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AN INITIAL INVESTIGATION INTO METHODS OF COMPUTING  
TRANSONIC AERODYNAMIC SENSITIVITY COEFFICIENTS



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July 1990 -- December 1990

**TEXAS A&M UNIVERSITY**

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I. Introduction

This report covers approximately the period from July 1990 thru December 1990. During this reporting period, work has continued on studies necessary to develop the "quasi-analytical" sensitivity method for three dimensional transonic flow about wings. In addition, initial numerical investigations have been carried out and some very preliminary results obtained.

II. Personnel

The individuals associated with this project during the present reporting period have been Dr. Leland A. Carlson, Principal Investigator, and Hesham Elbanna, Graduate Research Assistant. Mr. Elbanna has been partially supported by the project during this period.

III. Research Progress

The efforts during the past six months and the current status of the project are summarized by a report prepared by Mr. Elbanna and contained herein as Appendix I. (Note that Appendix I contains subappendices A thru D.) As can be seen from this appendix, the primary effort has been the continued development of the three-dimensional quasi-analytical sensitivity analysis and the ancillary driver programs needed to carry out the studies and perform comparisons. Currently, the code is essentially contained in one unified package which includes the following:

- (a) A three dimensional transonic wing analysis program (ZEBRA),



(b) A quasi-analytical portion which determines the matrix elements in the quasi-analytical equations,

(c) A method for computing the sensitivity coefficients from the resulting quasi-analytical equations,

(d) A package to determine for comparison purposes sensitivity coefficients via the finite difference approach, and,

(e) A graphics package.

The total program currently consists of about ten thousand FORTRAN statements, although it is hoped that this can be shortened significantly as the research progresses. Further, in the portion which determines the matrix elements, a major portion of the code from a time standpoint is for each grid only run once to determine symbolic logic that indicates where the non-zero elements are in the matrix. Once this portion is executed, a typical run requires 2-3 min for the transonic analysis, about 10 min for the quasi-analytical setup and solution (relatively independent of the number of design variables), about 2-3 minutes for a finite difference sensitivity analysis for each design variable, plus the time associated with graphical output. These times are all for the IBM 3090 at the TAMU Computer Services Center.

Thus, at this point the quasi-analytical approach and the finite difference approach each require about the same amount of computer time if only two design variables are considered. However, as the number of design variables is increased and as the quasi-analytical method is made more efficient, it is anticipated that the latter approach will be faster and more efficient.

One of the advances made during the last six months has been the investigation of various solvers for the sensitivity equations. As a result, the present scheme now uses an iterative conjugate gradient method and the generalized minimum residual algorithm (GEMRES). These





approaches appear to be very efficient and for the present test case only require a total memory for the entire code of 40 Mb. (Note that in the Appendix I, it is stated that the memory requirements are 90Mb. The larger value was initially used to ensure adequate allocation. However, it has since been determined that 40Mb at the most is actually needed.)

As indicated in Appendix I, some very preliminary results have been obtained with both the finite difference approach and the quasi-analytical method. However, as can be seen by looking at the results, the current quasi-analytical results are in error. Since this appendix was prepared, an error has been discovered in the coding for the determination of the quasi-analytical matrix elements associated with the wing boundary conditions and the wake. Consequently, the various MACSYMA codes are being re-run in order to generate the "correct" FORTRAN code. However, this is a lengthy process; and new results will probably not be available for this report.

In any event, it is believed that steady progress is being made and that useful results will be obtained soon.

#### IV. Project Status

During this period, additional funds were awarded to the Grant to cover the period 1 June 1990 thru 31 December 1990; and a renewal proposal to cover another twelve months was submitted. Subsequently, the facilitate interfacing with the renewal, the present period was extended thru February 28th 1991. It is anticipated that the renewal funds will be available March 1, 1991.



## V. Future Efforts

During the next six months, work will continue on developing the quasi-analytical approach. In addition to debugging the program etc. and obtaining correct answers, emphasis will be placed on making the quasi-analytical method more efficient with respect to both CPU time and storage requirements. Further, work will be initiated to handle additional design variables, to extend the method to transonic and supersonic freestreams, and to generalize the geometry specification. Also, after appropriate discussions with personnel at NASA Langley Research Center, consideration will be given to developing the quasi-analytical approach for a three-dimensional small perturbation potential code, which would be supplied by NASA Langley. The latter effort would allow comparison with the sensitivity results obtained using a full potential code.

## VI. Technical Monitor

The technical monitor for this project is Dr. E. Carson Yates, Jr., Interdisciplinary Research Office, NASA Langley, Research Center.



APPENDIX I

Determination of Aerodynamic Sensitivity Derivatives  
Based on the Full Potential Equation

H. M. Elbanna

January 1991



**DETERMINATION OF AERODYNAMIC SENSITIVITY DERIVATIVES  
BASED ON THE FULL POTENTIAL EQUATION**

Prof. L.A. CARLSON

H.M. ELBANNA, (January, 1991)

**Nomenclature**

ANOFI	Boundary condition term	$ANOFI(j, k)$
AJ1, AJ2	Metric functions	$AJ1(j), AJ2(j)$
A1K, A2K	Metric functions	$A1K(k), A2K(k)$
$C_p$	Pressure coefficient	
$c(y)$	Chord function	
CIR	Circulation	$CIR(j)$
DPU	Wing upper surface boundary term	
DPLO	Wing lower surface boundary term	
DXII	Metric function	$DXII(i)$
ILE	I-location of leading edge	
ITE	I-location of trailing edge	
J	Jacobian	$X_z$
KUP	K-location of plane above wing	
KLOW	K-location of plane below wing	
M	Local Mach number	$M_{i,j,k}$
$M_c$	Cutoff Mach number	$0.94 \geq M_c \leq 1.0$
$M_\infty$	Freestream Mach number	
$P_\infty$	Freestream pressure, nondimensionalized by	$[2\gamma/(\gamma + 1)]P_0$
$P_0$	Stagnation pressure	
$q_\infty$	Freestream velocity, nondimensionalized by	$V^*$
RIP	Retarded density coefficient	$RIP(j, k) = \bar{\rho}_{i+1/2,j,k}$
RIM	Retarded density coefficient	$RIM(j, k) = \bar{\rho}_{i-1/2,j,k}$
RJP	Retarded density coefficient	$RJP(j, k) = \bar{\rho}_{i,j+1/2,k}$
RJ	Retarded density coefficient	$RJ(j, k) = \bar{\rho}_{i,j-1/2,k}$
RKP	Retarded density coefficient	$RKP(j, k) = \bar{\rho}_{i,j,k+1/2}$
RK	Retarded density coefficient	$RK(j, k) = \bar{\rho}_{i,j,k-1/2}$
R1K	Modified retarded density coefficient for wing upper surface	
R1KU	Modified retarded density coefficient for wing lower surface	
R2KW	Modified retarded density coefficient for wake upper surface	
R2KP	Modified retarded density coefficient for wake lower surface	
U, V, W	Contravariant velocity components in computational plane	
x, y, z	Physical grid system	
X, Y, Z	Computational coordinates aligned with wing	
$xle(y)$	Leading edge function	
XD	Vector of design variables	
$\rho$	Density, nondimensionalized by	$\rho_0$
$\rho_\infty$	Freestream density, nondimensionalized by	$\rho_0$
$\rho_0$	Stagnation density	
$\bar{\rho}$	Retarded density coefficient	
$\bar{\delta}()$	First order backward difference operator	
$\alpha$	Angle of attack	
$\gamma$	Ratio of specific heats	
$\sigma$	Switching function	$\sigma = 1 - \nu$
$\phi$	Reduced potential function	
$\Phi$	Full potential function	

## Introduction

In this progress report, work carried out during the period from July 1990 to December 1990 will be outlined. In addition, various overall steps and equations related to the three-dimensional sensitivity project will be listed herein for future reference. At this stage, it is helpful to distinguish two main phases that characterize the three-dimensional analysis/sensitivity project. Phase one of this research<sup>1,2</sup> was concerned with modifying the analysis (ZEBRA) program to suit the sensitivity study, developing FORTRAN subroutines to calculate sensitivity derivatives using the finite-difference method, and, developing MACSYMA/FORTRAN algorithms to calculate the sensitivity coefficients using the quasianalytical method. These tasks were finalized by an assembly procedure that aimed at combining the above mentioned subroutines into one FORTRAN program. The main advantages of having a single FORTRAN program to carry out various analysis/sensitivity case studies are the minimization of disk read/write operations and the ability to debug/test/append any future additions to the entire project with ease, compatibility, and speed. The second phase of the project will be concerned with debugging operations, addition of design variables, increasing solver efficiency, and carrying out a variety of case studies. The sections covered in this report are as follows,

- Symbolic Differentiation of the Full Potential Residual Expression.
- Structure of the Analysis/Sensitivity FORTRAN Code.
- Linear Solvers for the Sensitivity Equation.
- Primary Results and Debugging Operations.
- Future Work.
- Further Theoretical Aspects.

It is to be noted that the following sections include the effort up to the current state of work progress, this state being at the junction between the first phase and the second phase of the analysis/sensitivity project.

### Symbolic Differentiation of the Full Potential Residual Expression

Following the line of formulation adopted in the two-dimensional sensitivity study, the quasianalytical method applied to the three-dimensional full potential equation yields the sensitivity equation,

$$\left[ \frac{\partial R_{i,j,k}}{\partial \phi_{ii,jj,kk}} \right] \left( \frac{\partial \phi_{ii,jj,kk}}{\partial XD} \right) = - \left( \frac{\partial R_{i,j,k}}{\partial XD} \right) \quad (1)$$

The residual expression of the full potential equation in conservative form (in the computational plane and using a shearing transformation) is written in terms of backward differences as,

$$R_{i,j,k} = \bar{\delta}_X \left( \frac{\rho U}{J} \right)_{i-1/2,j,k} + \bar{\delta}_Y \left( \frac{\rho V}{J} \right)_{i,j+1/2,k} + \bar{\delta}_Z \left( \frac{\rho W}{J} \right)_{i,j,k-1/2} \quad (2)$$

The density is replaced by the retarded density coefficient in order to maintain stability in regions of supersonic flow. Therefore, Eq.(2) is written as,

$$R_{i,j,k} = \bar{\delta}_X \left( \frac{\bar{\rho} U}{J} \right)_{i+1/2,j,k} + \bar{\delta}_Y \left( \frac{\bar{\rho} V}{J} \right)_{i,j+1/2,k} + \bar{\delta}_Z \left( \frac{\bar{\rho} W}{J} \right)_{i,j,k+1/2} \quad (3)$$

$$= \left[ \left( \frac{\bar{\rho} U}{J} \right)_{i+1/2,j,k} - \left( \frac{\bar{\rho} U}{J} \right)_{i-1/2,j,k} \right] + \left[ \left( \frac{\bar{\rho} V}{J} \right)_{i,j+1/2,k} - \left( \frac{\bar{\rho} V}{J} \right)_{i,j-1/2,k} \right] + \left[ \left( \frac{\bar{\rho} W}{J} \right)_{i,j,k+1/2} - \left( \frac{\bar{\rho} W}{J} \right)_{i,j,k-1/2} \right] \quad (4)$$



In ZEBRA, Eq.(4) is coded as follows,

$$R_{i,j,k} = (FIP - FIM) + (FJP - FJM) + (FKP - FKM) + ANOFI \quad (5)$$

$$= [RIP U_{i+1/2,j,k} - RIM U_{i-1/2,j,k}] + [RJP V_{i,j+1/2,k} - RJ V_{i,j-1/2,k}] + [RKP W_{i,j,k+1/2} - RK W_{i,j,k-1/2}] + ANOFI \quad (6)$$

where

$$ANOFI(i,j,k) = \begin{cases} -A33M R1K DPU, & k = KUP, \quad ILE \leq i \leq ITE \\ A33P R1KU DPLO, & k = KLOW, \quad ILE \leq i \leq ITE \\ A33M R2KW CIR, & k = KUP, \quad ITE < i \\ -A33M R2KP CIR, & k = KLOW, \quad ITE < i \end{cases} \quad (7)$$

is the term that includes wing and wake boundary conditions. Note that the Jacobian is incorporated into the transformation coefficients of the contravariant velocity components. Next, the retarded density coefficients are given by,

$$RIP(i,j,k) = (1 - \nu_{i-1/2,j,k})\rho_{i+1/2,j,k} + \nu_{i+1/2,j,k}\rho_{i-1/2,j,k} \quad (8)$$

$$= \sigma_{i+1/2,j,k}(\rho_{i+1/2,j,k} - \rho_{i-1/2,j,k}) + \rho_{i-1/2,j,k} \quad (9)$$

$$RJP(i,j,k) = \frac{1}{2}(\bar{\rho}_{i,j,k} + \bar{\rho}_{i,j+1,k}) \quad (10)$$

$$RKP(i,j,k) = \frac{1}{2}(\bar{\rho}_{i,j,k} + \bar{\rho}_{i,j,k+1}) \quad (11)$$

where

$$\rho_{i,j,k} = [1 - \frac{\gamma-1}{\gamma+1}(U\Phi_X + V\Phi_Y + W\Phi_Z)]_{i,j,k}^{\frac{1}{\gamma-1}} \quad (12)$$

$$\nu_{i,j,k} = \min[1, \max(1 - \frac{M_c}{M_{i,j,k}^2}, 0)] \quad (13)$$

Notice that the retarded density coefficient  $RIP(i,j,k)$  is evaluated only at the midsegment point  $i+1/2, j, k$  while the values at  $i, j+1/2, k$  and  $i, j, k+1/2$  [ $RJP(i,j,k)$  and  $RKP(i,j,k)$ ] are obtained by averages of the surrounding points. The Mach number is obtained from the following relation,

$$\frac{\rho_0}{\rho_{i,j,k}} = (\frac{T_0}{T})^{\frac{1}{\gamma-1}} = (1 + \frac{\gamma-1}{2}M_{i,j,k}^2)^{\frac{1}{\gamma-1}} \quad (14)$$

and therefore,

$$M_{i,j,k}^2 = \frac{2}{\gamma-1}(\rho_{i,j,k}^{1-\gamma} - 1) \quad (15)$$

where  $\rho_{i,j,k}$  is nondimensionalized by  $\rho_0$ . From Eq.(15) into Eq.(13),

$$\nu_{i,j,k} = \begin{cases} 0, & M_{i,j,k} < 1 \\ 1 - \frac{(\gamma-1)M_{i,j,k}^2/2}{\rho_{i,j,k}^{1-\gamma} - 1}, & M_{i,j,k} > 1 \end{cases} \quad (16)$$

and therefore,

$$\nu_{i+1/2,j,k} = \begin{cases} 0, & M_{i,j,k} < 1 \\ 1 - \frac{(\gamma-1)M_{i,j,k}^2/2}{[(\rho_{i,j,k} + \rho_{i-1/2,j,k})/2]^{1-\gamma} - 1}, & M_{i,j,k} > 1 \end{cases} \quad (17)$$

$$\sigma_{i+1/2,j,k} = 1 - \nu_{i-1/2,j,k} = \begin{cases} 1, & M_{i,j,k} < 1 \\ \frac{(\gamma-1)M_{i,j,k}^2/2}{[(\rho_{i,j,k} + \rho_{i-1,j,k})/2]^{2-\gamma-1}}, & M_{i,j,k} > 1 \end{cases} \quad (18)$$

