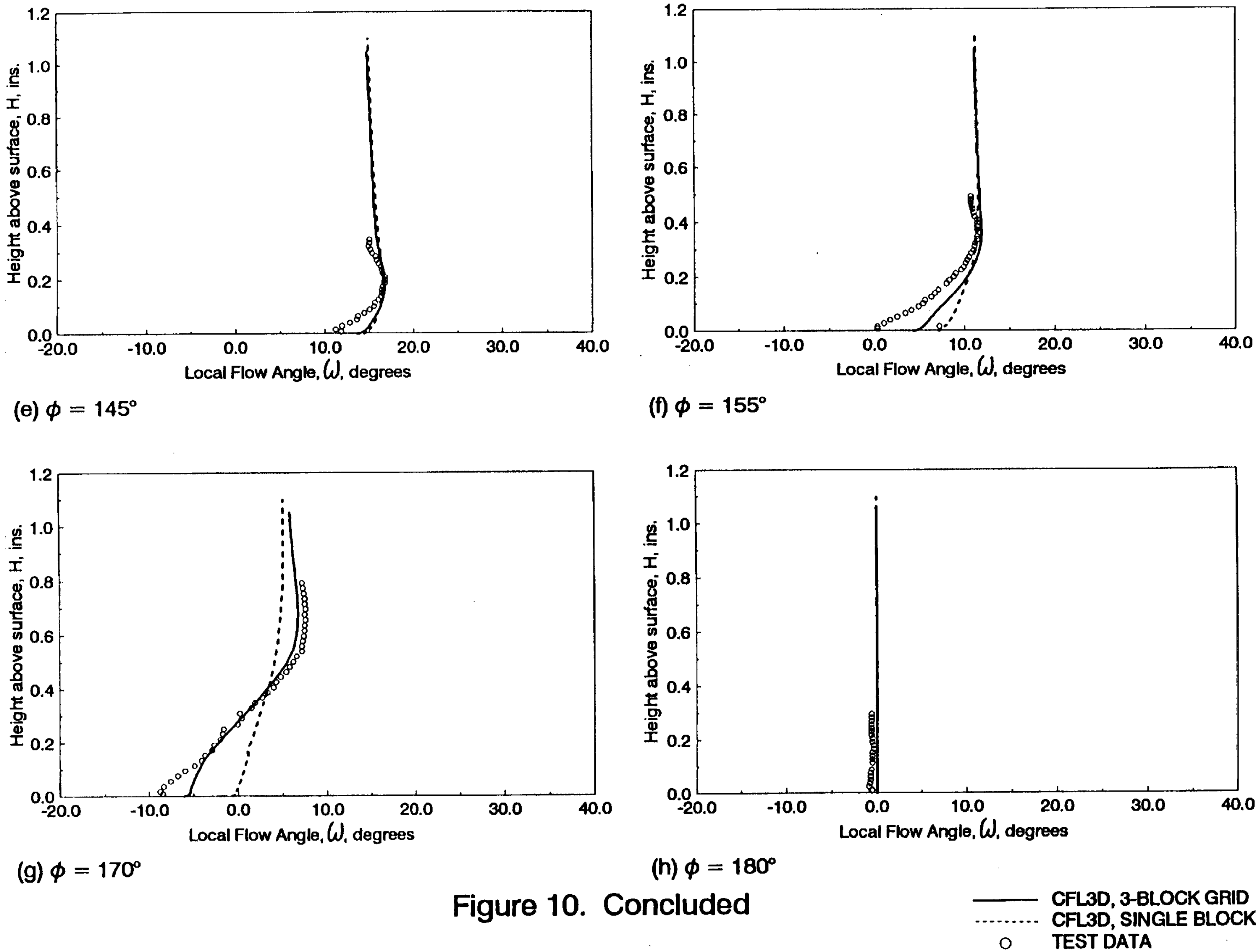
(a) $\phi = 0°$

(b) $\phi = 45°$

(c) $\phi = 90°$

(d) $\phi = 135°$

Figure 10. Flow Angle Profiles (x/l = 0.85)



(e) ϕ = 145°

(f) ϕ = 155°

(g) ϕ = 170°

(h) ϕ = 180°

Figure 10. Concluded

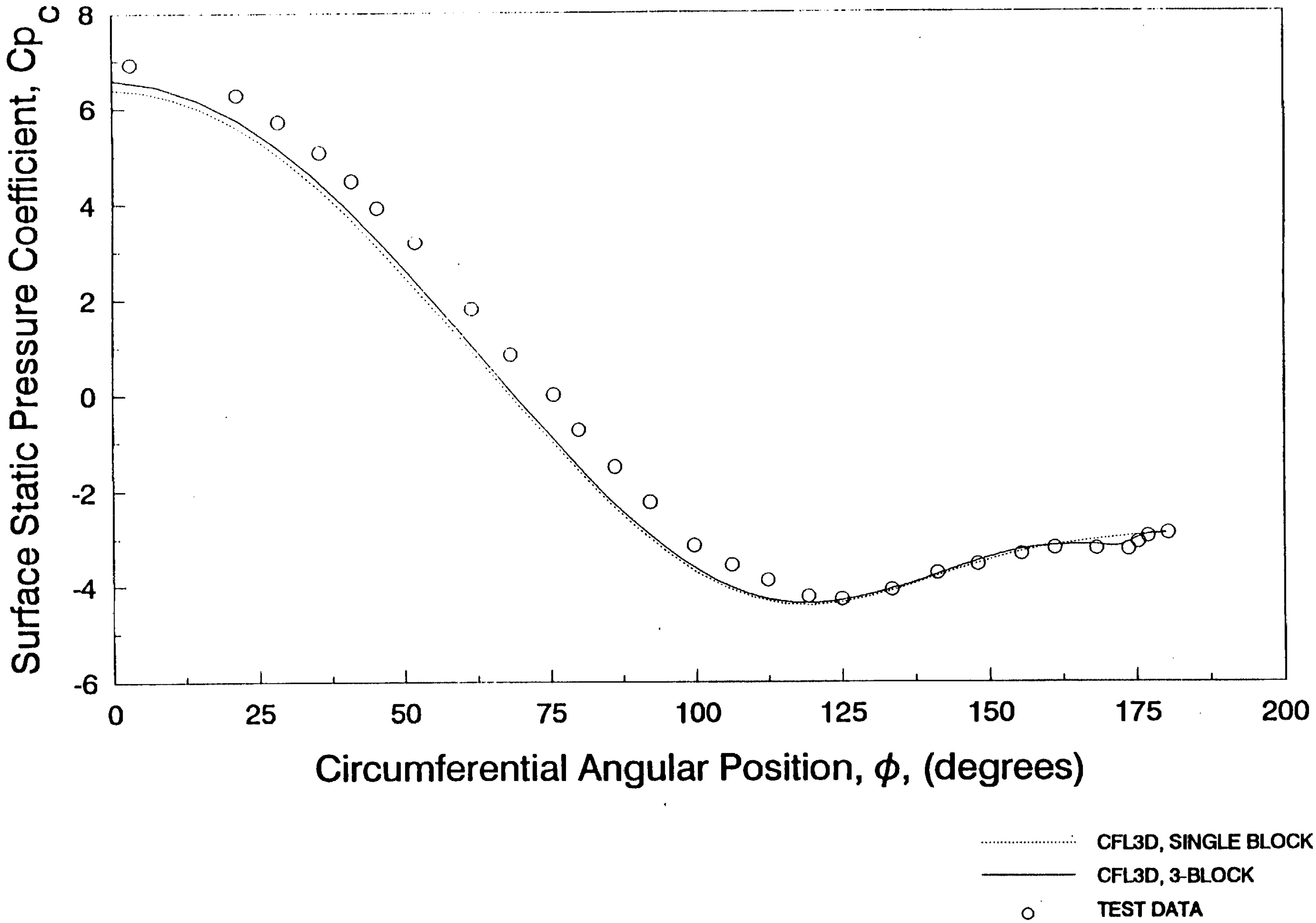
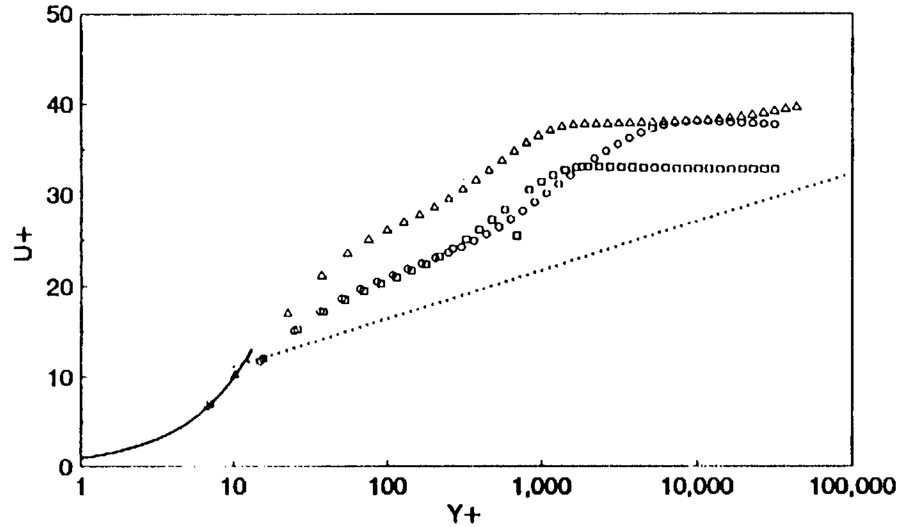
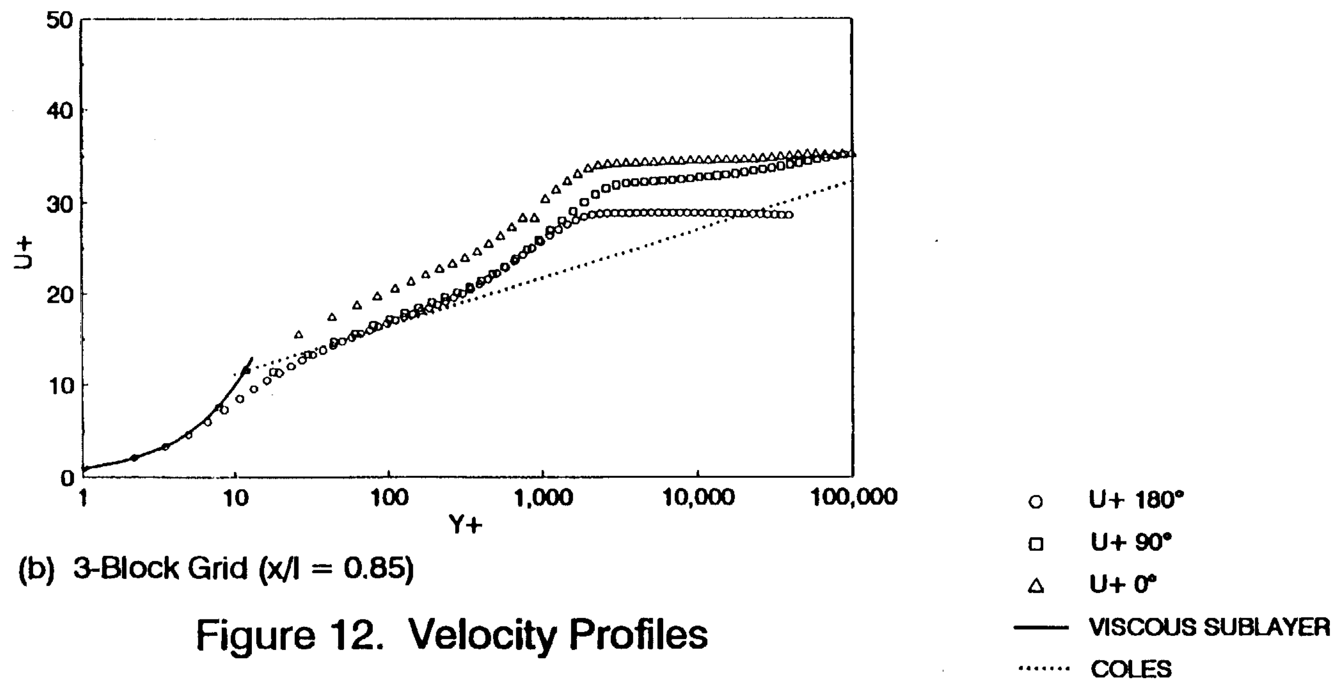


Figure 11. Surface Static Pressure Distribution (x/l = 0.85)

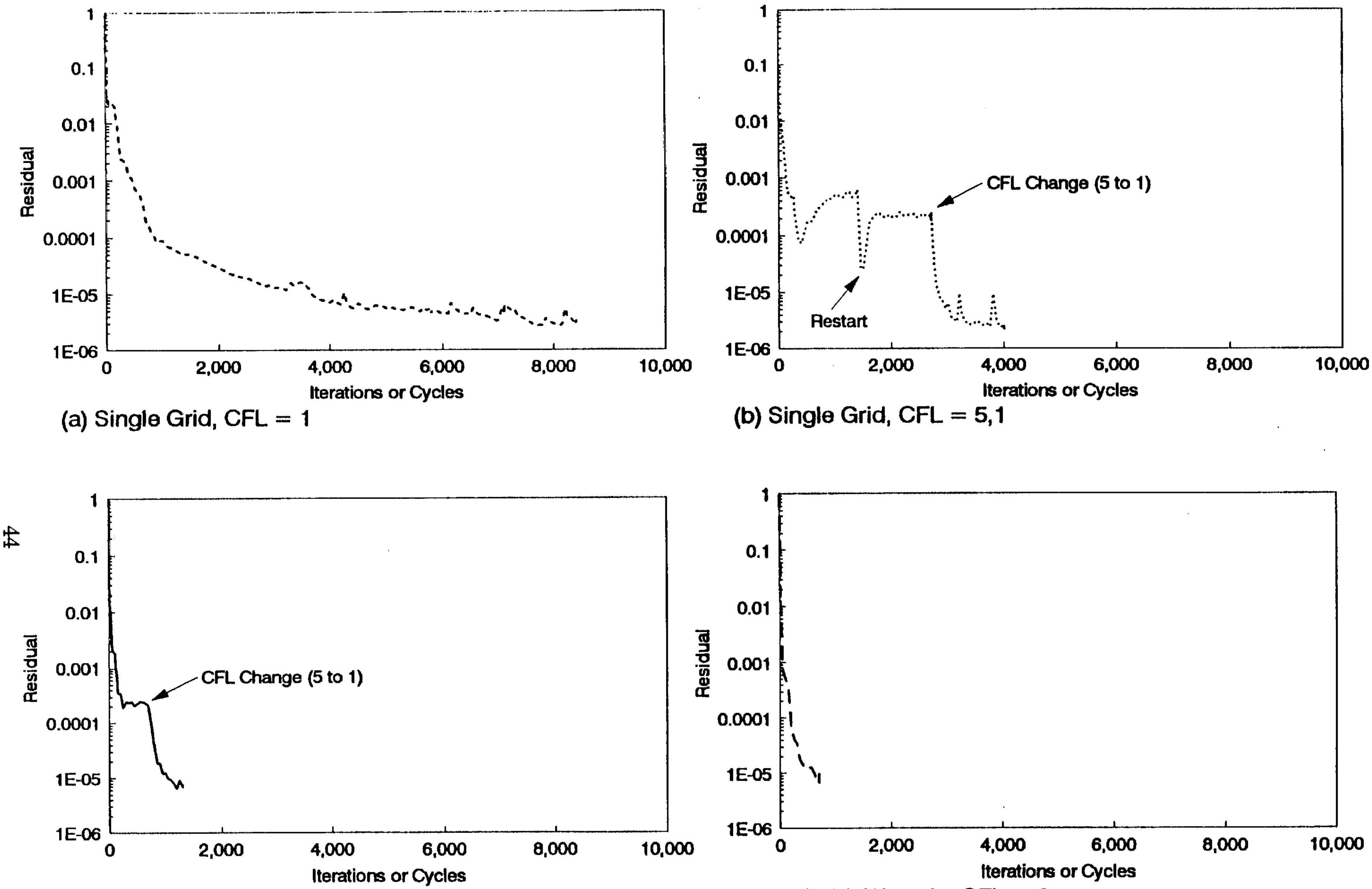


(a) Single Block Grid (x/l = 0.85)



(b) 3-Block Grid (x/l = 0.85)

Figure 12. Velocity Profiles



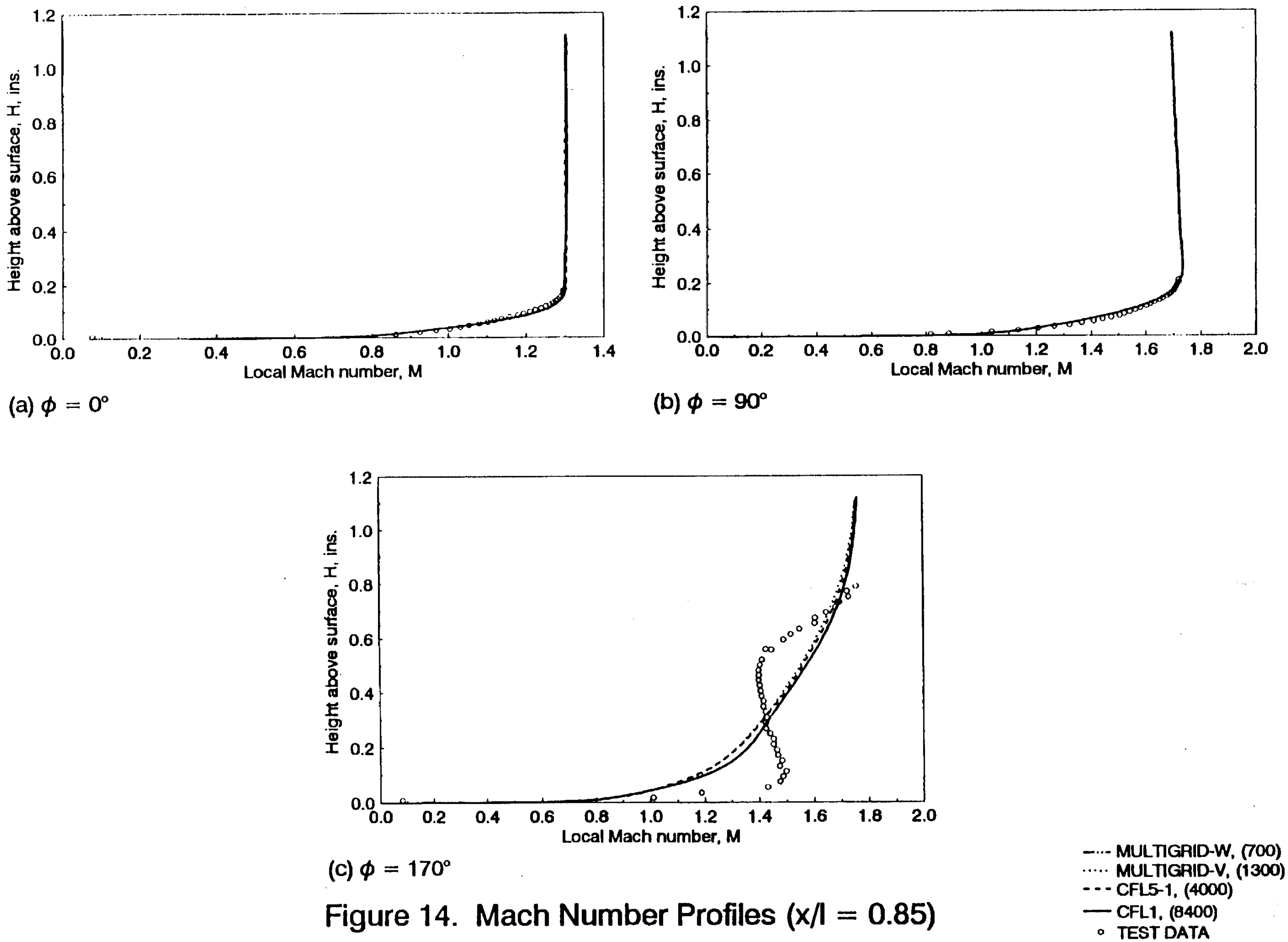
(a) Single Grid, CFL = 1

(b) Single Grid, CFL = 5,1

(c) Multigrid: V-cycle, CFL = 5,1

(d) Multigrid: W-cycle, CFL = 3

Figure 13. Convergence Histories

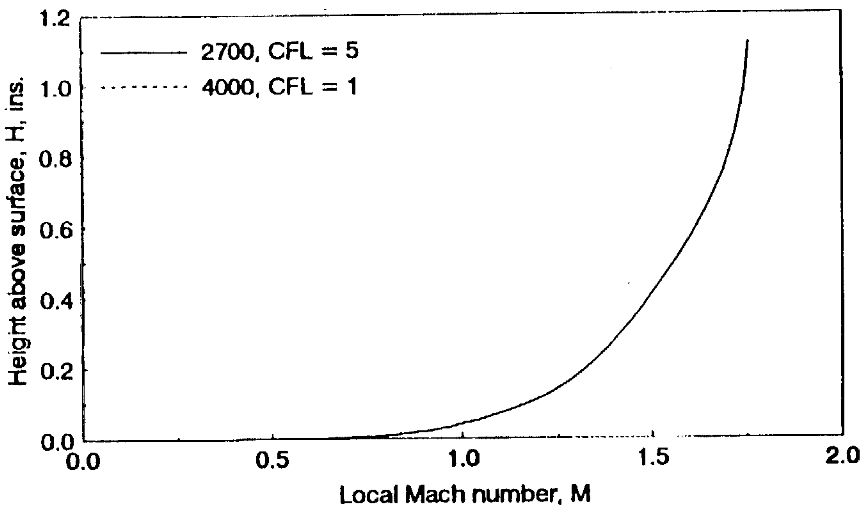


(a) $\phi = 0°$

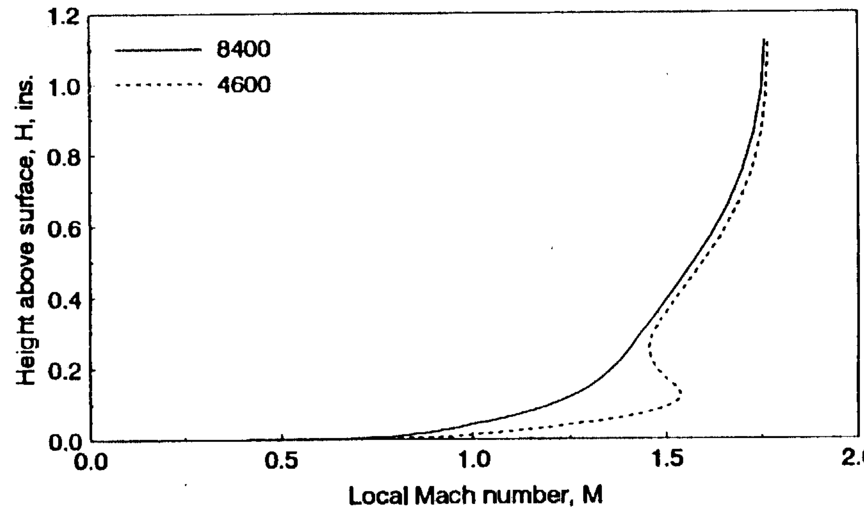
(b) $\phi = 90°$

(c) $\phi = 170°$

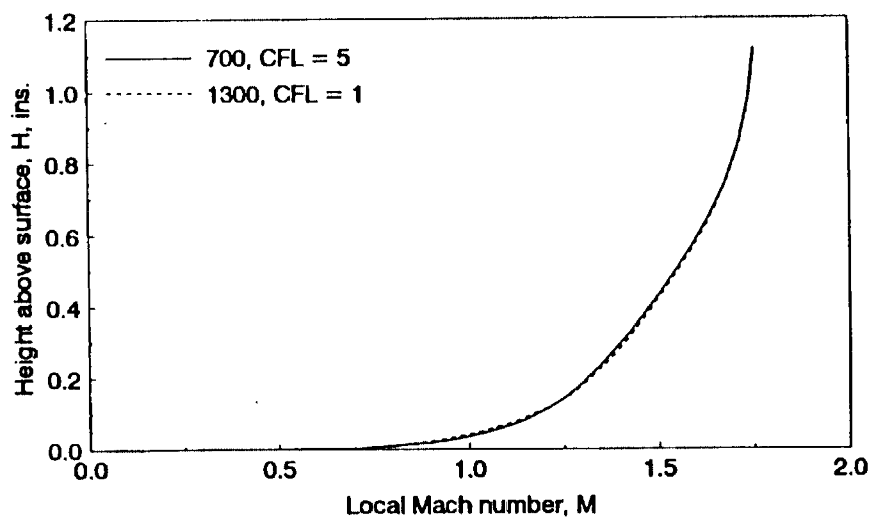
Figure 14. Mach Number Profiles (x/l = 0.85)



(a) Single Grid, CFL = 5, 1

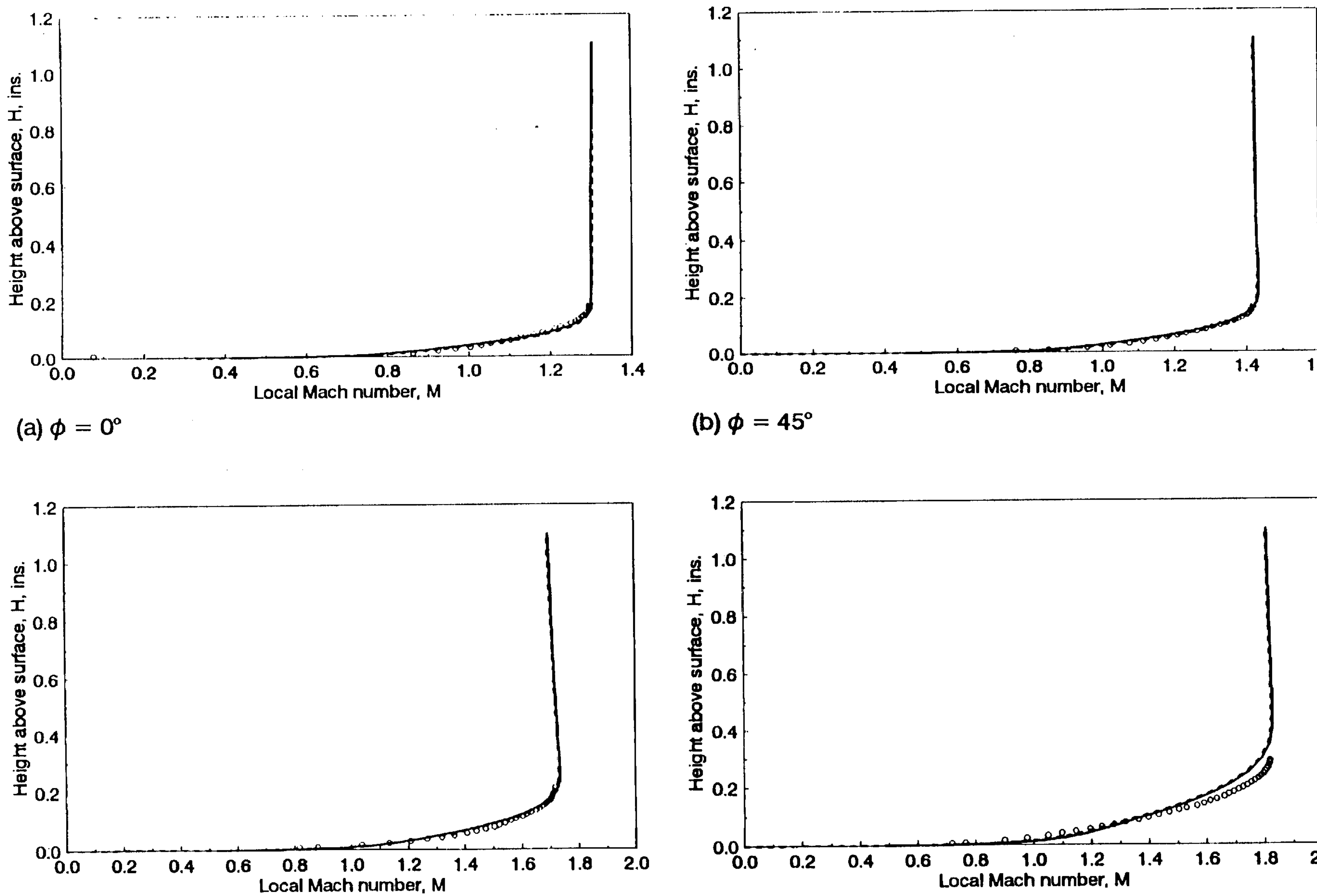


(b) Single Grid, CFL = 1



(c) Multigrid, V-cycle, 3 levels

Figure 15. Mach Number Profiles at ϕ = 170°, (x/l = 0.85)



(a) $\phi = 0°$

(b) $\phi = 45°$

(c) $\phi = 90°$

(d) $\phi = 135°$

Figure 16. Mach Number Profiles
Single Block Grid (x/l = 0.85)