The contravariant velocity components are given by,

$$U = (X_x^2 + X_y^2)\Phi_X + X_y\Phi_Y \quad (19)$$

$$V = X_y\Phi_X + \Phi_Y \quad (20)$$

$$W = \Phi_Z \quad (21)$$

In order to improve the convergence of the analysis routine, the full potential is split into separate perturbation and freestream components as follows,

$$\Phi_{i,j,k} = \phi_{i,j,k} + Xq_\infty \cos(\alpha) + Zq_\infty \sin(\alpha) \quad (22)$$

Differentiating Eq.(22) with respect to X,Y,Z respectively,

$$(\Phi_X)_{i,j,k} = (\phi_X)_{i,j,k} + X_x q_\infty \cos(\alpha) \quad (23)$$

$$(\Phi_Y)_{i,j,k} = (\phi_Y)_{i,j,k} + X_y q_\infty \cos(\alpha) \quad (24)$$

$$(\Phi_Z)_{i,j,k} = (\phi_Z)_{i,j,k} + Z_z q_\infty \sin(\alpha) \quad (25)$$

where

$$(\phi_X)_{i,j,k} = D_{XII}(i)(\phi_{i+1,j,k} - \phi_{i,j,k}) \quad (26)$$

$$(\phi_Y)_{i,j,k} = [AJ1(j)(\phi_{i,j,k} - \phi_{i,j-1,k} + \phi_{i+1,j,k} - \phi_{i+1,j-1,k}) + AJ2(j)(\phi_{i,j+1,k} - \phi_{i,j,k} + \phi_{i+1,j+1,k} - \phi_{i+1,j,k})]/2 \quad (27)$$

$$(\phi_Z)_{i,j,k} = [A1K(k)(\phi_{i,j,k} - \phi_{i,j,k-1}) + A2K(k)(\phi_{i,j,k-1} - \phi_{i,j,k}) + A1K(k)(\phi_{i+1,j,k} - \phi_{i+1,j,k-1}) + A2K(k)(\phi_{i+1,j,k-1} - \phi_{i+1,j,k})]/2 \quad (28)$$

Note that a shearing transformation is used to transform the physical grid system (x,y,z) into a computational grid (X,Y,Z) aligned with the wing. This transformation is given by,

$$X(x,y) = \frac{x - xle(y)}{c(y)} \quad (29)$$

$$Y(y) = y \quad (30)$$

$$Z(z) = z \quad (31)$$

Before carrying out the analytical differentiation of the residual expression, it is necessary to find all potential dependencies. Furthermore, the full expression is divided into subexpressions in order to simplify and optimize subsequent expression evaluations. Appendix A includes a MACSYMA program that determines various potential dependencies for each residual subexpression. The result of running this program is also included in Appendix A. In addition, the above equations are written in functional form and given herein to assist in understanding the steps involved in finding the potential dependencies. These equations are given as follows,

$$R_{i,j,k} = R_{i,j,k}(RIP, RIM, RJP, RJ, RKP, RK, U, V, W, ANOFI) \quad (32)$$

where

$$RIP = RIP(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (33)$$

$$RIM = RIM(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (34)$$

$$RJP = RJP(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (35)$$

$$RJ = RJ(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (36)$$

$$RKP = RKP(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (37)$$

$$RK = RK(\Phi_X, \Phi_Y, \Phi_Z, U, V, W) \quad (38)$$

$$ANOFI = ANOFI(R1K, DPU, R1KU, DPLO, R2KW, R2KP, CIR) \quad (39)$$

and,

$$U = U(\Phi_X, \Phi_Y) \quad (40)$$

$$V = V(\Phi_X, \Phi_Y) \quad (41)$$

$$W = W(\Phi_Z) \quad (42)$$

$$\Phi_X = \Phi_X[\phi_{ii,jj,kk}, M_\infty, \alpha] \quad (43)$$

$$\Phi_Y = \Phi_Y[\phi_{ii,jj,kk}, M_\infty, \alpha] \quad (44)$$

$$\Phi_Z = \Phi_Z[\phi_{ii,jj,kk}, M_\infty, \alpha] \quad (45)$$

As mentioned above, once the program in Appendix A is executed, potential dependencies are used in symbolically differentiating the general residual expression and residual boundary updates (wing, wake, and right hand side vectors). This is achieved using the MACSYMA program given in Appendix B. The result of running the analytic differentiation program is a segment of FORTRAN subroutines presented in Appendix C. This segment of FORTRAN code is then transferred from the VAX machine and linked into the analysis/sensitivity program on the IBM-3090.

It is to be noted that previous work<sup>1,2</sup> included operations similar to those mentioned above. However, residual updates were prepared separately using Eq.(5) with the last term 'ANOFI' (the term that includes wing and wake boundary conditions) replaced by the appropriate boundary terms, then each residual expression was simplified and differentiated using a different MACSYMA program. As a result, multiple MACSYMA codes (about six separate codes) had to be prepared to yield the required FORTRAN source segments. This resulted in a total size of about 12,000 lines of source code. No major problems were encountered in compiling this number of code lines since they were developed in the form of multiple subroutines. Currently, the same FORTRAN segments were reduced in size to about 7,000 lines of FORTRAN source code. This was achieved by handling both the general residual expression and the 'ANOFI' term separately thus cancelling repeated (or equivalent) portions of the FORTRAN code. Consequently, it should be noted

that the codes given in the Appendices are still being modified and optimized for size and speed and that the enclosed versions of these codes (up to date versions) are still being debugged and refined.

For the current three-dimensional problem, design variables were previously<sup>1,2</sup> defined as follows,

- (a) Freestream design variables. These include the freestream Mach number and the angle of attack.
- (b) Cross-section design variables. These include variables that define the airfoil section (such as maximum thickness, maximum camber, and location of maximum camber) and variables that define the setting of each spanwise section (such as geometric twist and dihedral).
- (c) Planform design variables. These are variables that define the geometry of the wing planform.

These variables are used in preparing the right hand side vectors. In carrying out this step, the residual is analytically differentiated with respect to each design variable and a corresponding segment of FORTRAN code is generated. Refer to Appendices B and C for the details of these operations.

Finally, Appendix D includes a MACSYMA program to further process the results obtained from solving the sensitivity equation. The result of running this program is a segment of FORTRAN code used to calculate pressure coefficient sensitivity derivatives given the reduced potential sensitivity derivatives. A transfer/link operation similar to the above is applied in order to merge this FORTRAN segment into the analysis/sensitivity program.

### Structure of the Analysis/Sensitivity FORTRAN Code

The analysis/sensitivity code is basically composed of the analysis program (ZEBRA), the finite-difference sensitivity driver, and the quasianalytical sensitivity driver. Furthermore, graphics routines are also included in the main code in order to assist in examining the results.

Execution of the main code starts thru an analysis (ZEBRA) run followed by sensitivity derivative calculations. These calculations are carried out either using the finite-difference method or using the quasi-analytical approach. The finite-difference portion of the code is set up to allow two consecutive ZEBRA runs to be used to calculate a vector of sensitivity derivatives. This brute force technique while straight forward in application has the disadvantages of being expensive to implement and exhibits accuracy problems. As for the quasianalytical sensitivity driver, it consists of two main parts. The first part is a group of nested DO-LOOPS used to assemble the jacobian matrix and the right hand side vector(s). This is achieved using calls to the FORTRAN segments generated via MACSYMA (see Appendix C). After the numerical assembly step is completed, the second part of the sensitivity driver, a setup that allows execution of one of several linear sparse solvers, is used to solve the sensitivity equation and yields the vector(s) of sensitivity derivatives. Finally, the resulting sensitivity derivatives ( $\partial\phi/\partial XD$ ) are further processed in order to obtain pressure coefficient sensitivity derivatives ( $\partial C_p/\partial XD$ ). This step is carried out separately using a MACSYMA program that generates corresponding FORTRAN subroutines (see Appendix D).

### Linear Solvers for the Sensitivity Equation

For the current three-dimensional problem and for the medium grid used, direct solvers that were previously used in the two-dimensional problem (those based on tridiagonal decomposition and full Gaussian elimination) failed to operate on the 3-D jacobian matrix basically due to memory limitations. On the other hand, iterative routines developed earlier for the two-dimensional problem worked properly however turned out to be somewhat slow. Later on, it was decided to try out some library routines that were available on the IBM-3090. These turned out to be extremely efficient with regards to memory requirements and speed of execution. Apparently, the reason for this efficiency lies in the ability of these routines to take advantage of the IBM-3090 architecture and vectorization facility besides being written in machine code and optimized for speed. In addition, the inclusion of these routines into the solver portion of the analysis/sensitivity program turned out to be straightforward in the form of regular FORTRAN calls. Two scientific library solvers (based on the iterative conjugate gradient method and the generalized minimum residual algorithm) were used with success and a GO REGION of about 90MB was allocated in the JCL with no major problems. Notice that the exact amount of storage needed for each of these solvers will depend on the structure of the jacobian matrix (roughly, the structure is sparse and banded), the details of which will be determined at a later stage.

### Primary Results and Debugging Operations

Currently, the MACSYMA codes are being debugged and revised to increase both the efficiency and handling of the resulting FORTRAN code segments. For example, as mentioned earlier, the last term in Eq.(5) is handled separately without revising Eq.(5) in its entirety. This has the advantage of reducing the size of both the MACSYMA program and FORTRAN generated segments. In addition, extensive debugging and review of the entire work will be performed in parallel to the above steps.

The sensitivity of the pressure coefficient  $C_p$  with respect to the design variables is obtained using  $\partial\phi/\partial XD$ . The expression for the pressure coefficient is,

$$C_p = \frac{P - P_\infty}{\rho q_\infty^2 / 2} \quad (46)$$

Substituting for the pressure using the isentropic relation, therefore

$$C_p = \frac{(\gamma + 1)/\gamma}{\rho q_\infty^2} (\rho^\gamma - \rho_\infty^\gamma) \quad (47)$$

where

$$\rho = \left[ 1 - \frac{\gamma - 1}{\gamma + 1} (U\Phi_X + V\Phi_Y + W\Phi_Z) \right]^{\frac{1}{\gamma-1}} \quad (48)$$

and  $U, V, W, \Phi_X, \Phi_Y, \Phi_Z$  are given by equations (19)-(21) and (23)-(25) respectively. Notice also that the freestream values  $q_\infty, \rho_\infty, \text{ and } P_\infty$  are obtained using the relations,

$$q_\infty = \left[ \frac{\gamma + 1}{\gamma - 1 + 2/M_\infty^2} \right]^{1/2} \quad (49)$$

$$\rho_\infty = \left[ 1 - \frac{\gamma - 1}{\gamma + 1} q_\infty^2 \right]^{1/(\gamma-1)} \quad (50)$$

$$P_\infty = \frac{\gamma + 1}{2\gamma} \rho_\infty^\gamma \quad (51)$$

Refer to Appendix D for the symbolic calculation of pressure coefficient sensitivity derivatives using reduced potential sensitivity derivatives.

Some primary results obtained by executing the analysis/sensitivity code about a fixed design point are also presented in this report following Appendix D. The planform used is that of an ONERA-M6 wing with a six percent noncambered parabolic-arc section and the flowfield ( $M_\infty = 0.8, \alpha = 0.0$ ) is computed on a  $45 \times 30 \times 16$  medium grid (i.e. symmetric subcritical flowfield). Figures (1) and (2) show the pressure coefficient for this subcritical case. Figures (3) and (4) include finite-difference pressure coefficient sensitivity derivatives with respect to Mach number and angle of attack respectively. Finally, Figures (5) and (6) contain the corresponding derivatives obtained by the quasianalytical method. Notice that the trends are different for both sets of the derivatives. It is believed that while the finite-difference results follow the trends obtained in the two-dimensional sensitivity study, the quasianalytical derivatives have different trends and therefore are in error. As mentioned earlier, debugging operations are underway with the finite-difference method being used as a reference for correct quasianalytical trends.

### Future Work

As mentioned in the first section, the second phase of this project will be towards overall debugging of the analysis/sensitivity code with the objective being to match the sensitivity derivatives obtained thru the quasianalytical method with those derivatives obtained thru the finite-difference approach. Initially, focus will be on sensitivities with respect to freestream design variables (Mach number and angle of attack) followed by sensitivities with respect to both airfoil and planform design variables. It is to be noted that the inclusion of the later variables might require some sort of semi-analytical treatment to handle right hand side calculations corresponding to these variables. Next, various case studies will be conducted in order

to compare and improve on both the accuracy and efficiency of the quasianalytical and finite difference methods. This step will be followed by a physical interpretation of the results. Finally, minor modifications in the form of supersonic boundary conditions will be added to the analysis/sensitivity program in order to allow execution of supersonic test cases.