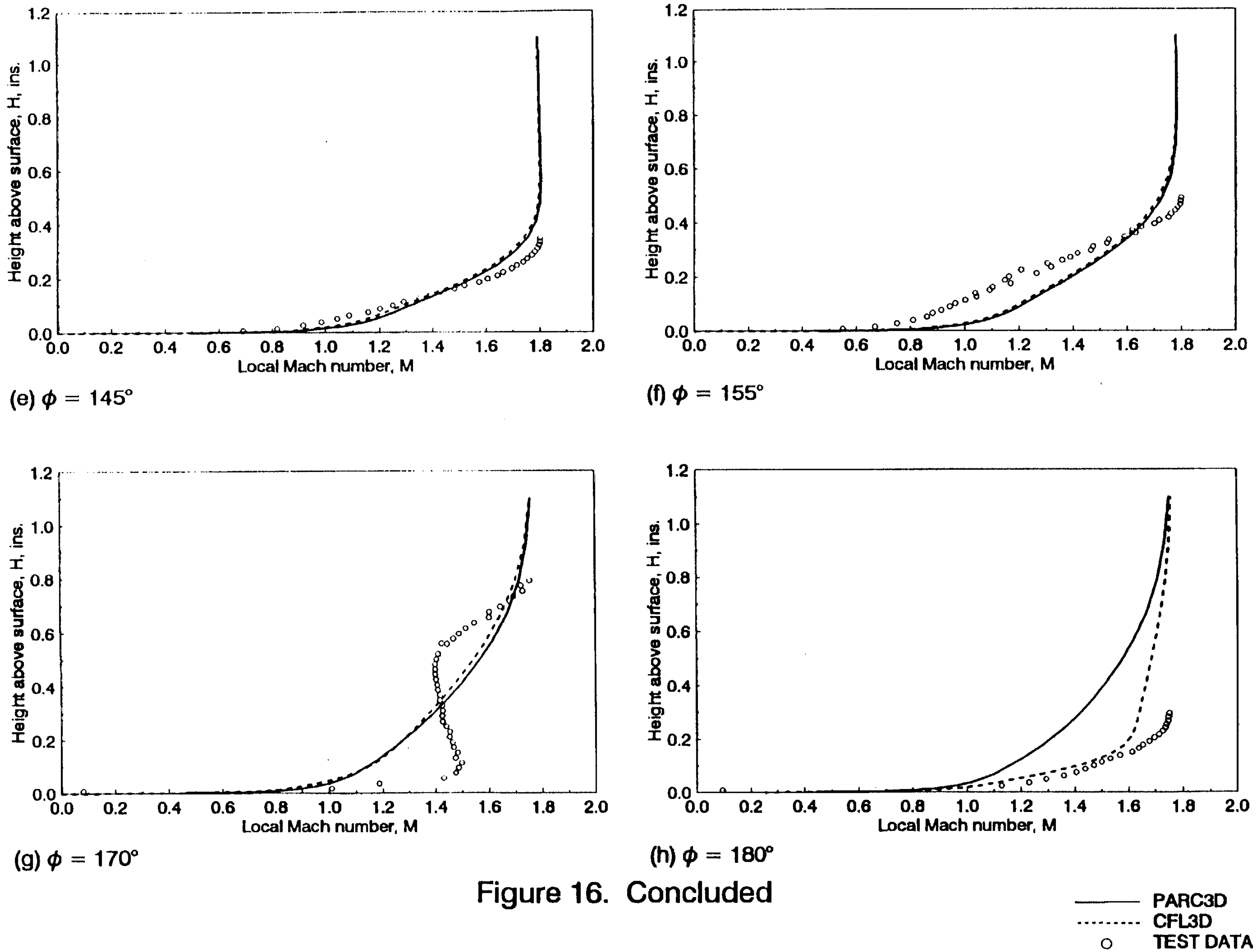


Figure 16. Concluded

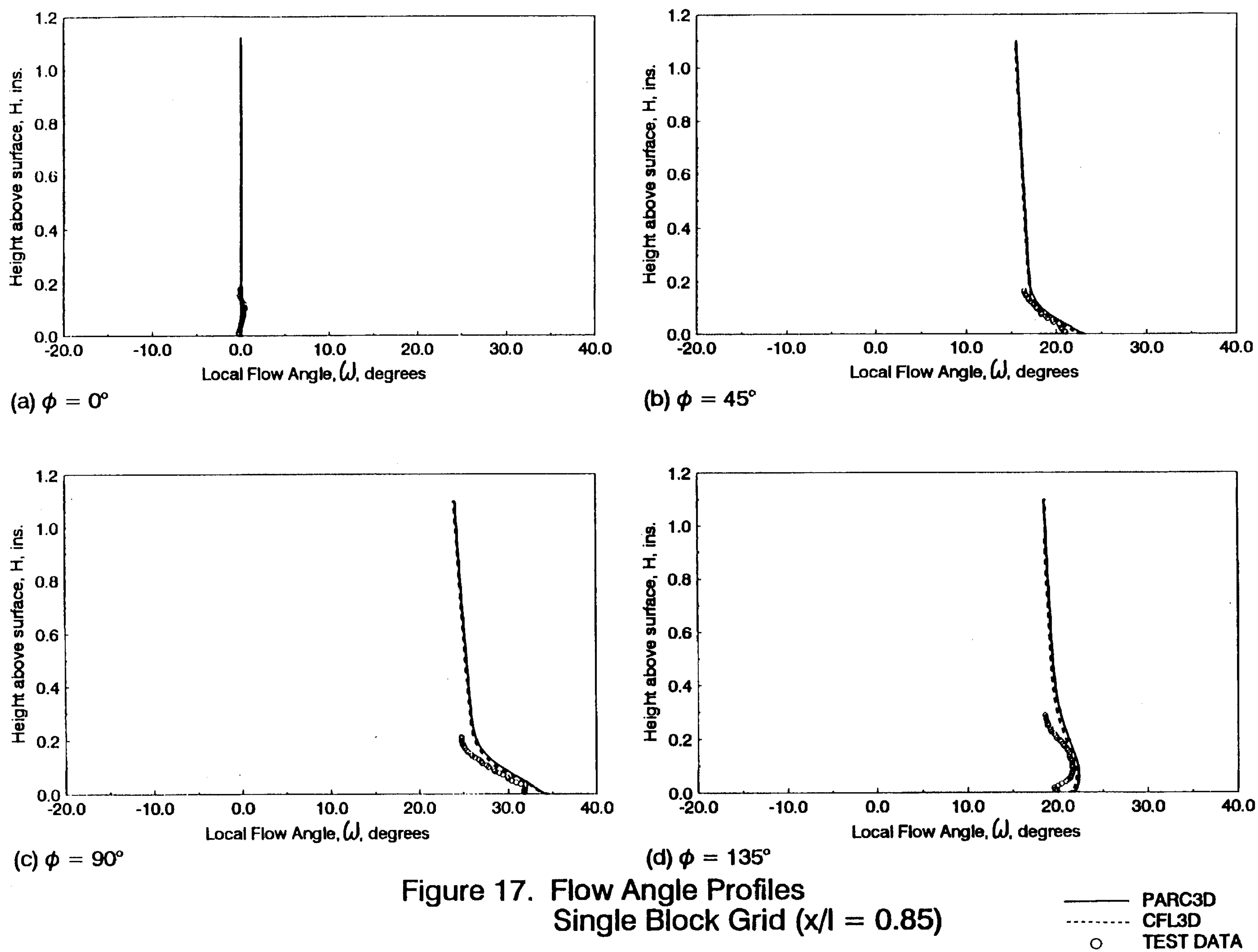
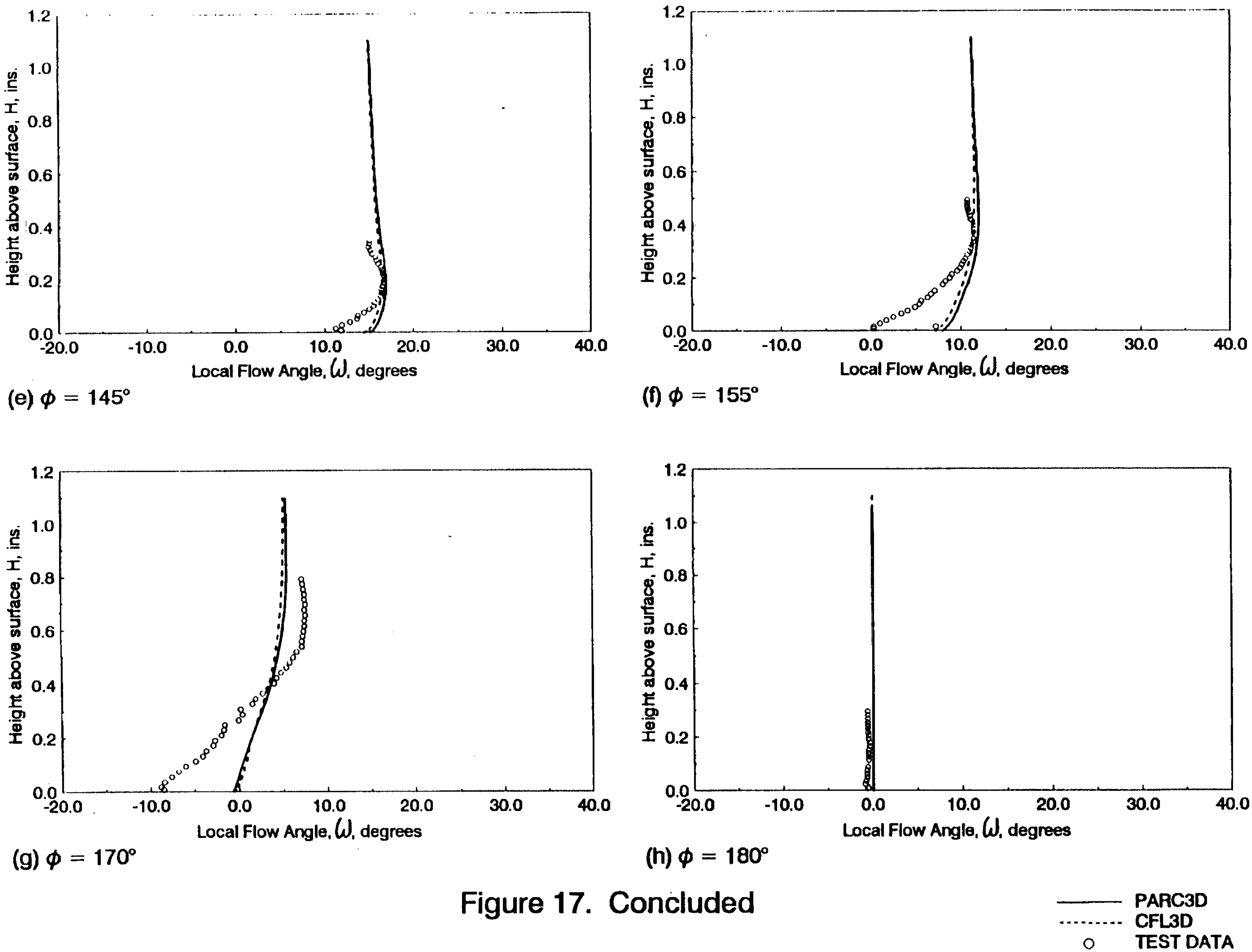


Figure 17. Flow Angle Profiles
Single Block Grid (x/l = 0.85)



(e) ϕ = 145°

(f) ϕ = 155°

(g) ϕ = 170°

(h) ϕ = 180°

Figure 17. Concluded

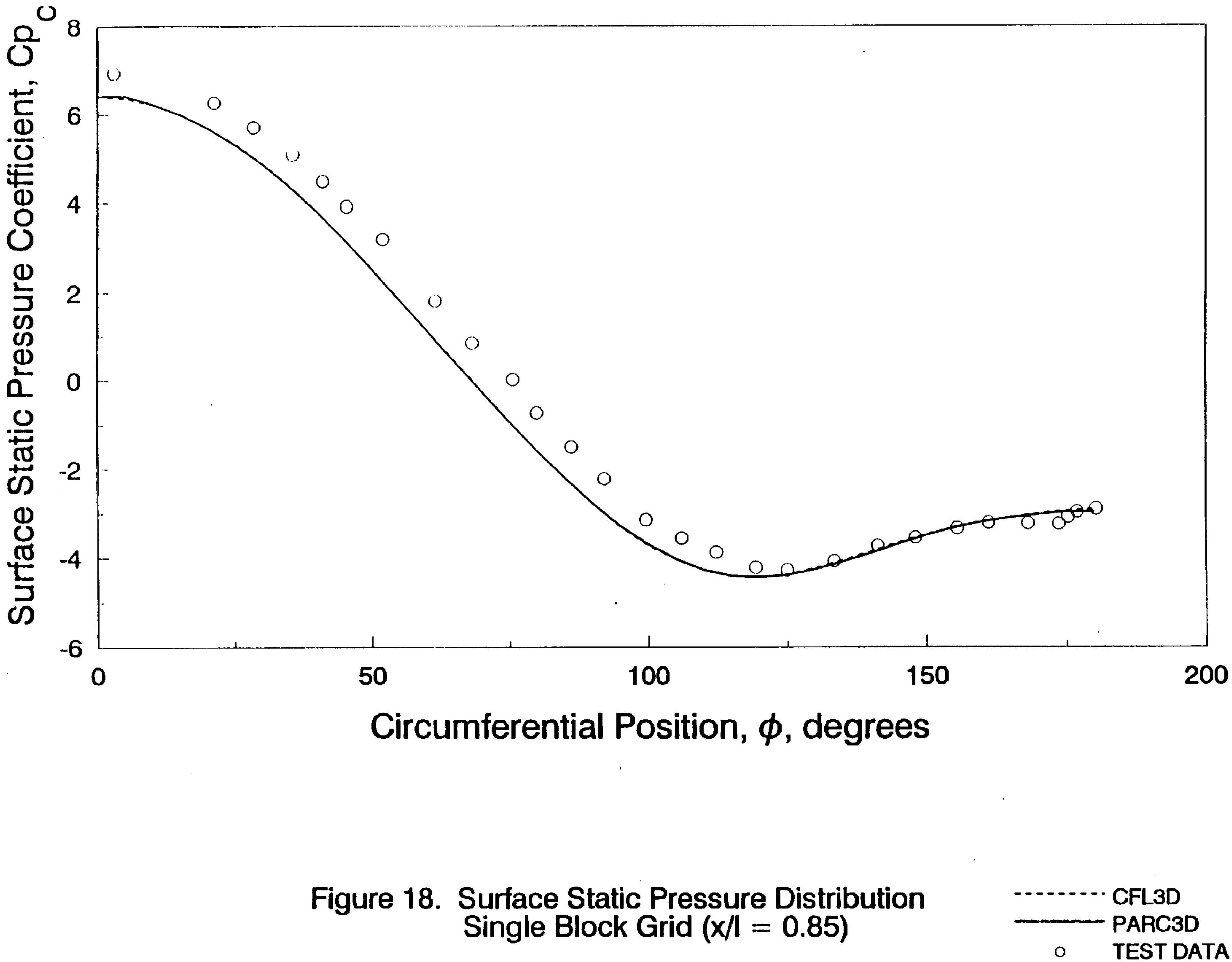


Figure 18. Surface Static Pressure Distribution
Single Block Grid (x/l = 0.85)

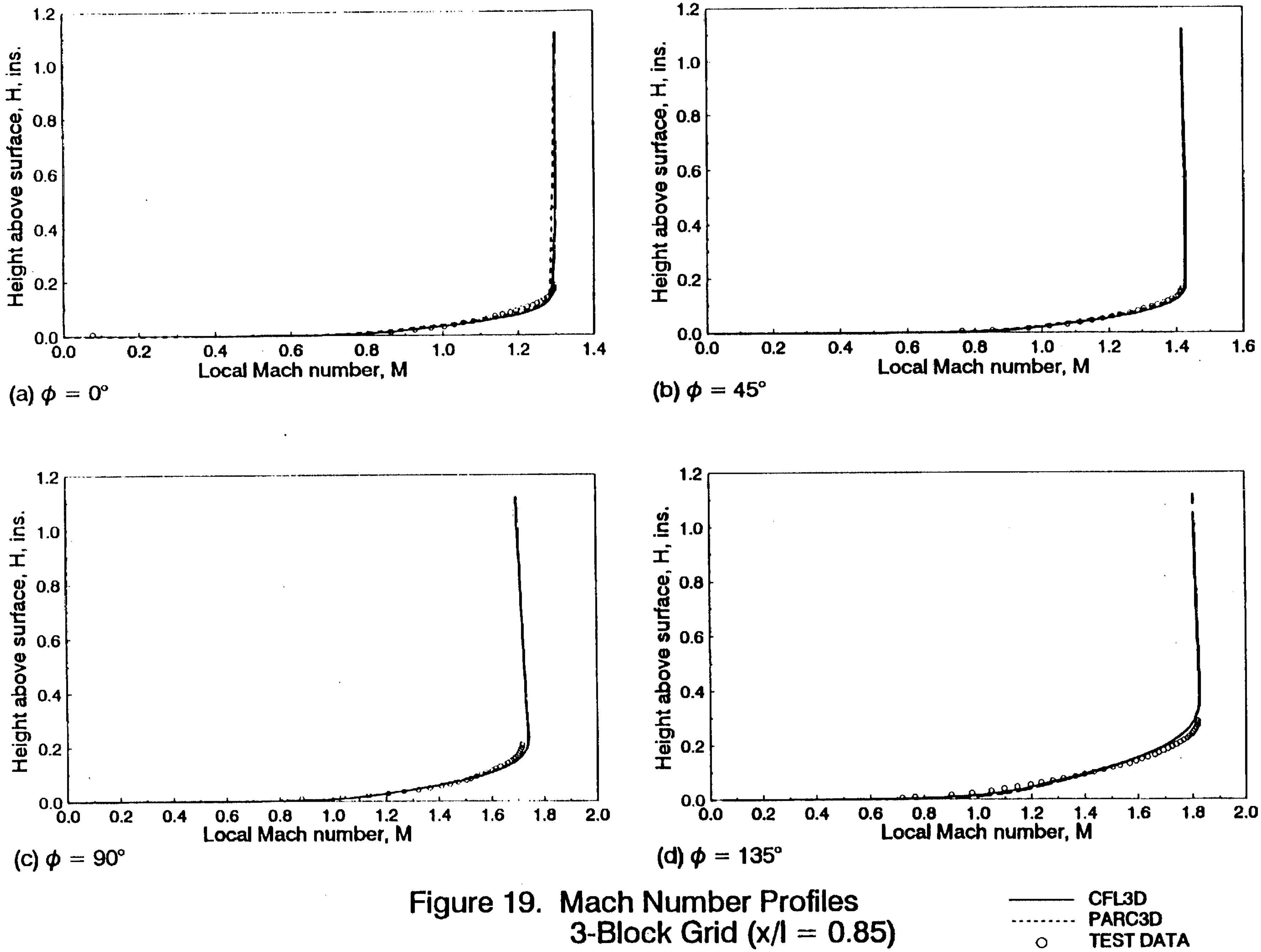


Figure 19. Mach Number Profiles
3-Block Grid (x/l = 0.85)

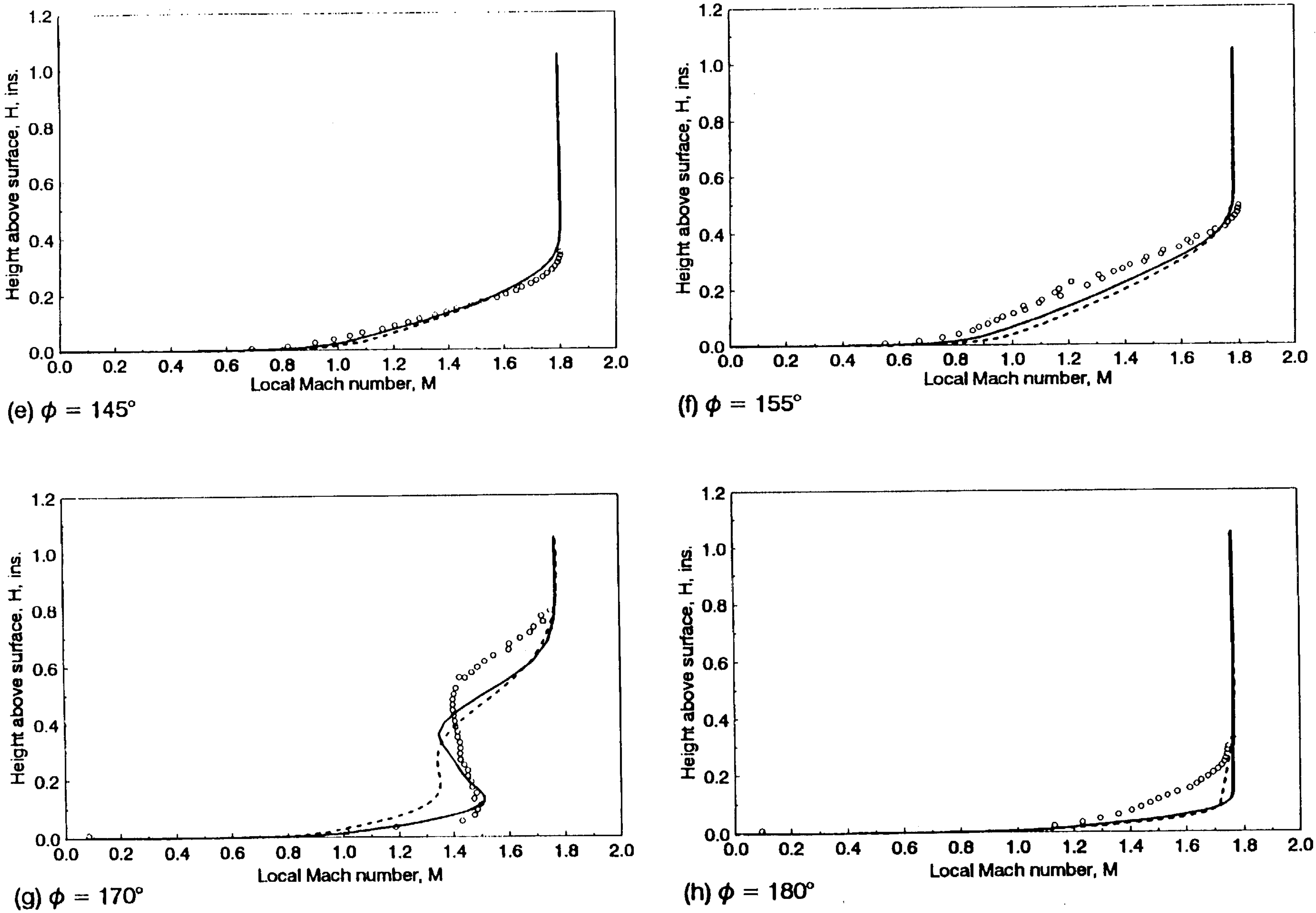
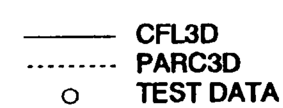
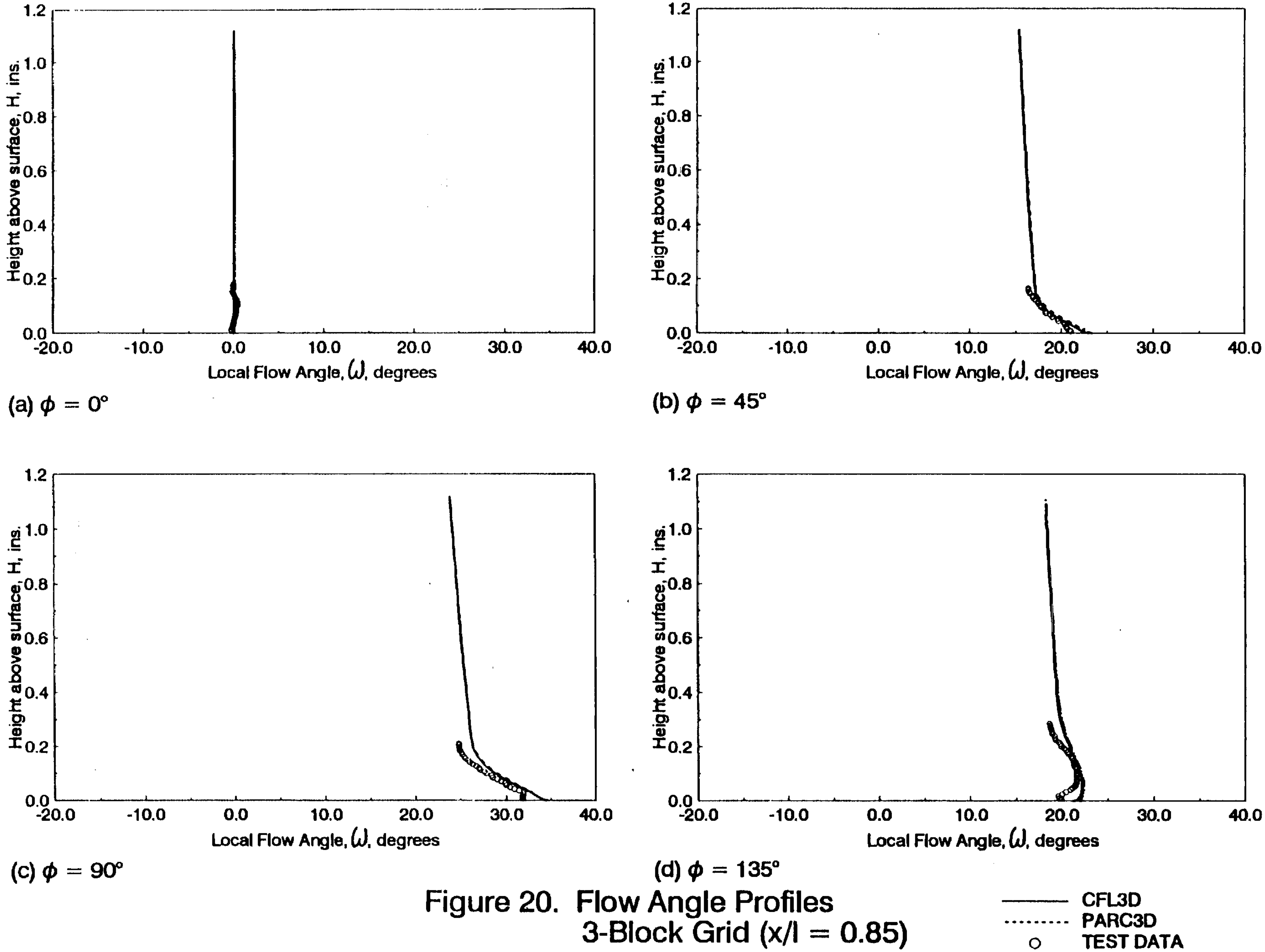


Figure 19. Concluded





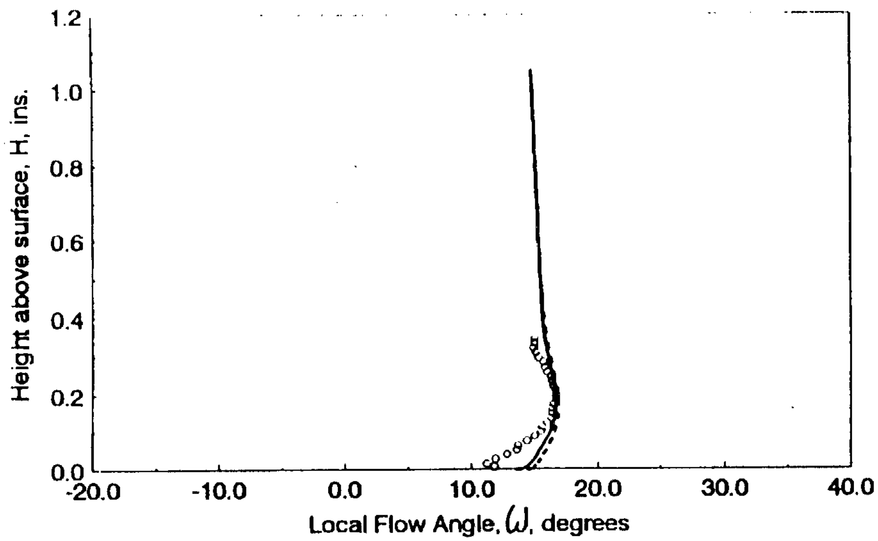
(a) ϕ = 0°

(b) ϕ = 45°

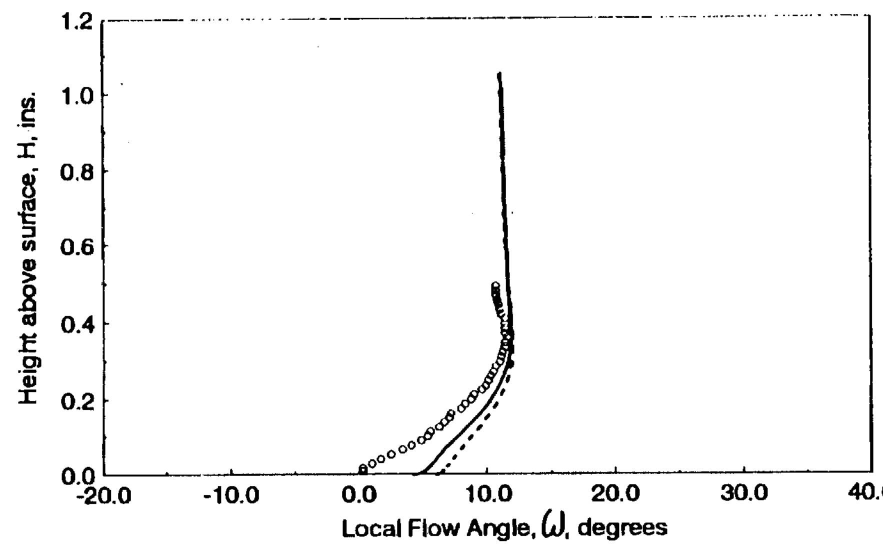
(c) ϕ = 90°

(d) ϕ = 135°

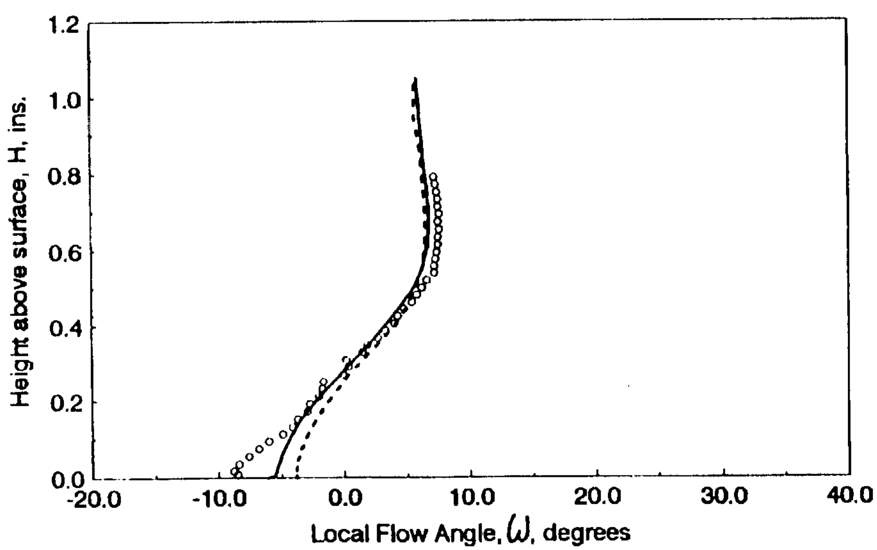
Figure 20. Flow Angle Profiles
3-Block Grid (x/l = 0.85)



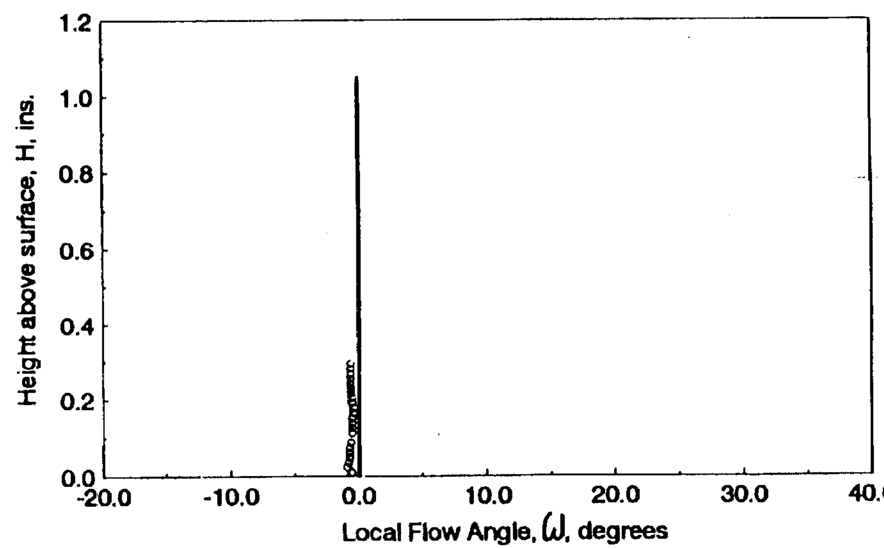
(e) ϕ = 145°



(f) ϕ = 155°



(g) ϕ = 170°



(h) ϕ = 180°

Fiugre 20. Concluded

CFL3D
PARC3D
TEST DATA

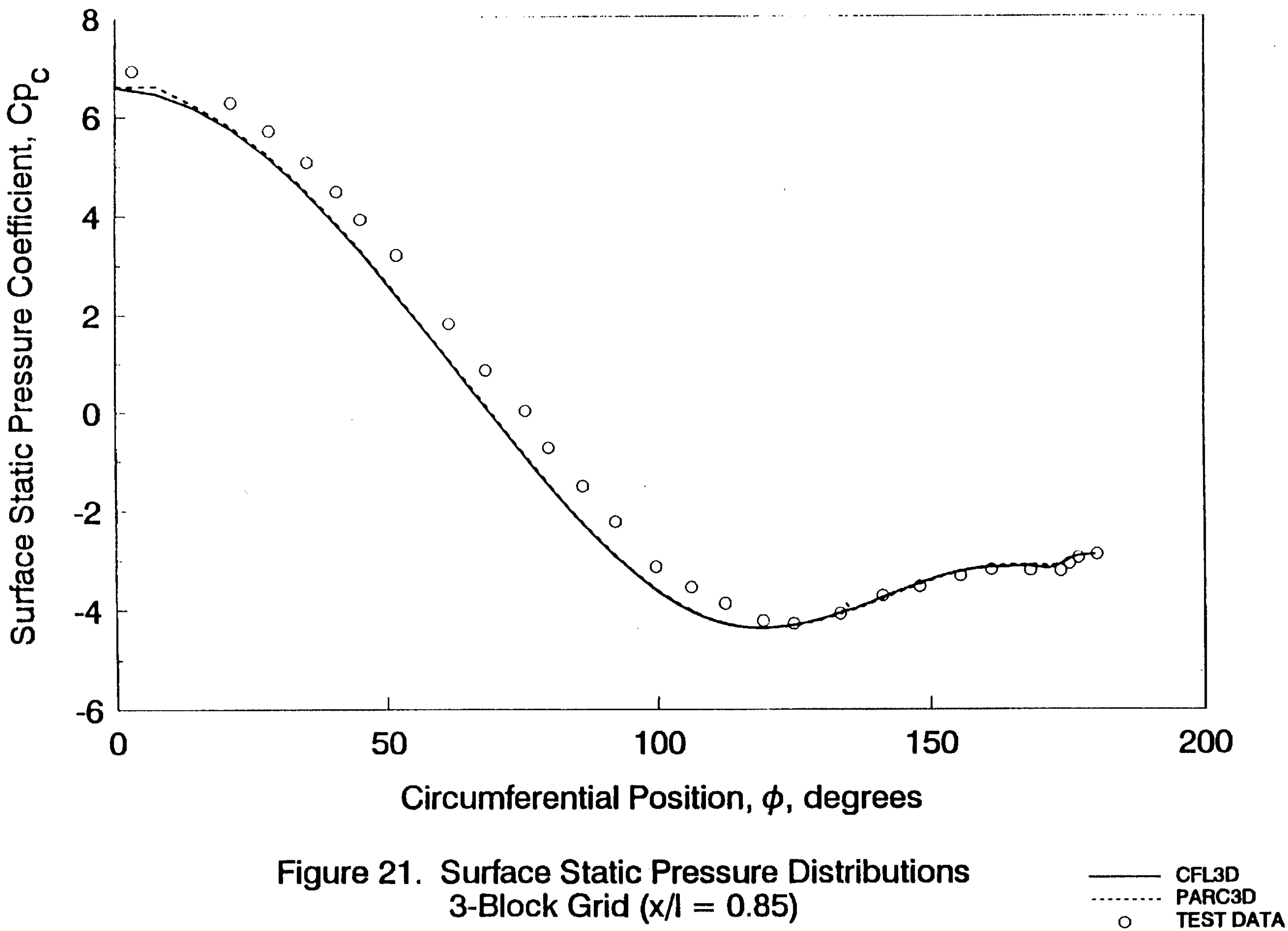


Figure 21. Surface Static Pressure Distributions
3-Block Grid (x/l = 0.85)