### Further Theoretical Aspects

In some optimization studies, higher sensitivity derivatives might be needed. In general, it is possible to extend the quasianalytical approach in order to obtain second order sensitivity derivatives. The following ideas<sup>3</sup> could be applied directly to the sensitivity equation. Consider the linear system,

$$A X = B \quad (52)$$

The sensitivity of X with respect to the elements of A and B ( $XD_m$ ) is obtained by differentiating Eq.(52) with respect to  $XD_m$ ,

$$\left[ \frac{\partial A}{\partial XD_m} \right] X - A \left[ \frac{\partial X}{\partial XD_m} \right] = \left[ \frac{\partial B}{\partial XD_m} \right] \quad (53)$$

or,

$$A \left[ \frac{\partial X}{\partial XD_m} \right] = \left[ \frac{\partial B}{\partial XD_m} - \frac{\partial A}{\partial XD_m} X \right] \quad (54)$$

Applying the above procedure to Eq.(1), second order sensitivity derivatives for the current three-dimensional problem could be obtained. The result is,

$$\left[ \frac{\partial R_{i,j,k}}{\partial \phi_{ii,jj,kk}} \right] \left( \frac{\partial^2 \phi_{ii,jj,kk}}{\partial XD_m \partial XD} \right) = - \left( \frac{\partial^2 R_{i,j,k}}{\partial XD_m \partial XD} + \frac{\partial^2 R_{i,j,k}}{\partial XD_m \partial \phi_{ii,jj,kk}} \frac{\partial \phi_{ii,jj,kk}}{\partial XD_m} \right) \quad (55)$$

The first term in Eq.(55) is the ( $n \times n$ ) jacobian matrix and is obtained as explained earlier. The second term represents the unknown second order sensitivity vector ( $n \times 1$ ). The third term is the ( $n \times 1$ ) vector of derivative of the right hand side with respect to a second design variable. The fourth term is the derivative of the jacobian matrix with respect to a design variable, and is an ( $n \times n$ ) matrix. Finally, the last term in Eq.(55) is the first order sensitivity vector, and would be obtained typically by solving Eq.(1). Notice that the extra work required to obtain second order derivatives would be to carry out additional MACSYMA operations (basically analytical differentiation) associated with the third and fourth terms of Eq.(55). Notice that Eq.(55) is similar to Eq.(1) except for the right hand sides which are modified. Similarly, the above procedure could be applied to obtain higher derivatives for the current three dimensional problem. Examples of second order sensitivity derivatives are  $\partial^2 \phi / \partial \alpha^2$  and  $\partial^2 \phi / \partial M_\infty \partial \alpha$ .

### References

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2. Carlson, L.A., An Initial Investigation into Methods of Computing Transonic Aerodynamic Sensitivity Coefficients, TAMRF Report No.5802-90-01, July 1990.
3. Deif, A., Sensitivity Analysis in Linear Systems, Springer Verlag, 1986.

# APPENDIX A

MACSYMA CODE TO FIND THE RESIDUAL DEPENDENCIES

```

/*-----*/
/*          RMD.MAC: POTENTIAL DEPENDENCIES          */
/*-----*/
/****** MACSYMA PROGRAM TO GENERATE RESIDUAL DEPENDENCIES ******/
/*-----*/
SHOWTIME: TRUES

PX(I,J,K) := [P(I+1,J ,K ),P(I ,J ,K )]$
PY(I,J,K) := [P(I ,J ,K ),P(I ,J-1,K ),P(I+1,J ,K ),
              P(I+1,J-1,K ),P(I ,J+1,K ),P(I+1,J+1,K )]$
PZ[0](I,J,K):= [P(I ,J ,K ),P(I ,J ,K-1),P(I ,J ,K+1),
               P(I+1,J ,K ),P(I+1,J ,K-1),P(I+1,J ,K+1)]$
PHIU(J)      := [P(ITE,J,KUP),P(ITE,J,KUP+1),P(ITE,J,KUP+2)]$
PHIL(J)      := [P(ITE,J,KLO),P(ITE,J,KLO-1),P(ITE,J,KLO-2)]$
CIRC(J)      := UNION(PHIU(J),PHIL(J))$

PZ[1](I,J,K):= [P(I ,J ,K ),P(I ,J ,K+1),P(I ,J ,K+2),
               P(I+1,J ,K ),P(I+1,J ,K+1),P(I+1,J ,K+2)]$
PZ[2](I,J,K):= [P(I ,J ,K ),P(I ,J ,K-1),P(I ,J ,K-2),
               P(I+1,J ,K ),P(I+1,J ,K-1),P(I+1,J ,K-2)]$
PZ[3](I,J,K):= UNION([P(I ,J,K ),P(I ,J,K-1),P(I ,J,K+1),
                    P(I+1,J,K ),P(I+1,J,K-1),P(I+1,J,K+1)],CIRC(J))$
PZ[4](I,J,K):= UNION([P(I ,J,K ),P(I ,J,K-1),P(I ,J,K+1),
                    P(I+1,J,K ),P(I+1,J,K-1),P(I+1,J,K+1)],CIRC(J))$

FOR N:0 THRU 4 DO (
RH [N](I,J,K) := UNION(PX(I,J,K),PY(I,J,K),PZ[N](I,J,K)),
RIP[N](I,J,K) := UNION(RH[N](I,J,K),RH[N](I-1,J,K))
RIM[N](I,J,K) := RIP[N](I-1,J,K) )$

RES(I,J,K) := [P(I ,J-1,K ),P(I ,J ,K ),P(I ,J+1,K ),
              P(I+1,J-1,K ),P(I+1,J ,K ),P(I+1,J+1,K ),
              P(I ,J ,K-1),P(I ,J ,K+1),P(I-1,J-1,K ),
              P(I-1,J ,K ),P(I-1,J+1,K ) ]$

R1K ( ) := UNION(RIP[1](I,J,K),RIM[1](I,J,K),RIP[1](I,J,K+1),RIM[1](I,J,K+1))$
R1KU( ) := UNION(RIP[2](I,J,K),RIM[2](I,J,K),RIP[2](I,J,K-1),RIM[2](I,J,K-1))$
R2KW( ) := UNION(RIP[3](I,J,K),RIM[3](I,J,K),RIP[3](I,J,K-1),RIM[3](I,J,K-1))$
R2KP( ) := UNION(RIP[4](I,J,K),RIM[4](I,J,K),RIP[4](I,J,K+1),RIM[4](I,J,K+1))$

FU (I,J):= [P(I,J,K),P(I,J,K+1),P(I,J,K+2)] $
FXU (I,J):= UNION(FU(I,J),FU(I-1,J),FU(I+1,J)) $
FYU (I,J):= UNION(FU(I,J),FU(I,J-1),FU(I,J+1)) $
DPU ( ) := UNION(FXU(I,J),FYU(I,J)) $

FL (I,J):= [P(I,J,K),P(I,J,K-1),P(I,J,K-2)] $
FXL (I,J):= UNION(FL(I,J),FL(I-1,J),FL(I+1,J)) $
FYL (I,J):= UNION(FL(I,J),FL(I,J-1),FL(I,J+1)) $
DPLO( ) := UNION(FXL(I,J),FYL(I,J)) $

ANOFI1( ) := UNION(R1K ,DPU )$
ANOFI2( ) := UNION(R1KU,DPLO)$
ANOFI3( ) := UNION(R2KW,CIRC)$
ANOFI4( ) := UNION(R2KP,CIRC)$

(RJ (I,J,K):=UNION(RIP[0](I,J,K),RIM[0](I,J,K),RIP[0](I,J-1,K),RIM[0](I,J-1,K)),
RJP(I,J,K):=RJ(I,J+1,K)
RK (I,J,K):=UNION(RIP[0](I,J,K),RIM[0](I,J,K),RIP[0](I,J,K-1),RIM[0](I,J,K-1)),
RKP(I,J,K):=RK(I,J,K+1)
RTOT(I,J,K):=UNION(RES,RIP,RIM,RJ,RJP,RK,RKP) )$

(RIP: RIP[0](I,J,K), RJ: RJ(I,J,K), RJP: RJP(I,J,K), RES: RES(I,J,K),
RIM: RIM[0](I,J,K), RK: RK(I,J,K), RKP: RKP(I,J,K), RTOT: RTOT(I,J,K))$

/*-----*/
(R1K : R1K ( ), DPU : DPU ( ) , ATT1: ANOFI1())$
(R1KU: R1KU(), DPLO: DPLO() , ATT2: ANOFI2())$
(R2KW: R2KW(), CIRC: CIRC(J), ATT3: ANOFI3())$
(R2KP: R2KP(), CIRC: CIRC(J), ATT4: ANOFI4())$
/*-----*/

```



LT :

[P(I-2,J-2,K-3)=P1 ,P(I-2,J-2,K-1)=P51,P(I-2,J-2,K+1)=P101,P(I-2,J-2,K+3)=P151,  
P(I-1,J-2,K-3)=P2 ,P(I-1,J-2,K-1)=P52,P(I-1,J-2,K+1)=P102,P(I-1,J-2,K+3)=P152,  
P(I ,J-2,K-3)=P3 ,P(I ,J-2,K-1)=P53,P(I ,J-2,K+1)=P103,P(I ,J-2,K+3)=P153,  
P(I+1,J-2,K-3)=P4 ,P(I+1,J-2,K-1)=P54,P(I+1,J-2,K+1)=P104,P(I+1,J-2,K+3)=P154,  
P(I+2,J-2,K-3)=P5 ,P(I+2,J-2,K-1)=P55,P(I+2,J-2,K+1)=P105,P(I+2,J-2,K+3)=P155,  
P(I-2,J-1,K-3)=P6 ,P(I-2,J-1,K-1)=P56,P(I-2,J-1,K+1)=P106,P(I-2,J-1,K+3)=P156,  
P(I-1,J-1,K-3)=P7 ,P(I-1,J-1,K-1)=P57,P(I-1,J-1,K+1)=P107,P(I-1,J-1,K+3)=P157,  
P(I ,J-1,K-3)=P8 ,P(I ,J-1,K-1)=P58,P(I ,J-1,K+1)=P108,P(I ,J-1,K+3)=P158,  
P(I+1,J-1,K-3)=P9 ,P(I+1,J-1,K-1)=P59,P(I+1,J-1,K+1)=P109,P(I+1,J-1,K+3)=P159,  
P(I+2,J-1,K-3)=P10,P(I+2,J-1,K-1)=P60,P(I+2,J-1,K+1)=P110,P(I+2,J-1,K+3)=P160,  
P(I-2,J ,K-3)=P11,P(I-2,J ,K-1)=P61,P(I-2,J ,K+1)=P111,P(I-2,J ,K+3)=P161,  
P(I-1,J ,K-3)=P12,P(I-1,J ,K-1)=P62,P(I-1,J ,K+1)=P112,P(I-1,J ,K+3)=P162,  
P(I ,J ,K-3)=P13,P(I ,J ,K-1)=P63,P(I ,J ,K+1)=P113,P(I ,J ,K+3)=P163,  
P(I+1,J ,K-3)=P14,P(I+1,J ,K-1)=P64,P(I+1,J ,K+1)=P114,P(I+1,J ,K+3)=P164,  
P(I+2,J ,K-3)=P15,P(I+2,J ,K-1)=P65,P(I+2,J ,K+1)=P115,P(I+2,J ,K+3)=P165,  
P(I-2,J+1,K-3)=P16,P(I-2,J+1,K-1)=P66,P(I-2,J+1,K+1)=P116,P(I-2,J+1,K+3)=P166,  
P(I-1,J+1,K-3)=P17,P(I-1,J+1,K-1)=P67,P(I-1,J+1,K+1)=P117,P(I-1,J+1,K+3)=P167,  
P(I ,J+1,K-3)=P18,P(I ,J+1,K-1)=P68,P(I ,J+1,K+1)=P118,P(I ,J+1,K+3)=P168,  
P(I+1,J+1,K-3)=P19,P(I+1,J+1,K-1)=P69,P(I+1,J+1,K+1)=P119,P(I+1,J+1,K+3)=P169,  
P(I+2,J+1,K-3)=P20,P(I+2,J+1,K-1)=P70,P(I+2,J+1,K+1)=P120,P(I+2,J+1,K+3)=P170,  
P(I-2,J+2,K-3)=P21,P(I-2,J+2,K-1)=P71,P(I-2,J+2,K+1)=P121,P(I-2,J+2,K+3)=P171,  
P(I-1,J+2,K-3)=P22,P(I-1,J+2,K-1)=P72,P(I-1,J+2,K+1)=P122,P(I-1,J+2,K+3)=P172,  
P(I ,J+2,K-3)=P23,P(I ,J+2,K-1)=P73,P(I ,J+2,K+1)=P123,P(I ,J+2,K+3)=P173,  
P(I+1,J+2,K-3)=P24,P(I+1,J+2,K-1)=P74,P(I+1,J+2,K+1)=P124,P(I+1,J+2,K+3)=P174,  
P(I+2,J+2,K-3)=P25,P(I+2,J+2,K-1)=P75,P(I+2,J+2,K+1)=P125,P(I+2,J+2,K+3)=P175,

P(I-2,J-2,K-2)=P26,P(I-2,J-2,K)=P76,P(I-2,J-2,K+2)=P126,P(ITE,J-1,KLO-2)=P176,  
P(I-1,J-2,K-2)=P27,P(I-1,J-2,K)=P77,P(I-1,J-2,K+2)=P127,P(ITE,J-1,KLO-1)=P177,  
P(I ,J-2,K-2)=P28,P(I ,J-2,K)=P78,P(I ,J-2,K+2)=P128,P(ITE,J-1,KLO )=P178,  
P(I+1,J-2,K-2)=P29,P(I+1,J-2,K)=P79,P(I+1,J-2,K+2)=P129,P(ITE,J-1,KUP )=P179,  
P(I+2,J-2,K-2)=P30,P(I+2,J-2,K)=P80,P(I+2,J-2,K+2)=P130,P(ITE,J-1,KUP+1)=P180,  
P(I-2,J-1,K-2)=P31,P(I-2,J-1,K)=P81,P(I-2,J-1,K+2)=P131,P(ITE,J-1,KUP+2)=P181,  
P(I-1,J-1,K-2)=P32,P(I-1,J-1,K)=P82,P(I-1,J-1,K+2)=P132,P(ITE,J ,KLO-2)=P182,  
P(I ,J-1,K-2)=P33,P(I ,J-1,K)=P83,P(I ,J-1,K+2)=P133,P(ITE,J ,KLO-1)=P183,  
P(I+1,J-1,K-2)=P34,P(I+1,J-1,K)=P84,P(I+1,J-1,K+2)=P134,P(ITE,J ,KLO )=P184,  
P(I+2,J-1,K-2)=P35,P(I+2,J-1,K)=P85,P(I+2,J-1,K+2)=P135,P(ITE,J ,KUP )=P185,  
P(I-2,J ,K-2)=P36,P(I-2,J ,K)=P86,P(I-2,J ,K+2)=P136,P(ITE,J ,KUP+1)=P186,  
P(I-1,J ,K-2)=P37,P(I-1,J ,K)=P87,P(I-1,J ,K+2)=P137,P(ITE,J ,KUP+2)=P187,  
P(I ,J ,K-2)=P38,P(I ,J ,K)=P88,P(I ,J ,K+2)=P138,P(ITE,J+1,KLO-2)=P188,  
P(I+1,J ,K-2)=P39,P(I+1,J ,K)=P89,P(I+1,J ,K+2)=P139,P(ITE,J+1,KLO-1)=P189,  
P(I+2,J ,K-2)=P40,P(I+2,J ,K)=P90,P(I+2,J ,K+2)=P140,P(ITE,J+1,KLO )=P190,  
P(I-2,J+1,K-2)=P41,P(I-2,J+1,K)=P91,P(I-2,J+1,K+2)=P141,P(ITE,J+1,KUP )=P191,  
P(I-1,J+1,K-2)=P42,P(I-1,J+1,K)=P92,P(I-1,J+1,K+2)=P142,P(ITE,J+1,KUP+1)=P192,  
P(I ,J+1,K-2)=P43,P(I ,J+1,K)=P93,P(I ,J+1,K+2)=P143,P(ITE,J+1,KUP+2)=P193,  
P(I+1,J+1,K-2)=P44,P(I+1,J+1,K)=P94,P(I+1,J+1,K+2)=P144,  
P(I+2,J+1,K-2)=P45,P(I+2,J+1,K)=P95,P(I+2,J+1,K+2)=P145,  
P(I-2,J+2,K-2)=P46,P(I-2,J+2,K)=P96,P(I-2,J+2,K+2)=P146,  
P(I-1,J+2,K-2)=P47,P(I-1,J+2,K)=P97,P(I-1,J+2,K+2)=P147,  
P(I ,J+2,K-2)=P48,P(I ,J+2,K)=P98,P(I ,J+2,K+2)=P148,  
P(I+1,J+2,K-2)=P49,P(I+1,J+2,K)=P99,P(I+1,J+2,K+2)=P149,  
P(I+2,J+2,K-2)=P50,P(I+2,J+2,K)=P100,P(I+1,J+2,K+2)=P150]\$,

(NI : [I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2],  
NJ : [J ,J ,J ,J-1,J-1,J-1,J ,J ,J ,J+1,J+1,J+1,J ,J ,J ],  
NK : [K ,K ,K ,K ,K ,K ,K-1,K-1,K-1,K ,K ,K ,K+1,K+1,K+1],  
NTO : [1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ],  
NT1 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,1 ,1 ,1 ],  
NT2 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ],  
NT3 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ],  
NT4 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,1 ,1 ,1 ])\$

(M : 0,  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PZ[0](NI[N],NJ[N],NK[N]))\$  
(M : 0,  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PZ[1](NI[N],NJ[N],NK[N]))\$  
(M : 0,  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PZ[2](NI[N],NJ[N],NK[N]))\$  
(M : 0,  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PZ[3](NI[N],NJ[N],NK[N]))\$  
(M : 0,

```

FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PX (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PY (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PZ[4](NI[N],NU[N],NK[N]))$

/*-----*/
(RLO: [RES, RIP, RIM, RU, RK, RJP, RKP, RTOT] , RPO : SUBST(LT,RLO) )$
FOR N:1 THRU 8 DO ( RPO[N]:SORT( RPO[N] ), PRINT("DEP",N,RPO[N]) )$
M : OS
FOR N:1 THRU 15 DO
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M])))$

(RL1: [R1K , DPU , ATT1] , RP1 : SUBST(LT,RL1) )$
FOR N:1 THRU 3 DO ( RP1[N]:SORT( RP1[N] ), PRINT("DEP",N,RP1[N]) )$
M : OS
FOR N:1 THRU 15 DO
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))$

(RL2: [R1KU, DPLO, ATT2] , RP2 : SUBST(LT,RL2) )$
FOR N:1 THRU 3 DO ( RP2[N]:SORT( RP2[N] ), PRINT("DEP",N,RP2[N]) )$
M : OS
FOR N:1 THRU 15 DO
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))$

(RL3: [R2KW, CIRC, ATT3] , RP3 : SUBST(LT,RL3) )$
FOR N:1 THRU 3 DO ( RP3[N]:SORT( RP3[N] ), PRINT("DEP",N,RP3[N]) )$
M : OS
FOR N:1 THRU 15 DO
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))$

(RL4: [R2KP, CIRC, ATT4] , RP4 : SUBST(LT,RL4) )$
FOR N:1 THRU 3 DO ( RP4[N]:SORT( RP4[N] ), PRINT("DEP",N,RP4[N]) )$
M : OS
FOR N:1 THRU 15 DO
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))$
FOR N:1 THRU 15 DO
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))$
/*-----*/

```

Executed on a VAX 8650 provided by

Academic Computing Services

Texas A & M University

Current date and time is 23-JAN-1991 08:52:31.18

\$ ! This is a login command procedure template

\$ IF F\$MODE ( ) .EQS. "BATCH" THEN EXIT

\$MAC

If you logged on to Venus by typing VENUS at the  
ENTER RESOURCE NAME prompt of the port selector,  
do NOT use the BREAK key to get out of Macsyma.

This is Macsyma 412.61 for DEC VAX 8650 Series Computers.

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Enhancements (c) 1982, 1988 Symbolics, Inc. All Rights Reserved.

Type "DESCRIBE(TRADE\_SECRET);" to see important legal notices.

Type "HELP();" for more information.

Checking password file: DISK\$PKG1:[MACSYMA\_412.SYSTEM]PASSWD-VENUS-412.TEXT

DISK\$PKG1:[MACSYMA\_412.SYSTEM]macsyma-init.fas;4 being loaded.

Init File Not Found: SYS\$USERDISKH:[HME4905]macsyma-init.mac

BATCH("RMD.MAC");

(C1)

```
(C2) /*-----*/
/*          RMD.MAC: POTENTIAL DEPENDENCIES          */
/*-----*/
/****** MACSYMA PROGRAM TO GENERATE RESIDUAL DEPENDENCIES *****/
/*-----*/
SHOWTIME: TRUE$
Time= 0 msec
```

(C3) PX(I,J,K) := [P(I+1,J ,K ),P(I ,J ,K )] \$  
Time= 20 msec

(C4) PY(I,J,K) := [P(I ,J ,K ),P(I ,J-1,K ),P(I+1,J ,K ),  
P(I+1,J-1,K ),P(I ,J+1,K ),P(I+1,J+1,K )] \$  
Time= 10 msec

(C5) PZ[0](I,J,K):= [P(I ,J ,K ),P(I ,J ,K-1),P(I ,J ,K+1),  
P(I+1,J ,K ),P(I+1,J ,K-1),P(I+1,J ,K+1)] \$  
Time= 10 msec

(C6) PHIU(J) := [P(ITE,J,KUP),P(ITE,J,KUP+1),P(ITE,J,KUP+2)] \$  
Time= 0 msec

(C7) PHIL(J) := [P(ITE,J,KLO),P(ITE,J,KLO-1),P(ITE,J,KLO-2)] \$  
Time= 0 msec

(C8) CIRC(J) := UNION(PHIU(J),PHIL(J)) \$  
Time= 0 msec

(C9) PZ[1](I,J,K):= [P(I ,J ,K ),P(I ,J ,K+1),P(I ,J ,K+2),  
P(I+1,J ,K ),P(I+1,J ,K+1),P(I+1,J ,K+2)] \$  
Time= 0 msec

(C10) PZ[2](I,J,K):= [P(I ,J ,K ),P(I ,J ,K-1),P(I ,J ,K-2),  
P(I+1,J ,K ),P(I+1,J ,K-1),P(I+1,J ,K-2)] \$  
Time= 10 msec

```

(C11) PZ[3](I,J,K):= UNION([P(I ,J,K ),P(I ,J,K-1),P(I ,J,K+1),
                          P(I+1,J,K ),P(I+1,J,K-1),P(I+1,J,K+1)],CIRC(J))$
Time= 0 msec

(C12) PZ[4](I,J,K):= UNION([P(I ,J,K ),P(I ,J,K-1),P(I ,J,K+1),
                          P(I+1,J,K ),P(I+1,J,K-1),P(I+1,J,K+1)],CIRC(J))$
Time= 10 msec

(C13) FOR N:0 THRU 4 DO (
RH [N](I,J,K ):= UNION(PX(I,J,K),PY(I,J,K),PZ[N](I,J,K)),
RIP[N](I,J,K ):= UNION(RH[N](I,J,K),RH[N](I-1,J,K))
RIM[N](I,J,K ):= RIP[N](I-1,J,K)
)
Time= 80 msec

(C14) RES(I,J,K) := [P(I ,J-1,K ),P(I ,J ,K ),P(I ,J+1,K ),
                    P(I+1,J-1,K ),P(I+1,J ,K ),P(I+1,J+1,K ),
                    P(I ,J ,K-1),P(I ,J ,K+1),P(I-1,J-1,K ),
                    P(I-1,J ,K ),P(I-1,J+1,K )
                    ]$
Time= 0 msec

(C15) R1K ( ) := UNION(RIP[1](I,J,K),RIM[1](I,J,K),RIP[1](I,J,K+1),RIM[1](I,J,K+1))$
Time= 10 msec

(C16) R1KU( ) := UNION(RIP[2](I,J,K),RIM[2](I,J,K),RIP[2](I,J,K-1),RIM[2](I,J,K-1))$
Time= 0 msec

(C17) R2KW( ) := UNION(RIP[3](I,J,K),RIM[3](I,J,K),RIP[3](I,J,K-1),RIM[3](I,J,K-1))$
Time= 0 msec

(C18) R2KP( ) := UNION(RIP[4](I,J,K),RIM[4](I,J,K),RIP[4](I,J,K+1),RIM[4](I,J,K+1))$
Time= 10 msec

(C19) FU (I,J):= [P(I,J,K),P(I,J,K+1),P(I,J,K+2)] $
Time= 0 msec

(C20) FXU (I,J):= UNION(FU(I,J),FU(I-1,J),FU(I+1,J)) $
Time= 0 msec

(C21) FYU (I,J):= UNION(FU(I,J),FU(I,J-1),FU(I,J+1)) $
Time= 0 msec

(C22) DPU ( ) := UNION(FXU(I,J),FYU(I,J)) $
Time= 10 msec

(C23) FL (I,J):= [P(I,J,K),P(I,J,K-1),P(I,J,K-2)] $
Time= 0 msec

(C24) FXL (I,J):= UNION(FL(I,J),FL(I-1,J),FL(I+1,J)) $
Time= 0 msec

(C25) FYL (I,J):= UNION(FL(I,J),FL(I,J-1),FL(I,J+1)) $
Time= 10 msec

(C26) DPLO( ) := UNION(FXL(I,J),FYL(I,J)) $
Time= 10 msec

```

(C27) ANOFI1() := UNION(R1K ,DPU )\$  
Time= 10 msec

(C28) ANOFI2() := UNION(R1KU,DPLO)\$  
Time= 0 msec

(C29) ANOFI3() := UNION(R2KW,CIRC)\$  
Time= 0 msec

(C30) ANOFI4() := UNION(R2KP,CIRC)\$  
Time= 10 msec

(C31) (RJ (I,J,K):=UNION(RIP[O](I,J,K),RIM[O](I,J,K),RIP[O](I,J-1,K),RIM[O](I,J-1,K)),  
RJP(I,J,K):=RJ(I,J+1,K)  
RK (I,J,K):=UNION(RIP[O](I,J,K),RIM[O](I,J,K),RIP[O](I,J,K-1),RIM[O](I,J,K-1)),  
RKP(I,J,K):=RK(I,J,K+1)  
RTOT(I,J,K):=UNION(RES,RIP,RIM,RJ,RJP,RK,RKP) )\$  
Time= 20 msec

(C32) (RIP: RIP[O](I,J,K), RJ: RJ(I,J,K), RJP: RJP(I,J,K), RES : RES(I,J,K),  
RIM: RIM[O](I,J,K), RK: RK(I,J,K), RKP: RKP(I,J,K), RTOT: RTOT(I,J,K))\$  
; Starting garbage collection due to dynamic-0 space overflow.  
; Finished garbage collection due to dynamic-0 space overflow.  
; Starting garbage collection due to dynamic-1 space overflow.  
; Finished garbage collection due to dynamic-1 space overflow.  
Time= 139300 msec

(C33) /\*-----\*/

(R1K : R1K (), DPU : DPU () , ATT1: ANOFI1())\$  
; Starting garbage collection due to dynamic-0 space overflow.  
; Finished garbage collection due to dynamic-0 space overflow.  
Time= 32320 msec

(C34) (R1KU: R1KU(), DPLO: DPLO() , ATT2: ANOFI2())\$  
Time= 29230 msec

(C35) (R2KW: R2KW(), CIRC: CIRC(J), ATT3: ANOFI3())\$  
; Starting garbage collection due to dynamic-1 space overflow.  
; Finished garbage collection due to dynamic-1 space overflow.  
Time= 41350 msec

(C36) (R2KP: R2KP(), CIRC: CIRC(J), ATT4: ANOFI4())\$  
; Starting garbage collection due to dynamic-0 space overflow.  
; Finished garbage collection due to dynamic-0 space overflow.  
Time= 40840 msec

(C37) /\*-----\*/

LT :  
[P(I-2,J-2,K-3)=P1 ,P(I-2,J-2,K-1)=P51,P(I-2,J-2,K+1)=P101,P(I-2,J-2,K+3)=P151,  
P(I-1,J-2,K-3)=P2 ,P(I-1,J-2,K-1)=P52,P(I-1,J-2,K+1)=P102,P(I-1,J-2,K+3)=P152,  
P(I ,J-2,K-3)=P3 ,P(I ,J-2,K-1)=P53,P(I ,J-2,K+1)=P103,P(I ,J-2,K+3)=P153,  
P(I+1,J-2,K-3)=P4 ,P(I+1,J-2,K-1)=P54,P(I+1,J-2,K+1)=P104,P(I+1,J-2,K+3)=P154,  
P(I+2,J-2,K-3)=P5 ,P(I+2,J-2,K-1)=P55,P(I+2,J-2,K+1)=P105,P(I+2,J-2,K+3)=P155,  
P(I-2,J-1,K-3)=P6 ,P(I-2,J-1,K-1)=P56,P(I-2,J-1,K+1)=P106,P(I-2,J-1,K+3)=P156,  
P(I-1,J-1,K-3)=P7 ,P(I-1,J-1,K-1)=P57,P(I-1,J-1,K+1)=P107,P(I-1,J-1,K+3)=P157,  
P(I ,J-1,K-3)=P8 ,P(I ,J-1,K-1)=P58,P(I ,J-1,K+1)=P108,P(I ,J-1,K+3)=P158,  
P(I+1,J-1,K-3)=P9 ,P(I+1,J-1,K-1)=P59,P(I+1,J-1,K+1)=P109,P(I+1,J-1,K+3)=P159,  
P(I+2,J-1,K-3)=P10,P(I+2,J-1,K-1)=P60,P(I+2,J-1,K+1)=P110,P(I+2,J-1,K+3)=P160,  
P(I-2,J ,K-3)=P11,P(I-2,J ,K-1)=P61,P(I-2,J ,K+1)=P111,P(I-2,J ,K+3)=P161,  
P(I-1,J ,K-3)=P12,P(I-1,J ,K-1)=P62,P(I-1,J ,K+1)=P112,P(I-1,J ,K+3)=P162,  
P(I ,J ,K-3)=P13,P(I ,J ,K-1)=P63,P(I ,J ,K+1)=P113,P(I ,J ,K+3)=P163,  
P(I+1,J ,K-3)=P14,P(I+1,J ,K-1)=P64,P(I+1,J ,K+1)=P114,P(I+1,J ,K+3)=P164.