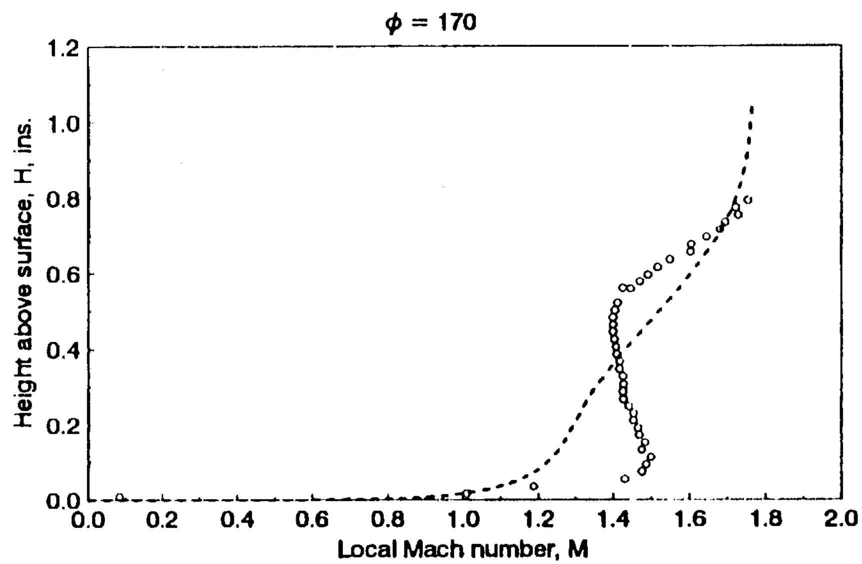


Figure 22a. Length Scale Search to Boundary Layer Edge (x/l = 0.85)

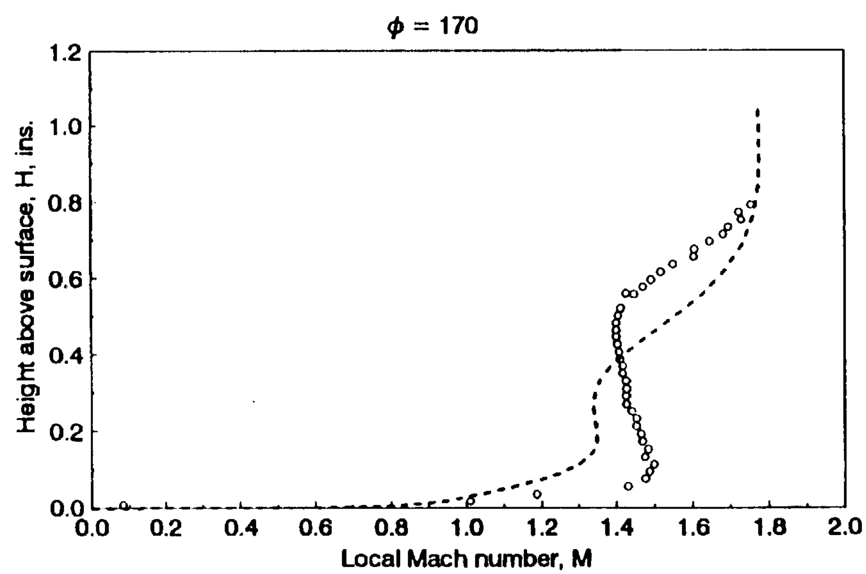


Figure 22b. Length Scale Search to Lower Edge of Vortex (x/l = 0.85)

--------- PARC3D, 3 BLOCK GRID
o TEST DATA

Appendix A

Test Data for Several Cases

Appendix A: Test Data for Several Cases

H	= height above surfaces in inches
ω	= flow angle in degrees relative to cone generator
M/ME	= Mach number / edge Mach number
T/TE	= static temperature / edge static temperature
UB/UE	= velocity / edge velocity
U/UE	= velocity component parallel to edge velocity / edge velocity
V/UE	= velocity component normal to edge velocity / edge velocity
$M * \sin(OM - OME)$	= Mach number * sin (flow angle - edge flow angle)
$M * \cos(OM - OME)$	= Mach number * cos (flow angle - edge flow angle)
$U1/UE$	= velocity component parallel to cone generator / edge velocity
$V1/UE$	= velocity component normal to cone generator / edge velocity
$MSOM$	= Mach number * sin (flow angle)
$MCOM$	= Mach number * cos (flow angle)
PE/POD	= edge static pressure /pitot static pressure outside boundary layer on windward generator
$DEL1$	= streamwise displacement thickness = $\int_0^{h_e} \left(1 - \frac{\rho u}{\rho_e u_e}\right) dh$
$DEL2$	= crossflow displacement thickness = $-\int_0^{h_e} \frac{\rho v}{\rho_e u_e} dh$
$TH11$	= $\int_0^{h_e} \frac{\rho u}{\rho_e u_e}\left(1 - \frac{u}{u_e}\right) dh$
$TH12$	= $\int_0^{h_e} \frac{\rho v}{\rho_e u_e}\left(1 - \frac{u}{u_e}\right) dh$
$TH21$	= $-\int_0^{h_e} \frac{v}{u_e} \frac{\rho u}{\rho_e u_e} dh$
$TH22$	= $-\int_0^{h_e} \frac{\rho v^2}{\rho_e u_e^2} dh$
AL/THC	= angle of attack / cone semi angle
$phipp$	= circumferential angle at which data was taken

RUN NO. 4511 MACH NUMBER 4.241 ALPHA= 0.C AL/THC= 0.0 PHIPP=180.00 PE/POD=0.1056

DEL1= 0.0915 DEL2= 0.0007 TH11= 0.0131 TH21= 0.0006 TH12= -0.0001 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OMF)	M*COS(OM-OMF)	U1/UF	V1/UF	MSOM	MCOM
0.007	0.2	1.339	0.374	2.621	0.606	0.606	-0.0021	-0.0047	1.339	0.606	0.0021	0.005	1.339
0.023	-0.6	2.089	0.584	1.901	0.805	0.805	-0.0141	-0.0365	2.089	0.805	-0.0084	-0.022	2.089
0.041	0.0	2.162	0.604	1.840	0.820	0.820	-0.0057	-0.0151	2.162	0.820	0.0	0.0	2.162
0.060	0.0	2.344	0.655	1.696	0.853	0.853	-0.0060	-0.0164	2.344	0.853	0.0	0.0	2.344
0.078	0.0	2.504	0.700	1.580	0.880	0.880	-0.0061	-0.0175	2.504	0.880	0.0	0.0	2.504
0.097	0.0	2.622	0.733	1.499	0.897	0.897	-0.0063	-0.0183	2.622	0.897	0.0	0.0	2.622
0.116	0.0	2.751	0.769	1.417	0.915	0.915	-0.0056	-0.0168	2.751	0.915	0.0008	0.002	2.751
0.135	0.0	2.851	0.797	1.356	0.928	0.928	-0.0057	-0.0174	2.851	0.928	0.0008	0.002	2.851
0.153	0.3	2.966	0.829	1.290	0.942	0.942	-0.0025	-0.0078	2.966	0.942	0.0041	0.013	2.966
0.173	0.3	3.066	0.857	1.236	0.953	0.953	-0.0008	-0.0027	3.066	0.953	0.0058	0.019	3.066
0.191	0.3	3.163	0.884	1.186	0.963	0.963	-0.0008	-0.0028	3.163	0.963	0.0059	0.019	3.163
0.209	0.3	3.261	0.912	1.138	0.973	0.973	-0.0008	-0.0028	3.261	0.973	0.0059	0.020	3.261
0.228	0.3	3.342	0.934	1.101	0.980	0.980	-0.0009	-0.0029	3.342	0.980	0.0060	0.020	3.342
0.246	0.4	3.402	0.951	1.074	0.985	0.985	0.0	0.0	3.402	0.985	0.0069	0.024	3.402
0.265	0.4	3.462	0.968	1.048	0.991	0.991	0.0	0.0	3.462	0.991	0.0069	0.024	3.462
0.284	0.4	3.499	0.978	1.032	0.994	0.994	0.0	0.0	3.499	0.994	0.0069	0.024	3.499
0.303	0.4	3.530	0.987	1.019	0.996	0.996	0.0	0.0	3.530	0.996	0.0070	0.025	3.530
0.321	0.4	3.558	0.995	1.008	0.998	0.998	0.0	0.0	3.558	0.998	0.0070	0.025	3.558
0.340	0.3	3.571	0.998	1.003	0.999	0.999	-0.0009	-0.0031	3.571	0.999	0.0061	0.022	3.571
0.359	0.4	3.578	1.000	1.000	1.000	1.000	0.0	0.0	3.578	1.000	0.0070	0.025	3.578
0.378	0.4	3.578	1.000	1.000	1.000	1.000	0.0	0.0	3.578	1.000	0.0070	0.025	3.578

ERROR - FLOATING-POINT DIVISION BY ZERO HAS OCCURRED IN SUB-PROGRAM DWEG
- AT ADDRESS 000852 RELATIVE TO THE ENTRY POINT OF DWEG

RUN NO. 4512 MACH NUMBER 4.243 ALPHA= 0.0 AL/THC= 0.0 PHIPP= 0.0 PE/POD=0.1956

DEL1= 0.0922 DEL2= 0.0001 TH11= 0.0132 TH21= 0.0001 TH12= -0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	0.0	1.301	0.364	2.659	0.593	0.593	-0.0062	-0.0136	1.301	0.593	0.0	0.0	1.301
0.016	1.2	1.923	0.538	2.046	0.769	0.769	0.0081	0.0201	1.923	0.769	0.0161	0.040	1.923
0.035	0.3	2.167	0.606	1.836	0.821	0.821	-0.0050	-0.0132	2.167	0.821	0.0036	0.009	2.167
0.053	0.5	2.259	0.631	1.762	0.838	0.838	-0.0007	-0.0020	2.259	0.838	0.0080	0.022	2.259
0.070	0.5	2.431	0.679	1.632	0.868	0.868	-0.0015	-0.0042	2.431	0.868	0.0076	0.021	2.431
0.089	0.5	2.565	0.717	1.537	0.889	0.889	-0.0016	-0.0045	2.565	0.889	0.0078	0.022	2.565
0.108	0.5	2.690	0.752	1.455	0.907	0.907	-0.0016	-0.0047	2.690	0.907	0.0079	0.023	2.690
0.127	0.5	2.800	0.783	1.386	0.921	0.921	-0.0016	-0.0049	2.800	0.921	0.0080	0.024	2.800
0.146	0.5	2.911	0.814	1.321	0.935	0.935	-0.0008	-0.0025	2.911	0.935	0.0090	0.028	2.911
0.164	0.5	3.016	0.843	1.263	0.947	0.947	-0.0008	-0.0026	3.016	0.947	0.0091	0.029	3.016
0.184	0.6	3.120	0.872	1.208	0.958	0.958	0.0	0.0	3.120	0.958	0.0100	0.033	3.119
0.201	0.6	3.206	0.896	1.165	0.967	0.967	0.0	0.0	3.206	0.967	0.0101	0.034	3.205
0.220	0.6	3.301	0.923	1.120	0.976	0.976	0.0	0.0	3.301	0.976	0.0102	0.035	3.301
0.238	0.6	3.373	0.943	1.087	0.983	0.983	0.0	0.0	3.373	0.983	0.0103	0.035	3.373
0.257	0.6	3.431	0.959	1.061	0.988	0.988	0.0	0.0	3.431	0.988	0.0103	0.036	3.431
0.275	0.6	3.480	0.973	1.040	0.992	0.992	0.0	0.0	3.480	0.992	0.0104	0.036	3.480
0.293	0.6	3.521	0.984	1.023	0.995	0.995	0.0	0.0	3.521	0.995	0.0104	0.037	3.521
0.312	0.6	3.548	0.992	1.012	0.998	0.998	0.0	0.0	3.548	0.998	0.0104	0.037	3.548
0.331	0.6	3.565	0.997	1.005	0.999	0.999	0.0	0.0	3.565	0.999	0.0105	0.037	3.565
0.350	0.6	3.577	1.000	1.000	1.000	1.000	0.0	0.0	3.577	1.000	0.0105	0.037	3.577
0.369	0.6	3.577	1.000	1.000	1.000	1.000	0.0	0.0	3.577	1.000	0.0105	0.037	3.577
0.387	0.6	3.578	1.000	1.000	1.000	1.000	0.0	0.0	3.578	1.000	0.0105	0.037	3.578

RUN NO. 4514 MACH NUMBER 4.245 ALPHA= 15.65 AL/THC= 1.252 PHIPP= 0.0 PE/P00=0.2977

DEL1= 0.0401 DEL2= -0.0005 TH11= 0.0095 TH21= -0.0005 TH12= 0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	0.0	1.160	0.465	1.768	0.619	0.619	-0.0065	-0.0121	1.160	0.619	0.0	0.0	1.160
0.007	0.0	1.165	0.467	1.765	0.621	0.621	-0.0065	-0.0122	1.165	0.621	0.0	0.0	1.165
0.008	0.0	1.391	0.558	1.618	0.709	0.709	-0.0074	-0.0146	1.391	0.709	0.0	0.0	1.391
0.008	0.0	1.361	0.546	1.637	0.698	0.698	-0.0073	-0.0143	1.361	0.698	0.0	0.0	1.361
0.013	0.0	1.552	0.622	1.514	0.766	0.766	-0.0074	-0.0149	1.552	0.766	0.0007	0.001	1.552
0.018	0.3	1.697	0.681	1.423	0.812	0.812	-0.0035	-0.0074	1.697	0.812	0.0050	0.010	1.697
0.022	0.6	1.782	0.714	1.372	0.837	0.837	0.0	0.0	1.782	0.837	0.0088	0.019	1.781
0.022	0.3	1.776	0.712	1.376	0.835	0.835	-0.0036	-0.0077	1.776	0.835	0.0051	0.011	1.776
0.026	0.8	1.822	0.731	1.349	0.848	0.848	0.0022	0.0048	1.822	0.848	0.0111	0.024	1.822
0.031	0.8	1.872	0.751	1.319	0.862	0.862	0.0023	0.0049	1.872	0.862	0.0113	0.025	1.872
0.035	0.8	1.900	0.762	1.303	0.870	0.870	0.0023	0.0050	1.900	0.870	0.0114	0.025	1.900
0.035	0.6	1.897	0.761	1.304	0.869	0.869	0.0008	0.0017	1.897	0.869	0.0099	0.022	1.897
0.040	0.8	1.902	0.763	1.302	0.870	0.870	0.0030	0.0066	1.902	0.870	0.0122	0.027	1.902
0.045	0.9	1.896	0.760	1.305	0.869	0.869	0.0045	0.0099	1.896	0.869	0.0136	0.030	1.896
0.048	0.8	1.896	0.760	1.305	0.869	0.869	0.0038	0.0083	1.896	0.869	0.0129	0.028	1.896
0.049	0.8	1.912	0.767	1.296	0.873	0.873	0.0038	0.0083	1.912	0.873	0.0129	0.028	1.912
0.054	0.9	1.930	0.774	1.286	0.878	0.878	0.0046	0.0101	1.930	0.878	0.0138	0.030	1.930
0.059	0.9	1.977	0.793	1.259	0.890	0.890	0.0047	0.0104	1.977	0.890	0.0140	0.031	1.977
0.061	0.8	1.995	0.800	1.249	0.894	0.894	0.0039	0.0087	1.995	0.894	0.0133	0.030	1.995
0.063	0.9	1.984	0.796	1.255	0.891	0.891	0.0047	0.0104	1.984	0.891	0.0140	0.031	1.984
0.074	0.8	2.093	0.839	1.196	0.918	0.918	0.0040	0.0091	2.093	0.918	0.0136	0.031	2.093
0.087	0.8	2.169	0.870	1.156	0.935	0.935	0.0041	0.0095	2.168	0.935	0.0139	0.032	2.168
0.100	0.8	2.237	0.897	1.121	0.950	0.950	0.0041	0.0098	2.237	0.950	0.0141	0.033	2.237
0.114	0.8	2.299	0.922	1.091	0.963	0.963	0.0042	0.0100	2.299	0.963	0.0143	0.034	2.299
0.128	0.8	2.358	0.946	1.062	0.975	0.975	0.0043	0.0103	2.358	0.974	0.0145	0.035	2.357
0.141	0.8	2.404	0.964	1.041	0.984	0.984	0.0043	0.0105	2.404	0.983	0.0146	0.036	2.404
0.155	0.8	2.436	0.977	1.026	0.990	0.990	0.0035	0.0085	2.436	0.989	0.0138	0.034	2.436
0.169	0.8	2.459	0.986	1.016	0.994	0.994	0.0035	0.0086	2.459	0.994	0.0139	0.034	2.458
0.182	0.7	2.474	0.992	1.009	0.996	0.996	0.0017	0.0043	2.474	0.996	0.0122	0.030	2.474
0.196	0.6	2.485	0.996	1.004	0.998	0.998	0.0009	0.0022	2.485	0.998	0.0113	0.028	2.485
0.208	0.6	2.491	0.999	1.001	1.000	1.000	0.0	0.0	2.491	1.000	0.0105	0.026	2.491
0.222	0.6	2.492	0.999	1.001	1.000	1.000	0.0	0.0	2.492	1.000	0.0105	0.026	2.492
0.235	0.6	2.494	1.000	1.000	1.000	1.000	0.0	0.0	2.494	1.000	0.0105	0.026	2.493

RUN NO. 4516 MACH NUMBER 4.243 ALPHA= 15.65 AL/THC= 1.252 PHIPP= 22.50 PE/POD=0.2759

DEL1= 0.0409 DEL2= -0.0017 TH11= 0.0094 TH21= -0.0016 TH12= 0.0002 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	6.9	1.180	0.464	1.794	0.621	0.621	0.0173	0.0329	1.179	0.617	0.0752	0.143	1.171
0.007	7.2	1.191	0.468	1.787	0.626	0.626	0.0208	0.0395	1.190	0.621	0.0790	0.150	1.181
0.008	7.3	1.295	0.509	1.718	0.667	0.667	0.0227	0.0441	1.294	0.662	0.0848	0.165	1.284
0.011	6.6	1.535	0.604	1.559	0.754	0.753	0.0171	0.0348	1.535	0.749	0.0873	0.178	1.525
0.016	6.6	1.694	0.666	1.457	0.804	0.804	0.0175	0.0369	1.693	0.799	0.0924	0.195	1.683
0.020	6.8	1.775	0.698	1.407	0.828	0.828	0.0217	0.0465	1.774	0.822	0.0987	0.212	1.762
0.021	6.6	1.791	0.704	1.397	0.832	0.832	0.0189	0.0406	1.791	0.827	0.0964	0.207	1.779
0.026	6.6	1.843	0.724	1.366	0.847	0.847	0.0185	0.0402	1.842	0.841	0.0973	0.212	1.830
0.031	6.6	1.896	0.745	1.335	0.861	0.861	0.0188	0.0414	1.895	0.855	0.0990	0.218	1.883
0.034	6.8	1.923	0.756	1.319	0.868	0.868	0.0227	0.0503	1.922	0.862	0.1035	0.229	1.909
0.035	6.5	1.929	0.758	1.315	0.870	0.870	0.0182	0.0404	1.929	0.864	0.0992	0.220	1.917
0.040	6.6	1.918	0.754	1.321	0.867	0.867	0.0189	0.0418	1.918	0.861	0.0996	0.220	1.905
0.045	6.6	1.921	0.755	1.320	0.868	0.867	0.0189	0.0419	1.921	0.862	0.0997	0.221	1.908
0.048	6.9	1.924	0.756	1.318	0.868	0.868	0.0235	0.0520	1.923	0.862	0.1043	0.231	1.910
0.050	6.5	1.937	0.762	1.310	0.872	0.872	0.0183	0.0406	1.937	0.866	0.0995	0.221	1.925
0.055	6.4	1.978	0.778	1.287	0.882	0.882	0.0169	0.0380	1.978	0.877	0.0991	0.222	1.966
0.060	6.3	2.020	0.794	1.263	0.892	0.892	0.0148	0.0335	2.019	0.887	0.0979	0.222	2.007
0.062	6.8	2.045	0.804	1.249	0.899	0.898	0.0235	0.0535	2.045	0.892	0.1072	0.244	2.031
0.065	6.2	2.052	0.807	1.245	0.900	0.900	0.0141	0.0322	2.051	0.895	0.0980	0.223	2.039
0.076	6.3	2.141	0.842	1.197	0.921	0.921	0.0153	0.0355	2.140	0.915	0.1010	0.235	2.128
0.090	6.1	2.229	0.876	1.150	0.940	0.940	0.0131	0.0311	2.229	0.935	0.1007	0.239	2.216
0.106	6.1	2.302	0.905	1.114	0.955	0.955	0.0125	0.0301	2.301	0.950	0.1015	0.245	2.289
0.120	6.0	2.362	0.929	1.084	0.967	0.967	0.0118	0.0289	2.361	0.961	0.1019	0.249	2.348
0.134	5.6	2.421	0.952	1.056	0.978	0.978	0.0051	0.0127	2.421	0.973	0.0963	0.238	2.409
0.149	5.5	2.465	0.969	1.036	0.986	0.986	0.0034	0.0086	2.465	0.981	0.0954	0.238	2.453
0.163	5.5	2.498	0.982	1.021	0.992	0.992	0.0026	0.0065	2.498	0.987	0.0951	0.239	2.486
0.178	5.4	2.518	0.990	1.011	0.996	0.996	0.0017	0.0044	2.518	0.991	0.0946	0.239	2.507
0.193	5.4	2.531	0.995	1.006	0.998	0.998	0.0009	0.0022	2.531	0.993	0.0939	0.238	2.519
0.207	5.3	2.538	0.998	1.002	0.999	0.999	0.0	0.0	2.538	0.995	0.0932	0.237	2.527
0.221	5.3	2.541	0.999	1.001	1.000	1.000	0.0	0.0	2.541	0.995	0.0932	0.237	2.530
0.236	5.3	2.543	1.000	1.000	1.000	1.000	0.0	0.0	2.543	0.996	0.0932	0.237	2.532

RUN NO. 4518 MACH NUMBER 4.244 ALPHA= 15.65 AL/THC= 1.252 PHIPP= 45.00 PE/POD=1.2163

DEL1= 0.0471 DEL2= -0.0041 TH11= 0.0100 TH21= -0.0036 TH12= 0.0004 TH22= -0.0001

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	12.9	1.216	0.447	1.915	0.618	0.618	0.0317	0.0624	1.215	0.603	0.1385	0.272	1.185
0.007	12.9	1.294	0.476	1.859	0.648	0.647	0.0334	0.0666	1.293	0.632	0.1453	0.290	1.261
0.009	12.9	1.337	0.491	1.828	0.664	0.663	0.0341	0.0686	1.335	0.647	0.1487	0.299	1.303
0.012	13.6	1.578	0.580	1.656	0.746	0.745	0.0471	0.0996	1.575	0.725	0.1757	0.372	1.534
0.017	13.6	1.761	0.647	1.531	0.801	0.799	0.0506	0.1112	1.758	0.778	0.1886	0.415	1.712
0.020	14.1	1.838	0.675	1.481	0.822	0.820	0.0588	0.1314	1.833	0.797	0.2002	0.448	1.782
0.022	13.7	1.855	0.682	1.470	0.826	0.825	0.0533	0.1197	1.852	0.803	0.1957	0.439	1.803
0.026	13.5	1.918	0.705	1.430	0.843	0.841	0.0508	0.1157	1.914	0.819	0.1961	0.446	1.865
0.031	13.3	1.974	0.725	1.395	0.856	0.855	0.0487	0.1122	1.970	0.834	0.1964	0.453	1.921
0.035	13.8	1.996	0.733	1.381	0.862	0.860	0.0571	0.1323	1.992	0.837	0.2056	0.476	1.939
0.036	13.1	2.002	0.735	1.378	0.863	0.862	0.0473	0.1096	1.999	0.841	0.1962	0.455	1.949
0.040	13.1	1.998	0.734	1.380	0.862	0.861	0.0472	0.1094	1.995	0.840	0.1960	0.454	1.946
0.045	13.0	1.995	0.733	1.381	0.862	0.861	0.0451	0.1044	1.993	0.840	0.1938	0.449	1.944
0.049	13.5	2.003	0.736	1.377	0.863	0.862	0.0527	0.1223	1.999	0.840	0.2016	0.468	1.947
0.063	12.9	2.135	0.785	1.298	0.894	0.893	0.0452	0.1080	2.133	0.871	0.1995	0.477	2.081
0.050	12.8	2.028	0.745	1.362	0.869	0.868	0.0419	0.0976	2.025	0.848	0.1920	0.448	1.978
0.056	12.6	2.072	0.761	1.335	0.880	0.879	0.0402	0.0947	2.070	0.858	0.1922	0.453	2.022
0.060	12.4	2.113	0.776	1.311	0.889	0.888	0.0372	0.0885	2.111	0.868	0.1909	0.454	2.064
0.065	12.2	2.155	0.792	1.286	0.898	0.898	0.0342	0.0820	2.154	0.878	0.1895	0.455	2.107
0.070	12.1	2.196	0.807	1.263	0.907	0.906	0.0329	0.0797	2.195	0.887	0.1898	0.460	2.147
0.075	12.0	2.231	0.820	1.244	0.914	0.914	0.0316	0.0771	2.230	0.894	0.1897	0.463	2.183
0.078	12.4	2.244	0.824	1.236	0.917	0.916	0.0384	0.0940	2.242	0.895	0.1969	0.482	2.192
0.080	11.8	2.262	0.831	1.227	0.920	0.920	0.0286	0.0702	2.260	0.901	0.1879	0.462	2.21[illegible]
0.093	12.1	2.343	0.861	1.183	0.936	0.936	0.0343	0.0859	2.341	0.915	0.1963	0.491	2.291
0.109	11.5	2.428	0.892	1.139	0.952	0.952	0.0249	0.0635	2.427	0.933	0.1878	0.484	2.379
0.124	11.3	2.503	0.920	1.101	0.965	0.965	0.0219	0.0568	2.503	0.947	0.1891	0.491	2.455
0.139	10.5	2.565	0.942	1.071	0.976	0.976	0.0094	0.0246	2.565	0.959	0.1786	0.470	2.522
0.155	10.4	2.614	0.960	1.049	0.983	0.983	0.0077	0.0205	2.614	0.967	0.1784	0.474	2.571
0.170	10.3	2.650	0.974	1.032	0.989	0.989	0.0060	0.0162	2.650	0.973	0.1777	0.476	2.607
0.185	10.3	2.673	0.982	1.022	0.993	0.993	0.0052	0.0140	2.673	0.977	0.1775	0.478	2.630
0.200	10.1	2.691	0.989	1.014	0.995	0.995	0.0017	0.0047	2.691	0.980	0.1746	0.472	2.649
0.215	10.1	2.699	0.991	1.010	0.997	0.997	0.0017	0.0047	2.699	0.981	0.1748	0.473	2.657
0.230	10.0	2.706	0.994	1.007	0.998	0.998	0.0	0.0	2.706	0.982	0.1732	0.470	2.665
0.245	10.0	2.709	0.995	1.006	0.998	0.998	0.0	0.0	2.709	0.983	0.1733	0.470	2.668
0.260	10.0	2.713	0.997	1.004	0.999	0.999	0.0	0.0	2.713	0.984	0.1734	0.471	2.672
0.275	10.0	2.718	0.999	1.002	0.999	0.999	0.0	0.0	2.718	0.984	0.1735	0.472	2.676
0.290	10.0	2.722	1.000	1.000	1.000	1.000	0.0	0.0	2.722	0.985	0.1736	0.473	2.680