P(I+2,J ,K-3)=P15,P(I+2,J ,K-1)=P65,P(I+2,J ,K+1)=P115,P(I+2,J ,K+3)=P165,  
P(I-2,J+1,K-3)=P16,P(I-2,J+1,K-1)=P66,P(I-2,J+1,K+1)=P116,P(I-2,J+1,K+3)=P166,  
P(I-1,J+1,K-3)=P17,P(I-1,J+1,K-1)=P67,P(I-1,J+1,K+1)=P117,P(I-1,J+1,K+3)=P167,  
P(I ,J+1,K-3)=P18,P(I ,J+1,K-1)=P68,P(I ,J+1,K+1)=P118,P(I ,J+1,K+3)=P168,  
P(I+1,J+1,K-3)=P19,P(I+1,J+1,K-1)=P69,P(I+1,J+1,K+1)=P119,P(I+1,J+1,K+3)=P169,  
P(I+2,J+1,K-3)=P20,P(I+2,J+1,K-1)=P70,P(I+2,J+1,K+1)=P120,P(I+2,J+1,K+3)=P170,  
P(I-2,J+2,K-3)=P21,P(I-2,J+2,K-1)=P71,P(I-2,J+2,K+1)=P121,P(I-2,J+2,K+3)=P171,  
P(I-1,J+2,K-3)=P22,P(I-1,J+2,K-1)=P72,P(I-1,J+2,K+1)=P122,P(I-1,J+2,K+3)=P172,  
P(I ,J+2,K-3)=P23,P(I ,J+2,K-1)=P73,P(I ,J+2,K+1)=P123,P(I ,J+2,K+3)=P173,  
P(I+1,J+2,K-3)=P24,P(I+1,J+2,K-1)=P74,P(I+1,J+2,K+1)=P124,P(I+1,J+2,K+3)=P174,  
P(I+2,J+2,K-3)=P25,P(I+2,J+2,K-1)=P75,P(I+2,J+2,K+1)=P125,P(I+2,J+2,K+3)=P175.

P(I-2,J-2,K-2)=P26,P(I-2,J-2,K)=P76,P(I-2,J-2,K+2)=P126,P(ITE,J-1,KLO-2)=P176,  
P(I-1,J-2,K-2)=P27,P(I-1,J-2,K)=P77,P(I-1,J-2,K+2)=P127,P(ITE,J-1,KLO-1)=P177,  
P(I ,J-2,K-2)=P28,P(I ,J-2,K)=P78,P(I ,J-2,K+2)=P128,P(ITE,J-1,KLO )=P178,  
P(I+1,J-2,K-2)=P29,P(I+1,J-2,K)=P79,P(I+1,J-2,K+2)=P129,P(ITE,J-1,KUP )=P179,  
P(I+2,J-2,K-2)=P30,P(I+2,J-2,K)=P80,P(I+2,J-2,K+2)=P130,P(ITE,J-1,KUP+1)=P180,  
P(I-2,J-1,K-2)=P31,P(I-2,J-1,K)=P81,P(I-2,J-1,K+2)=P131,P(ITE,J-1,KUP+2)=P181,  
P(I-1,J-1,K-2)=P32,P(I-1,J-1,K)=P82,P(I-1,J-1,K+2)=P132,P(ITE,J ,KLO-2)=P182,  
P(I ,J-1,K-2)=P33,P(I ,J-1,K)=P83,P(I ,J-1,K+2)=P133,P(ITE,J ,KLO-1)=P183,  
P(I+1,J-1,K-2)=P34,P(I+1,J-1,K)=P84,P(I+1,J-1,K+2)=P134,P(ITE,J ,KLO )=P184,  
P(I+2,J-1,K-2)=P35,P(I+2,J-1,K)=P85,P(I+2,J-1,K+2)=P135,P(ITE,J ,KUP )=P185,  
P(I-2,J ,K-2)=P36,P(I-2,J ,K)=P86,P(I-2,J ,K+2)=P136,P(ITE,J ,KUP+1)=P186,  
P(I-1,J ,K-2)=P37,P(I-1,J ,K)=P87,P(I-1,J ,K+2)=P137,P(ITE,J ,KUP+2)=P187,  
P(I ,J ,K-2)=P38,P(I ,J ,K)=P88,P(I ,J ,K+2)=P138,P(ITE,J+1,KLO-2)=P188,  
P(I+1,J ,K-2)=P39,P(I+1,J ,K)=P89,P(I+1,J ,K+2)=P139,P(ITE,J+1,KLO-1)=P189,  
P(I+2,J ,K-2)=P40,P(I+2,J ,K)=P90,P(I+2,J ,K+2)=P140,P(ITE,J+1,KLO )=P190,  
P(I-2,J+1,K-2)=P41,P(I-2,J+1,K)=P91,P(I-2,J+1,K+2)=P141,P(ITE,J+1,KUP )=P191,  
P(I-1,J+1,K-2)=P42,P(I-1,J+1,K)=P92,P(I-1,J+1,K+2)=P142,P(ITE,J+1,KUP+1)=P192,  
P(I ,J+1,K-2)=P43,P(I ,J+1,K)=P93,P(I ,J+1,K+2)=P143,P(ITE,J+1,KUP+2)=P193,  
P(I+1,J+1,K-2)=P44,P(I+1,J+1,K)=P94,P(I+1,J+1,K+2)=P144,  
P(I+2,J+1,K-2)=P45,P(I+2,J+1,K)=P95,P(I+2,J+1,K+2)=P145,  
P(I-2,J+2,K-2)=P46,P(I-2,J+2,K)=P96,P(I-2,J+2,K+2)=P146,  
P(I-1,J+2,K-2)=P47,P(I-1,J+2,K)=P97,P(I-1,J+2,K+2)=P147,  
P(I ,J+2,K-2)=P48,P(I ,J+2,K)=P98,P(I ,J+2,K+2)=P148,  
P(I+1,J+2,K-2)=P49,P(I+1,J+2,K)=P99,P(I+1,J+2,K+2)=P149,  
P(I+2,J+2,K-2)=P50,P(I+2,J+2,K)=P100,P(I+1,J+2,K+2)=P150]\$.  
Time= 880 msec

(C38) (NI : [I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2],  
NJ : [J ,J ,J ,J-1,J-1,J-1,J ,J ,J ,J+1,J+1,J+1,J ,J ,J ],  
NK : [K ,K ,K ,K ,K ,K ,K-1,K-1,K-1,K ,K ,K ,K+1,K+1,K+1],  
NTO : [1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ],  
NT1 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,1 ,1 ],  
NT2 : [1 ,1 ,1 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ],  
NT3 : [1 ,1 ,1 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ],  
NT4 : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,1 ,1 ])\$  
Time= 70 msec

(C39) (M : O,  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NTO[N]=1 THEN PPO[M]: PZ[0](NI[N],NJ[N],NK[N]))\$.  
Time= 1550 msec

(C40) (M : O,  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT1[N]=1 THEN PP1[M]: PZ[1](NI[N],NJ[N],NK[N]))\$.  
Time= 890 msec

(C41) (M : O,  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT2[N]=1 THEN PP2[M]: PZ[2](NI[N],NJ[N],NK[N]))\$.  
Time= 920 msec

(C42) (M : O,  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PX (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PY (NI[N],NJ[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT3[N]=1 THEN PP3[M]: PZ[3](NI[N],NJ[N],NK[N]))\$.  
Time= 6310 msec

```
(C43) (M : O,  
FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PX (NI[N],NU[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PY (NI[N],NU[N],NK[N])),  
FOR N:1 THRU 15 DO (M:M+1,IF NT4[N]=1 THEN PP4[M]: PZ[4](NI[N],NU[N],NK[N]))$  
Time= 6410 msec
```

```
(C44) /*-----*/  
(RLO: [RES, RIP, RIM, RJ, RK, RJP, RKP, RTOT] , RPO : SUBST(LT,RLO) )$  
Time= 14730 msec
```

```
(C45) FOR N:1 THRU 8 DO ( RPO[N]:SORT( RPO[N] ), PRINT("DEP",N,RPO[N]) )$  
DEP 1 [P113, P63, P82, P83, P84, P87, P88, P89, P92, P93, P94]  
DEP 2 [P112, P113, P114, P62, P63, P64, P82, P83, P84, P87, P88, P89, P92, P93,  
P94]  
DEP 3 [P111, P112, P113, P61, P62, P63, P81, P82, P83, P86, P87, P88, P91, P92,  
P93]  
DEP 4 [P106, P107, P108, P109, P111, P112, P113, P114, P56, P57, P58, P59, P61,  
P62, P63, P64, P76, P77, P78, P79, P81, P82, P83, P84, P86, P87, P88, P89, P91,  
P92, P93, P94]  
DEP 5 [P111, P112, P113, P114, P36, P37, P38, P39, P56, P57, P58, P59, P61,  
P62, P63, P64, P66, P67, P68, P69, P81, P82, P83, P84, P86, P87, P88, P89, P91,  
P92, P93, P94]  
DEP 6 [P111, P112, P113, P114, P116, P117, P118, P119, P61, P62, P63, P64, P66,  
P67, P68, P69, P81, P82, P83, P84, P86, P87, P88, P89, P91, P92, P93, P94, P96,  
P97, P98, P99]  
DEP 7 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P136, P137, P138, P139, P61, P62, P63, P64, P81, P82, P83, P84, P86, P87, P88,  
P89, P91, P92, P93, P94]  
DEP 8 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P136, P137, P138, P139, P36, P37, P38, P39, P56, P57, P58, P59, P61, P62, P63,  
P64, P66, P67, P68, P69, P76, P77, P78, P79, P81, P82, P83, P84, P86, P87, P88,  
P89, P91, P92, P93, P94, P96, P97, P98, P99]  
Time= 1320 msec
```

```
(C46) M : O$  
Time= 10 msec
```

```
(C47) FOR N:1 THRU 15 DO  
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M])))$  
LPO 1 [P88, P89]  
LPO 2 [P87, P88]  
LPO 3 [P86, P87]  
LPO 4 [P83, P84]  
LPO 5 [P82, P83]  
; Starting garbage collection due to dynamic-1 space overflow.  
; Finished garbage collection due to dynamic-1 space overflow.  
LPO 6 [P81, P82]
```

LPO 7 [P63, P64]  
LPO 8 [P62, P63]  
LPO 9 [P61, P62]  
LPO 10 [P93, P94]  
LPO 11 [P92, P93]  
LPO 12 [P91, P92]  
LPO 13 [P113, P114]  
LPO 14 [P112, P113]  
LPO 15 [P111, P112]  
Time= 7890 msec

(C48) FOR N:1 THRU 15 DO  
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M]))))\$

LPO 16 [P83, P84, P88, P89, P93, P94]  
LPO 17 [P82, P83, P87, P88, P92, P93]  
LPO 18 [P81, P82, P86, P87, P91, P92]  
LPO 19 [P78, P79, P83, P84, P88, P89]  
LPO 20 [P77, P78, P82, P83, P87, P88]  
LPO 21 [P76, P77, P81, P82, P86, P87]  
LPO 22 [P58, P59, P63, P64, P68, P69]  
LPO 23 [P57, P58, P62, P63, P67, P68]  
LPO 24 [P56, P57, P61, P62, P66, P67]  
LPO 25 [P88, P89, P93, P94, P98, P99]  
LPO 26 [P87, P88, P92, P93, P97, P98]  
LPO 27 [P86, P87, P91, P92, P96, P97]  
LPO 28 [P108, P109, P113, P114, P118, P119]  
LPO 29 [P107, P108, P112, P113, P117, P118]  
LPO 30 [P106, P107, P111, P112, P116, P117]  
Time= 7730 msec

(C49) FOR N:1 THRU 15 DO  
(M:M+1,IF NTO[N]=1 THEN (PPO[M]:SORT(SUBST(LT,PPO[M])),PRINT("LPO",M,PPO[M]))))\$

LPO 31 [P113, P114, P63, P64, P88, P89]  
LPO 32 [P112, P113, P62, P63, P87, P88]  
LPO 33 [P111, P112, P61, P62, P86, P87]  
LPO 34 [P108, P109, P58, P59, P83, P84]  
LPO 35 [P107, P108, P57, P58, P82, P83]  
LPO 36 [P106, P107, P56, P57, P81, P82]  
LPO 37 [P38, P39, P63, P64, P88, P89]  
LPO 38 [P37, P38, P62, P63, P87, P88]  
LPO 39 [P36, P37, P61, P62, P86, P87]  
LPO 40 [P118, P119, P68, P69, P93, P94]  
LPO 41 [P117, P118, P67, P68, P92, P93]



LPO 42 [P116, P117, P66, P67, P91, P92]  
LPO 43 [P113, P114, P138, P139, P88, P89]  
LPO 44 [P112, P113, P137, P138, P87, P88]  
LPO 45 [P111, P112, P136, P137, P86, P87]  
Time= 7070 msec

(C50) (RL1: [R1K , DPU , ATT1] , RP1 : SUBST(LT,RL1) )\$  
Time= 5620 msec

(C51) FOR N:1 THRU 3 DO ( RP1[N]:SORT( RP1[N] ), PRINT("DEP",N,RP1[N]) )\$  
DEP 1 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P136, P137, P138, P139, P161, P162, P163, P164, P81, P82, P83, P84, P86, P87,  
P88, P89, P91, P92, P93, P94]  
DEP 2 [P108, P112, P113, P114, P118, P133, P137, P138, P139, P143, P83, P87,  
P88, P89, P93]  
DEP 3 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P133, P136, P137, P138, P139, P143, P161, P162, P163, P164, P81, P82, P83, P84,  
P86, P87, P88, P89, P91, P92, P93, P94]  
Time= 510 msec

(C52) M : 0\$  
Time= 0 msec

(C53) FOR N:1 THRU 15 DO  
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))\$  
LP1 1 [P88, P89]  
LP1 2 [P87, P88]  
LP1 3 [P86, P87]  
LP1 13 [P113, P114]  
LP1 14 [P112, P113]  
LP1 15 [P111, P112]  
Time= 1410 msec

(C54) FOR N:1 THRU 15 DO  
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))\$  
LP1 16 [P83, P84, P88, P89, P93, P94]  
LP1 17 [P82, P83, P87, P88, P92, P93]  
LP1 18 [P81, P82, P86, P87, P91, P92]  
LP1 28 [P108, P109, P113, P114, P118, P119]  
LP1 29 [P107, P108, P112, P113, P117, P118]  
LP1 30 [P106, P107, P111, P112, P116, P117]  
Time= 2860 msec