RUN NO. 4520 MACH NUMBER 4.247 ALPHA= 15.65 AL/THC= 1.252 PHIPP= 67.50 PE/POO=0.1504

DEL1= 0.C608 DEL2= -0.0054 TH11= 0.0113 TH21= -0.0047 TH12= 0.0007 TH22= -0.0003

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OMF)	M*COS(OM-OMF)	U1/UE	V1/UE	MSOM	MCOM
0.007	19.9	1.158	0.386	2.208	0.573	0.570	0.0661	0.1335	1.150	0.539	0.1952	0.394	1.089
0.009	19.9	1.414	0.471	2.000	0.667	0.662	0.0768	0.1630	1.405	0.627	0.2269	0.481	1.330
0.012	18.6	1.575	0.525	1.872	0.718	0.715	0.0668	0.1466	1.568	0.681	0.2293	0.503	1.492
0.017	18.5	1.761	0.587	1.728	0.772	0.769	0.0708	0.1615	1.754	0.732	0.2454	0.560	1.670
0.022	18.5	1.893	0.631	1.631	0.806	0.802	0.0736	0.1729	1.885	0.764	0.2559	0.601	1.795
0.023	19.1	1.921	0.640	1.611	0.813	0.809	0.0830	0.1962	1.911	0.768	0.2665	0.630	1.815
0.026	18.3	1.956	0.652	1.586	0.821	0.818	0.0724	0.1725	1.949	0.780	0.2584	0.616	1.857
0.031	18.2	2.013	0.671	1.547	0.834	0.831	0.0713	0.1719	2.005	0.793	0.2603	0.628	1.912
0.036	17.9	2.050	0.683	1.522	0.843	0.840	0.0676	0.1644	2.043	0.802	0.2587	0.629	1.951
0.038	18.6	2.047	0.682	1.523	0.842	0.839	0.0781	0.1898	2.038	0.798	0.2686	0.653	1.940
0.040	17.8	2.055	0.685	1.518	0.844	0.841	0.0671	0.1633	2.048	0.803	0.2585	0.629	1.956
0.045	17.7	2.057	0.686	1.516	0.844	0.842	0.0657	0.1600	2.051	0.804	0.2573	0.627	1.959
0.050	17.4	2.081	0.694	1.500	0.850	0.847	0.0613	0.1502	2.076	0.811	0.2544	0.623	1.986
0.052	18.0	2.101	0.700	1.487	0.854	0.851	0.0703	0.1729	2.094	0.812	0.2639	0.649	1.998
0.055	17.2	2.130	0.710	1.468	0.860	0.858	0.0582	0.1442	2.125	0.822	0.2538	0.629	2.036
0.060	17.0	2.183	0.728	1.433	0.871	0.869	0.0562	0.1409	2.179	0.833	0.2545	0.638	2.088
0.065	16.6	2.219	0.740	1.411	0.878	0.877	0.0506	0.1277	2.215	0.842	0.2507	0.633	2.126
0.066	17.0	2.253	0.751	1.389	0.885	0.883	0.0577	0.1470	2.249	0.847	0.2591	0.660	2.155
0.069	16.5	2.263	0.754	1.384	0.887	0.886	0.0492	0.1255	2.259	0.851	0.2513	0.641	2.170
0.074	16.3	2.306	0.769	1.357	0.895	0.894	0.0478	0.1231	2.302	0.859	0.2519	0.649	2.213
0.079	16.0	2.338	0.779	1.338	0.901	0.900	0.0434	0.1126	2.335	0.866	0.2490	0.646	2.247
0.081	16.2	2.362	0.787	1.323	0.906	0.905	0.0461	0.1203	2.359	0.870	0.2527	0.659	2.268
0.084	15.9	2.373	0.791	1.317	0.908	0.907	0.0409	0.1068	2.371	0.873	0.2481	0.649	2.283
0.089	15.8	2.409	0.803	1.296	0.914	0.913	0.0399	0.1051	2.407	0.880	0.2486	0.655	2.318
0.093	15.6	2.442	0.814	1.277	0.920	0.919	0.0376	0.0997	2.440	0.886	0.2477	0.658	2.352
0.097	15.8	2.466	0.822	1.263	0.924	0.923	0.0413	0.1102	2.464	0.889	0.2522	0.673	2.373
0.098	15.3	2.473	0.824	1.260	0.925	0.924	0.0333	0.0889	2.471	0.892	0.2447	0.654	2.384
0.103	15.2	2.499	0.833	1.245	0.929	0.929	0.0315	0.0846	2.497	0.897	0.2440	0.656	2.411
0.108	15.1	2.528	0.843	1.229	0.934	0.934	0.0300	0.0812	2.527	0.902	0.2437	0.660	2.441
0.112	15.3	2.556	0.852	1.214	0.939	0.938	0.0328	0.0892	2.554	0.906	0.2474	0.674	2.466
0.127	14.9	2.639	0.880	1.170	0.952	0.951	0.0262	0.0728	2.638	0.920	0.2440	0.677	2.550
0.142	14.6	2.708	0.903	1.135	0.962	0.962	0.0225	0.0633	2.708	0.931	0.2428	0.684	2.621
0.157	14.2	2.780	0.927	1.100	0.972	0.972	0.0159	0.0456	2.780	0.942	0.2387	0.683	2.695
0.172	14.0	2.835	0.945	1.074	0.979	0.979	0.0120	0.0346	2.835	0.950	0.2366	0.685	2.751
0.188	13.7	2.880	0.960	1.053	0.985	0.985	0.0069	0.0201	2.880	0.957	0.2330	0.681	2.799
0.202	13.5	2.918	0.973	1.036	0.990	0.990	0.0038	0.0112	2.918	0.963	0.2311	0.681	2.837
0.217	13.4	2.943	0.981	1.025	0.993	0.993	0.0014	0.0041	2.943	0.966	0.2295	0.680	2.864
0.231	13.3	2.958	0.986	1.018	0.995	0.995	0.0007	0.0021	2.957	0.968	0.2292	0.681	2.878
0.246	13.3	2.967	0.989	1.014	0.996	0.996	0.0007	0.0021	2.967	0.969	0.2295	0.684	2.887
0.261	13.3	2.979	0.993	1.009	0.998	0.998	0.0003	0.0010	2.979	0.971	0.2295	0.685	2.899
0.276	13.2	2.987	0.996	1.006	0.998	0.998	-0.0007	-0.0021	2.987	0.972	0.2287	0.684	2.908
0.291	13.3	3.000	1.000	1.000	1.000	1.000	0.0	0.0	3.000	0.973	0.2297	0.689	2.920

RUN NO. 4522 MACH NUMBER 4.245 ALPHA= 15.65 AI/THC= 1.252 PHIPP= 90.00 PE/POO=0.0930

DEL1= 0.0851 DEL2= -0.0091 TH11= 0.0132 TH21= -0.0080 TH12= 0.0011 TH22= -0.0006

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	23.0	1.185	0.348	2.595	0.560	0.555	0.0770	0.1629	1.174	0.516	0.2187	0.463	1.091
0.009	23.0	1.322	0.388	2.463	0.609	0.603	0.0837	0.1817	1.309	0.560	0.2376	0.516	1.217
0.013	23.0	1.565	0.459	2.231	0.686	0.679	0.0945	0.2157	1.551	0.631	0.2680	0.612	1.441
0.013	23.9	1.640	0.481	2.162	0.707	0.699	0.1087	0.2520	1.620	0.646	0.2867	0.665	1.499
0.017	23.0	1.785	0.524	2.030	0.746	0.739	0.1026	0.2454	1.768	0.687	0.2913	0.697	1.644
0.022	22.9	1.924	0.564	1.910	0.780	0.773	0.1067	0.2631	1.906	0.718	0.3040	0.750	1.772
0.027	22.5	2.007	0.589	1.841	0.799	0.792	0.1037	0.2606	1.990	0.738	0.3062	0.769	1.854
0.031	22.7	2.040	0.599	1.814	0.806	0.799	0.1063	0.2691	2.023	0.744	0.3106	0.786	1.883
0.032	22.3	2.063	0.605	1.796	0.811	0.804	0.1025	0.2607	2.046	0.750	0.3082	0.784	1.908
0.037	22.3	2.103	0.617	1.764	0.819	0.813	0.1033	0.2651	2.086	0.758	0.3112	0.799	1.946
0.042	22.1	2.111	0.619	1.757	0.821	0.815	0.1001	0.2573	2.095	0.761	0.3086	0.794	1.956
0.047	21.7	2.121	0.622	1.750	0.823	0.818	0.0955	0.2460	2.107	0.765	0.3049	0.786	1.970
0.047	22.0	2.129	0.625	1.743	0.825	0.819	0.0988	0.2550	2.114	0.765	0.3084	0.796	1.975
0.052	21.6	2.174	0.638	1.709	0.834	0.828	0.0944	0.2461	2.160	0.775	0.3066	0.800	2.021
0.057	21.1	2.229	0.654	1.667	0.844	0.840	0.0888	0.2345	2.217	0.788	0.3042	0.803	2.079
0.062	20.9	2.281	0.669	1.629	0.854	0.850	0.0872	0.2329	2.269	0.798	0.3052	0.815	2.130
0.066	20.6	2.330	0.684	1.593	0.863	0.859	0.0830	0.2241	2.319	0.808	0.3036	0.820	2.181
0.065	20.8	2.299	0.675	1.615	0.857	0.853	0.0860	0.2308	2.288	0.801	0.3050	0.818	2.149
0.072	20.4	2.376	0.697	1.561	0.871	0.867	0.0808	0.2203	2.366	0.816	0.3036	0.828	2.227
0.077	20.2	2.425	0.712	1.527	0.879	0.876	0.0785	0.2164	2.416	0.825	0.3036	0.837	2.276
0.082	19.9	2.468	0.724	1.498	0.886	0.883	0.0742	0.2065	2.459	0.833	0.3014	0.839	2.321
0.082	20.0	2.461	0.722	1.503	0.885	0.882	0.0759	0.2111	2.452	0.832	0.3028	0.842	2.313
0.087	19.8	2.503	0.734	1.475	0.892	0.889	0.0731	0.2051	2.495	0.839	0.3018	0.847	2.356
0.092	19.5	2.542	0.746	1.450	0.898	0.895	0.0692	0.1959	2.534	0.846	0.2997	0.848	2.396
0.097	19.2	2.573	0.755	1.430	0.903	0.900	0.0655	0.1866	2.566	0.852	0.2974	0.848	2.429
0.099	19.1	2.595	0.761	1.416	0.906	0.904	0.0632	0.1810	2.589	0.856	0.2962	0.848	2.453
0.117	18.5	2.707	0.794	1.348	0.922	0.920	0.0557	0.1634	2.702	0.874	0.2932	0.861	2.567
0.134	18.0	2.815	0.826	1.286	0.936	0.935	0.0474	0.1424	2.811	0.891	0.2891	0.869	2.677
0.153	17.5	2.910	0.854	1.234	0.948	0.947	0.0404	0.1239	2.907	0.904	0.2855	0.876	2.775
0.170	16.9	2.995	0.879	1.190	0.958	0.958	0.0311	0.0972	2.993	0.917	0.2792	0.873	2.865
0.188	16.4	3.075	0.902	1.150	0.967	0.967	0.0230	0.0730	3.074	0.928	0.2737	0.870	2.949
0.205	16.1	3.141	0.921	1.118	0.974	0.974	0.0180	0.0581	3.140	0.936	0.2708	0.873	3.017
0.222	15.8	3.197	0.938	1.092	0.980	0.980	0.0120	0.0391	3.197	0.943	0.2665	0.869	3.077
0.240	15.7	3.247	0.952	1.069	0.985	0.985	0.0110	0.0363	3.246	0.948	0.2669	0.880	3.125
0.257	15.7	3.290	0.965	1.050	0.989	0.989	0.0100	0.0333	3.290	0.952	0.2670	0.888	3.168
0.275	15.5	3.332	0.977	1.032	0.993	0.993	0.0080	0.0267	3.332	0.957	0.2660	0.893	3.210
0.291	15.4	3.368	0.988	1.017	0.996	0.996	0.0052	0.0176	3.368	0.961	0.2643	0.893	3.247
0.309	15.2	3.388	0.994	1.009	0.998	0.998	0.0024	0.0083	3.388	0.963	0.2620	0.889	3.269
0.326	15.1	3.398	0.997	1.005	0.999	0.999	0.0	0.0	3.398	0.965	0.2599	0.884	3.281
0.345	15.1	3.409	1.000	1.000	1.000	1.000	0.0	0.0	3.409	0.966	0.2602	0.887	3.291

RUN NO. 4525 MACH NUMBER 4.247 ALPHA= 15.65 AL/THC= 1.252 PHIPP=112.50 PE/POD=0.0541

DEL1= 0.1223 DEL2= -0.0126 TH11= 0.0156 TH21= -0.0109 TH12= 0.0017 TH22= -0.0010

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	27.8	1.013	0.262	3.318	0.477	0.466	0.0975	0.2072	0.992	0.422	0.2223	0.473	0.896
0.007	27.6	1.013	0.262	3.318	0.477	0.467	0.0955	0.2030	0.993	0.422	0.2205	0.469	0.898
0.010	27.8	1.278	0.330	3.015	0.573	0.561	0.1172	0.2613	1.251	0.507	0.2672	0.596	1.130
0.016	26.6	1.521	0.393	2.734	0.649	0.638	0.1195	0.2798	1.495	0.581	0.2908	0.681	1.360
0.020	26.6	1.719	0.444	2.514	0.704	0.692	0.1297	0.3168	1.690	0.629	0.3153	0.770	1.537
0.025	26.4	1.880	0.486	2.343	0.743	0.731	0.1347	0.3407	1.849	0.665	0.3309	0.837	1.684
0.026	26.6	1.861	0.481	2.363	0.739	0.726	0.1354	0.3410	1.829	0.661	0.3303	0.832	1.664
0.030	26.1	1.967	0.508	2.255	0.763	0.751	0.1337	0.3449	1.936	0.685	0.3355	0.865	1.766
0.036	25.9	2.028	0.524	2.194	0.776	0.764	0.1336	0.3494	1.998	0.698	0.3391	0.887	1.824
0.040	25.7	2.070	0.535	2.153	0.785	0.773	0.1319	0.3481	2.041	0.707	0.3400	0.897	1.866
0.045	25.4	2.098	0.542	2.127	0.790	0.779	0.1293	0.3434	2.070	0.714	0.3392	0.901	1.895
0.047	25.4	2.084	0.538	2.140	0.787	0.777	0.1291	0.3419	2.056	0.711	0.3382	0.895	1.882
0.051	25.2	2.129	0.550	2.098	0.796	0.786	0.1273	0.3404	2.101	0.720	0.3390	0.906	1.926
0.056	24.8	2.176	0.562	2.054	0.805	0.796	0.1232	0.3329	2.150	0.731	0.3378	0.913	1.975
0.061	24.5	2.231	0.576	2.004	0.816	0.807	0.1206	0.3298	2.207	0.742	0.3382	0.925	2.030
0.066	24.2	2.292	0.592	1.950	0.827	0.818	0.1173	0.3253	2.269	0.754	0.3383	0.938	2.091
0.069	24.1	2.301	0.594	1.942	0.828	0.820	0.1164	0.3235	2.278	0.756	0.3379	0.939	2.101
0.071	23.9	2.345	0.605	1.905	0.836	0.828	0.1149	0.3223	2.322	0.764	0.3385	0.950	2.144
0.076	23.6	2.396	0.619	1.862	0.844	0.837	0.1114	0.3161	2.375	0.774	0.3377	0.959	2.196
0.090	22.9	2.511	0.648	1.769	0.862	0.856	0.1033	0.3008	2.493	0.794	0.3353	0.976	2.313
0.113	21.9	2.693	0.695	1.632	0.888	0.884	0.0913	0.2768	2.679	0.824	0.3314	1.005	2.499
0.134	20.9	2.844	0.734	1.528	0.908	0.904	0.0775	0.2429	2.833	0.848	0.3238	1.014	2.657
0.156	20.2	2.987	0.771	1.437	0.924	0.922	0.0671	0.2167	2.979	0.868	0.3186	1.029	2.804
0.178	19.4	3.116	0.805	1.359	0.938	0.937	0.0553	0.1837	3.111	0.885	0.3113	1.034	2.940
0.200	18.7	3.232	0.834	1.295	0.950	0.949	0.0447	0.1522	3.228	0.899	0.3044	1.036	3.061
0.221	18.1	3.345	0.864	1.235	0.960	0.959	0.0352	0.1226	3.343	0.913	0.2982	1.039	3.180
0.243	17.6	3.464	0.894	1.177	0.970	0.970	0.0274	0.0979	3.462	0.925	0.2936	1.048	3.301
0.264	17.1	3.586	0.926	1.120	0.980	0.980	0.0181	0.0663	3.585	0.937	0.2874	1.052	3.428
0.286	16.7	3.673	0.948	1.082	0.986	0.986	0.0127	0.0474	3.673	0.945	0.2841	1.058	3.517
0.307	16.4	3.723	0.961	1.060	0.990	0.990	0.0066	0.0247	3.723	0.950	0.2792	1.050	3.572
0.329	16.3	3.766	0.972	1.043	0.993	0.993	0.0045	0.0171	3.765	0.953	0.2780	1.054	3.615
0.432	16.0	3.873	1.000	1.000	1.000	1.000	0.0	0.0	3.873	0.961	0.2756	1.067	3.723

ERROR - FLOATING-POINT DIVISION BY ZERO HAS OCCURRED IN SUB-PROGRAM DWEG
- AT ADDRESS 000852 RELATIVE TO THE ENTRY POINT OF DWEG

RUN NO. 4527 MACH NUMBER 4.248 ALPHA= 15.65 AL/THC= 1.252 PHIPP=135.00 PE/POO=0.0277

DEL1= 0.1571 DEL2= -0.0150 TH11= 0.0156 TH21= -0.0130 TH12= 0.0020 TH22= -0.0015

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	29.5	0.688	0.153	4.588	0.328	0.320	0.0755	0.1582	0.669	0.286	0.1617	0.339	0.598
0.013	28.3	1.204	0.268	3.893	0.530	0.518	0.1110	0.2523	1.177	0.466	0.2511	0.571	1.060
0.020	28.9	1.614	0.360	3.301	0.654	0.638	0.1443	0.3562	1.574	0.572	0.3166	0.781	1.413
0.021	28.7	1.587	0.354	3.339	0.647	0.632	0.1398	0.3431	1.550	0.568	0.3104	0.762	1.393
0.029	28.7	1.813	0.404	3.030	0.704	0.687	0.1518	0.3912	1.770	0.618	0.3375	0.870	1.591
0.035	28.5	1.955	0.436	2.845	0.736	0.719	0.1562	0.4152	1.911	0.647	0.3505	0.932	1.719
0.043	28.0	2.074	0.463	2.699	0.760	0.744	0.1552	0.4235	2.031	0.671	0.3566	0.973	1.832
0.047	27.8	2.115	0.472	2.650	0.768	0.752	0.1550	0.4270	2.071	0.679	0.3587	0.988	1.870
0.050	27.6	2.141	0.478	2.619	0.773	0.758	0.1530	0.4240	2.099	0.685	0.3583	0.993	1.897
0.058	27.2	2.212	0.493	2.537	0.786	0.772	0.1500	0.4222	2.172	0.699	0.3592	1.011	1.968
0.066	26.8	2.275	0.507	2.467	0.797	0.783	0.1469	0.4193	2.236	0.711	0.3596	1.027	2.030
0.073	26.4	2.366	0.528	2.369	0.812	0.799	0.1433	0.4174	2.329	0.728	0.3606	1.051	2.120
0.075	26.3	2.390	0.533	2.344	0.816	0.803	0.1424	0.4170	2.353	0.732	0.3609	1.057	2.143
0.081	26.0	2.448	0.546	2.284	0.825	0.813	0.1399	0.4150	2.412	0.742	0.3611	1.072	2.201
0.088	25.5	2.533	0.565	2.200	0.838	0.827	0.1357	0.4101	2.499	0.756	0.3609	1.091	2.285
0.096	25.1	2.598	0.579	2.137	0.847	0.837	0.1316	0.4038	2.567	0.767	0.3598	1.104	2.352
0.103	24.6	2.683	0.598	2.058	0.858	0.849	0.1261	0.3943	2.654	0.780	0.3580	1.119	2.439
0.104	24.8	2.683	0.598	2.058	0.858	0.849	0.1278	0.3994	2.653	0.780	0.3595	1.124	2.437
0.111	24.3	2.745	0.612	2.003	0.866	0.858	0.1218	0.3859	2.718	0.790	0.3563	1.129	2.503
0.132	23.2	2.924	0.652	1.853	0.888	0.881	0.1089	0.3588	2.902	0.816	0.3504	1.154	2.686
0.160	22.0	3.150	0.703	1.682	0.911	0.906	0.0929	0.3211	3.134	0.845	0.3421	1.183	2.920
0.187	20.9	3.349	0.747	1.548	0.929	0.926	0.0770	0.2773	3.337	0.868	0.3323	1.197	3.127
0.216	20.1	3.544	0.790	1.430	0.945	0.943	0.0651	0.2441	3.536	0.887	0.3256	1.221	3.327
0.244	19.3	3.756	0.838	1.314	0.960	0.959	0.0528	0.2064	3.750	0.906	0.3181	1.244	3.543
0.272	18.4	3.952	0.881	1.218	0.973	0.972	0.0373	0.1517	3.949	0.923	0.3076	1.247	3.750
0.302	17.5	4.119	0.919	1.143	0.982	0.982	0.0223	0.0934	4.118	0.937	0.2953	1.239	3.928
0.330	16.8	4.233	0.944	1.095	0.988	0.988	0.0112	0.0480	4.233	0.946	0.2864	1.227	4.051
0.358	16.4	4.328	0.965	1.058	0.993	0.993	0.0043	0.0189	4.328	0.952	0.2811	1.226	4.151
0.386	16.2	4.386	0.978	1.036	0.996	0.996	0.0	0.0	4.386	0.956	0.2777	1.224	4.212
0.414	16.2	4.424	0.987	1.022	0.997	0.997	0.0	0.0	4.424	0.958	0.2782	1.234	4.249
0.520	16.2	4.484	1.000	1.000	1.000	1.000	0.0	0.0	4.484	0.960	0.2790	1.251	4.306

RUN NO. 4530 MACH NUMBER 4.244 ALPHA= 15.65 AL/THC= 1.252 PHIPP=139.78 PE/POO=0.0239

DEL1= 0.1750 DEL2= -0.0179 TH11= 0.0161 TH21= -0.0157 TH12= 0.0022 TH22= -0.0017

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	29.2	0.349	0.074	5.265	0.171	0.166	0.0401	0.0819	0.339	0.149	0.0834	0.170	0.305
0.014	27.7	1.192	0.254	4.199	0.521	0.510	0.1085	0.2481	1.166	0.462	0.2420	0.553	1.056
0.015	30.5	1.315	0.281	4.007	0.562	0.543	0.1439	0.3370	1.271	0.484	0.2850	0.667	1.133
0.024	28.4	1.651	0.352	3.490	0.658	0.642	0.1457	0.3656	1.610	0.579	0.3135	0.786	1.452
0.034	28.4	1.884	0.402	3.154	0.714	0.696	0.1571	0.4144	1.837	0.628	0.3391	0.895	1.658
0.044	27.9	2.042	0.436	2.941	0.747	0.730	0.1588	0.4340	1.995	0.660	0.3498	0.956	1.804
0.047	28.0	2.097	0.448	2.869	0.758	0.740	0.1628	0.4503	2.048	0.669	0.3564	0.986	1.851
0.054	27.5	2.159	0.461	2.791	0.770	0.753	0.1575	0.4418	2.113	0.683	0.3549	0.995	1.915
0.064	27.0	2.255	0.481	2.674	0.787	0.771	0.1543	0.4422	2.211	0.701	0.3567	1.022	2.010
0.074	26.5	2.368	0.505	2.542	0.806	0.791	0.1519	0.4465	2.325	0.721	0.3597	1.057	2.119
0.078	26.4	2.429	0.518	2.474	0.815	0.801	0.1520	0.4530	2.386	0.730	0.3624	1.080	2.175
0.084	25.9	2.482	0.530	2.416	0.823	0.810	0.1470	0.4433	2.442	0.740	0.3601	1.086	2.232
0.094	25.4	2.578	0.550	2.315	0.837	0.825	0.1423	0.4384	2.541	0.756	0.3596	1.108	2.328
0.104	24.8	2.678	0.571	2.216	0.850	0.840	0.1358	0.4276	2.643	0.772	0.3572	1.125	2.430
0.111	24.8	2.750	0.587	2.147	0.860	0.849	0.1367	0.4372	2.715	0.780	0.3606	1.153	2.496
0.114	24.4	2.773	0.592	2.125	0.863	0.853	0.1306	0.4199	2.741	0.786	0.3558	1.144	2.526
0.124	23.9	2.871	0.613	2.036	0.874	0.865	0.1260	0.4140	2.841	0.799	0.3547	1.165	2.624
0.134	23.5	2.955	0.631	1.964	0.884	0.875	0.1204	0.4025	2.927	0.810	0.3520	1.177	2.710
0.143	23.3	3.052	0.651	1.883	0.894	0.886	0.1190	0.4063	3.025	0.821	0.3535	1.207	2.803
0.144	23.0	3.036	0.648	1.896	0.892	0.885	0.1135	0.3863	3.012	0.821	0.3480	1.184	2.796
0.154	22.6	3.110	0.664	1.837	0.900	0.893	0.1092	0.3774	3.087	0.830	0.3460	1.196	2.871
0.164	22.2	3.228	0.689	1.748	0.911	0.905	0.1033	0.3660	3.208	0.844	0.3436	1.218	2.990
0.177	22.0	3.283	0.701	1.709	0.916	0.910	0.1013	0.3631	3.263	0.849	0.3431	1.230	3.044
0.210	20.6	3.536	0.755	1.540	0.936	0.933	0.0808	0.3051	3.523	0.877	0.3295	1.244	3.310
0.242	19.6	3.768	0.804	1.405	0.953	0.950	0.0665	0.2628	3.758	0.897	0.3204	1.267	3.548
0.275	18.6	4.014	0.857	1.277	0.968	0.967	0.0507	0.2101	4.009	0.917	0.3095	1.284	3.803
0.308	17.8	4.204	0.897	1.189	0.978	0.978	0.0358	0.1540	4.201	0.932	0.2982	1.282	4.004
0.342	17.0	4.363	0.931	1.122	0.986	0.986	0.0232	0.1028	4.362	0.943	0.2883	1.276	4.173
0.374	16.3	4.463	0.952	1.082	0.991	0.991	0.0121	0.0545	4.462	0.951	0.2789	1.256	4.282
0.405	16.2	4.546	0.970	1.051	0.994	0.994	0.0095	0.0436	4.546	0.955	0.2774	1.268	4.365
0.439	15.9	4.588	0.979	1.035	0.996	0.996	0.0052	0.0240	4.588	0.958	0.2737	1.261	4.412
0.471	15.8	4.613	0.984	1.026	0.997	0.997	0.0035	0.0161	4.613	0.959	0.2723	1.260	4.438
0.504	15.8	4.634	0.989	1.018	0.998	0.998	0.0035	0.0162	4.634	0.960	0.2725	1.266	4.458
0.537	15.8	4.652	0.993	1.012	0.999	0.999	0.0026	0.0122	4.652	0.961	0.2719	1.267	4.476
0.570	15.8	4.669	0.996	1.006	0.999	0.999	0.0026	0.0122	4.669	0.962	0.2721	1.271	4.493
0.602	15.6	4.687	1.000	1.000	1.000	1.000	0.0	0.0	4.687	0.963	0.2698	1.264	4.513

RUN NO. 4533 MACH NUMBER 4.247 ALPHA= 15.65 AL/THC= 1.252 PHIPP=146.98 PE/POD=0.0304

DEL1= 0.2023 DEL2= -0.0145 TH11= 0.0192 TH21= -0.0130 TH12= 0.0015 TH22= -0.0011

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	7.7	0.537	0.120	4.742	0.261	0.260	-0.0189	-0.0388	0.536	0.259	0.0350	0.072	0.532
0.008	7.9	0.574	0.128	4.706	0.278	0.277	-0.0193	-0.0398	0.572	0.275	0.0380	0.078	0.568
0.019	7.5	1.089	0.243	4.054	0.489	0.488	-0.0370	-0.0824	1.086	0.485	0.0639	0.142	1.080
0.031	8.8	1.345	0.300	3.683	0.576	0.575	-0.0304	-0.0709	1.343	0.569	0.0883	0.206	1.329
0.032	11.9	1.335	0.298	3.697	0.573	0.573	0.0004	0.0009	1.335	0.561	0.1180	0.275	1.307
0.044	14.3	1.519	0.339	3.431	0.628	0.628	0.0270	0.0652	1.518	0.609	0.1551	0.375	1.472
0.057	16.2	1.682	0.375	3.204	0.672	0.670	0.0511	0.1278	1.677	0.645	0.1874	0.469	1.615
0.069	17.5	1.800	0.402	3.043	0.701	0.697	0.0691	0.1776	1.792	0.668	0.2108	0.541	1.717
0.073	17.3	1.905	0.425	2.907	0.725	0.721	0.0695	0.1826	1.896	0.692	0.2160	0.568	1.818
0.082	18.5	1.945	0.434	2.855	0.733	0.728	0.0851	0.2255	1.932	0.696	0.2327	0.617	1.844
0.094	19.0	2.097	0.468	2.668	0.765	0.759	0.0958	0.2629	2.081	0.723	0.2494	0.684	1.983
0.107	19.5	2.216	0.495	2.530	0.787	0.780	0.1046	0.2947	2.197	0.742	0.2624	0.739	2.090
0.116	19.0	2.340	0.522	2.394	0.808	0.802	0.1013	0.2933	2.322	0.764	0.2636	0.763	2.212
0.119	19.5	2.346	0.523	2.388	0.809	0.802	0.1078	0.3127	2.325	0.763	0.2700	0.783	2.211
0.132	19.5	2.468	0.551	2.261	0.828	0.821	0.1107	0.3298	2.446	0.781	0.2767	0.825	2.326
0.145	19.5	2.585	0.577	2.147	0.845	0.838	0.1130	0.3454	2.561	0.797	0.2824	0.864	2.436
0.157	19.2	2.710	0.605	2.031	0.862	0.855	0.1110	0.3491	2.688	0.814	0.2841	0.893	2.559
0.160	19.2	2.743	0.612	2.002	0.866	0.859	0.1110	0.3514	2.721	0.818	0.2849	0.902	2.591
0.170	19.1	2.830	0.632	1.927	0.877	0.870	0.1111	0.3587	2.808	0.829	0.2872	0.927	2.674
0.183	18.6	2.928	0.653	1.847	0.888	0.882	0.1042	0.3437	2.908	0.842	0.2830	0.933	2.776
0.195	18.4	3.023	0.675	1.774	0.898	0.893	0.1020	0.3432	3.003	0.853	0.2830	0.952	2.869
0.204	17.9	3.110	0.694	1.709	0.907	0.902	0.0952	0.3262	3.093	0.864	0.2783	0.954	2.960
0.208	17.9	3.123	0.697	1.700	0.909	0.904	0.0959	0.3296	3.105	0.865	0.2793	0.960	2.971
0.220	17.2	3.203	0.715	1.643	0.916	0.912	0.0850	0.2970	3.190	0.876	0.2704	0.945	3.061
0.247	16.0	3.420	0.763	1.502	0.935	0.933	0.0685	0.2504	3.410	0.899	0.2584	0.945	3.286
0.291	15.1	3.703	0.826	1.340	0.957	0.955	0.0537	0.2080	3.697	0.924	0.2486	0.962	3.576
0.335	13.9	3.982	0.889	1.202	0.975	0.974	0.0354	0.1445	3.980	0.946	0.2344	0.958	3.866
0.378	13.0	4.192	0.936	1.111	0.986	0.986	0.0207	0.0878	4.191	0.961	0.2225	0.946	4.084
0.421	12.4	4.327	0.966	1.057	0.993	0.993	0.0097	0.0423	4.327	0.970	0.2132	0.929	4.226
0.465	12.1	4.389	0.979	1.034	0.996	0.996	0.0038	0.0169	4.388	0.974	0.2081	0.917	4.292
0.508	12.0	4.423	0.987	1.021	0.997	0.997	0.0021	0.0093	4.423	0.976	0.2067	0.917	4.32[illegible]
0.552	11.9	4.438	0.990	1.016	0.998	0.998	0.0017	0.0077	4.438	0.976	0.2065	0.918	4.342
0.596	11.9	4.452	0.994	1.010	0.999	0.999	0.0017	0.0078	4.452	0.977	0.2066	0.921	4.356
0.641	11.9	4.469	0.997	1.004	0.999	0.999	0.0014	0.0062	4.469	0.978	0.2064	0.923	4.373
0.684	11.8	4.481	1.000	1.000	1.000	1.000	0.0	0.0	4.481	0.979	0.2052	0.919	4.385

RUN NO. 4536 MACH NUMBER 4.245 ALPHA= 15.65 AL/THC= 1.252 PHIPP=154.58 PE/POD=0.0346

DEL1= 0.2704 DEL2= -0.0116 TH11= 0.0258 TH21= -0.0111 TH12= 0.0005 TH22= -0.0008

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	-0.0	0.368	0.085	4.636	0.183	0.181	-0.0286	-0.0576	0.364	0.183	-0.0002	-0.000	0.368
0.018	-0.8	0.823	0.190	4.193	0.389	0.383	-0.0661	-0.1400	0.811	0.389	-0.0057	-0.012	0.823
0.034	0.2	1.068	0.246	3.877	0.485	0.479	-0.0741	-0.1632	1.055	0.485	0.0014	0.003	1.068
0.040	-0.3	1.124	0.259	3.801	0.505	0.499	-0.0808	-0.1797	1.110	0.505	-0.0022	-0.005	1.124
0.049	2.6	1.217	0.281	3.674	0.538	0.534	-0.0597	-0.1350	1.209	0.537	0.0242	0.055	1.216
0.065	4.5	1.345	0.310	3.496	0.580	0.578	-0.0446	-0.1034	1.341	0.578	0.0459	0.106	1.341
0.080	6.0	1.460	0.337	3.338	0.615	0.614	-0.0312	-0.0741	1.459	0.612	0.0647	0.154	1.452
0.085	5.4	1.499	0.346	3.285	0.627	0.625	-0.0388	-0.0928	1.496	0.624	0.0590	0.141	1.493
0.097	7.6	1.559	0.360	3.204	0.644	0.643	-0.0154	-0.0373	1.559	0.638	0.0849	0.206	1.546
0.112	9.0	1.679	0.387	3.045	0.676	0.676	0.0006	0.0015	1.679	0.667	0.1057	0.263	1.658
0.128	10.1	1.777	0.410	2.918	0.700	0.700	0.0143	0.0363	1.777	0.689	0.1230	0.312	1.750
0.132	9.9	1.834	0.423	2.847	0.713	0.713	0.0118	0.0304	1.834	0.703	0.1227	0.315	1.807
0.144	11.2	1.901	0.438	2.764	0.729	0.728	0.0286	0.0746	1.899	0.715	0.1415	0.369	1.864
0.159	12.0	2.010	0.464	2.633	0.752	0.751	0.0400	0.1070	2.008	0.736	0.1564	0.418	1.966
0.175	12.9	2.130	0.491	2.496	0.776	0.774	0.0532	0.1460	2.125	0.757	0.1730	0.475	2.077
0.179	12.6	2.177	0.502	2.444	0.785	0.783	0.0507	0.1405	2.173	0.766	0.1719	0.477	2.125
0.191	13.5	2.249	0.519	2.367	0.798	0.795	0.0630	0.1776	2.242	0.776	0.1860	0.524	2.187
0.207	13.8	2.375	0.548	2.237	0.819	0.816	0.0693	0.2008	2.367	0.796	0.1954	0.567	2.307
0.222	14.2	2.504	0.577	2.112	0.839	0.836	0.0762	0.2274	2.494	0.814	0.2053	0.613	2.428
0.226	13.9	2.540	0.586	2.079	0.845	0.841	0.0736	0.2214	2.530	0.820	0.2036	0.612	2.465
0.273	14.1	2.892	0.667	1.782	0.890	0.886	0.0807	0.2621	2.880	0.863	0.2176	0.707	2.804
0.320	13.5	3.216	0.742	1.552	0.924	0.921	0.0733	0.2551	3.206	0.898	0.2156	0.751	3.127
0.368	12.4	3.519	0.811	1.369	0.950	0.948	0.0571	0.2118	3.513	0.927	0.2039	0.756	3.437
0.414	11.1	3.793	0.875	1.228	0.969	0.968	0.0372	0.1456	3.790	0.951	0.1874	0.733	3.721
0.462	10.2	4.017	0.926	1.126	0.983	0.983	0.0214	0.0876	4.016	0.968	0.1741	0.711	3.953
0.508	9.5	4.165	0.960	1.065	0.991	0.991	0.0104	0.0436	4.165	0.978	0.1645	0.691	4.107
0.557	9.3	4.240	0.978	1.036	0.995	0.995	0.0061	0.0259	4.240	0.982	0.1608	0.685	4.184
0.603	9.1	4.274	0.986	1.023	0.997	0.997	0.0035	0.0149	4.274	0.984	0.1585	0.680	4.220
0.652	9.1	4.298	0.991	1.014	0.998	0.998	0.0035	0.0150	4.298	0.985	0.1587	0.683	4.243
0.700	9.1	4.308	0.993	1.010	0.999	0.999	0.0035	0.0150	4.308	0.986	0.1588	0.685	4.253
0.749	9.0	4.324	0.997	1.005	0.999	0.999	0.0017	0.0075	4.324	0.987	0.1572	0.680	4.270
0.797	8.9	4.337	1.000	1.000	1.000	1.000	0.0	0.0	4.337	0.988	0.1556	0.675	4.284

RUN NO. 4540 MACH NUMBER 4.244 ALPHA= 15.65 AL/THC= 1.252 PHIPP=166.85 PF/POD=0.0368

DEL1= 0.4120 DEL2= 0.0058 TH11= 0.0446 TH21= 0.0027 TH12= -0.0031 TH22= -0.0016

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-0.9	0.653	0.158	4.063	0.319	0.317	-0.0361	-0.0739	0.649	0.319	-0.0050	-0.010	0.653
0.020	-1.7	1.126	0.273	3.518	0.511	0.507	-0.0654	-0.1440	1.117	0.511	-0.0156	-0.034	1.125
0.065	-2.5	1.573	0.381	2.950	0.654	0.648	-0.0927	-0.2230	1.557	0.654	-0.0291	-0.070	1.571
0.112	-2.9	1.813	0.439	2.661	0.716	0.708	-0.1065	-0.2695	1.793	0.715	-0.0369	-0.093	1.810
0.160	-3.5	1.970	0.477	2.483	0.752	0.742	-0.1196	-0.3133	1.945	0.750	-0.0466	-0.122	1.966
0.207	-3.5	2.049	0.496	2.397	0.768	0.759	-0.1215	-0.3241	2.024	0.767	-0.0469	-0.125	2.046
0.253	-2.5	2.070	0.501	2.375	0.773	0.765	-0.1095	-0.2935	2.049	0.772	-0.0344	-0.092	2.068
0.300	-0.1	2.049	0.496	2.397	0.768	0.765	-0.0763	-0.2035	2.039	0.768	-0.0013	-0.004	2.049
0.349	2.8	2.080	0.504	2.364	0.775	0.774	-0.0372	-0.0998	2.078	0.774	0.0385	0.103	2.078
0.395	5.2	2.199	0.533	2.242	0.797	0.797	-0.0049	-0.0134	2.199	0.794	0.0730	0.201	2.190
0.442	7.0	2.402	0.582	2.048	0.832	0.832	0.0211	0.0608	2.401	0.826	0.1022	0.295	2.384
0.488	8.0	2.653	0.642	1.832	0.870	0.869	0.0372	0.1134	2.650	0.861	0.1218	0.371	2.627
0.535	8.3	2.940	0.712	1.616	0.905	0.904	0.0426	0.1385	2.937	0.896	0.1307	0.424	2.909
0.581	8.3	3.228	0.782	1.430	0.935	0.934	0.0440	0.1520	3.224	0.925	0.1349	0.466	3.194
0.630	8.0	3.492	0.846	1.282	0.958	0.957	0.0401	0.1462	3.489	0.948	0.1333	0.486	3.458
0.678	7.2	3.760	0.911	1.152	0.977	0.977	0.0273	0.1050	3.758	0.970	0.1225	0.471	3.730
0.726	6.3	3.951	0.957	1.070	0.990	0.990	0.0121	0.0483	3.951	0.984	0.1086	0.434	3.928
0.773	5.7	4.103	0.994	1.010	0.999	0.999	0.0026	0.0107	4.103	0.994	0.1000	0.411	4.083
0.780	5.6	4.129	1.000	1.000	1.000	1.000	0.0	0.0	4.129	0.995	0.0976	0.403	4.109

ERROR - FLOATING-POINT DIVISION BY ZERO HAS OCCURRED IN SUB-PROGRAM DWEG
- AT ADDRESS 000852 RELATIVE TO THE ENTRY POINT OF DWEG

ERROR - FLOATING-POINT DIVISION BY ZERO HAS OCCURRED IN SUB-PROGRAM DWEG
- AT ADDRESS 000852 RELATIVE TO THE ENTRY POINT OF DWEG

RUN NO. 4541 MACH NUMBER 4.245 ALPHA= 15.65 AL/THC= 1.252 PHIPP=179.93 PE/POD=0.0414

DEL1= 0.1476 DEL2= 0.0009 TH11= 0.0153 TH21= 0.0007 TH12= -0.0001 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-0.5	1.088	0.253	3.802	0.493	0.493	-0.0045	-0.0099	1.088	0.493	-0.0045	-0.010	1.088
0.008	-0.3	1.078	0.251	3.815	0.489	0.489	-0.0022	-0.0049	1.078	0.489	-0.0022	-0.005	1.078
0.015	-1.6	1.536	0.357	3.195	0.638	0.638	-0.0180	-0.0434	1.535	0.638	-0.0180	-0.043	1.535
0.027	-1.1	1.906	0.443	2.724	0.731	0.731	-0.0145	-0.0379	1.905	0.731	-0.0145	-0.038	1.905
0.038	-1.2	2.040	0.474	2.567	0.759	0.759	-0.0164	-0.0441	2.039	0.759	-0.0164	-0.044	2.039
0.039	-1.0	2.053	0.477	2.551	0.762	0.762	-0.0138	-0.0373	2.053	0.762	-0.0138	-0.037	2.053
0.052	-0.7	2.121	0.493	2.475	0.776	0.776	-0.0092	-0.0252	2.121	0.776	-0.0092	-0.025	2.121
0.064	-0.6	2.230	0.518	2.358	0.796	0.796	-0.0086	-0.0241	2.229	0.796	-0.0086	-0.024	2.229
0.077	-0.6	2.361	0.549	2.224	0.818	0.818	-0.0083	-0.0239	2.361	0.818	-0.0083	-0.024	2.361
0.084	-0.7	2.420	0.562	2.166	0.828	0.828	-0.0104	-0.0304	2.420	0.828	-0.0104	-0.030	2.420
0.089	-0.6	2.470	0.574	2.118	0.835	0.835	-0.0087	-0.0259	2.470	0.835	-0.0087	-0.026	2.470
0.102	-0.6	2.589	0.602	2.009	0.853	0.853	-0.0083	-0.0253	2.589	0.853	-0.0083	-0.025	2.589
0.114	-0.4	2.681	0.623	1.929	0.866	0.866	-0.0063	-0.0197	2.681	0.866	-0.0063	-0.020	2.681
0.127	-0.4	2.791	0.649	1.838	0.880	0.880	-0.0061	-0.0195	2.791	0.880	-0.0061	-0.019	2.791
0.131	-0.6	2.821	0.656	1.814	0.883	0.883	-0.0086	-0.0276	2.821	0.883	-0.0086	-0.028	2.821
0.139	-0.4	2.891	0.672	1.760	0.891	0.891	-0.0056	-0.0182	2.890	0.891	-0.0056	-0.018	2.890
0.152	-0.3	2.996	0.696	1.682	0.903	0.903	-0.0054	-0.0178	2.996	0.903	-0.0054	-0.018	2.996
0.164	-0.3	3.101	0.721	1.609	0.914	0.914	-0.0051	-0.0173	3.101	0.914	-0.0051	-0.017	3.101
0.176	-0.3	3.187	0.741	1.551	0.923	0.923	-0.0045	-0.0156	3.187	0.923	-0.0045	-0.016	3.187
0.178	-0.4	3.187	0.741	1.551	0.923	0.923	-0.0068	-0.0234	3.187	0.923	-0.0068	-0.023	3.187
0.189	-0.3	3.289	0.764	1.487	0.932	0.932	-0.0046	-0.0161	3.289	0.932	-0.0046	-0.016	3.289
0.225	-0.3	3.547	0.824	1.337	0.953	0.953	-0.0050	-0.0186	3.547	0.953	-0.0050	-0.019	3.547
0.271	-0.2	3.844	0.893	1.189	0.974	0.974	-0.0034	-0.0134	3.844	0.974	-0.0034	-0.013	3.844
0.318	0.1	4.085	0.950	1.084	0.989	0.989	0.0010	0.0043	4.085	0.989	0.0010	0.004	4.085
0.366	0.1	4.205	0.977	1.036	0.995	0.995	0.0014	0.0059	4.205	0.995	0.0014	0.006	4.205
0.412	0.0	4.252	0.988	1.019	0.997	0.997	0.0007	0.0030	4.252	0.997	0.0007	0.003	4.252
0.460	0.0	4.294	0.998	1.003	1.000	1.000	0.0007	0.0030	4.294	1.000	0.0007	0.003	4.294
0.505	0.0	4.298	0.999	1.002	1.000	1.000	0.0007	0.0030	4.298	1.000	0.0007	0.003	4.298
0.553	0.0	4.298	0.999	1.002	1.000	1.000	0.0	0.0	4.298	1.000	0.0	0.0	4.298
0.598	0.0	4.302	1.000	1.000	1.000	1.000	0.0	0.0	4.302	1.000	0.0	0.0	4.302

RUN NO. 4544 MACH NUMBER 1.801 ALPHA= 0.0 AL/THC= 0.0 PHIPP=179.93 PF/POD=0.2954

DEL1= 0.0510 DEL2= -0.0016 TH11= 0.0199 TH21= -0.0015 TH12= 0.0001 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OMF)	UI/UE	VI/UF	MSOM	MCOM
0.008	-0.0	0.806	0.507	1.333	0.585	0.585	0.0039	0.0053	0.806	0.585	-0.0002	-0.000	0.806
0.015	-0.1	0.952	0.598	1.275	0.676	0.676	0.0040	0.0056	0.952	0.676	-0.0007	-0.001	0.952
0.023	-0.1	1.033	0.649	1.241	0.723	0.723	0.0038	0.0054	1.032	0.723	-0.0013	-0.002	1.033
0.031	-0.1	1.088	0.684	1.218	0.755	0.755	0.0042	0.0061	1.088	0.755	-0.0011	-0.002	1.088
0.039	0.0	1.130	0.710	1.200	0.778	0.778	0.0060	0.0087	1.130	0.778	0.0005	0.001	1.130
0.047	0.0	1.167	0.733	1.184	0.798	0.798	0.0058	0.0086	1.167	0.798	0.0003	0.000	1.167
0.054	0.1	1.195	0.751	1.171	0.813	0.813	0.0071	0.0104	1.195	0.813	0.0014	0.002	1.195
0.062	-0.0	1.225	0.770	1.158	0.829	0.829	0.0055	0.0081	1.225	0.829	-0.0003	-0.000	1.225
0.069	0.0	1.249	0.785	1.148	0.841	0.841	0.0062	0.0092	1.249	0.841	0.0003	0.000	1.249
0.077	-0.1	1.271	0.799	1.139	0.852	0.852	0.0048	0.0071	1.270	0.852	-0.0012	-0.002	1.271
0.085	-0.1	1.298	0.816	1.126	0.866	0.866	0.0048	0.0073	1.298	0.866	-0.0012	-0.002	1.298
0.093	-0.0	1.315	0.827	1.119	0.875	0.874	0.0058	0.0087	1.315	0.875	-0.0003	-0.000	1.315
0.101	-0.1	1.337	0.840	1.110	0.885	0.885	0.0053	0.0079	1.337	0.885	-0.0009	-0.001	1.337
0.109	-0.1	1.353	0.850	1.103	0.893	0.893	0.0053	0.0080	1.353	0.893	-0.0009	-0.001	1.353
0.118	-0.1	1.371	0.862	1.095	0.902	0.902	0.0050	0.0077	1.371	0.902	-0.0013	-0.002	1.371
0.125	-0.1	1.394	0.877	1.084	0.913	0.913	0.0054	0.0083	1.394	0.913	-0.0010	-0.001	1.394
0.133	-0.1	1.402	0.881	1.081	0.916	0.916	0.0054	0.0083	1.402	0.916	-0.0010	-0.001	1.402
0.141	-0.0	1.422	0.894	1.072	0.926	0.926	0.0061	0.0094	1.422	0.926	-0.0003	-0.000	1.422
0.150	-0.0	1.436	0.903	1.066	0.932	0.932	0.0062	0.0095	1.436	0.932	-0.0003	-0.001	1.436
0.158	0.1	1.452	0.913	1.059	0.940	0.940	0.0082	0.0127	1.452	0.940	0.0016	0.003	1.452
0.165	0.2	1.463	0.920	1.054	0.945	0.945	0.0096	0.0148	1.463	0.945	0.0030	0.005	1.463
0.174	0.4	1.485	0.934	1.045	0.954	0.954	0.0130	0.0202	1.485	0.954	0.0063	0.010	1.485
0.182	0.2	1.485	0.934	1.045	0.954	0.954	0.0100	0.0156	1.485	0.954	0.0033	0.005	1.485
0.190	0.2	1.502	0.944	1.038	0.962	0.962	0.0097	0.0152	1.501	0.962	0.0030	0.005	1.502
0.197	0.2	1.517	0.953	1.032	0.968	0.968	0.0101	0.0159	1.517	0.968	0.0034	0.005	1.517
0.205	0.1	1.522	0.957	1.029	0.971	0.971	0.0088	0.0138	1.522	0.971	0.0020	0.003	1.522
0.213	0.2	1.534	0.964	1.024	0.976	0.976	0.0095	0.0150	1.534	0.976	0.0027	0.004	1.534
0.220	0.1	1.541	0.969	1.021	0.979	0.979	0.0092	0.0145	1.541	0.979	0.0024	0.004	1.541
0.228	0.0	1.552	0.976	1.016	0.984	0.984	0.0076	0.0119	1.552	0.984	0.0007	0.001	1.552
0.236	-0.1	1.555	0.978	1.015	0.985	0.985	0.0058	0.0092	1.555	0.985	-0.0010	-0.002	1.555
0.244	-0.1	1.569	0.986	1.009	0.991	0.991	0.0048	0.0077	1.569	0.991	-0.0021	-0.003	1.569
0.252	-0.2	1.569	0.986	1.009	0.991	0.991	0.0028	0.0044	1.569	0.991	-0.0041	-0.007	1.569
0.260	-0.2	1.576	0.990	1.006	0.994	0.994	0.0042	0.0066	1.576	0.994	-0.0028	-0.004	1.576
0.268	-0.3	1.580	0.993	1.005	0.995	0.995	0.0024	0.0039	1.580	0.995	-0.0045	-0.007	1.580
0.276	-0.3	1.582	0.994	1.004	0.996	0.996	0.0021	0.0033	1.582	0.996	-0.0049	-0.008	1.582
0.283	-0.3	1.586	0.997	1.002	0.998	0.998	0.0014	0.0022	1.586	0.998	-0.0056	-0.009	1.586
0.291	-0.3	1.587	0.997	1.002	0.998	0.998	0.0010	0.0017	1.587	0.998	-0.0059	-0.009	1.587
0.299	-0.4	1.587	0.998	1.001	0.999	0.999	0.0003	0.0006	1.587	0.999	-0.0066	-0.011	1.587
0.307	-0.4	1.591	1.000	1.000	1.000	1.000	0.0003	0.0006	1.591	1.000	-0.0066	-0.011	1.591
0.315	-0.4	1.590	0.999	1.000	1.000	1.000	0.0	0.0	1.590	1.000	-0.0070	-0.011	1.590
0.323	-0.4	1.591	1.000	1.000	1.000	1.000	0.0	0.0	1.591	1.000	-0.0070	-0.011	1.591

RUN NO. 4545 MACH NUMBER 1.801 ALPHA= 0.0 AL/THC= 0.0 PHIPP= 0.0 PE/POD=0.2954

DEL1= 0.0511 DEL2= -0.0016 TH11= 0.0199 TH21= -0.0015 TH12= 0.0001 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	0.0	0.788	0.495	1.340	0.573	0.573	0.0040	0.0055	0.788	0.573	0.0	0.0	0.788
0.013	-0.0	0.912	0.573	1.291	0.651	0.651	0.0041	0.0057	0.912	0.651	-0.0005	-0.001	0.912
0.021	-0.2	1.016	0.639	1.248	0.714	0.714	0.0030	0.0043	1.016	0.714	-0.0020	-0.003	1.016
0.029	-0.2	1.075	0.675	1.224	0.747	0.747	0.0029	0.0041	1.075	0.747	-0.0023	-0.003	1.075
0.037	-0.2	1.122	0.705	1.203	0.774	0.774	0.0032	0.0047	1.122	0.774	-0.0022	-0.003	1.122
0.044	-0.1	1.157	0.727	1.188	0.793	0.793	0.0036	0.0052	1.157	0.793	-0.0019	-0.003	1.157
0.052	-0.1	1.185	0.745	1.176	0.808	0.808	0.0037	0.0054	1.185	0.808	-0.0020	-0.003	1.185
0.060	-0.2	1.211	0.761	1.164	0.822	0.822	0.0032	0.0047	1.211	0.822	-0.0026	-0.004	1.211
0.067	-0.1	1.239	0.779	1.153	0.836	0.836	0.0041	0.0061	1.239	0.836	-0.0018	-0.003	1.239
0.074	-0.2	1.269	0.798	1.139	0.852	0.852	0.0036	0.0053	1.269	0.852	-0.0024	-0.004	1.269
0.082	-0.1	1.286	0.808	1.132	0.860	0.860	0.0042	0.0063	1.286	0.860	-0.0018	-0.003	1.286
0.090	-0.1	1.310	0.823	1.121	0.872	0.872	0.0046	0.0069	1.310	0.872	-0.0015	-0.002	1.310
0.098	-0.1	1.327	0.834	1.114	0.881	0.881	0.0046	0.0070	1.327	0.881	-0.0015	-0.002	1.327
0.107	-0.1	1.347	0.847	1.105	0.890	0.890	0.0050	0.0075	1.347	0.890	-0.0012	-0.002	1.347
0.114	0.0	1.363	0.857	1.098	0.898	0.898	0.0066	0.0100	1.363	0.898	0.0003	0.000	1.363
0.122	0.2	1.384	0.870	1.089	0.908	0.908	0.0098	0.0150	1.384	0.908	0.0035	0.005	1.384
0.130	0.1	1.395	0.877	1.084	0.913	0.913	0.0080	0.0122	1.395	0.913	0.0016	0.002	1.395
0.138	0.0	1.416	0.890	1.075	0.923	0.923	0.0068	0.0104	1.416	0.923	0.0003	0.000	1.416
0.146	0.3	1.429	0.898	1.069	0.929	0.929	0.0113	0.0175	1.429	0.929	0.0049	0.007	1.429
0.153	0.2	1.444	0.908	1.063	0.936	0.936	0.0091	0.0141	1.444	0.936	0.0026	0.004	1.444
0.162	0.0	1.464	0.921	1.054	0.945	0.945	0.0069	0.0107	1.464	0.945	0.0003	0.001	1.464
0.170	0.0	1.478	0.929	1.048	0.951	0.951	0.0070	0.0108	1.478	0.951	0.0003	0.001	1.478
0.178	0.1	1.489	0.936	1.043	0.956	0.956	0.0083	0.0130	1.489	0.956	0.0017	0.003	1.489
0.186	0.1	1.495	0.940	1.041	0.959	0.959	0.0077	0.0120	1.495	0.959	0.0010	0.002	1.495
0.193	0.1	1.510	0.949	1.035	0.965	0.965	0.0084	0.0132	1.510	0.965	0.0017	0.003	1.510
0.201	0.1	1.521	0.956	1.030	0.970	0.970	0.0091	0.0143	1.521	0.970	0.0024	0.004	1.521
0.209	0.1	1.525	0.959	1.028	0.972	0.972	0.0088	0.0138	1.525	0.972	0.0020	0.003	1.525
0.217	0.0	1.539	0.967	1.022	0.978	0.978	0.0072	0.0113	1.539	0.978	0.0003	0.001	1.539
0.225	0.0	1.546	0.972	1.019	0.981	0.981	0.0075	0.0119	1.546	0.981	0.0007	0.001	1.546
0.232	0.0	1.553	0.976	1.016	0.984	0.984	0.0072	0.0114	1.553	0.984	0.0003	0.001	1.553
0.240	0.0	1.564	0.983	1.011	0.989	0.989	0.0069	0.0109	1.564	0.989	0.0	0.0	1.564
0.248	0.0	1.569	0.986	1.009	0.991	0.991	0.0073	0.0115	1.569	0.991	0.0003	0.001	1.569
0.255	0.0	1.573	0.989	1.008	0.993	0.993	0.0069	0.0110	1.573	0.993	0.0	0.0	1.573
0.263	0.0	1.578	0.992	1.005	0.995	0.995	0.0069	0.0110	1.578	0.995	0.0	0.0	1.578
0.271	-0.2	1.580	0.993	1.005	0.995	0.995	0.0035	0.0055	1.580	0.995	-0.0035	-0.006	1.580
0.279	-0.2	1.583	0.995	1.003	0.997	0.997	0.0031	0.0050	1.583	0.997	-0.0038	-0.006	1.583
0.287	-0.4	1.586	0.997	1.002	0.998	0.998	0.0	0.0	1.586	0.998	-0.0070	-0.011	1.586
0.295	-0.2	1.586	0.997	1.002	0.998	0.998	0.0035	0.0055	1.586	0.998	-0.0035	-0.006	1.586
0.302	-0.3	1.590	0.999	1.000	1.000	1.000	0.0021	0.0033	1.590	1.000	-0.0049	-0.008	1.590
0.310	-0.4	1.589	0.999	1.001	0.999	0.999	0.0	0.0	1.589	0.999	-0.0070	-0.011	1.589
0.318	-0.4	1.591	1.000	1.000	1.000	1.000	0.0	0.0	1.591	1.000	-0.0070	-0.011	1.591

RUN NO. 4546 MACH NUMBER 1.798 ALPHA= 15.78 AL/THC= 1.262 PHIPP= 0.0 PE/POD=0.4549

DEL1= 0.0268 DEL2= -0.0003 TH11= 0.0118 TH21= -0.0003 TH12= 0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	-0.2	0.759	0.585	1.198	0.641	0.641	-0.0022	-0.0026	0.759	0.641	-0.0025	-0.003	0.759
0.013	-0.3	0.862	0.665	1.163	0.717	0.717	-0.0033	-0.0039	0.862	0.717	-0.0035	-0.004	0.862
0.020	-0.2	0.925	0.714	1.141	0.762	0.762	-0.0027	-0.0032	0.925	0.762	-0.0029	-0.004	0.925
0.027	-0.1	0.968	0.747	1.125	0.792	0.792	-0.0011	-0.0014	0.968	0.792	-0.0014	-0.002	0.968
0.033	-0.1	1.004	0.774	1.112	0.817	0.817	-0.0009	-0.0011	1.004	0.817	-0.0011	-0.001	1.004
0.039	-0.0	1.031	0.795	1.102	0.835	0.835	-0.0003	-0.0004	1.031	0.835	-0.0006	-0.001	1.031
0.046	0.0	1.054	0.813	1.093	0.850	0.850	0.0003	0.0004	1.054	0.850	0.0	0.0	1.054
0.052	0.1	1.080	0.833	1.083	0.867	0.867	0.0012	0.0015	1.080	0.867	0.0009	0.001	1.080
0.058	0.1	1.102	0.850	1.075	0.882	0.882	0.0015	0.0019	1.102	0.882	0.0012	0.002	1.102
0.064	0.2	1.119	0.863	1.068	0.892	0.892	0.0028	0.0035	1.119	0.892	0.0025	0.003	1.119
0.071	0.2	1.138	0.878	1.061	0.904	0.904	0.0041	0.0052	1.138	0.904	0.0038	0.005	1.138
0.077	0.3	1.158	0.893	1.053	0.917	0.917	0.0051	0.0065	1.158	0.917	0.0048	0.006	1.158
0.084	0.3	1.179	0.910	1.045	0.930	0.930	0.0052	0.0066	1.179	0.930	0.0049	0.006	1.179
0.090	0.3	1.194	0.921	1.040	0.939	0.939	0.0052	0.0067	1.194	0.939	0.0049	0.006	1.194
0.097	0.3	1.210	0.934	1.033	0.949	0.949	0.0053	0.0068	1.210	0.949	0.0050	0.006	1.210
0.104	0.5	1.224	0.945	1.028	0.958	0.958	0.0080	0.0103	1.224	0.958	0.0077	0.010	1.224
0.110	0.4	1.239	0.956	1.022	0.966	0.966	0.0067	0.0087	1.239	0.966	0.0064	0.008	1.239
0.118	0.4	1.251	0.965	1.018	0.973	0.973	0.0068	0.0087	1.251	0.973	0.0065	0.008	1.251
0.123	0.4	1.261	0.973	1.014	0.979	0.979	0.0068	0.0088	1.261	0.979	0.0065	0.008	1.261
0.130	0.2	1.269	0.979	1.011	0.984	0.984	0.0045	0.0058	1.269	0.984	0.0041	0.005	1.269
0.137	0.1	1.276	0.984	1.008	0.988	0.988	0.0017	0.0022	1.276	0.988	0.0014	0.002	1.276
0.143	-0.0	1.281	0.988	1.006	0.991	0.991	0.0	0.0	1.281	0.991	-0.0003	-0.000	1.281
0.150	-0.1	1.287	0.993	1.003	0.995	0.995	-0.0010	-0.0013	1.287	0.995	-0.0014	-0.002	1.287
0.156	-0.2	1.290	0.995	1.002	0.996	0.996	-0.0038	-0.0050	1.290	0.996	-0.0042	-0.005	1.290
0.163	-0.0	1.294	0.998	1.001	0.999	0.999	-0.0003	-0.0005	1.294	0.999	-0.0007	-0.001	1.294
0.170	0.0	1.294	0.998	1.001	0.999	0.999	0.0007	0.0009	1.294	0.999	0.0003	0.000	1.294
0.175	-0.1	1.294	0.998	1.001	0.999	0.999	-0.0021	-0.0027	1.294	0.999	-0.0024	-0.003	1.294
0.182	-0.0	1.296	1.000	1.000	1.000	1.000	0.0	0.0	1.296	1.000	-0.0003	-0.000	1.296