(C55) FOR N:1 THRU 15 DO  
(M:M+1,IF NT1[N]=1 THEN (PP1[M]:SORT(SUBST(LT,PP1[M])),PRINT("LP1",M,PP1[M])))\$  
LP1 31 [P113, P114, P138, P139, P88, P89]  
LP1 32 [P112, P113, P137, P138, P87, P88]

LP1 33 [P111, P112, P136, P137, P86, P87]  
LP1 43 [P113, P114, P138, P139, P163, P164]  
LP1 44 [P112, P113, P137, P138, P162, P163]  
LP1 45 [P111, P112, P136, P137, P161, P162]  
Time= 2990 msec

(C56) (RL2: [R1KU, DPLO, ATT2] , RP2 : SUBST(LT,RL2) )\$  
Time= 5460 msec

(C57) FOR N:1 THRU 3 DO ( RP2[N]:SORT( RP2[N] ), PRINT("DEP",N,RP2[N]) )\$  
DEP 1 [P11, P12, P13, P14, P36, P37, P38, P39, P56, P57, P58, P59, P61, P62,  
P63, P64, P66, P67, P68, P69, P81, P82, P83, P84, P86, P87, P88, P89, P91, P92,  
P93, P94]  
DEP 2 [P33, P37, P38, P39, P43, P58, P62, P63, P64, P68, P83, P87, P88, P89,  
P93]  
DEP 3 [P11, P12, P13, P14, P33, P36, P37, P38, P39, P43, P56, P57, P58, P59,  
P61, P62, P63, P64, P66, P67, P68, P69, P81, P82, P83, P84, P86, P87, P88, P89,  
P91, P92, P93, P94]  
Time= 500 msec

(C58) M : O\$  
Time= 0 msec

(C59) FOR N:1 THRU 15 DO  
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))\$  
LP2 1 [P88, P89]  
LP2 2 [P87, P88]  
LP2 3 [P86, P87]  
LP2 7 [P63, P64]  
LP2 8 [P62, P63]  
LP2 9 [P61, P62]  
Time= 1320 msec

(C60) FOR N:1 THRU 15 DO  
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))\$  
LP2 16 [P83, P84, P88, P89, P93, P94]  
LP2 17 [P82, P83, P87, P88, P92, P93]  
LP2 18 [P81, P82, P86, P87, P91, P92]  
LP2 22 [P58, P59, P63, P64, P68, P69]  
LP2 23 [P57, P58, P62, P63, P67, P68]  
LP2 24 [P56, P57, P61, P62, P66, P67]  
Time= 3150 msec

(C61) FOR N:1 THRU 15 DO  
(M:M+1,IF NT2[N]=1 THEN (PP2[M]:SORT(SUBST(LT,PP2[M])),PRINT("LP2",M,PP2[M])))\$  
LP2 31 [P38, P39, P63, P64, P88, P89]  
LP2 32 [P37, P38, P62, P63, P87, P88]

LP2 33 [P36, P37, P61, P62, P86, P87]

LP2 37 [P13, P14, P38, P39, P63, P64]

LP2 38 [P12, P13, P37, P38, P62, P63]

LP2 39 [P11, P12, P36, P37, P61, P62]  
Time= 2950 msec

(C62) (RL3: [R2KW, CIRC, ATT3], RP3 : SUBST(LT,RL3) )\$  
: Starting garbage collection due to dynamic-O space overflow.  
: Finished garbage collection due to dynamic-O space overflow.  
Time= 9140 msec

(C63) FOR N:1 THRU 3 DO ( RP3[N]:SORT( RP3[N] ), PRINT("DEP",N,RP3[N]) )\$  
DEP 1 [P111, P112, P113, P114, P182, P183, P184, P185, P186, P187, P36, P37,  
P38, P39, P56, P57, P58, P59, P61, P62, P63, P64, P66, P67, P68, P69, P81, P82,  
P83, P84, P86, P87, P88, P89, P91, P92, P93, P94]  
DEP 2 [P182, P183, P184, P185, P186, P187]  
DEP 3 [P111, P112, P113, P114, P182, P183, P184, P185, P186, P187, P36, P37,  
P38, P39, P56, P57, P58, P59, P61, P62, P63, P64, P66, P67, P68, P69, P81, P82,  
P83, P84, P86, P87, P88, P89, P91, P92, P93, P94]  
Time= 530 msec

(C64) M : 0\$  
Time= 0 msec

(C65) FOR N:1 THRU 15 DO  
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))\$  
LP3 1 [P88, P89]  
LP3 2 [P87, P88]  
LP3 3 [P86, P87]  
LP3 7 [P63, P64]  
LP3 8 [P62, P63]  
LP3 9 [P61, P62]  
Time= 1300 msec

(C66) FOR N:1 THRU 15 DO  
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))\$  
LP3 16 [P83, P84, P88, P89, P93, P94]  
LP3 17 [P82, P83, P87, P88, P92, P93]  
LP3 18 [P81, P82, P86, P87, P91, P92]  
LP3 22 [P58, P59, P63, P64, P68, P69]  
LP3 23 [P57, P58, P62, P63, P67, P68]  
LP3 24 [P56, P57, P61, P62, P66, P67]  
Time= 3030 msec

(C67) FOR N:1 THRU 15 DO  
(M:M+1,IF NT3[N]=1 THEN (PP3[M]:SORT(SUBST(LT,PP3[M])),PRINT("LP3",M,PP3[M])))\$  
LP3 31 [P113, P114, P182, P183, P184, P185, P186, P187, P63, P64, P88, P89]  
LP3 32 [P112, P113, P182, P183, P184, P185, P186, P187, P62, P63, P87, P88]

LP3 33 [P111, P112, P182, P183, P184, P185, P186, P187, P61, P62, P86, P87]  
LP3 37 [P182, P183, P184, P185, P186, P187, P38, P39, P63, P64, P88, P89]  
LP3 38 [P182, P183, P184, P185, P186, P187, P37, P38, P62, P63, P87, P88]  
LP3 39 [P182, P183, P184, P185, P186, P187, P36, P37, P61, P62, P86, P87]  
Time= 5260 msec

(C68) (RL4: [R2KP, CIRC, ATT4] , RP4 : SUBST(LT,RL4) )\$  
Time= 5180 msec

(C69) FOR N:1 THRU 3 DO ( RP4[N]:SORT( RP4[N] ), PRINT("DEP",N,RP4[N]) )\$  
DEP 1 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P136, P137, P138, P139, P182, P183, P184, P185, P186, P187, P61, P62, P63, P64,  
P81, P82, P83, P84, P86, P87, P88, P89, P91, P92, P93, P94]  
DEP 2 [P182, P183, P184, P185, P186, P187]  
DEP 3 [P106, P107, P108, P109, P111, P112, P113, P114, P116, P117, P118, P119,  
P136, P137, P138, P139, P182, P183, P184, P185, P186, P187, P61, P62, P63, P64,  
P81, P82, P83, P84, P86, P87, P88, P89, P91, P92, P93, P94]  
Time= 470 msec

(C70) M : 0\$  
Time= 10 msec

(C71) FOR N:1 THRU 15 DO  
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))\$  
LP4 1 [P88, P89]  
LP4 2 [P87, P88]  
LP4 3 [P86, P87]  
LP4 13 [P113, P114]  
LP4 14 [P112, P113]  
LP4 15 [P111, P112]  
Time= 1330 msec

(C72) FOR N:1 THRU 15 DO  
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))\$  
LP4 16 [P83, P84, P88, P89, P93, P94]  
LP4 17 [P82, P83, P87, P88, P92, P93]  
LP4 18 [P81, P82, P86, P87, P91, P92]  
LP4 28 [P108, P109, P113, P114, P118, P119]  
LP4 29 [P107, P108, P112, P113, P117, P118]  
LP4 30 [P106, P107, P111, P112, P116, P117]  
Time= 3030 msec

(C73) FOR N:1 THRU 15 DO  
(M:M+1,IF NT4[N]=1 THEN (PP4[M]:SORT(SUBST(LT,PP4[M])),PRINT("LP4",M,PP4[M])))\$  
LP4 31 [P113, P114, P182, P183, P184, P185, P186, P187, P63, P64, P88, P89]  
LP4 32 [P112, P113, P182, P183, P184, P185, P186, P187, P62, P63, P87, P88]  
LP4 33 [P111, P112, P182, P183, P184, P185, P186, P187, P61, P62, P86, P87]

LP4 43 [P113, P114, P138, P139, P182, P183, P184, P185, P186, P187, P88, P89]

LP4 44 [P112, P113, P137, P138, P182, P183, P184, P185, P186, P187, P87, P88]

LP4 45 [P111, P112, P136, P137, P182, P183, P184, P185, P186, P187, P86, P87]

Time= 5040 msec

(C74) /\*-----\*/

Accumulated Computation Time= 400140 msec

Time= 421880 msec

(D74) DONE

QUIT();

(C75)

%DCL-W-SKPDAT, image data (records not beginning with "\$") ignored

HME4905 job terminated at 23-JAN-1991 09:05:46.65

Blockading/Information::	374	Peak working set size:	4096
Direct I/O count:	580	Peak page file size:	40493
Page faults:	147965	Mounted volumes:	0
Charged CPU time:	0 00:07:11.01	Elapsed time:	0 00:13:18.49

# APPENDIX B

MACSYMA CODE TO DIFFERENTIATE THE RESIDUAL

```

/*-----*/
/* RMDER.MAC : GENERAL RESIDUAL EXPRESSION & WING,WAKE UPDATES (K=KUP,K=KLOW) */
/*
/* MACSYMA PROGRAM TO GENERATE FORTRAN SOURCE CODE FOR THE JACOBIAN & RHS */
/*
/* DEC 12, 1990
/*-----*/
SHOWTIME:TRUE$

```

```

RESIDUAL : RIP*TA11P*(P89-P88)
+ RIP*TA12P*(TAJ1*(P88-P83+P89-P84)+TAJ2*(P93-P88+P94-P89))
+ RIP*QXINF*2/DXIC(I)
+S *(RIM*TA11M*(P88-P87)
+ RIM*TA12M*(TAJ1*(P88-P83+P87-P82)+TAJ2*(P93-P88+P92-P87))
+ RIM*QXINF*2/DXIC(I))
+ RJP*TA22P*(P93-P88)
+ RJP*TA21P*(TAI1*(P88-P87+P93-P92)+TAI2*(P89-P88+P94-P93))
+S *(RJ *TA22M*(P88-P83)
+ RJ *TA21M*(TAI1*(P88-P87+P83-P82)+TAI2*(P89-P88+P84-P83)))

+V1*(RKP*TA33P*(P113-P88) + RKP*QZINF*2*XIXXI(J,I)/DZETAC(K))
+V2*(RK *TA33M*(P88 -P63) + RK *QZINF*2*XIXXI(J,I)/DZETAC(K))$

```

```

PX(I,J,K) := DXII(I)*(P(J,K,I+1)+S*P(J,K,I)) + QXINF/XIXIP(J,I)$
PY(I,J,K) := (1/2)*(AJ1(J)*(P(J ,K,I)-P(J-1,K,I)+P(J ,K,I+1)-P(J-1,K,I+1))
+AJ2(J)*(P(J+1,K,I)-P(J ,K,I)+P(J+1,K,I+1)-P(J ,K,I+1)))
+ QXINF*S*XIYIP(J,I)/XIXIP(J,I)$
PZ[0](I,J,K) := (1/2)*(A1K(K)*(P(J,K ,I)-P(J,K-1,I)+P(J,K ,I+1)-P(J,K-1,I+1))
+A2K(K)*(P(J,K+1,I)-P(J,K ,I)+P(J,K+1,I+1)-P(J,K ,I+1)))
+ QZINF$

```

```

PZ[1](I,J,K) := (1/2)*(DC1*P(J,K,I )+DC2*P(J,K+1,I )+DC3*P(J,K+2,I )
+DC1*P(J,K,I+1)+DC2*P(J,K+1,I+1)+DC3*P(J,K+2,I+1)) + QZINF$
PZ[2](I,J,K) := (1/2)*(DC4*P(J,K,I )+DC5*P(J,K-1,I )+DC6*P(J,K-2,I )
+DC4*P(J,K,I+1)+DC5*P(J,K-1,I+1)+DC6*P(J,K-2,I+1)) + QZINF$

```

```

CI(J) := CC1*P(J,KUP ,ITE)+S*CC2*P(J,KUP +1,ITE)+ CC3*P(J,KUP +2,ITE)
+S*CC4*P(J,KLOW,ITE)+ CC5*P(J,KLOW-1,ITE)+S*CC6*P(J,KLOW-2,ITE)$

```

```

PZ[3](I,J,K) := (1/2)*(A1K(K)*(P(J,K ,I)-P(J,K-1,I)+P(J,K ,I+1)-P(J,K-1,I+1))
+A2K(K)*(P(J,K+1,I)-P(J,K ,I)+P(J,K+1,I+1)-P(J,K ,I+1)))
+ QZINF - A1K(K)*CI(J)$
PZ[4](I,J,K) := (1/2)*(A1K(K)*(P(J,K ,I)-P(J,K-1,I)+P(J,K ,I+1)-P(J,K-1,I+1))
+A2K(K)*(P(J,K+1,I)-P(J,K ,I)+P(J,K+1,I+1)-P(J,K ,I+1)))
+ QZINF - A2K(K)*CI(J)$

```

```

U(I,J,K) := A11R (J,I)*PX(I,J,K) + XIYIP(J,I)*PY(I,J,K)$
V(I,J,K) := XIYIP(J,I)*PX(I,J,K) + PY(I,J,K)$

```

```

FOR N:0 THRU 4 DO (
RH [N](I,J,K):=(1+G1*(U(I,J,K)*PX(I,J,K)+V(I,J,K)*PY(I,J,K)+PZ[N](I,J,K)=2))*G2.
SG [N](I,J,K):= G3 * ( RH[N](I,J,K)+RH[N](I-1,J,K))*G4 + G5 ) * NP
RIP[N](I,J,K):= SG(I,J,K)*(RH[N](I,J,K)+S*RH[N](I-1,J,K)) + RH[N](I-1,J,K)
RIM[N](I,J,K):= RIP[N](I-1,J,K) )$

```

```

R1K ():=(3*RIP[1](I,J,K)+3*RIM[1](I,J,K)+S*RIP[1](I,J,K+1)+S*RIM[1](I,J,K+1))/4$
R1KU():=(3*RIP[2](I,J,K)+3*RIM[2](I,J,K)+S*RIP[2](I,J,K-1)+S*RIM[2](I,J,K-1))/4$
R2KW():=( RIP[3](I,J,K)+ RIM[3](I,J,K)+ RIP[3](I,J,K-1)+ RIM[3](I,J,K-1))/4$
R2KP():=( RIP[4](I,J,K)+ RIM[4](I,J,K)+ RIP[4](I,J,K+1)+ RIM[4](I,J,K+1))/4$

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FU (I,J) := CC1*P(J,K,I) + S*CC2*P(J,K+1,I) + CC3*P(J,K+2,I)$
FXU ():= TAI1*(FU(I,J)+S*FU(I-1,J))+TAI2*(FU(I+1,J)+S*FU(I,J))$
FYU ():= TAJ1*(FU(I,J)+S*FU(I,J-1))+TAJ2*(FU(I,J+1)+S*FU(I,J))$
UU ():= (XIXX(J,I)#2+XIYX(J,I)#2)*FXU() + XIYX(J,I)*FYU() + XIXX(J,I)*QXINF$
VU ():= XIYX(J,I)*FXU() + FYU()$
DDPU():= (UU()*DDZXU+VU()*DDZYU-QZINF) * DZETA(KLOW)$

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FL (I,J) := CC4*P(J,K,I) + S*CC5*P(J,K-1,I) + CC6*P(J,K-2,I)$
FXL ():= TAI1*(FL(I,J)+S*FL(I-1,J))+TAI2*(FL(I+1,J)+S*FL(I,J))$
FYL ():= TAJ1*(FL(I,J)+S*FL(I,J-1))+TAJ2*(FL(I,J+1)+S*FL(I,J))$
UL ():= (XIXX(J,I)#2+XIYX(J,I)#2)*FXL() + XIYX(J,I)*FYL() + XIXX(J,I)*QXINF$
VL ():= XIYX(J,I)*FXL() + FYL()$
DDPL():= (UL()*DDZXL+VL()*DDZYL-QZINF) * DZETA(KLOW)$