RUN NO. 4547 MACH NUMBER 1.797 ALPHA= 15.78 AL/THC= 1.262 PHIPP= 45.00 PE/POD=0.3793

DEL1= 0.0275 DEL2= -0.0043 TH11= 0.0112 TH21= -0.0037 TH12= 0.0006 TH22= -0.0002

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	21.0	0.762	0.537	1.256	0.602	0.600	0.0483	0.0611	0.759	0.562	0.2157	0.273	0.711
0.010	20.9	0.851	0.600	1.225	0.664	0.662	0.0521	0.0668	0.848	0.620	0.2369	0.304	0.795
0.017	20.6	0.958	0.675	1.185	0.735	0.733	0.0536	0.0698	0.955	0.688	0.2584	0.337	0.897
0.024	20.5	1.022	0.721	1.160	0.776	0.774	0.0558	0.0734	1.020	0.727	0.2721	0.358	0.957
0.031	20.4	1.075	0.758	1.139	0.809	0.807	0.0559	0.0742	1.072	0.758	0.2815	0.374	1.008
0.038	20.3	1.113	0.785	1.124	0.832	0.830	0.0560	0.0749	1.111	0.781	0.2881	0.385	1.044
0.045	19.7	1.149	0.810	1.110	0.853	0.852	0.0485	0.0653	1.147	0.803	0.2870	0.386	1.082
0.052	19.6	1.180	0.832	1.097	0.871	0.870	0.0483	0.0654	1.178	0.821	0.2919	0.395	1.111
0.059	19.0	1.208	0.852	1.085	0.887	0.886	0.0399	0.0544	1.207	0.839	0.2886	0.393	1.142
0.066	18.8	1.232	0.869	1.076	0.901	0.900	0.0377	0.0516	1.231	0.853	0.2903	0.397	1.166
0.073	18.3	1.263	0.891	1.063	0.918	0.918	0.0311	0.0428	1.262	0.872	0.2889	0.397	1.199
0.080	18.3	1.287	0.907	1.054	0.931	0.931	0.0302	0.0418	1.286	0.884	0.2917	0.403	1.222
0.088	18.1	1.304	0.919	1.046	0.940	0.940	0.0272	0.0378	1.303	0.894	0.2916	0.404	1.240
0.095	17.8	1.328	0.936	1.037	0.953	0.953	0.0233	0.0324	1.328	0.908	0.2915	0.406	1.265
0.102	17.7	1.345	0.948	1.030	0.962	0.962	0.0218	0.0305	1.344	0.917	0.2926	0.409	1.281
0.109	17.5	1.364	0.961	1.022	0.972	0.972	0.0193	0.0271	1.363	0.927	0.2929	0.411	1.300
0.116	17.5	1.376	0.970	1.017	0.978	0.978	0.0181	0.0255	1.376	0.933	0.2936	0.413	1.313
0.123	17.1	1.388	0.979	1.012	0.985	0.985	0.0113	0.0160	1.388	0.941	0.2889	0.407	1.327
0.130	16.9	1.400	0.987	1.008	0.991	0.991	0.0093	0.0132	1.400	0.948	0.2886	0.408	1.339
0.137	16.9	1.406	0.992	1.005	0.994	0.994	0.0080	0.0113	1.406	0.951	0.2883	0.408	1.346
0.145	16.6	1.412	0.996	1.002	0.997	0.997	0.0038	0.0054	1.412	0.955	0.2852	0.404	1.353
0.152	16.5	1.412	0.996	1.002	0.997	0.997	0.0024	0.0035	1.412	0.956	0.2838	0.402	1.354
0.159	16.4	1.418	0.999	1.000	1.000	1.000	-0.0003	-0.0005	1.418	0.959	0.2819	0.400	1.360
0.166	16.4	1.418	1.000	1.000	1.000	1.000	0.0	0.0	1.418	0.959	0.2823	0.400	1.361

RUN NO. 4548 MACH NUMBER 1.799 ALPHA= 15.78 AL/THC= 1.262 PHIPP= 90.00 PE/POD=0.2393

DEL1= 0.0360 DEL2= -0.0081 TH11= 0.0125 TH21= -0.0069 TH12= 0.0012 TH22= -0.0005

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	31.8	0.817	0.476	1.403	0.563	0.559	0.0683	0.0990	0.811	0.479	0.2965	0.430	0.695
0.009	31.8	0.882	0.514	1.376	0.602	0.598	0.0732	0.1072	0.876	0.512	0.3173	0.465	0.750
0.016	31.8	1.037	0.604	1.309	0.690	0.685	0.0841	0.1263	1.029	0.587	0.3639	0.546	0.881
0.022	31.9	1.133	0.659	1.265	0.742	0.736	0.0922	0.1408	1.124	0.630	0.3924	0.599	0.961
0.029	31.9	1.207	0.703	1.231	0.780	0.774	0.0967	0.1496	1.198	0.662	0.4123	0.638	1.024
0.036	31.4	1.265	0.737	1.204	0.808	0.803	0.0924	0.1445	1.257	0.690	0.4207	0.658	1.080
0.042	30.9	1.320	0.769	1.179	0.835	0.830	0.0881	0.1394	1.313	0.716	0.4281	0.677	1.133
0.049	30.4	1.364	0.794	1.159	0.855	0.851	0.0828	0.1322	1.358	0.738	0.4321	0.689	1.177
0.056	30.0	1.408	0.820	1.139	0.875	0.871	0.0799	0.1285	1.402	0.757	0.4378	0.705	1.218
0.063	29.9	1.441	0.839	1.123	0.889	0.886	0.0784	0.1271	1.436	0.771	0.4428	0.718	1.250
0.070	29.4	1.473	0.858	1.109	0.903	0.900	0.0721	0.1177	1.469	0.787	0.4431	0.723	1.284
0.077	29.0	1.504	0.875	1.095	0.916	0.914	0.0664	0.1091	1.500	0.801	0.4435	0.728	1.316
0.084	28.5	1.521	0.886	1.087	0.923	0.921	0.0596	0.0982	1.518	0.811	0.4406	0.726	1.337
0.091	28.4	1.541	0.897	1.078	0.931	0.930	0.0582	0.0962	1.538	0.819	0.4427	0.732	1.355
0.099	27.8	1.561	0.909	1.069	0.940	0.938	0.0495	0.0822	1.559	0.831	0.4385	0.728	1.380
0.106	27.6	1.579	0.919	1.061	0.947	0.946	0.0466	0.0777	1.577	0.839	0.4389	0.732	1.399
0.113	27.1	1.602	0.932	1.051	0.956	0.955	0.0390	0.0654	1.600	0.851	0.4360	0.731	1.425
0.120	27.0	1.616	0.941	1.045	0.962	0.961	0.0372	0.0626	1.615	0.857	0.4368	0.734	1.439
0.127	26.7	1.631	0.950	1.038	0.967	0.967	0.0317	0.0535	1.630	0.864	0.4344	0.732	1.457
0.134	26.3	1.650	0.961	1.029	0.975	0.974	0.0259	0.0438	1.650	0.874	0.4322	0.732	1.479
0.141	26.0	1.661	0.967	1.025	0.979	0.979	0.0205	0.0348	1.661	0.880	0.4291	0.728	1.493
0.149	25.8	1.674	0.975	1.019	0.984	0.984	0.0172	0.0292	1.674	0.886	0.4282	0.729	1.507
0.155	25.5	1.684	0.980	1.015	0.987	0.987	0.0121	0.0206	1.684	0.891	0.4251	0.725	1.520
0.162	25.4	1.691	0.984	1.012	0.990	0.990	0.0100	0.0171	1.690	0.894	0.4243	0.725	1.527
0.169	25.2	1.700	0.990	1.007	0.994	0.994	0.0062	0.0107	1.700	0.899	0.4224	0.723	1.539
0.177	25.1	1.704	0.992	1.006	0.995	0.995	0.0049	0.0083	1.704	0.901	0.4218	0.722	1.543
0.184	24.9	1.708	0.994	1.004	0.996	0.996	0.0017	0.0030	1.708	0.904	0.4195	0.719	1.549
0.191	25.0	1.711	0.996	1.003	0.998	0.998	0.0031	0.0054	1.711	0.904	0.4213	0.722	1.551
0.198	24.8	1.716	0.999	1.001	0.999	0.999	0.0007	0.0012	1.716	0.907	0.4198	0.721	1.557
0.206	24.8	1.717	0.999	1.000	1.000	1.000	0.0003	0.0006	1.717	0.907	0.4196	0.721	1.558
0.212	24.8	1.718	1.000	1.000	1.000	1.000	0.0	0.0	1.718	0.908	0.4194	0.720	1.559

RUN NO. 4549 MACH NUMBER 1.796 ALPHA= 15.78 AL/THC= 1.262 PHIPP=135.00 PE/POD=0.2043

DEL1= 0.0641 DEL2= -0.0068 TH11= 0.0211 TH21= -0.0059 TH12= 0.0009 TH22= -0.0002

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OMF)	M*COS(OM-OMF)	U1/UE	V1/UE	MSOM	MCOM
0.007	19.9	0.718	0.395	1.507	0.484	0.484	0.0110	0.0163	0.718	0.456	0.1647	0.244	0.675
0.009	19.7	0.765	0.421	1.488	0.513	0.513	0.0098	0.0147	0.765	0.483	0.1728	0.258	0.720
0.017	19.6	0.901	0.495	1.430	0.592	0.592	0.0110	0.0167	0.901	0.558	0.1991	0.303	0.849
0.024	20.0	0.978	0.538	1.395	0.635	0.635	0.0155	0.0239	0.978	0.597	0.2170	0.334	0.919
0.032	20.4	1.049	0.577	1.362	0.673	0.673	0.0214	0.0333	1.049	0.631	0.2347	0.366	0.984
0.040	20.9	1.097	0.603	1.340	0.698	0.697	0.0280	0.0440	1.096	0.652	0.2487	0.391	1.025
0.047	21.1	1.145	0.629	1.317	0.722	0.721	0.0317	0.0503	1.144	0.674	0.2599	0.412	1.068
0.054	21.4	1.195	0.657	1.293	0.747	0.746	0.0367	0.0588	1.194	0.695	0.2725	0.436	1.113
0.062	21.5	1.235	0.679	1.273	0.766	0.765	0.0388	0.0625	1.233	0.713	0.2805	0.452	1.149
0.069	21.6	1.279	0.703	1.252	0.787	0.786	0.0412	0.0670	1.278	0.732	0.2894	0.471	1.190
0.077	21.6	1.318	0.724	1.234	0.804	0.803	0.0429	0.0703	1.316	0.748	0.2966	0.486	1.225
0.085	21.8	1.363	0.749	1.212	0.825	0.824	0.0460	0.0761	1.361	0.766	0.3060	0.506	1.266
0.093	21.6	1.397	0.768	1.195	0.840	0.839	0.0442	0.0736	1.395	0.781	0.3091	0.514	1.299
0.101	21.6	1.432	0.787	1.179	0.854	0.853	0.0456	0.0764	1.430	0.794	0.3151	0.528	1.331
0.109	21.6	1.469	0.808	1.161	0.870	0.869	0.0458	0.0774	1.467	0.809	0.3204	0.541	1.366
0.118	21.6	1.503	0.826	1.144	0.884	0.883	0.0463	0.0787	1.501	0.822	0.3252	0.553	1.398
0.124	21.4	1.530	0.841	1.132	0.895	0.894	0.0440	0.0753	1.528	0.833	0.3265	0.558	1.425
0.132	21.3	1.567	0.861	1.115	0.909	0.908	0.0438	0.0754	1.565	0.847	0.3309	0.570	1.459
0.140	21.3	1.591	0.875	1.103	0.919	0.918	0.0436	0.0755	1.589	0.856	0.3337	0.578	1.482
0.149	21.3	1.613	0.887	1.093	0.927	0.926	0.0437	0.0760	1.611	0.864	0.3364	0.585	1.503
0.156	21.1	1.635	0.899	1.083	0.935	0.935	0.0408	0.0713	1.634	0.873	0.3364	0.588	1.526
0.164	21.0	1.662	0.914	1.070	0.945	0.945	0.0396	0.0696	1.661	0.883	0.3385	0.595	1.552
0.172	20.7	1.677	0.922	1.063	0.951	0.950	0.0358	0.0632	1.676	0.889	0.3367	0.594	1.569
0.180	20.6	1.694	0.931	1.056	0.957	0.956	0.0337	0.0597	1.693	0.896	0.3367	0.596	1.586
0.188	20.4	1.711	0.941	1.048	0.963	0.963	0.0309	0.0549	1.710	0.903	0.3360	0.597	1.604
0.195	20.2	1.726	0.949	1.041	0.968	0.968	0.0280	0.0500	1.725	0.908	0.3350	0.597	1.619
0.202	19.9	1.740	0.957	1.035	0.973	0.973	0.0228	0.0407	1.740	0.915	0.3316	0.593	1.636
0.211	19.8	1.754	0.964	1.029	0.978	0.978	0.0205	0.0367	1.753	0.920	0.3309	0.593	1.650
0.218	19.6	1.767	0.971	1.023	0.982	0.982	0.0175	0.0314	1.766	0.925	0.3295	0.593	1.664
0.226	19.3	1.779	0.978	1.018	0.986	0.986	0.0131	0.0236	1.778	0.931	0.3267	0.589	1.678
0.233	19.2	1.787	0.982	1.014	0.989	0.989	0.0107	0.0193	1.787	0.934	0.3254	0.588	1.688
0.241	19.2	1.797	0.988	1.010	0.993	0.993	0.0104	0.0188	1.797	0.937	0.3261	0.590	1.697
0.249	18.9	1.801	0.990	1.008	0.994	0.994	0.0062	0.0113	1.801	0.940	0.3226	0.585	1.704
0.256	18.9	1.807	0.994	1.005	0.996	0.996	0.0056	0.0101	1.807	0.942	0.3227	0.585	1.710
0.264	18.8	1.812	0.996	1.003	0.998	0.998	0.0038	0.0070	1.812	0.944	0.3215	0.584	1.715
0.272	18.7	1.816	0.998	1.001	0.999	0.999	0.0028	0.0051	1.816	0.946	0.3209	0.583	1.720
0.279	18.7	1.817	0.999	1.001	0.999	0.999	0.0014	0.0025	1.817	0.947	0.3197	0.581	1.721
0.287	18.6	1.819	1.000	1.000	1.000	1.000	0.0	0.0	1.819	0.948	0.3186	0.580	1.724

RUN NO. 4550 MACH NUMBER 1.799 ALPHA= 15.78 AL/THC= 1.262 PHIPP=145.83 PE/POD=0.2144

DEL1= 0.0853 DEL2= -0.0024 TH11= 0.0281 TH21= -0.0025 TH12= -0.0002 TH22= -0.0001

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	11.8	0.691	0.384	1.504	0.471	0.470	-0.0260	-0.0381	0.690	0.461	0.0964	0.142	0.676
0.015	11.2	0.819	0.455	1.453	0.548	0.547	-0.0358	-0.0534	0.817	0.538	0.1069	0.160	0.803
0.028	11.9	0.918	0.510	1.410	0.606	0.605	-0.0328	-0.0497	0.917	0.593	0.1247	0.189	0.899
0.039	12.8	0.985	0.547	1.380	0.643	0.643	-0.0245	-0.0375	0.985	0.627	0.1425	0.218	0.961
0.051	13.6	1.043	0.580	1.353	0.674	0.674	-0.0167	-0.0258	1.043	0.655	0.1581	0.245	1.014
0.063	13.7	1.087	0.604	1.333	0.697	0.697	-0.0151	-0.0235	1.086	0.677	0.1656	0.258	1.056
0.075	14.4	1.159	0.644	1.299	0.734	0.734	-0.0074	-0.0117	1.159	0.711	0.1825	0.288	1.122
0.088	15.0	1.203	0.668	1.278	0.756	0.756	0.0005	0.0008	1.203	0.730	0.1958	0.312	1.162
0.100	15.5	1.251	0.695	1.255	0.779	0.779	0.0065	0.0105	1.251	0.751	0.2076	0.334	1.206
0.113	15.6	1.292	0.718	1.236	0.798	0.798	0.0092	0.0149	1.291	0.768	0.2150	0.348	1.244
0.125	16.0	1.349	0.749	1.208	0.824	0.824	0.0141	0.0231	1.348	0.792	0.2265	0.371	1.297
0.136	16.3	1.390	0.772	1.189	0.842	0.842	0.0191	0.0315	1.389	0.808	0.2360	0.390	1.334
0.149	16.4	1.429	0.794	1.170	0.859	0.859	0.0207	0.0344	1.429	0.824	0.2419	0.403	1.371
0.161	16.4	1.482	0.823	1.145	0.881	0.881	0.0218	0.0367	1.481	0.845	0.2487	0.418	1.421
0.173	16.5	1.520	0.844	1.127	0.897	0.896	0.0241	0.0408	1.519	0.860	0.2549	0.432	1.457
0.185	16.7	1.574	0.874	1.102	0.918	0.917	0.0269	0.0461	1.573	0.879	0.2631	0.451	1.507
0.198	16.7	1.606	0.892	1.087	0.930	0.930	0.0282	0.0488	1.605	0.891	0.2677	0.462	1.538
0.210	16.7	1.643	0.913	1.070	0.944	0.944	0.0277	0.0482	1.643	0.905	0.2708	0.471	1.574
0.222	16.5	1.664	0.925	1.060	0.952	0.952	0.0259	0.0453	1.664	0.913	0.2711	0.474	1.596
0.235	16.4	1.696	0.942	1.046	0.964	0.964	0.0242	0.0426	1.696	0.925	0.2724	0.479	1.627
0.246	16.3	1.715	0.953	1.037	0.971	0.971	0.0220	0.0389	1.715	0.932	0.2721	0.481	1.647
0.258	16.0	1.738	0.966	1.027	0.979	0.978	0.0178	0.0315	1.737	0.941	0.2701	0.480	1.670
0.271	15.8	1.756	0.975	1.019	0.985	0.985	0.0141	0.0251	1.755	0.948	0.2682	0.478	1.689
0.284	15.7	1.771	0.984	1.013	0.990	0.990	0.0118	0.0210	1.771	0.953	0.2673	0.478	1.705
0.296	15.3	1.781	0.990	1.008	0.994	0.994	0.0049	0.0087	1.781	0.959	0.2616	0.469	1.719
0.309	15.1	1.791	0.995	1.004	0.997	0.997	0.0017	0.0031	1.791	0.963	0.2594	0.466	1.729
0.321	14.9	1.796	0.998	1.002	0.999	0.999	-0.0010	-0.0019	1.796	0.965	0.2571	0.462	1.735
0.334	15.0	1.800	1.000	1.000	1.000	1.000	0.0003	0.0006	1.800	0.966	0.2588	0.466	1.739
0.346	15.0	1.800	1.000	1.000	1.000	1.000	0.0	0.0	1.800	0.966	0.2585	0.465	1.739

RUN NO. 4551 MACH NUMBER 1.796 ALPHA= 15.78 AL/THC= 1.262 PHIPP=156.93 PE/POD=0.2206

DEL1= 0.1622 DEL2= 0.0076 TH11= 0.0514 TH21= 0.0042 TH12= -0.0034 TH22= -0.0006

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	0.3	0.550	0.306	1.553	0.381	0.375	-0.0688	-0.0993	0.541	0.381	0.0020	0.003	0.550
0.016	0.3	0.670	0.373	1.511	0.458	0.450	-0.0825	-0.1207	0.659	0.458	0.0026	0.004	0.670
0.028	1.0	0.752	0.418	1.479	0.509	0.502	-0.0854	-0.1262	0.741	0.509	0.0092	0.014	0.752
0.040	1.7	0.811	0.451	1.455	0.544	0.537	-0.0853	-0.1272	0.801	0.544	0.0160	0.024	0.811
0.052	2.5	0.861	0.479	1.434	0.574	0.568	-0.0814	-0.1222	0.853	0.573	0.0254	0.038	0.860
0.065	3.4	0.882	0.491	1.425	0.586	0.581	-0.0744	-0.1121	0.875	0.585	0.0347	0.052	0.881
0.076	4.1	0.914	0.509	1.411	0.604	0.600	-0.0696	-0.1054	0.908	0.603	0.0430	0.065	0.912
0.089	4.9	0.945	0.525	1.397	0.621	0.618	-0.0632	-0.0961	0.940	0.619	0.0526	0.080	0.941
0.101	5.4	0.965	0.537	1.388	0.632	0.630	-0.0588	-0.0898	0.961	0.629	0.0591	0.090	0.961
0.113	5.6	1.003	0.558	1.371	0.653	0.651	-0.0578	-0.0888	0.999	0.650	0.0640	0.098	0.998
0.125	6.3	1.044	0.581	1.352	0.675	0.673	-0.0523	-0.0808	1.041	0.671	0.0736	0.114	1.031
0.138	6.7	1.039	0.578	1.354	0.672	0.671	-0.0471	-0.0728	1.036	0.668	0.0782	0.121	1.031
0.150	7.1	1.094	0.608	1.329	0.701	0.700	-0.0440	-0.0687	1.092	0.696	0.0867	0.135	1.085
0.161	7.2	1.106	0.615	1.323	0.708	0.706	-0.0429	-0.0671	1.104	0.702	0.0889	0.139	1.097
0.174	8.0	1.171	0.651	1.292	0.741	0.740	-0.0349	-0.0552	1.170	0.733	0.1031	0.163	1.160
0.186	8.3	1.150	0.640	1.302	0.730	0.729	-0.0308	-0.0486	1.149	0.722	0.1051	0.166	1.138
0.199	8.8	1.165	0.648	1.295	0.737	0.737	-0.0242	-0.0382	1.164	0.729	0.1131	0.179	1.151
0.211	9.0	1.265	0.703	1.247	0.786	0.785	-0.0230	-0.0371	1.264	0.776	0.1232	0.198	1.249
0.224	9.6	1.209	0.673	1.274	0.759	0.759	-0.0146	-0.0232	1.209	0.748	0.1266	0.202	1.192
0.235	9.9	1.319	0.733	1.222	0.811	0.811	-0.0110	-0.0180	1.319	0.799	0.1397	0.227	1.299
0.248	10.1	1.306	0.726	1.228	0.805	0.805	-0.0084	-0.0137	1.306	0.792	0.1412	0.229	1.286
0.260	10.3	1.360	0.756	1.202	0.829	0.829	-0.0064	-0.0104	1.360	0.816	0.1477	0.242	1.338
0.271	10.5	1.390	0.773	1.188	0.843	0.843	-0.0024	-0.0039	1.390	0.828	0.1541	0.254	1.367
0.285	10.7	1.417	0.788	1.175	0.854	0.854	0.0006	0.0010	1.417	0.839	0.1592	0.264	1.392
0.296	11.0	1.467	0.816	1.151	0.876	0.876	0.0046	0.0077	1.467	0.859	0.1671	0.280	1.440
0.310	11.1	1.475	0.820	1.147	0.879	0.879	0.0061	0.0103	1.475	0.862	0.1691	0.284	1.447
0.322	11.2	1.527	0.850	1.123	0.900	0.900	0.0082	0.0139	1.527	0.883	0.1751	0.297	1.498
0.335	11.4	1.534	0.853	1.119	0.903	0.903	0.0113	0.0193	1.534	0.885	0.1788	0.304	1.504
0.346	11.4	1.591	0.885	1.093	0.925	0.925	0.0113	0.0194	1.590	0.907	0.1828	0.314	1.559
0.360	11.6	1.632	0.908	1.074	0.941	0.941	0.0141	0.0245	1.631	0.922	0.1885	0.327	1.599
0.370	11.4	1.620	0.901	1.080	0.936	0.936	0.0118	0.0204	1.619	0.918	0.1853	0.321	1.588
0.383	11.4	1.653	0.920	1.064	0.949	0.949	0.0119	0.0208	1.653	0.930	0.1879	0.327	1.621
0.395	11.4	1.701	0.946	1.043	0.966	0.966	0.0118	0.0208	1.701	0.947	0.1910	0.336	1.668
0.408	11.4	1.718	0.956	1.035	0.972	0.972	0.0115	0.0204	1.718	0.953	0.1918	0.339	1.684
0.419	11.1	1.752	0.974	1.020	0.984	0.984	0.0076	0.0135	1.752	0.966	0.1901	0.338	1.719
0.432	11.0	1.760	0.979	1.017	0.987	0.987	0.0048	0.0086	1.760	0.969	0.1880	0.335	1.728
0.445	10.9	1.776	0.988	1.010	0.993	0.993	0.0031	0.0056	1.776	0.975	0.1873	0.335	1.744
0.456	10.8	1.785	0.993	1.006	0.996	0.996	0.0017	0.0031	1.785	0.978	0.1866	0.334	1.753
0.468	10.7	1.794	0.998	1.002	0.999	0.999	0.0007	0.0013	1.794	0.981	0.1861	0.334	1.763
0.480	10.7	1.796	0.999	1.001	0.999	0.999	0.0	0.0	1.796	0.982	0.1855	0.333	1.765
0.492	10.7	1.798	1.000	1.000	1.000	1.000	0.0	0.0	1.798	0.983	0.1857	0.334	1.767

RUN NO. 4552 MACH NUMBER 1.795 ALPHA= 15.78 AL/THC= 1.262 PHIPP=169.03 PE/POD=0.2219

DEL1= 0.1741 DEL2= 0.0514 TH11= 0.0694 TH21= 0.0434 TH12= -0.0080 TH22= -0.0080

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-8.5	0.834	0.475	1.418	0.566	0.545	-0.1534	-0.2259	0.803	0.560	-0.0841	-0.124	0.825
0.017	-8.8	1.010	0.576	1.342	0.667	0.641	-0.1836	-0.2781	0.971	0.659	-0.1020	-0.155	0.998
0.035	-8.4	1.187	0.677	1.260	0.760	0.732	-0.2041	-0.3188	1.144	0.752	-0.1110	-0.173	1.174
0.055	-7.6	1.430	0.815	1.147	0.873	0.844	-0.2227	-0.3647	1.382	0.865	-0.1154	-0.189	1.417
0.075	-6.8	1.475	0.841	1.125	0.892	0.866	-0.2159	-0.3569	1.432	0.886	-0.1060	-0.175	1.465
0.094	-6.0	1.486	0.847	1.120	0.897	0.873	-0.2045	-0.3389	1.447	0.892	-0.0938	-0.155	1.478
0.113	-4.9	1.498	0.854	1.115	0.902	0.882	-0.1884	-0.3130	1.465	0.899	-0.0767	-0.127	1.493
0.132	-4.1	1.474	0.840	1.126	0.892	0.875	-0.1741	-0.2879	1.446	0.890	-0.0635	-0.105	1.470
0.152	-3.7	1.483	0.845	1.122	0.895	0.879	-0.1690	-0.2799	1.456	0.894	-0.0578	-0.096	1.480
0.172	-2.9	1.468	0.837	1.129	0.889	0.876	-0.1556	-0.2570	1.445	0.888	-0.0450	-0.074	1.466
0.191	-2.7	1.464	0.835	1.130	0.888	0.875	-0.1517	-0.2503	1.443	0.887	-0.0412	-0.068	1.463
0.211	-2.0	1.452	0.828	1.136	0.882	0.871	-0.1402	-0.2307	1.434	0.882	-0.0302	-0.050	1.451
0.231	-1.7	1.453	0.829	1.136	0.883	0.872	-0.1357	-0.2234	1.436	0.883	-0.0256	-0.042	1.453
0.250	-1.6	1.440	0.821	1.142	0.877	0.867	-0.1342	-0.2203	1.423	0.877	-0.0248	-0.041	1.439
0.268	-0.5	1.426	0.813	1.148	0.871	0.863	-0.1164	-0.1906	1.413	0.871	-0.0076	-0.012	1.426
0.289	0.4	1.425	0.812	1.149	0.871	0.865	-0.1022	-0.1672	1.415	0.871	0.0067	0.011	1.425
0.308	0.2	1.427	0.814	1.148	0.872	0.865	-0.1053	-0.1724	1.417	0.872	0.0037	0.006	1.427
0.329	1.5	1.425	0.812	1.149	0.871	0.866	-0.0868	-0.1420	1.418	0.870	0.0222	0.036	1.424
0.348	1.9	1.416	0.807	1.153	0.867	0.863	-0.0795	-0.1298	1.410	0.866	0.0290	0.047	1.415
0.368	2.7	1.417	0.808	1.152	0.867	0.865	-0.0677	-0.1107	1.413	0.866	0.0409	0.067	1.416
0.386	3.3	1.409	0.804	1.156	0.864	0.862	-0.0591	-0.0964	1.406	0.863	0.0491	0.080	1.407
0.405	4.0	1.407	0.802	1.157	0.863	0.861	-0.0482	-0.0785	1.405	0.861	0.0599	0.098	1.404
0.425	4.3	1.403	0.800	1.159	0.861	0.860	-0.0439	-0.0715	1.401	0.859	0.0640	0.104	1.399
0.445	4.8	1.399	0.798	1.161	0.859	0.859	-0.0360	-0.0586	1.398	0.856	0.0716	0.117	1.394
0.463	5.4	1.400	0.798	1.160	0.860	0.860	-0.0273	-0.0445	1.400	0.856	0.0803	0.131	1.394
0.482	5.8	1.399	0.798	1.161	0.859	0.859	-0.0207	-0.0337	1.399	0.855	0.0869	0.141	1.392
0.501	6.2	1.404	0.801	1.158	0.862	0.862	-0.0153	-0.0250	1.404	0.857	0.0925	0.151	1.396
0.521	6.6	1.411	0.804	1.155	0.865	0.864	-0.0091	-0.0148	1.411	0.859	0.0991	0.162	1.401
0.540	7.2	1.425	0.812	1.149	0.871	0.871	0.0	0.0	1.425	0.864	0.1088	0.178	1.414
0.558	7.2	1.445	0.824	1.140	0.879	0.879	0.0006	0.0010	1.445	0.872	0.1105	0.182	1.433
0.577	7.3	1.469	0.838	1.128	0.890	0.890	0.0019	0.0031	1.469	0.883	0.1131	0.187	1.457
0.595	7.4	1.490	0.849	1.119	0.898	0.898	0.0038	0.0062	1.490	0.891	0.1160	0.192	1.477
0.615	7.5	1.516	0.864	1.107	0.909	0.909	0.0044	0.0074	1.516	0.902	0.1180	0.197	1.503
0.635	7.5	1.548	0.882	1.092	0.922	0.922	0.0055	0.0092	1.548	0.914	0.1207	0.203	1.534
0.655	7.6	1.603	0.914	1.067	0.944	0.944	0.0072	0.0123	1.603	0.936	0.1252	0.213	1.589
0.675	7.5	1.605	0.915	1.066	0.945	0.945	0.0059	0.0101	1.605	0.937	0.1240	0.211	1.591
0.695	7.6	1.645	0.938	1.048	0.960	0.960	0.0064	0.0109	1.645	0.952	0.1263	0.216	1.630
0.714	7.5	1.680	0.958	1.033	0.973	0.973	0.0048	0.0082	1.680	0.965	0.1263	0.218	1.666
0.733	7.5	1.694	0.966	1.026	0.979	0.979	0.0048	0.0083	1.694	0.970	0.1270	0.220	1.680
0.752	7.4	1.728	0.985	1.012	0.991	0.991	0.0035	0.0060	1.728	0.982	0.1272	0.222	1.713
0.772	7.3	1.722	0.982	1.014	0.989	0.989	0.0017	0.0030	1.722	0.981	0.1253	0.218	1.709
0.791	7.2	1.754	1.000	1.000	1.000	1.000	0.0	0.0	1.754	0.992	0.1250	0.219	1.740

RUN NO. 4553 MACH NUMBER 1.796 ALPHA= 15.78 AL/THC= 1.262 PHIPP=179.90 PF/PCD=0.2300

DEL1= 0.C494 DEL2= -0.0002 TH11= 0.0176 TH21= -0.0003 TH12= -0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-0.6	0.948	0.542	1.366	0.634	0.634	0.0	0.0	0.948	0.633	-0.0069	-0.010	0.948
0.023	-0.9	1.130	0.647	1.283	0.733	0.733	-0.0036	-0.0055	1.130	0.732	-0.0115	-0.018	1.130
0.035	-0.8	1.230	0.704	1.237	0.782	0.782	-0.0019	-0.0030	1.230	0.782	-0.0104	-0.016	1.230
0.048	-0.7	1.293	0.740	1.207	0.813	0.813	-0.0017	-0.0027	1.293	0.813	-0.0105	-0.017	1.293
0.061	-0.7	1.358	0.777	1.177	0.843	0.843	-0.0015	-0.0024	1.358	0.843	-0.0106	-0.017	1.358
0.074	-0.7	1.405	0.803	1.155	0.864	0.864	-0.0006	-0.0010	1.405	0.864	-0.0099	-0.016	1.404
0.087	-0.6	1.438	0.822	1.140	0.878	0.878	0.0009	0.0015	1.438	0.878	-0.0086	-0.014	1.437
0.100	-0.5	1.471	0.841	1.125	0.892	0.892	0.0016	0.0026	1.471	0.892	-0.0081	-0.013	1.471
0.113	-0.5	1.500	0.858	1.111	0.904	0.904	0.0019	0.0031	1.500	0.904	-0.0079	-0.013	1.500
0.126	-0.5	1.532	0.876	1.097	0.918	0.918	0.0022	0.0037	1.532	0.918	-0.0077	-0.013	1.532
0.139	-0.5	1.567	0.897	1.080	0.932	0.932	0.0026	0.0044	1.567	0.932	-0.0075	-0.013	1.567
0.151	-0.5	1.612	0.922	1.060	0.949	0.949	0.0027	0.0045	1.612	0.949	-0.0076	-0.013	1.612
0.165	-0.4	1.636	0.936	1.049	0.959	0.959	0.0037	0.0063	1.636	0.959	-0.0067	-0.011	1.636
0.178	-0.4	1.652	0.945	1.042	0.965	0.965	0.0034	0.0058	1.652	0.965	-0.0071	-0.012	1.651
0.191	-0.5	1.676	0.959	1.032	0.974	0.974	0.0027	0.0047	1.676	0.974	-0.0078	-0.013	1.676
0.205	-0.5	1.694	0.969	1.023	0.981	0.981	0.0021	0.0035	1.694	0.981	-0.0086	-0.015	1.694
0.217	-0.6	1.711	0.979	1.016	0.987	0.987	0.0010	0.0018	1.711	0.986	-0.0096	-0.017	1.710
0.230	-0.6	1.725	0.987	1.010	0.992	0.992	0.0010	0.0018	1.725	0.992	-0.0097	-0.017	1.725
0.242	-0.6	1.734	0.992	1.006	0.995	0.995	0.0010	0.0018	1.734	0.995	-0.0097	-0.017	1.734
0.255	-0.6	1.738	0.994	1.004	0.997	0.997	0.0010	0.0018	1.738	0.996	-0.0097	-0.017	1.738
0.268	-0.6	1.744	0.998	1.002	0.999	0.999	0.0003	0.0006	1.744	0.999	-0.0105	-0.018	1.744
0.282	-0.6	1.745	0.998	1.001	0.999	0.999	0.0	0.0	1.745	0.999	-0.0108	-0.019	1.745
0.295	-0.6	1.748	1.000	1.000	1.000	1.000	0.0	0.0	1.748	1.000	-0.0108	-0.019	1.748

RUN NO. 4554 MACH NUMBER 1.801 ALPHA= 22.72 AL/THC= 1.818 PHIPP= 0.0 PE/POD=0.5471

DEL1= 0.0225 DEL2= 0.0004 TH11= 0.0103 TH21= 0.0004 TH12= -0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-0.1	0.681	0.600	1.151	0.644	0.644	-0.0007	-0.0007	0.681	0.644	-0.0011	-0.001	0.681
0.014	-0.2	0.788	0.695	1.118	0.735	0.735	-0.0026	-0.0027	0.788	0.735	-0.0031	-0.003	0.788
0.022	-0.3	0.851	0.750	1.098	0.786	0.786	-0.0030	-0.0033	0.851	0.786	-0.0036	-0.004	0.851
0.030	-0.3	0.896	0.790	1.083	0.822	0.822	-0.0032	-0.0034	0.896	0.822	-0.0037	-0.004	0.896
0.037	-0.3	0.922	0.813	1.074	0.843	0.843	-0.0032	-0.0035	0.922	0.843	-0.0038	-0.004	0.922
0.045	-0.3	0.956	0.843	1.063	0.869	0.869	-0.0033	-0.0037	0.956	0.869	-0.0039	-0.004	0.956
0.052	-0.3	0.980	0.864	1.055	0.888	0.888	-0.0034	-0.0038	0.980	0.888	-0.0040	-0.004	0.980
0.060	-0.3	1.005	0.886	1.046	0.907	0.907	-0.0035	-0.0039	1.005	0.907	-0.0041	-0.005	1.005
0.068	-0.3	1.026	0.905	1.038	0.922	0.922	-0.0035	-0.0039	1.026	0.922	-0.0042	-0.005	1.026
0.075	-0.3	1.044	0.921	1.032	0.935	0.935	-0.0036	-0.0040	1.044	0.935	-0.0042	-0.005	1.044
0.083	-0.2	1.063	0.937	1.025	0.949	0.949	-0.0033	-0.0037	1.063	0.949	-0.0040	-0.004	1.063
0.090	-0.2	1.078	0.950	1.020	0.960	0.960	-0.0034	-0.0038	1.078	0.960	-0.0040	-0.005	1.078
0.099	0.0	1.092	0.963	1.015	0.970	0.970	0.0007	0.0008	1.092	0.970	0.0	0.0	1.092
0.107	-0.1	1.101	0.971	1.012	0.977	0.977	-0.0007	-0.0008	1.101	0.977	-0.0014	-0.002	1.101
0.114	-0.1	1.112	0.981	1.008	0.984	0.984	-0.0010	-0.0012	1.112	0.984	-0.0017	-0.002	1.112
0.122	-0.1	1.118	0.986	1.006	0.989	0.989	-0.0010	-0.0012	1.118	0.989	-0.0017	-0.002	1.118
0.130	-0.2	1.122	0.990	1.004	0.992	0.992	-0.0024	-0.0027	1.122	0.992	-0.0031	-0.004	1.122
0.137	-0.1	1.130	0.996	1.001	0.997	0.997	-0.0014	-0.0016	1.130	0.997	-0.0021	-0.002	1.130
0.146	-0.1	1.130	0.996	1.001	0.997	0.997	-0.0014	-0.0016	1.130	0.997	-0.0021	-0.002	1.130
0.153	-0.1	1.134	1.000	1.000	1.000	1.000	-0.0010	-0.0012	1.134	1.000	-0.0017	-0.002	1.134
0.161	-0.2	1.132	0.998	1.001	0.999	0.999	-0.0035	-0.0040	1.132	0.999	-0.0042	-0.005	1.132
0.169	-0.2	1.131	0.997	1.001	0.998	0.998	-0.0035	-0.0039	1.131	0.998	-0.0042	-0.005	1.131
0.177	-0.2	1.134	1.000	1.000	1.000	1.000	-0.0028	-0.0032	1.134	1.000	-0.0035	-0.004	1.134
0.184	-0.0	1.134	1.000	1.000	1.000	1.000	0.0	0.0	1.134	1.000	-0.0007	-0.001	1.134

RUN NO. 4555 MACH NUMBER 1.798 ALPHA= 22.72 AL/THC= 1.818 PHIPP= 45.00 PF/POD=0.4262

DEL1= 0.0237 DEL2= -0.0041 TH11= 0.0099 TH21= -0.0034 TH12= 0.0006 TH22= -0.0002

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	27.9	0.745	0.561	1.217	0.619	0.617	0.0557	0.0670	0.742	0.547	0.2897	0.349	0.658
0.014	27.7	0.881	0.663	1.171	0.718	0.715	0.0621	0.0761	0.877	0.635	0.3336	0.409	0.780
0.020	27.6	0.967	0.729	1.139	0.778	0.775	0.0653	0.0813	0.964	0.689	0.3598	0.448	0.858
0.027	27.3	1.012	0.762	1.123	0.807	0.805	0.0648	0.0811	1.009	0.717	0.3708	0.465	0.899
0.035	26.9	1.057	0.796	1.106	0.837	0.835	0.0604	0.0763	1.054	0.747	0.3784	0.478	0.943
0.041	26.5	1.095	0.824	1.091	0.861	0.859	0.0568	0.0722	1.092	0.770	0.3845	0.489	0.979
0.048	25.9	1.123	0.846	1.080	0.879	0.878	0.0488	0.0623	1.122	0.791	0.3843	0.491	1.010
0.055	25.5	1.154	0.869	1.068	0.898	0.897	0.0429	0.0551	1.152	0.811	0.3863	0.496	1.041
0.062	25.2	1.180	0.888	1.058	0.914	0.913	0.0392	0.0506	1.178	0.827	0.3891	0.502	1.067
0.070	24.7	1.202	0.905	1.050	0.927	0.927	0.0314	0.0407	1.201	0.842	0.3871	0.502	1.092
0.076	24.5	1.223	0.921	1.041	0.940	0.939	0.0285	0.0371	1.222	0.855	0.3895	0.507	1.113
0.083	24.2	1.241	0.935	1.034	0.950	0.950	0.0239	0.0312	1.241	0.867	0.3893	0.508	1.132
0.091	23.9	1.262	0.951	1.026	0.963	0.963	0.0195	0.0256	1.262	0.880	0.3901	0.511	1.154
0.098	23.6	1.280	0.964	1.019	0.973	0.973	0.0153	0.0201	1.280	0.891	0.3901	0.513	1.172
0.105	23.4	1.294	0.975	1.013	0.981	0.981	0.0116	0.0154	1.294	0.900	0.3900	0.515	1.188
0.112	23.2	1.304	0.982	1.009	0.987	0.987	0.0076	0.0100	1.304	0.907	0.3884	0.513	1.199
0.119	23.0	1.313	0.989	1.006	0.992	0.992	0.0048	0.0064	1.313	0.913	0.3879	0.514	1.209
0.126	23.0	1.317	0.992	1.004	0.994	0.994	0.0045	0.0060	1.317	0.915	0.3884	0.515	1.212
0.133	22.8	1.323	0.997	1.002	0.998	0.998	0.0010	0.0014	1.323	0.920	0.3866	0.513	1.220
0.139	22.8	1.327	0.999	1.000	1.000	1.000	0.0007	0.0009	1.327	0.922	0.3870	0.514	1.224
0.147	22.7	1.328	1.000	1.000	1.000	1.000	0.0	0.0	1.328	0.922	0.3865	0.513	1.225

RUN NO. 4556 MACH NUMBER 1.797 ALPHA= 22.72 AI/THC= 1.818 PHIPP= 90.00 PF/PCD=0.2021

DEL1= 0.0316 DEL2= -0.0090 TH11= 0.0103 TH21= -0.0077 TH12= 0.0013 TH22= -0.0008

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	44.0	0.898	0.493	1.432	0.590	0.581	0.1033	0.1571	0.884	0.424	0.4099	0.624	0.646
0.014	43.6	1.096	0.602	1.341	0.697	0.687	0.1177	0.1850	1.080	0.504	0.4811	0.756	0.793
0.021	43.6	1.237	0.680	1.273	0.767	0.756	0.1284	0.2072	1.220	0.556	0.5285	0.853	0.897
0.028	42.9	1.321	0.725	1.233	0.805	0.796	0.1257	0.2061	1.305	0.590	0.5483	0.899	0.968
0.035	42.2	1.404	0.771	1.193	0.842	0.833	0.1219	0.2031	1.389	0.623	0.5661	0.944	1.039
0.042	41.4	1.454	0.798	1.169	0.863	0.856	0.1127	0.1897	1.441	0.647	0.5711	0.962	1.090
0.048	40.5	1.511	0.830	1.142	0.887	0.881	0.1022	0.1742	1.501	0.674	0.5763	0.982	1.148
0.056	39.7	1.562	0.858	1.118	0.907	0.902	0.0913	0.1573	1.554	0.698	0.5793	0.998	1.202
0.063	39.1	1.595	0.876	1.102	0.920	0.916	0.0834	0.1446	1.589	0.714	0.5803	1.006	1.238
0.070	38.7	1.611	0.885	1.095	0.926	0.923	0.0765	0.1331	1.605	0.723	0.5783	1.006	1.258
0.077	38.3	1.624	0.892	1.089	0.931	0.928	0.0714	0.1246	1.619	0.730	0.5771	1.007	1.274
0.084	37.7	1.647	0.905	1.078	0.939	0.937	0.0622	0.1091	1.643	0.743	0.5746	1.008	1.30[illegible]
0.091	37.1	1.668	0.916	1.068	0.947	0.946	0.0532	0.0937	1.665	0.755	0.5718	1.007	1.330
0.098	36.9	1.697	0.932	1.055	0.957	0.956	0.0494	0.0876	1.695	0.766	0.5746	1.018	1.357
0.105	36.5	1.721	0.945	1.044	0.966	0.965	0.0435	0.0775	1.719	0.776	0.5746	1.024	1.383
0.112	35.9	1.738	0.954	1.037	0.972	0.971	0.0329	0.0588	1.737	0.788	0.5693	1.018	1.408
0.119	35.5	1.751	0.962	1.031	0.976	0.976	0.0276	0.0495	1.750	0.795	0.5676	1.018	1.425
0.127	35.2	1.765	0.970	1.024	0.981	0.981	0.0223	0.0401	1.765	0.802	0.5660	1.018	1.442
0.133	35.1	1.782	0.979	1.017	0.987	0.987	0.0203	0.0367	1.782	0.808	0.5675	1.025	1.458
0.140	34.7	1.791	0.983	1.013	0.990	0.990	0.0142	0.0256	1.790	0.814	0.5641	1.020	1.471
0.148	34.5	1.797	0.987	1.010	0.992	0.992	0.0104	0.0188	1.797	0.817	0.5622	1.018	1.481
0.155	34.4	1.809	0.994	1.005	0.996	0.996	0.0087	0.0158	1.809	0.822	0.5630	1.022	1.492
0.161	34.3	1.809	0.994	1.005	0.996	0.996	0.0059	0.0107	1.809	0.823	0.5607	1.018	1.495
0.168	34.1	1.813	0.996	1.003	0.998	0.998	0.0035	0.0063	1.813	0.826	0.5595	1.017	1.501
0.176	34.1	1.819	0.999	1.001	0.999	0.999	0.0024	0.0044	1.819	0.828	0.5597	1.018	1.507
0.183	33.9	1.821	1.000	1.000	1.000	1.000	0.0	0.0	1.821	0.830	0.5580	1.016	1.511

RUN NO. 4557 MACH NUMBER 1.797 ALPHA= 22.72 AL/THC= 1.818 PHIPP=112.50 PE/POD=0.1224

DEL1= 0.0445 DEL2= -0.0127 TH11= 0.0128 TH21= -0.0109 TH12= 0.0018 TH22= -0.0013

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.007	48.6	0.858	0.406	1.651	0.522	0.510	0.1113	0.1831	0.838	0.345	0.3912	0.644	0.568
0.010	48.1	0.979	0.463	1.590	0.584	0.571	0.1199	0.2011	0.958	0.389	0.4346	0.729	0.653
0.018	48.0	1.209	0.572	1.465	0.692	0.678	0.1404	0.2452	1.184	0.463	0.5144	0.898	0.809
0.025	47.4	1.364	0.645	1.380	0.758	0.744	0.1462	0.2630	1.338	0.513	0.5579	1.004	0.923
0.033	46.7	1.474	0.697	1.320	0.801	0.788	0.1455	0.2676	1.450	0.549	0.5835	1.074	1.010
0.040	46.0	1.566	0.741	1.271	0.835	0.823	0.1407	0.2638	1.544	0.580	0.6004	1.126	1.088
0.048	45.3	1.630	0.771	1.237	0.858	0.847	0.1344	0.2556	1.610	0.603	0.6096	1.159	1.147
0.056	44.3	1.677	0.793	1.212	0.873	0.865	0.1212	0.2328	1.661	0.625	0.6095	1.171	1.201
0.063	43.7	1.706	0.807	1.197	0.883	0.875	0.1134	0.2191	1.692	0.639	0.6094	1.178	1.234
0.071	43.2	1.730	0.818	1.185	0.891	0.884	0.1067	0.2072	1.718	0.650	0.6092	1.183	1.262
0.078	42.5	1.779	0.842	1.160	0.906	0.901	0.0985	0.1934	1.769	0.668	0.6125	1.203	1.311
0.086	42.0	1.820	0.861	1.139	0.919	0.914	0.0909	0.1802	1.811	0.683	0.6144	1.217	1.354
0.094	41.3	1.859	0.879	1.120	0.930	0.927	0.0821	0.1639	1.851	0.699	0.6145	1.228	1.395
0.102	40.8	1.894	0.896	1.103	0.941	0.938	0.0741	0.1493	1.888	0.712	0.6148	1.238	1.434
0.110	40.3	1.919	0.908	1.090	0.948	0.946	0.0665	0.1346	1.915	0.723	0.6132	1.241	1.464
0.118	39.8	1.946	0.920	1.078	0.956	0.954	0.0580	0.1181	1.942	0.735	0.6111	1.245	1.496
0.126	39.6	1.970	0.932	1.066	0.962	0.961	0.0557	0.1141	1.967	0.741	0.6134	1.256	1.518
0.133	39.1	1.991	0.942	1.056	0.968	0.967	0.0480	0.0987	1.989	0.751	0.6108	1.256	1.545
0.141	38.7	2.007	0.949	1.049	0.972	0.971	0.0414	0.0855	2.006	0.759	0.6082	1.256	1.566
0.150	38.3	2.023	0.957	1.041	0.977	0.976	0.0344	0.0713	2.022	0.766	0.6053	1.254	1.588
0.157	38.1	2.034	0.962	1.036	0.979	0.979	0.0318	0.0660	2.033	0.770	0.6049	1.256	1.600
0.165	37.7	2.054	0.972	1.027	0.985	0.984	0.0244	0.0509	2.054	0.779	0.6022	1.256	1.626
0.174	37.5	2.067	0.978	1.021	0.988	0.988	0.0214	0.0447	2.066	0.784	0.6017	1.259	1.639
0.181	37.3	2.070	0.979	1.020	0.989	0.989	0.0169	0.0354	2.070	0.787	0.5986	1.253	1.647
0.188	37.1	2.081	0.984	1.015	0.992	0.991	0.0149	0.0312	2.080	0.790	0.5987	1.256	1.659
0.197	36.9	2.088	0.988	1.012	0.994	0.993	0.0101	0.0211	2.088	0.795	0.5960	1.253	1.671
0.204	36.7	2.093	0.990	1.010	0.995	0.995	0.0076	0.0161	2.093	0.797	0.5947	1.251	1.678
0.212	36.7	2.099	0.993	1.007	0.996	0.996	0.0070	0.0147	2.099	0.799	0.5951	1.254	1.683
0.220	36.6	2.101	0.994	1.006	0.997	0.997	0.0052	0.0110	2.101	0.800	0.5939	1.252	1.687
0.227	36.5	2.101	0.994	1.006	0.997	0.997	0.0038	0.0081	2.101	0.801	0.5928	1.249	1.689
0.235	36.5	2.107	0.996	1.003	0.998	0.998	0.0031	0.0066	2.107	0.803	0.5931	1.252	1.694
0.242	36.3	2.107	0.996	1.003	0.998	0.998	0.0	0.0	2.107	0.805	0.5906	1.247	1.698
0.250	36.3	2.114	1.000	1.000	1.000	1.000	0.0	0.0	2.114	0.806	0.5917	1.251	1.704

RUN NO. 4558 MACH NUMBER 1.796 ALPHA= 22.72 AL/THC= 1.818 PHIPP=118.93 PF/POD=0.1138

DEL1= 0.0610 DEL2= -0.0169 TH11= 0.0171 TH21= -0.0145 TH12= 0.0023 TH22= -0.0016

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	49.2	0.785	0.359	1.744	0.474	0.461	0.1106	0.1834	0.764	0.309	0.3588	0.595	0.513
0.012	48.7	0.990	0.452	1.638	0.579	0.564	0.1302	0.2228	0.965	0.382	0.4351	0.745	0.653
0.022	48.5	1.247	0.569	1.494	0.696	0.679	0.1542	0.2763	1.216	0.461	0.5218	0.935	0.826
0.031	48.1	1.410	0.644	1.402	0.762	0.745	0.1630	0.3016	1.377	0.509	0.5674	1.049	0.942
0.039	46.4	1.513	0.691	1.344	0.801	0.787	0.1487	0.2809	1.487	0.552	0.5804	1.096	1.042
0.049	45.5	1.598	0.730	1.297	0.831	0.819	0.1414	0.2720	1.575	0.582	0.5931	1.141	1.119
0.057	44.8	1.651	0.754	1.268	0.849	0.838	0.1343	0.2611	1.630	0.602	0.5987	1.164	1.171
0.066	44.2	1.680	0.767	1.252	0.859	0.849	0.1269	0.2483	1.662	0.615	0.5991	1.172	1.204
0.075	43.5	1.729	0.789	1.226	0.874	0.866	0.1186	0.2346	1.713	0.634	0.6023	1.191	1.253
0.084	42.8	1.784	0.815	1.197	0.891	0.885	0.1086	0.2174	1.771	0.654	0.6050	1.211	1.310
0.093	42.2	1.824	0.833	1.177	0.903	0.898	0.1015	0.2049	1.812	0.669	0.6068	1.225	1.351
0.103	41.5	1.863	0.851	1.156	0.915	0.910	0.0924	0.1883	1.854	0.685	0.6068	1.236	1.394
0.112	40.9	1.898	0.867	1.139	0.925	0.921	0.0838	0.1720	1.890	0.698	0.6061	1.244	1.433
0.120	40.6	1.923	0.878	1.126	0.932	0.928	0.0796	0.1643	1.916	0.707	0.6071	1.253	1.459
0.129	40.1	1.953	0.892	1.111	0.940	0.937	0.0713	0.1482	1.948	0.719	0.6056	1.258	1.494
0.139	39.5	1.974	0.901	1.101	0.946	0.944	0.0627	0.1308	1.970	0.729	0.6023	1.257	1.522
0.148	39.2	2.004	0.915	1.087	0.954	0.952	0.0574	0.1206	2.000	0.739	0.6028	1.266	1.553
0.157	38.7	2.021	0.923	1.079	0.958	0.957	0.0493	0.1040	2.018	0.748	0.5991	1.263	1.577
0.167	38.3	2.038	0.930	1.070	0.963	0.962	0.0428	0.0907	2.036	0.755	0.5966	1.263	1.599
0.175	38.1	2.056	0.939	1.062	0.967	0.966	0.0397	0.0843	2.054	0.761	0.5969	1.269	1.618
0.184	38.0	2.068	0.944	1.056	0.970	0.970	0.0381	0.0812	2.066	0.765	0.5973	1.273	1.629
0.194	37.6	2.078	0.949	1.052	0.973	0.972	0.0314	0.0671	2.077	0.771	0.5935	1.268	1.646
0.203	37.4	2.096	0.957	1.043	0.977	0.977	0.0281	0.0603	2.095	0.776	0.5936	1.273	1.665
0.212	37.1	2.097	0.958	1.042	0.978	0.977	0.0230	0.0494	2.097	0.780	0.5897	1.265	1.673
0.221	37.0	2.101	0.959	1.041	0.979	0.978	0.0222	0.0477	2.100	0.781	0.5896	1.266	1.677
0.230	37.0	2.107	0.962	1.038	0.980	0.980	0.0214	0.0460	2.107	0.783	0.5898	1.268	1.683
0.238	36.8	2.106	0.961	1.039	0.980	0.980	0.0188	0.0404	2.105	0.784	0.5875	1.263	1.685
0.247	36.7	2.112	0.964	1.036	0.981	0.981	0.0171	0.0369	2.112	0.786	0.5871	1.264	1.692
0.256	36.7	2.117	0.967	1.033	0.983	0.982	0.0163	0.0351	2.117	0.788	0.5872	1.265	1.697
0.266	36.7	2.123	0.970	1.030	0.984	0.984	0.0163	0.0352	2.123	0.789	0.5881	1.269	1.702
0.275	36.6	2.136	0.975	1.024	0.987	0.987	0.0146	0.0317	2.136	0.793	0.5886	1.274	1.715
0.284	36.5	2.143	0.978	1.021	0.989	0.989	0.0138	0.0299	2.142	0.794	0.5888	1.276	1.721
0.293	36.5	2.152	0.983	1.017	0.991	0.991	0.0130	0.0282	2.152	0.797	0.5895	1.280	1.730
0.302	36.4	2.160	0.986	1.013	0.993	0.993	0.0121	0.0264	2.160	0.799	0.5899	1.283	1.738
0.311	36.4	2.168	0.990	1.010	0.995	0.995	0.0122	0.0265	2.168	0.800	0.5910	1.288	1.744
0.320	36.4	2.176	0.994	1.006	0.997	0.997	0.0122	0.0266	2.176	0.802	0.5921	1.293	1.750
0.329	36.3	2.178	0.994	1.006	0.997	0.997	0.0104	0.0228	2.177	0.803	0.5910	1.291	1.754
0.339	36.2	2.185	0.998	1.002	0.999	0.999	0.0087	0.0191	2.185	0.806	0.5907	1.292	1.762
0.348	35.8	2.187	0.999	1.001	0.999	0.999	0.0017	0.0038	2.187	0.810	0.5852	1.281	1.773
0.357	35.8	2.190	1.000	1.000	1.000	1.000	0.0017	0.0038	2.190	0.811	0.5857	1.283	1.775
0.366	35.7	2.190	1.000	1.000	1.000	1.000	0.0	0.0	2.190	0.812	0.5842	1.280	1.777

RUN NO. 4559 MACH NUMBER 1.799 ALPHA= 22.72 AL/THC= 1.818 PHIPP=122.37 PE/POD=0.1508

DEL1= 0.0577 DEL2= 0.0134 TH11= 0.0127 TH21= 0.0114 TH12= -0.0020 TH22= -0.0015

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	7.8	0.307	0.164	1.671	0.212	0.186	-0.1014	-0.1471	0.270	0.210	0.0288	0.042	0.304
0.028	11.5	0.584	0.312	1.594	0.393	0.357	-0.1653	-0.2455	0.530	0.385	0.0788	0.117	0.572
0.047	26.1	0.958	0.511	1.439	0.613	0.603	-0.1091	-0.1705	0.943	0.550	0.2701	0.422	0.860
0.066	39.1	1.312	0.700	1.267	0.788	0.787	0.0371	0.0618	1.310	0.611	0.4967	0.827	1.018
0.085	40.6	1.419	0.757	1.214	0.834	0.832	0.0618	0.1052	1.415	0.633	0.5433	0.924	1.077
0.105	39.4	1.607	0.857	1.123	0.908	0.907	0.0475	0.0841	1.605	0.702	0.5765	1.020	1.242
0.125	38.3	1.685	0.899	1.086	0.937	0.936	0.0319	0.0573	1.684	0.735	0.5811	1.045	1.321
0.145	36.8	1.810	0.965	1.029	0.979	0.979	0.0077	0.0142	1.810	0.784	0.5873	1.085	1.448
0.165	35.3	1.901	1.014	0.989	1.008	1.008	-0.0194	-0.0365	1.900	0.823	0.5825	1.098	1.551
0.184	34.2	1.959	1.045	0.964	1.026	1.025	-0.0385	-0.0735	1.957	0.848	0.5772	1.102	1.619
0.205	33.0	2.002	1.068	0.945	1.038	1.036	-0.0616	-0.1187	1.998	0.871	0.5654	1.090	1.679
0.225	32.2	2.030	1.083	0.933	1.046	1.044	-0.0757	-0.1469	2.025	0.885	0.5583	1.083	1.717
0.245	31.7	1.978	1.055	0.955	1.031	1.028	-0.0845	-0.1621	1.972	0.878	0.5420	1.040	1.683
0.264	31.6	1.960	1.045	0.963	1.026	1.022	-0.0858	-0.1640	1.953	0.874	0.5376	1.027	1.669
0.284	32.9	1.865	0.995	1.004	0.997	0.995	-0.0600	-0.1122	1.862	0.837	0.5422	1.014	1.565
0.305	31.8	1.838	0.981	1.016	0.988	0.985	-0.0784	-0.1458	1.833	0.840	0.5216	0.970	1.562
0.325	35.6	1.858	0.991	1.007	0.995	0.995	-0.0139	-0.0259	1.858	0.809	0.5791	1.082	1.511
0.345	34.1	1.871	0.998	1.002	0.999	0.998	-0.0401	-0.0751	1.869	0.827	0.5599	1.049	1.549
0.365	35.1	1.876	1.001	0.999	1.000	1.000	-0.0218	-0.0409	1.876	0.818	0.5760	1.080	1.534
0.384	36.0	1.855	0.990	1.009	0.994	0.994	-0.0061	-0.0113	1.855	0.804	0.5849	1.092	1.500
0.404	36.0	1.858	0.991	1.007	0.995	0.995	-0.0061	-0.0113	1.858	0.804	0.5854	1.093	1.502
0.424	36.4	1.855	0.990	1.009	0.994	0.994	0.0	0.0	1.855	0.800	0.5898	1.101	1.493
0.444	36.7	1.855	0.990	1.009	0.994	0.994	0.0061	0.0113	1.855	0.796	0.5946	1.110	1.487
0.464	36.2	1.861	0.993	1.006	0.996	0.996	-0.0026	-0.0049	1.861	0.803	0.5887	1.100	1.501
0.483	36.2	1.866	0.996	1.004	0.997	0.997	-0.0026	-0.0049	1.866	0.804	0.5898	1.104	1.505
0.502	36.0	1.865	0.995	1.004	0.997	0.997	-0.0070	-0.0130	1.865	0.807	0.5860	1.096	1.509
0.523	36.5	1.869	0.997	1.002	0.998	0.998	0.0026	0.0049	1.869	0.802	0.5945	1.113	1.502
0.542	36.4	1.875	1.000	1.000	1.000	1.000	0.0	0.0	1.875	0.805	0.5934	1.112	1.509

RUN NO. 4560 MACH NUMBER 1.794 ALPHA= 22.72 AL/THC= 1.818 PHIPP=127.95 PE/POD=0.1620

DEL1= 0.1473 DEL2= 0.0067 TH11= 0.0326 TH21= -0.0028 TH12= -0.0095 TH22= -0.0039

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-9.3	0.440	0.222	1.716	0.291	0.230	-0.1789	-0.2701	0.347	0.287	-0.0471	-0.071	0.434
0.024	-9.8	0.602	0.305	1.661	0.393	0.308	-0.2439	-0.3741	0.472	0.387	-0.0668	-0.103	0.593
0.044	-7.4	0.691	0.350	1.626	0.446	0.361	-0.2621	-0.4064	0.559	0.442	-0.0574	-0.089	0.686
0.063	-2.5	0.701	0.355	1.622	0.452	0.387	-0.2334	-0.3623	0.601	0.451	-0.0197	-0.031	0.701
0.083	2.5	0.730	0.369	1.610	0.469	0.421	-0.2062	-0.3213	0.656	0.468	0.0204	0.032	0.730
0.102	9.0	0.775	0.392	1.591	0.494	0.466	-0.1659	-0.2600	0.730	0.488	0.0773	0.121	0.766
0.121	16.6	0.865	0.438	1.550	0.545	0.533	-0.1133	-0.1799	0.846	0.522	0.1556	0.247	0.829
0.141	21.1	0.920	0.465	1.524	0.574	0.569	-0.0750	-0.1201	0.912	0.536	0.2067	0.331	0.858
0.160	28.6	1.059	0.536	1.455	0.646	0.646	0.0	0.0	1.059	0.567	0.3094	0.507	0.930
0.179	30.6	1.260	0.637	1.353	0.741	0.740	0.0259	0.0440	1.259	0.638	0.3772	0.641	1.084
0.200	32.8	1.371	0.694	1.295	0.789	0.787	0.0578	0.1004	1.368	0.663	0.4276	0.743	1.153
0.219	33.2	1.593	0.806	1.182	0.876	0.873	0.0703	0.1278	1.588	0.733	0.4797	0.872	1.333
0.238	33.1	1.705	0.862	1.127	0.915	0.913	0.0718	0.1338	1.700	0.767	0.4999	0.931	1.429
0.257	32.4	1.771	0.896	1.095	0.937	0.935	0.0621	0.1174	1.767	0.791	0.5022	0.949	1.495
0.278	31.8	1.910	0.966	1.030	0.981	0.979	0.0547	0.1066	1.907	0.833	0.5167	1.007	1.623
0.298	31.2	1.929	0.976	1.022	0.986	0.985	0.0447	0.0875	1.927	0.843	0.5108	0.999	1.650
0.318	30.4	1.980	1.001	0.999	1.001	1.000	0.0314	0.0622	1.979	0.863	0.5064	1.002	1.708
0.339	30.1	2.003	1.013	0.989	1.007	1.007	0.0264	0.0524	2.002	0.871	0.5051	1.004	1.733
0.359	29.6	2.015	1.019	0.983	1.011	1.010	0.0176	0.0352	2.014	0.879	0.4991	0.995	1.752
0.378	29.6	2.018	1.021	0.982	1.011	1.011	0.0177	0.0352	2.018	0.879	0.4996	0.997	1.755
0.397	29.2	2.019	1.021	0.981	1.012	1.012	0.0106	0.0211	2.019	0.883	0.4936	0.985	1.763
0.417	29.1	2.019	1.021	0.981	1.012	1.012	0.0088	0.0176	2.019	0.884	0.4921	0.982	1.765
0.437	29.1	2.015	1.019	0.983	1.011	1.010	0.0088	0.0176	2.015	0.883	0.4914	0.980	1.760
0.457	29.1	2.010	1.017	0.986	1.009	1.009	0.0088	0.0175	2.010	0.882	0.4908	0.977	1.756
0.477	29.0	2.005	1.014	0.988	1.008	1.008	0.0070	0.0140	2.005	0.881	0.4886	0.972	1.754
0.497	29.0	2.003	1.013	0.989	1.007	1.007	0.0070	0.0140	2.003	0.881	0.4883	0.971	1.752
0.517	29.0	1.997	1.010	0.991	1.005	1.005	0.0070	0.0139	1.997	0.879	0.4875	0.968	1.746
0.536	28.9	1.993	1.008	0.993	1.004	1.004	0.0053	0.0104	1.993	0.879	0.4854	0.963	1.745
0.557	28.9	1.988	1.006	0.995	1.003	1.003	0.0053	0.0104	1.988	0.878	0.4848	0.961	1.741
0.576	28.7	1.981	1.002	0.998	1.001	1.001	0.0017	0.0035	1.981	0.878	0.4807	0.951	1.738
0.595	28.7	1.980	1.001	0.999	1.001	1.001	0.0017	0.0035	1.980	0.878	0.4805	0.951	1.736
0.615	28.6	1.977	1.000	1.000	1.000	1.000	0.0	0.0	1.977	0.878	0.4787	0.946	1.736

RUN NO. 4561 MACH NUMBER 1.796 ALPHA= 22.72 AL/THC= 1.818 PHIPP=147.75 PE/POD=0.1671

DEL1= 0.2175 DEL2= 0.2483 TH11= 0.1053 TH21= 0.1953 TH12= -0.0530 TH22= -0.1079

H	OMEGA	MACH NU.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-6.1	0.868	0.498	1.398	0.588	0.510	-0.2937	-0.4332	0.752	0.585	-0.0630	-0.093	0.863
0.018	-6.7	1.179	0.676	1.259	0.758	0.653	-0.3848	-0.5982	1.015	0.753	-0.0885	-0.138	1.171
0.038	-7.0	1.397	0.801	1.157	0.862	0.740	-0.4412	-0.7155	1.200	0.855	-0.1050	-0.170	1.387
0.057	-6.4	1.416	0.812	1.148	0.870	0.752	-0.4376	-0.7123	1.224	0.865	-0.0970	-0.158	1.407
0.077	-6.5	1.423	0.816	1.145	0.873	0.754	-0.4404	-0.7178	1.228	0.867	-0.0988	-0.161	1.414
0.096	-7.4	1.475	0.846	1.120	0.896	0.766	-0.4639	-0.7643	1.262	0.888	-0.1153	-0.190	1.463
0.116	-7.9	1.504	0.863	1.107	0.908	0.772	-0.4776	-0.7915	1.279	0.899	-0.1255	-0.208	1.490
0.135	-8.2	1.512	0.867	1.104	0.911	0.772	-0.4833	-0.8024	1.282	0.901	-0.1307	-0.217	1.496
0.155	-8.5	1.523	0.873	1.099	0.915	0.773	-0.4898	-0.8149	1.287	0.905	-0.1361	-0.226	1.506
0.175	-8.9	1.537	0.881	1.092	0.921	0.775	-0.4976	-0.8303	1.293	0.910	-0.1425	-0.238	1.518
0.195	-9.0	1.557	0.893	1.083	0.929	0.781	-0.5033	-0.8433	1.309	0.918	-0.1453	-0.244	1.538
0.215	-9.1	1.569	0.900	1.078	0.934	0.784	-0.5080	-0.8534	1.317	0.922	-0.1485	-0.249	1.549
0.234	-9.3	1.572	0.901	1.076	0.935	0.783	-0.5107	-0.8584	1.317	0.923	-0.1511	-0.254	1.551
0.254	-9.1	1.588	0.911	1.069	0.942	0.790	-0.5122	-0.8639	1.333	0.930	-0.1497	-0.253	1.568
0.274	-8.8	1.593	0.913	1.067	0.943	0.795	-0.5083	-0.8582	1.342	0.932	-0.1443	-0.244	1.574
0.294	-8.8	1.596	0.915	1.066	0.945	0.795	-0.5096	-0.8610	1.344	0.933	-0.1453	-0.246	1.577
0.314	-8.4	1.587	0.910	1.070	0.941	0.796	-0.5015	-0.8456	1.343	0.931	-0.1375	-0.232	1.570
0.334	-8.3	1.585	0.909	1.070	0.940	0.797	-0.4998	-0.8425	1.343	0.931	-0.1358	-0.229	1.569
0.354	-8.1	1.567	0.899	1.078	0.933	0.792	-0.4939	-0.8294	1.330	0.924	-0.1323	-0.222	1.552
0.374	-7.1	1.614	0.925	1.058	0.951	0.816	-0.4893	-0.8298	1.384	0.944	-0.1184	-0.201	1.601
0.393	-6.0	1.514	0.868	1.103	0.911	0.791	-0.4530	-0.7522	1.313	0.906	-0.0953	-0.158	1.505
0.412	-5.5	1.504	0.863	1.107	0.908	0.791	-0.4448	-0.7373	1.311	0.903	-0.0878	-0.145	1.497
0.432	-4.3	1.514	0.868	1.103	0.911	0.804	-0.4300	-0.7141	1.335	0.909	-0.0691	-0.115	1.509
0.451	-3.5	1.469	0.842	1.123	0.893	0.793	-0.4095	-0.6737	1.305	0.891	-0.0545	-0.090	1.466
0.471	-2.4	1.469	0.842	1.123	0.893	0.801	-0.3949	-0.6497	1.318	0.892	-0.0382	-0.063	1.468
0.490	-1.5	1.454	0.834	1.130	0.887	0.802	-0.3789	-0.6215	1.315	0.886	-0.0232	-0.038	1.454
0.509	-0.2	1.416	0.812	1.148	0.870	0.795	-0.3538	-0.5760	1.294	0.870	-0.0030	-0.005	1.416
0.529	0.4	1.361	0.780	1.174	0.845	0.776	-0.3350	-0.5394	1.249	0.845	0.0066	0.011	1.361
0.549	2.9	1.414	0.811	1.149	0.869	0.812	-0.3094	-0.5034	1.322	0.868	0.0447	0.073	1.413
0.567	4.7	1.416	0.812	1.148	0.870	0.822	-0.2847	-0.4634	1.338	0.867	0.0713	0.116	1.411
0.586	8.1	1.387	0.795	1.161	0.857	0.825	-0.2312	-0.3742	1.336	0.848	0.1215	0.197	1.373
0.605	10.4	1.377	0.789	1.166	0.852	0.829	-0.1968	-0.3179	1.339	0.838	0.1546	0.250	1.354
0.626	13.5	1.392	0.798	1.159	0.859	0.846	-0.1529	-0.2477	1.370	0.836	0.2014	0.326	1.353
0.644	15.2	1.401	0.803	1.155	0.863	0.854	-0.1283	-0.2083	1.385	0.833	0.2271	0.368	1.351
0.665	17.1	1.430	0.820	1.142	0.876	0.870	-0.1014	-0.1655	1.420	0.837	0.2583	0.422	1.366
0.685	17.9	1.461	0.838	1.127	0.889	0.885	-0.0914	-0.1502	1.453	0.846	0.2733	0.449	1.390
0.705	20.0	1.504	0.863	1.107	0.908	0.906	-0.0601	-0.0997	1.501	0.853	0.3104	0.514	1.413
0.724	21.3	1.566	0.898	1.079	0.933	0.932	-0.0407	-0.0683	1.564	0.869	0.3388	0.569	1.459
0.743	22.1	1.560	0.894	1.082	0.930	0.930	-0.0276	-0.0463	1.559	0.862	0.3500	0.587	1.445
0.762	22.8	1.632	0.936	1.049	0.959	0.959	-0.0167	-0.0285	1.632	0.884	0.3715	0.633	1.505
0.782	23.3	1.681	0.964	1.028	0.977	0.977	-0.0077	-0.0132	1.681	0.897	0.3872	0.666	1.543
0.801	23.8	1.744	1.000	1.000	1.000	1.000	0.0	0.0	1.744	0.915	0.4035	0.704	1.596

C-2

RUN NO. 4562 MACH NUMBER 1.795 ALPHA= 22.72 AL/THC= 1.818 PHIPP=153.15 PE/POD=0.1607

DEL1= 0.C492 DEL2= 0.1934 TH11= 0.0299 TH21= 0.1832 TH12= -0.0103 TH22= -0.0580

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-1.9	0.700	0.406	1.453	0.489	0.481	-0.0917	-0.1313	0.688	0.489	-0.0162	-0.023	0.700
0.014	-1.9	0.820	0.475	1.407	0.564	0.554	-0.1056	-0.1537	0.806	0.563	-0.0187	-0.027	0.820
0.032	-2.9	1.046	0.606	1.310	0.693	0.679	-0.1417	-0.2138	1.023	0.692	-0.0351	-0.053	1.044
0.050	-4.2	1.093	0.633	1.288	0.719	0.700	-0.1629	-0.2478	1.065	0.717	-0.0526	-0.080	1.090
0.070	-8.1	1.200	0.695	1.239	0.774	0.740	-0.2263	-0.3509	1.148	0.766	-0.1091	-0.169	1.188
0.089	-9.9	1.395	0.808	1.149	0.866	0.820	-0.2791	-0.4494	1.320	0.853	-0.1489	-0.240	1.374
0.107	-13.5	1.622	0.940	1.046	0.961	0.888	-0.3662	-0.6181	1.500	0.934	-0.2243	-0.379	1.577
0.126	-14.3	1.533	0.888	1.085	0.926	0.851	-0.3646	-0.6040	1.409	0.897	-0.2286	-0.379	1.486
0.145	-13.6	1.621	0.939	1.046	0.960	0.887	-0.3675	-0.6202	1.497	0.933	-0.2258	-0.381	1.575
0.164	-14.3	1.689	0.978	1.016	0.986	0.907	-0.3885	-0.6653	1.552	0.956	-0.2436	-0.417	1.636
0.183	-14.0	1.618	0.937	1.048	0.959	0.884	-0.3733	-0.6294	1.490	0.931	-0.2321	-0.391	1.570
0.203	-13.7	1.744	1.011	0.992	1.007	0.929	-0.3868	-0.6703	1.610	0.978	-0.2384	-0.413	1.695
0.221	-13.3	1.799	1.043	0.969	1.026	0.950	-0.3877	-0.6799	1.666	0.999	-0.2360	-0.414	1.751
0.240	-12.9	1.813	1.050	0.963	1.031	0.957	-0.3828	-0.6733	1.683	1.005	-0.2301	-0.405	1.767
0.259	-12.9	1.836	1.064	0.953	1.038	0.964	-0.3856	-0.6817	1.704	1.012	-0.2318	-0.410	1.789
0.279	-12.2	1.845	1.069	0.949	1.042	0.972	-0.3749	-0.6642	1.721	1.018	-0.2201	-0.390	1.803
0.297	-11.5	1.833	1.062	0.954	1.038	0.972	-0.3616	-0.6389	1.718	1.017	-0.2068	-0.365	1.796
0.317	-10.9	1.821	1.055	0.959	1.033	0.972	-0.3501	-0.6168	1.713	1.015	-0.1954	-0.344	1.788
0.336	-10.5	1.840	1.066	0.952	1.040	0.981	-0.3454	-0.6111	1.735	1.022	-0.1895	-0.335	1.809
0.354	-10.0	1.836	1.064	0.953	1.038	0.982	-0.3364	-0.5946	1.737	1.023	-0.1803	-0.319	1.808
0.373	-9.6	1.830	1.060	0.956	1.037	0.983	-0.3289	-0.5808	1.736	1.022	-0.1729	-0.305	1.805
0.390	-8.7	1.795	1.040	0.970	1.025	0.977	-0.3098	-0.5429	1.711	1.013	-0.1550	-0.272	1.775
0.410	-8.1	1.832	1.061	0.955	1.037	0.992	-0.3032	-0.5355	1.752	1.027	-0.1461	-0.258	1.813
0.428	-7.9	1.821	1.055	0.959	1.033	0.989	-0.2987	-0.5263	1.743	1.024	-0.1420	-0.250	1.804
0.447	-6.9	1.804	1.045	0.967	1.027	0.989	-0.2797	-0.4911	1.735	1.020	-0.1234	-0.217	1.790
0.466	-6.2	1.806	1.046	0.966	1.028	0.993	-0.2679	-0.4705	1.744	1.022	-0.1111	-0.195	1.796
0.484	-5.4	1.805	1.046	0.966	1.028	0.996	-0.2539	-0.4458	1.749	1.023	-0.0967	-0.170	1.797
0.502	-4.8	1.769	1.025	0.981	1.016	0.987	-0.2405	-0.4190	1.719	1.012	-0.0850	-0.148	1.763
0.522	-4.0	1.793	1.039	0.971	1.024	0.998	-0.2285	-0.4002	1.747	1.021	-0.0714	-0.125	1.788
0.540	-3.2	1.768	1.024	0.982	1.015	0.992	-0.2128	-0.3706	1.729	1.013	-0.0567	-0.099	1.765
0.558	-2.4	1.805	1.046	0.966	1.028	1.008	-0.2014	-0.3537	1.770	1.027	-0.0430	-0.076	1.803
0.577	-1.7	1.805	1.046	0.966	1.028	1.010	-0.1891	-0.3320	1.774	1.027	-0.0305	-0.054	1.804
0.595	-0.9	1.806	1.046	0.966	1.028	1.013	-0.1750	-0.3074	1.780	1.028	-0.0162	-0.028	1.806
0.614	0.3	1.794	1.039	0.971	1.024	1.013	-0.1531	-0.2683	1.774	1.024	0.0054	0.009	1.794
0.632	0.8	1.789	1.036	0.973	1.022	1.012	-0.1440	-0.2520	1.771	1.022	0.0143	0.025	1.788
0.652	1.5	1.776	1.029	0.978	1.018	1.009	-0.1311	-0.2288	1.761	1.018	0.0266	0.046	1.776
0.670	2.3	1.772	1.027	0.980	1.016	1.010	-0.1168	-0.2037	1.760	1.016	0.0408	0.071	1.771
0.689	3.2	1.765	1.023	0.983	1.014	1.009	-0.1007	-0.1753	1.756	1.012	0.0566	0.099	1.762
0.709	4.1	1.764	1.022	0.984	1.014	1.010	-0.0848	-0.1476	1.758	1.011	0.0725	0.126	1.759
0.727	5.0	1.746	1.011	0.991	1.007	1.005	-0.0685	-0.1187	1.742	1.003	0.0878	0.152	1.739
0.746	5.8	1.742	1.009	0.993	1.006	1.004	-0.0544	-0.0942	1.739	1.000	0.1016	0.176	1.733
0.765	6.7	1.740	1.008	0.994	1.005	1.004	-0.0386	-0.0668	1.739	0.998	0.1173	0.203	1.728
0.783	7.8	1.742	1.009	0.993	1.006	1.005	-0.0193	-0.0334	1.741	0.996	0.1365	0.236	1.725
0.802	8.9	1.726	1.000	1.000	1.000	1.000	0.0	0.0	1.726	0.988	0.1547	0.267	1.705

RUN NO. 4563 MACH NUMBER 1.797 ALPHA= 22.72 AL/THC= 1.818 PHIPP=160.82 PE/POD=0.1398

DEL1= -0.C490 DEL2= 0.2444 TH11= -0.0037 TH21= 0.2458 TH12= 0.0014 TH22= -0.0852

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	-25.9	1.091	0.654	1.257	0.734	0.649	-0.3427	-0.5097	0.965	0.660	-0.3204	-0.477	0.982
0.008	-26.4	1.129	0.677	1.240	0.754	0.663	-0.3587	-0.5372	0.994	0.675	-0.3359	-0.503	1.011
0.011	-26.6	1.321	0.792	1.153	0.851	0.748	-0.4067	-0.6315	1.161	0.761	-0.3810	-0.592	1.181
0.017	-25.8	1.539	0.923	1.056	0.948	0.839	-0.4416	-0.7165	1.362	0.854	-0.4128	-0.670	1.385
0.020	-25.7	1.619	0.971	1.021	0.981	0.869	-0.4561	-0.7528	1.434	0.884	-0.4263	-0.704	1.459
0.024	-24.9	1.721	1.032	0.977	1.020	0.910	-0.4615	-0.7784	1.534	0.925	-0.4303	-0.726	1.560
0.030	-23.8	1.813	1.087	0.939	1.053	0.948	-0.4585	-0.7889	1.632	0.963	-0.4259	-0.733	1.658
0.036	-22.8	1.871	1.122	0.915	1.073	0.974	-0.4502	-0.7846	1.698	0.989	-0.4168	-0.726	1.724
0.040	-22.8	1.882	1.129	0.911	1.077	0.978	-0.4519	-0.7896	1.709	0.993	-0.4184	-0.731	1.735
0.042	-22.0	1.915	1.148	0.898	1.088	0.994	-0.4417	-0.7773	1.750	1.009	-0.4076	-0.717	1.776
0.049	-21.0	1.928	1.156	0.893	1.092	1.006	-0.4268	-0.7533	1.775	1.019	-0.3924	-0.693	1.799
0.055	-20.3	1.921	1.152	0.895	1.090	1.009	-0.4136	-0.7288	1.777	1.022	-0.3791	-0.668	1.801
0.059	-20.5	1.913	1.148	0.898	1.088	1.005	-0.4153	-0.7307	1.768	1.019	-0.3809	-0.670	1.792
0.061	-20.3	1.940	1.163	0.888	1.096	1.014	-0.4159	-0.7360	1.795	1.028	-0.3812	-0.674	1.819
0.067	-20.3	1.965	1.179	0.878	1.104	1.022	-0.4191	-0.7458	1.818	1.035	-0.3840	-0.683	1.843
0.074	-20.3	1.987	1.191	0.870	1.111	1.028	-0.4216	-0.7538	1.838	1.042	-0.3864	-0.691	1.863
0.077	-19.7	1.992	1.195	0.867	1.113	1.034	-0.4115	-0.7366	1.851	1.047	-0.3760	-0.673	1.875
0.080	-20.3	2.006	1.203	0.862	1.117	1.034	-0.4239	-0.7613	1.856	1.047	-0.3885	-0.698	1.881
0.087	-20.2	2.017	1.210	0.858	1.121	1.038	-0.4225	-0.7606	1.868	1.052	-0.3869	-0.697	1.893
0.093	-20.2	2.024	1.214	0.855	1.123	1.040	-0.4233	-0.7632	1.875	1.054	-0.3877	-0.699	1.900
0.097	-19.6	2.021	1.212	0.856	1.122	1.043	-0.4130	-0.7442	1.880	1.057	-0.3772	-0.680	1.904
0.099	-19.8	2.033	1.219	0.852	1.125	1.045	-0.4179	-0.7548	1.887	1.058	-0.3821	-0.690	1.912
0.105	-19.8	2.026	1.215	0.855	1.123	1.043	-0.4162	-0.7506	1.881	1.057	-0.3804	-0.686	1.906
0.112	-19.7	2.028	1.216	0.854	1.124	1.044	-0.4156	-0.7500	1.885	1.058	-0.3798	-0.685	1.909
0.117	-19.5	2.031	1.218	0.853	1.125	1.047	-0.4113	-0.7428	1.890	1.060	-0.3755	-0.678	1.915
0.118	-19.7	2.027	1.216	0.854	1.124	1.044	-0.4145	-0.7478	1.884	1.058	-0.3787	-0.683	1.908
0.125	-19.7	2.030	1.217	0.853	1.124	1.045	-0.4148	-0.7488	1.887	1.059	-0.3790	-0.684	1.911
0.131	-19.7	2.028	1.216	0.854	1.124	1.045	-0.4147	-0.7483	1.885	1.058	-0.3789	-0.684	1.910
0.135	-19.5	2.027	1.216	0.854	1.124	1.046	-0.4109	-0.7412	1.887	1.059	-0.3750	-0.677	1.911
0.137	-19.7	2.024	1.214	0.855	1.123	1.043	-0.4142	-0.7468	1.881	1.057	-0.3784	-0.682	1.906
0.144	-19.6	2.017	1.210	0.858	1.121	1.042	-0.4125	-0.7426	1.876	1.055	-0.3768	-0.678	1.900
0.154	-19.1	2.016	1.209	0.858	1.120	1.045	-0.4032	-0.7257	1.881	1.058	-0.3674	-0.661	1.904
0.174	-19.1	2.005	1.202	0.863	1.117	1.042	-0.4020	-0.7217	1.870	1.055	-0.3663	-0.658	1.894
0.194	-19.0	1.992	1.195	0.867	1.113	1.039	-0.3988	-0.7139	1.860	1.052	-0.3632	-0.650	1.883
0.214	-19.0	1.975	1.185	0.874	1.108	1.034	-0.3969	-0.7079	1.844	1.047	-0.3615	-0.645	1.867
0.233	-19.0	1.954	1.172	0.882	1.101	1.028	-0.3945	-0.7002	1.824	1.040	-0.3593	-0.638	1.847
0.252	-19.0	1.941	1.164	0.887	1.097	1.024	-0.3921	-0.6940	1.813	1.037	-0.3570	-0.632	1.835
0.271	-18.9	1.916	1.149	0.897	1.089	1.017	-0.3883	-0.6836	1.790	1.030	-0.3535	-0.622	1.813
0.291	-18.8	1.888	1.133	0.908	1.079	1.010	-0.3815	-0.6675	1.767	1.022	-0.3469	-0.607	1.788
0.310	-18.4	1.880	1.127	0.912	1.076	1.009	-0.3743	-0.6536	1.762	1.021	-0.3397	-0.593	1.783
0.331	-17.9	1.851	1.110	0.923	1.067	1.003	-0.3631	-0.6300	1.740	1.015	-0.3287	-0.570	1.761
0.349	-17.7	1.825	1.095	0.934	1.058	0.996	-0.3557	-0.6137	1.719	1.008	-0.3216	-0.555	1.739
0.369	-17.0	1.813	1.087	0.939	1.053	0.996	-0.3430	-0.5902	1.714	1.007	-0.3089	-0.531	1.733
0.389	-16.9	1.803	1.082	0.943	1.050	0.994	-0.3393	-0.5827	1.707	1.005	-0.3053	-0.524	1.726
0.407	-16.2	1.794	1.076	0.947	1.047	0.995	-0.3261	-0.5589	1.705	1.005	-0.2921	-0.501	1.723
0.426	-15.5	1.785	1.070	0.951	1.044	0.995	-0.3129	-0.5352	1.703	1.006	-0.2789	-0.477	1.720
0.446	-14.8	1.767	1.060	0.958	1.037	0.993	-0.2998	-0.5108	1.692	1.003	-0.2658	-0.453	1.708
0.465	-14.1	1.755	1.052	0.963	1.033	0.992	-0.2855	-0.4851	1.686	1.002	-0.2516	-0.427	1.702
0.483	-13.3	1.745	1.046	0.967	1.029	0.993	-0.2707	-0.4590	1.683	1.002	-0.2367	-0.401	1.698
0.502	-12.5	1.730	1.038	0.973	1.024	0.991	-0.2563	-0.4332	1.675	0.999	-0.2225	-0.376	1.689
0.522	-12.0	1.722	1.033	0.977	1.021	0.991	-0.2461	-0.4152	1.671	0.998	-0.2122	-0.358	1.685
0.541	-11.0	1.711	1.026	0.982	1.016	0.991	-0.2278	-0.3834	1.667	0.998	-0.1939	-0.326	1.679
0.559	-9.8	1.707	1.024	0.983	1.015	0.994	-0.2076	-0.3492	1.671	1.000	-0.1737	-0.292	1.682
0.579	-9.1	1.698	1.018	0.987	1.011	0.993	-0.1947	-0.3268	1.666	0.999	-0.1608	-0.270	1.676
0.598	-8.0	1.689	1.013	0.991	1.008	0.993	-0.1751	-0.2933	1.664	0.998	-0.1412	-0.237	1.673
0.617	-7.0	1.689	1.013	0.991	1.008	0.996	-0.1577	-0.2642	1.668	1.001	-0.1238	-0.207	1.676
0.636	-6.2	1.679	1.007	0.995	1.005	0.994	-0.1424	-0.2380	1.662	0.999	-0.1085	-0.181	1.669
0.657	-5.4	1.672	1.003	0.998	1.002	0.994	-0.1282	-0.2140	1.659	0.997	-0.0943	-0.157	1.665

0.676	-4.5	1.669	1.001	0.999	1.001	0.994	-0.1124	-0.1875	1.659	0.998	-0.0785	-0.131	1.664
0.695	-3.3	1.671	1.002	0.999	1.001	0.997	-0.0907	-0.1514	1.664	1.000	-0.0568	-0.095	1.668
0.714	-2.4	1.666	0.999	1.001	0.999	0.996	-0.0767	-0.1278	1.661	0.998	-0.0427	-0.071	1.664
0.734	-1.5	1.667	1.000	1.000	1.000	0.998	-0.0602	-0.1003	1.664	1.000	-0.0262	-0.044	1.667
0.752	-0.2	1.666	0.999	1.001	0.999	0.999	-0.0375	-0.0625	1.665	0.999	-0.0035	-0.006	1.666
0.771	0.5	1.666	0.999	1.001	0.999	0.999	-0.0253	-0.0421	1.665	0.999	0.0087	0.015	1.666
0.790	1.9	1.667	1.000	1.000	1.000	1.000	0.0	0.0	1.667	0.999	0.0340	0.057	1.666

RUN NO. 4565 MACH NUMBER 1.794 ALPHA= 22.72 AL/THC= 1.818 PHIPP=180.00 PE/POD=0.2137

DEL1= 0.0380 DEL2= -0.0000 TH11= 0.0128 TH21= -0.0001 TH12= -0.0000 TH22= -0.0000

H	OMEGA	MACH NO.	M/ME	T/TE	UB/UE	U/UE	V/UE	M*SIN(OM-OME)	M*COS(OM-OME)	U1/UE	V1/UE	MSOM	MCOM
0.008	0.0	0.904	0.505	1.411	0.600	0.600	-0.0036	-0.0054	0.904	0.600	0.0002	0.000	0.904
0.015	-0.1	1.078	0.602	1.332	0.695	0.695	-0.0053	-0.0083	1.078	0.695	-0.0010	-0.002	1.078
0.023	-0.1	1.196	0.668	1.276	0.754	0.754	-0.0058	-0.0092	1.196	0.754	-0.0011	-0.002	1.196
0.030	0.0	1.272	0.710	1.240	0.791	0.791	-0.0047	-0.0075	1.272	0.791	0.0003	0.000	1.272
0.038	0.1	1.340	0.748	1.208	0.822	0.822	-0.0034	-0.0056	1.340	0.822	0.0017	0.003	1.340
0.046	0.2	1.387	0.774	1.185	0.843	0.843	-0.0024	-0.0039	1.387	0.843	0.0029	0.005	1.387
0.053	0.2	1.431	0.799	1.165	0.862	0.862	-0.0021	-0.0035	1.431	0.862	0.0033	0.005	1.431
0.060	0.3	1.472	0.822	1.145	0.880	0.880	-0.0005	-0.0015	1.472	0.880	0.0046	0.008	1.472
0.068	0.3	1.504	0.840	1.130	0.893	0.893	-0.0006	-0.0011	1.504	0.893	0.0050	0.008	1.504
0.075	0.4	1.525	0.852	1.120	0.901	0.901	0.0	0.0	1.525	0.901	0.0057	0.010	1.525
0.083	0.4	1.547	0.864	1.110	0.910	0.910	0.0010	0.0016	1.547	0.910	0.0067	0.011	1.547
0.090	0.5	1.575	0.880	1.097	0.921	0.921	0.0016	0.0027	1.575	0.921	0.0074	0.013	1.575
0.098	0.5	1.591	0.888	1.090	0.927	0.927	0.0023	0.0039	1.591	0.927	0.0081	0.014	1.591
0.106	0.5	1.617	0.903	1.078	0.937	0.937	0.0026	0.0045	1.617	0.937	0.0085	0.015	1.617
0.114	0.5	1.640	0.916	1.067	0.946	0.946	0.0026	0.0046	1.640	0.946	0.0086	0.015	1.640
0.122	0.5	1.660	0.927	1.058	0.953	0.953	0.0027	0.0046	1.660	0.953	0.0087	0.015	1.660
0.129	0.5	1.698	0.948	1.041	0.967	0.967	0.0027	0.0047	1.698	0.967	0.0088	0.015	1.698
0.139	0.5	1.710	0.955	1.036	0.972	0.972	0.0027	0.0048	1.710	0.972	0.0088	0.016	1.710
0.144	0.5	1.725	0.963	1.029	0.977	0.977	0.0027	0.0049	1.725	0.977	0.0089	0.016	1.725
0.152	0.5	1.736	0.969	1.024	0.981	0.981	0.0024	0.0042	1.736	0.981	0.0086	0.015	1.736
0.160	0.5	1.749	0.977	1.018	0.986	0.986	0.0017	0.0031	1.749	0.986	0.0079	0.014	1.749
0.168	0.4	1.761	0.983	1.013	0.990	0.990	0.0014	0.0025	1.761	0.990	0.0076	0.014	1.761
0.175	0.4	1.769	0.988	1.009	0.993	0.993	0.0014	0.0025	1.769	0.993	0.0076	0.014	1.769
0.184	0.4	1.773	0.990	1.008	0.994	0.994	0.0007	0.0012	1.773	0.994	0.0069	0.012	1.773
0.191	0.4	1.782	0.995	1.004	0.997	0.997	0.0007	0.0012	1.782	0.997	0.0070	0.012	1.782
0.198	0.4	1.784	0.996	1.003	0.998	0.998	0.0003	0.0006	1.784	0.998	0.0066	0.012	1.784
0.206	0.4	1.787	0.998	1.002	0.999	0.999	0.0	0.0	1.787	0.999	0.0063	0.011	1.787
0.214	0.4	1.789	0.999	1.001	0.999	0.999	0.0	0.0	1.789	0.999	0.0063	0.011	1.789
0.221	0.4	1.791	1.000	1.000	1.000	1.000	0.0	0.0	1.791	1.000	0.0063	0.011	1.791

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13. ABSTRACT ***(Maximum 200 words)***

The proper use of a computational fluid dynamics code requires a good understanding of the particular code being applied. In this report the application of CFL3D, a thin-layer Navier-Stokes code, is compared with the results obtained from PARC3D, a full Navier-Stokes code. In order to gain an understanding of the use of this code, a simple problem was chosen in which several key features of the code could be exercised. The problem chosen is a cone in supersonic flow at an angle of attack. The issues of grid resolution, grid blocking, and multigridding with CFL3D are explored. The use of multigridding resulted in a significant reduction in the computational time required to solve the problem. Solutions obtained are compared with the results using the full Navier-Stokes equations solver PARC3D. The results obtained with the CFL3D code compared well with the PARC3D solutions.

14. SUBJECT TERMS

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Lewis Research Center
Cleveland, OH 44135-3191