```

```

(ANOFI1 : S *(R1K * TA33M * DDPU + R1K *QZINF*2*XIXXI(J,I)/DZETAC(K)),
ANOFI2 : R1KU * TA33P * DDPL + R1KU*QZINF*2*XIXXI(J,I)/DZETAC(K) ,
ANOFI3 : R2KW * TA33M * CIR
ANOFI4 : S * R2KP * TA33P * CIR )$

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(NI : [I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2,I ,I-1,I-2],
NU : [J ,J ,J ,J-1,J-1,J-1,J ,J ,J ,J+1,J+1,J+1,J ,J ,J ],
NK : [K ,K ,K ,K ,K ,K ,K-1,K-1,K-1,K ,K ,K ,K+1,K+1,K+1],
NT[0] : [1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ,1 ],
NT[1] : [1 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ],
NT[2] : [1 ,1 ,1 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ],
NT[3] : [1 ,1 ,1 ,0 ,0 ,0 ,1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ],
NT[4] : [1 ,1 ,1 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ,0 ])$
FOR L:0 THRU 4 DO (M : 0,
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PP[L,M]:PX (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PP[L,M]:PY (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PP[L,M]:PZ[L](NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PP[L,M]: U (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PP[L,M]: V (NI[N],NU[N],NK[N]))$
KILL(PX,PY,PZ[0],PZ[1],PZ[2],PZ[3],PZ[4],U,V)$
FOR L:0 THRU 4 DO (M : 0,
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PF[L,M]:PX (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PF[L,M]:PY (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PF[L,M]:PZ[L](NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PF[L,M]: U (NI[N],NU[N],NK[N])),
FOR N:1 THRU 15 DO (M:M+1,IF PART(NT[L],N)=1 THEN PF[L,M]: V (NI[N],NU[N],NK[N]))$

RTTO:
[P(J ,K-2,I-2)=P36 ,P(J ,K-2,I-1)=P37 ,P(J ,K-2,I)=P38 ,P(J ,K-2,I+1)=P39 ,
P(J-1,K-1,I-2)=P56 ,P(J-1,K-1,I-1)=P57 ,P(J-1,K-1,I)=P58 ,P(J-1,K-1,I+1)=P59 ,
P(J ,K-1,I-2)=P61 ,P(J ,K-1,I-1)=P62 ,P(J ,K-1,I)=P63 ,P(J ,K-1,I+1)=P64 ,
P(J+1,K-1,I-2)=P66 ,P(J+1,K-1,I-1)=P67 ,P(J+1,K-1,I)=P68 ,P(J+1,K-1,I+1)=P69 ,
P(J-2,K ,I-2)=P76 ,P(J-2,K ,I-1)=P77 ,P(J-2,K ,I)=P78 ,P(J-2,K ,I+1)=P79 ,
P(J-1,K ,I-2)=P81 ,P(J-1,K ,I-1)=P82 ,P(J-1,K ,I)=P83 ,P(J-1,K ,I+1)=P84 ,
P(J ,K ,I-2)=P86 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I)=P88 ,P(J ,K ,I+1)=P89 ,
P(J+1,K ,I-2)=P91 ,P(J+1,K ,I-1)=P92 ,P(J+1,K ,I)=P93 ,P(J+1,K ,I+1)=P94 ,
P(J+2,K ,I-2)=P96 ,P(J+2,K ,I-1)=P97 ,P(J+2,K ,I)=P98 ,P(J+2,K ,I+1)=P99 ,
P(J-1,K+1,I-2)=P106 ,P(J-1,K+1,I-1)=P107 ,P(J-1,K+1,I)=P108 ,P(J-1,K+1,I+1)=P109 ,
P(J ,K+1,I-2)=P111 ,P(J ,K+1,I-1)=P112 ,P(J ,K+1,I)=P113 ,P(J ,K+1,I+1)=P114 ,
P(J+1,K+1,I-2)=P116 ,P(J+1,K+1,I-1)=P117 ,P(J+1,K+1,I)=P118 ,P(J+1,K+1,I+1)=P119 ,
P(J ,K+2,I-2)=P136 ,P(J ,K+2,I-1)=P137 ,P(J ,K+2,I)=P138 ,P(J ,K+2,I+1)=P139]$
RTT1:
[P(J-1,K ,I-2)=P81 ,P(J-1,K ,I-1)=P82 ,P(J-1,K ,I)=P83 ,P(J-1,K ,I+1)=P84 ,
P(J ,K ,I-2)=P86 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I)=P88 ,P(J ,K ,I+1)=P89 ,
P(J+1,K ,I-2)=P91 ,P(J+1,K ,I-1)=P92 ,P(J+1,K ,I)=P93 ,P(J+1,K ,I+1)=P94 ,
P(J-1,K+1,I-2)=P106 ,P(J-1,K+1,I-1)=P107 ,P(J-1,K+1,I)=P108 ,P(J-1,K+1,I+1)=P109 ,
P(J ,K+1,I-2)=P111 ,P(J ,K+1,I-1)=P112 ,P(J ,K+1,I)=P113 ,P(J ,K+1,I+1)=P114 ,
P(J+1,K+1,I-2)=P116 ,P(J+1,K+1,I-1)=P117 ,P(J+1,K+1,I)=P118 ,P(J+1,K+1,I+1)=P119 ,
P(J-1,K+2,I)=P133 ,
P(J ,K+2,I-2)=P136 ,P(J ,K+2,I-1)=P137 ,P(J ,K+2,I)=P138 ,P(J ,K+2,I+1)=P139 ,
P(J+1,K+2,I)=P143 ,
P(J ,K+3,I-2)=P161 ,P(J ,K+3,I-1)=P162 ,P(J ,K+3,I)=P163 ,P(J ,K+3,I+1)=P164]$
RTT2:
[P(J ,K-3,I-2)=P11 ,P(J ,K-3,I-1)=P12 ,P(J ,K-3,I)=P13 ,P(J ,K-3,I+1)=P14 ,
P(J-1,K-2,I)=P33 ,
P(J ,K-2,I-2)=P36 ,P(J ,K-2,I-1)=P37 ,P(J ,K-2,I)=P38 ,P(J ,K-2,I+1)=P39 ,
P(J+1,K-2,I)=P43 ,
P(J-1,K-1,I-2)=P56 ,P(J-1,K-1,I-1)=P57 ,P(J-1,K-1,I)=P58 ,P(J-1,K-1,I+1)=P59 ,
P(J ,K-1,I-2)=P61 ,P(J ,K-1,I-1)=P62 ,P(J ,K-1,I)=P63 ,P(J ,K-1,I+1)=P64 ,
P(J+1,K-1,I-2)=P66 ,P(J+1,K-1,I-1)=P67 ,P(J+1,K-1,I)=P68 ,P(J+1,K-1,I+1)=P69 ,
P(J-1,K ,I-2)=P81 ,P(J-1,K ,I-1)=P82 ,P(J-1,K ,I)=P83 ,P(J-1,K ,I+1)=P84 ,
P(J ,K ,I-2)=P86 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I)=P88 ,P(J ,K ,I+1)=P89 ,
P(J+1,K ,I-2)=P91 ,P(J+1,K ,I-1)=P92 ,P(J+1,K ,I)=P93 ,P(J+1,K ,I+1)=P94 ]$
RTT3:
[P(J ,K-2,I-2)=P36 ,P(J ,K-2,I-1)=P37 ,P(J ,K-2,I)=P38 ,P(J ,K-2,I+1)=P39 ,
P(J-1,K-1,I-2)=P56 ,P(J-1,K-1,I-1)=P57 ,P(J-1,K-1,I)=P58 ,P(J-1,K-1,I+1)=P59 ,
P(J ,K-1,I-2)=P61 ,P(J ,K-1,I-1)=P62 ,P(J ,K-1,I)=P63 ,P(J ,K-1,I+1)=P64 ,
P(J+1,K-1,I-2)=P66 ,P(J+1,K-1,I-1)=P67 ,P(J+1,K-1,I)=P68 ,P(J+1,K-1,I+1)=P69 ,
P(J-1,K ,I-2)=P81 ,P(J-1,K ,I-1)=P82 ,P(J-1,K ,I)=P83 ,P(J-1,K ,I+1)=P84 ,
P(J ,K ,I-2)=P86 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I)=P88 ,P(J ,K ,I+1)=P89 ,
P(J+1,K ,I-2)=P91 ,P(J+1,K ,I-1)=P92 ,P(J+1,K ,I)=P93 ,P(J+1,K ,I+1)=P94 ]$
P(J ,K+1,I-2)=P111 ,P(J ,K+1,I-1)=P112 ,P(J ,K+1,I)=P113 ,P(J ,K+1,I+1)=P114 ,
P(J ,KLOW-2,ITE)=P182 ,P(J ,KLOW-1,ITE)=P183 ,P(J ,KLOW ,ITE)=P184 ,
P(J ,KUP ,ITE)=P185 ,P(J ,KUP +1,ITE)=P186 ,P(J ,KUP +2,ITE)=P187 ]$
RTT4:
[P(J ,K-1,I-2)=P61 ,P(J ,K-1,I-1)=P62 ,P(J ,K-1,I)=P63 ,P(J ,K-1,I+1)=P64 ,
P(J-1,K ,I-2)=P81 ,P(J-1,K ,I-1)=P82 ,P(J-1,K ,I)=P83 ,P(J-1,K ,I+1)=P84 ,
P(J ,K ,I-2)=P86 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I)=P88 ,P(J ,K ,I+1)=P89 ,
P(J+1,K ,I-2)=P91 ,P(J+1,K ,I-1)=P92 ,P(J+1,K ,I)=P93 ,P(J+1,K ,I+1)=P94 ,
P(J-1,K+1,I-2)=P106 ,P(J-1,K+1,I-1)=P107 ,P(J-1,K+1,I)=P108 ,P(J-1,K+1,I+1)=P109 ,
P(J ,K+1,I-2)=P111 ,P(J ,K+1,I-1)=P112 ,P(J ,K+1,I)=P113 ,P(J ,K+1,I+1)=P114 ,
P(J+1,K+1,I-2)=P116 ,P(J+1,K+1,I-1)=P117 ,P(J+1,K+1,I)=P118 ,P(J+1,K+1,I+1)=P119 ,
P(J ,K+2,I-2)=P136 ,P(J ,K+2,I-1)=P137 ,P(J ,K+2,I)=P138 ,P(J ,K+2,I+1)=P139 ,
P(J ,KLOW-2,ITE)=P182 ,P(J ,KLOW-1,ITE)=P183 ,P(J ,KLOW ,ITE)=P184 ,
P(J ,KUP ,ITE)=P185 ,P(J ,KUP +1,ITE)=P186 ,P(J ,KUP +2,ITE)=P187 ]$

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(LPP[1] : [P88 ,P89 ], LPP0[31] : [P63 ,P64 ,P88 ,P89 ,P113,P114],
LPP[2] : [P87 ,P88 ], LPP0[32] : [P62 ,P63 ,P87 ,P88 ,P112,P113],
LPP[3] : [P86 ,P87 ], LPP0[33] : [P61 ,P62 ,P86 ,P87 ,P111,P112],
LPP[4] : [P83 ,P84 ], LPP0[34] : [P58 ,P59 ,P83 ,P84 ,P108,P109],
LPP[5] : [P82 ,P83 ], LPP0[35] : [P57 ,P58 ,P82 ,P83 ,P107,P108],
LPP[6] : [P81 ,P82 ], LPP0[36] : [P56 ,P57 ,P81 ,P82 ,P106,P107],
LPP[7] : [P63 ,P64 ], LPP0[37] : [P38 ,P39 ,P63 ,P64 ,P88 ,P89 ],
LPP[8] : [P62 ,P63 ], LPP0[38] : [P37 ,P38 ,P62 ,P63 ,P87 ,P88 ],
LPP[9] : [P61 ,P62 ], LPP0[39] : [P36 ,P37 ,P61 ,P62 ,P86 ,P87 ],
LPP[10] : [P93 ,P94 ], LPP0[40] : [P68 ,P69 ,P93 ,P94 ,P118,P119],
LPP[11] : [P92 ,P93 ], LPP0[41] : [P67 ,P68 ,P92 ,P93 ,P117,P118],
LPP[12] : [P91 ,P92 ], LPP0[42] : [P66 ,P67 ,P91 ,P92 ,P116,P117],
LPP[13] : [P113,P114], LPP0[43] : [P88 ,P89 ,P113,P114,P138,P139],
LPP[14] : [P112,P113], LPP0[44] : [P87 ,P88 ,P112,P113,P137,P138],
LPP[15] : [P111,P112], LPP0[45] : [P86 ,P87 ,P111,P112,P136,P137],
LPP[16] : [P83 ,P84 ,P88 ,P89 ,P93 ,P94 ], LPP[46]:LPP[16], LPP[61]:LPP[16],
LPP[17] : [P82 ,P83 ,P87 ,P88 ,P92 ,P93 ], LPP[47]:LPP[17], LPP[62]:LPP[17],
LPP[18] : [P81 ,P82 ,P86 ,P87 ,P91 ,P92 ], LPP[48]:LPP[18], LPP[63]:LPP[18],
LPP[19] : [P78 ,P79 ,P83 ,P84 ,P88 ,P89 ], LPP[49]:LPP[19], LPP[64]:LPP[19],
LPP[20] : [P77 ,P78 ,P82 ,P83 ,P87 ,P88 ], LPP[50]:LPP[20], LPP[65]:LPP[20],
LPP[21] : [P76 ,P77 ,P81 ,P82 ,P86 ,P87 ], LPP[51]:LPP[21], LPP[66]:LPP[21],
LPP[22] : [P58 ,P59 ,P63 ,P64 ,P68 ,P69 ], LPP[52]:LPP[22], LPP[67]:LPP[22],
LPP[23] : [P57 ,P58 ,P62 ,P63 ,P67 ,P68 ], LPP[53]:LPP[23], LPP[68]:LPP[23],
LPP[24] : [P56 ,P57 ,P61 ,P62 ,P66 ,P67 ], LPP[54]:LPP[24], LPP[69]:LPP[24],
LPP[25] : [P88 ,P89 ,P93 ,P94 ,P98 ,P99 ], LPP[55]:LPP[25], LPP[70]:LPP[25],
LPP[26] : [P87 ,P88 ,P92 ,P93 ,P97 ,P98 ], LPP[56]:LPP[26], LPP[71]:LPP[26],
LPP[27] : [P86 ,P87 ,P91 ,P92 ,P96 ,P97 ], LPP[57]:LPP[27], LPP[72]:LPP[27],
LPP[28] : [P108,P109,P113,P114,P118,P119], LPP[58]:LPP[28], LPP[73]:LPP[28],
LPP[29] : [P107,P108,P112,P113,P117,P118], LPP[59]:LPP[29], LPP[74]:LPP[29],
LPP[30] : [P106,P107,P111,P112,P116,P117], LPP[60]:LPP[30], LPP[75]:LPP[30],
LPP1[31] : [P88 ,P89 ,P113,P114,P138,P139], LPP2[31] : [P38 ,P39 ,P63 ,P64 ,P88 ,P89 ],
LPP1[32] : [P87 ,P88 ,P112,P113,P137,P138], LPP2[32] : [P37 ,P38 ,P62 ,P63 ,P87 ,P88 ],
LPP1[33] : [P86 ,P87 ,P111,P112,P136,P137], LPP2[33] : [P36 ,P37 ,P61 ,P62 ,P86 ,P87 ],
LPP1[34] : [P83 ,P84 ,P108,P109,P133,P134], LPP2[34] : [P33 ,P34 ,P58 ,P59 ,P83 ,P84 ],
LPP1[35] : [P82 ,P83 ,P107,P108,P132,P133], LPP2[35] : [P32 ,P33 ,P57 ,P58 ,P82 ,P83 ],
LPP1[36] : [P81 ,P82 ,P106,P107,P131,P132], LPP2[36] : [P31 ,P32 ,P56 ,P57 ,P81 ,P82 ],
LPP1[37] : [P63 ,P64 ,P88 ,P89 ,P113,P114], LPP2[37] : [P13 ,P14 ,P38 ,P39 ,P63 ,P64 ],
LPP1[38] : [P62 ,P63 ,P87 ,P88 ,P112,P113], LPP2[38] : [P12 ,P13 ,P37 ,P38 ,P62 ,P63 ],
LPP1[39] : [P61 ,P62 ,P86 ,P87 ,P111,P112], LPP2[39] : [P11 ,P12 ,P36 ,P37 ,P61 ,P62 ],
LPP1[40] : [P93 ,P94 ,P118,P119,P143,P144], LPP2[40] : [P43 ,P44 ,P68 ,P69 ,P93 ,P94 ],
LPP1[41] : [P92 ,P93 ,P117,P118,P142,P143], LPP2[41] : [P42 ,P43 ,P67 ,P68 ,P92 ,P93 ],
LPP1[42] : [P91 ,P92 ,P116,P117,P141,P142], LPP2[42] : [P41 ,P42 ,P66 ,P67 ,P91 ,P92 ],
LPP1[43] : [P113,P114,P138,P139,P163,P164], LPP2[43] : [P63 ,P64 ,P88 ,P89 ,P113 ,P114],
LPP1[44] : [P112,P113,P137,P138,P162,P163], LPP2[44] : [P62 ,P63 ,P87 ,P88 ,P112 ,P113],
LPP1[45] : [P111,P112,P136,P137,P161,P162], LPP2[45] : [P61 ,P62 ,P86 ,P87 ,P111 ,P112])$
SCIR : [P182,P183,P184,P185,P186,P187]$
(LPP3[31] : [P63 ,P64 ,P88 ,P89 ,P113,P114], LPP3[31] : APPEND(LPP3[31],SCIR),
LPP3[32] : [P62 ,P63 ,P87 ,P88 ,P112,P113], LPP3[32] : APPEND(LPP3[32],SCIR),
LPP3[33] : [P61 ,P62 ,P86 ,P87 ,P111,P112], LPP3[33] : APPEND(LPP3[33],SCIR),
LPP3[34] : [P58 ,P59 ,P83 ,P84 ,P108,P109],
LPP3[35] : [P57 ,P58 ,P82 ,P83 ,P107,P108],
LPP3[36] : [P56 ,P57 ,P81 ,P82 ,P106,P107],
LPP3[37] : [P38 ,P39 ,P63 ,P64 ,P88 ,P89 ], LPP3[37] : APPEND(LPP3[37],SCIR),
LPP3[38] : [P37 ,P38 ,P62 ,P63 ,P87 ,P88 ], LPP3[38] : APPEND(LPP3[38],SCIR),
LPP3[39] : [P36 ,P37 ,P61 ,P62 ,P86 ,P87 ], LPP3[39] : APPEND(LPP3[39],SCIR),
LPP3[40] : [P68 ,P69 ,P93 ,P94 ,P118,P119],
LPP3[41] : [P67 ,P68 ,P92 ,P93 ,P117,P118],
LPP3[42] : [P66 ,P67 ,P91 ,P92 ,P116,P117],
LPP3[43] : [P88 ,P89 ,P113,P114,P138,P139], LPP3[43] : APPEND(LPP3[43],SCIR),
LPP3[44] : [P87 ,P88 ,P112,P113,P137,P138], LPP3[44] : APPEND(LPP3[44],SCIR),
LPP3[45] : [P86 ,P87 ,P111,P112,P136,P137], LPP3[45] : APPEND(LPP3[45],SCIR))$

SRIP : [P62 ,P63 ,P64 ,P82 ,P83 ,P84 ,P87 ,P88 ,P89 ,P92 ,P93 ,P94 ,P112,P113,P114]$
SRIM : [P61 ,P62 ,P63 ,P81 ,P82 ,P83 ,P86 ,P87 ,P88 ,P91 ,P92 ,P93 ,P111,P112,P113]$
SRJ : [P56 ,P57 ,P58 ,P59 ,P61 ,P62 ,P63 ,P64 ,P76 ,P77 ,P78 ,P79 ,P81 ,P82 ,P83 ,P84 ,
P86 ,P87 ,P88 ,P89 ,P91 ,P92 ,P93 ,P94 ,P106 ,P107 ,P108 ,P109 ,P111 ,P112 ,P113 ,P114]$
SRK : [P36 ,P37 ,P38 ,P39 ,P56 ,P57 ,P58 ,P59 ,P61 ,P62 ,P63 ,P64 ,P66 ,P67 ,P68 ,P69 ,
P81 ,P82 ,P83 ,P84 ,P86 ,P87 ,P88 ,P89 ,P91 ,P92 ,P93 ,P94 ,P111 ,P112 ,P113 ,P114]$
SRJP : [P61 ,P62 ,P63 ,P64 ,P66 ,P67 ,P68 ,P69 ,P81 ,P82 ,P83 ,P84 ,P86 ,P87 ,P88 ,P89 ,
P91 ,P92 ,P93 ,P94 ,P96 ,P97 ,P98 ,P99 ,P111 ,P112 ,P113 ,P114 ,P116 ,P117 ,P118 ,P119]$
SRKP : [P61 ,P62 ,P63 ,P64 ,P81 ,P82 ,P83 ,P84 ,P86 ,P87 ,P88 ,P89 ,P91 ,P92 ,P93 ,
P94 ,P106 ,P107 ,P108 ,P109 ,P111 ,P112 ,P113 ,P114 ,P116 ,P117 ,P118 ,P119 ,
P136 ,P137 ,P138 ,P139]$
SR1K : [P81 ,P82 ,P83 ,P84 ,P86 ,P87 ,P88 ,P89 ,P91 ,P92 ,P93 ,P94 ,P106 ,P107 ,P108 ,
P109 ,P111 ,P112 ,P113 ,P114 ,P116 ,P117 ,P118 ,P119 ,P136 ,P137 ,P138 ,P139 ,
P161 ,P162 ,P163 ,P164]$
SDPU : [P83 ,P87 ,P88 ,P89 ,P93 ,P108 ,P112 ,P113 ,P114 ,P118 ,P133 ,P137 ,P138 ,P139 ,P143]$
SR1KU : [P11 ,P12 ,P13 ,P14 ,P36 ,P37 ,P38 ,P39 ,P56 ,P57 ,P58 ,P59 ,P61 ,P62 ,P63 ,P64 ,
P66 ,P67 ,P68 ,P69 ,P81 ,P82 ,P83 ,P84 ,P86 ,P87 ,P88 ,P89 ,P91 ,P92 ,P93 ,P94]$
SDPLO : [P33 ,P37 ,P38 ,P39 ,P43 ,P58 ,P62 ,P63 ,P64 ,P68 ,P83 ,P87 ,P88 ,P89 ,P93]$

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SR2KW:APPEND(SRK ,[P182,P183,P184,P185,P186,P187])$
SR2KP:APPEND(SRKP,[P182,P183,P184,P185,P186,P187])$

RTTW :[P(J ,KLOW-2,ITE)=P182, P(J ,KLOW-1,ITE)=P183, P(J ,KLOW ,ITE)=P184,
P(J ,KUP ,ITE)=P185, P(J ,KUP +1,ITE)=P186, P(J ,KUP +2,ITE)=P187]$
LUKI :[J-2=JM2, J-1=JM1, J+1=JP1, J+2=JP2, K-2=KM2, K-1=KM1, K+1=KP1, K+2=KP2,
I-2=IM2, I-1=IM1, I+1=IP1, I+2=IP2]$
/*-----*/
( MATCHDECLARE([DIFF,A,B],TRUE), TELLSIMP('DIFF(A,B),CONCAT(A,B)) )$

DEPENDS(RIP,SRIP,RIM,SRIM,RJ,SRJ,RK,SRK,RJP,SRJP,RKP,SRKP)$
FOR M:1 THRU LENGTH(RTT0 ) DO ( DER [M]: DIFF(RESIDUAL,RHS(RTT0[M])) )$
REMOVE([RIP,RIM,RJ,RK,RJP,RKP],DEPENDENCY)$

DEPENDS(R1K,SR1K,DDPU,SDPU,R1KU,SR1KU,DDPL,SDPLO,R2KW,SR2KW,R2KP,SR2KP,CIR,SCIR)$
FOR M:1 THRU LENGTH(RTT1) DO ( DER1[M]: DIFF(ANOFI1,RHS(RTT1[M])) )$
FOR M:1 THRU LENGTH(RTT2) DO ( DER2[M]: DIFF(ANOFI2,RHS(RTT2[M])) )$
FOR M:1 THRU LENGTH(RTT3) DO ( DER3[M]: DIFF(ANOFI3,RHS(RTT3[M])) )$
FOR M:1 THRU LENGTH(RTT4) DO ( DER4[M]: DIFF(ANOFI4,RHS(RTT4[M])) )$
REMOVE([R1K,DDPU,R1KU,DDPL,R2KW,R2KP,CIR],DEPENDENCY)$

( SDES:[XD1,XD2,XD3,XD4,XD5], SDES1:[XD1,XD2], SDES2:[XD3,XD4,XD5] )$
DEPENDS([OXINF,QZINF],SDES1,[DDZXU,DDZYU,DDZXL,DDZYL],SDES2)$

DEPENDS([RIP,RIM,RJ,RK,RJP,RKP],SDES1)$
FOR M:1 THRU LENGTH(SDES1) DO ( DRS [M]: DIFF(RESIDUAL,SDES1[M]) )$
REMOVE([RIP,RIM,RJ,RK,RJP,RKP],DEPENDENCY)$

DEPENDS([R1K,R1KU,R2KW,R2KP],SDES1,[DDPU,DDPL],SDES)$
FOR M:1 THRU LENGTH(SDES ) DO ( DRS1[M]: DIFF(ANOFI1,SDES[M]),
DRS2[M]: DIFF(ANOFI2,SDES[M]),
DRS3[M]: DIFF(ANOFI3,SDES[M]),
DRS4[M]: DIFF(ANOFI4,SDES[M]) )$
REMOVE([R1K,R1KU,R2KW,R2KP,DDPU,DDPL],DEPENDENCY)$
/*-----*/
(PFO: MAKELIST (PF[0,N]=CONCAT(PO,N),N,1,75),
PF1: MAKELIST (PF[1,N]=CONCAT(PA,N),N,1,75),
PF2: MAKELIST (PF[2,N]=CONCAT(PB,N),N,1,75),
PF3: MAKELIST (PF[3,N]=CONCAT(PC,N),N,1,75),
PF4: MAKELIST (PF[4,N]=CONCAT(PD,N),N,1,75))$

(LT : SUBST(PFO, [RIP[O](I,J,K), RIM[O](I,J,K),
RIP[O](I,J-1,K), RIM[O](I,J-1,K), RIP[O](I,J,K-1), RIM[O](I,J,K-1),
RIP[O](I,J+1,K), RIM[O](I,J+1,K), RIP[O](I,J,K+1), RIM[O](I,J,K+1)]),
LR : [RIP, RIM, RIPJM, RIPKM, RIMJM, RIMKM, RIPJP, RIMJP, RIPKP, RIMKP],
FOR N:1 THRU 10 DO (LT[N] : SUBST(LUJI,LT[N]), LR[N] :: LT[N]))$
(RJ : (1/4) * (RIP+RIM+RIPJM+RIMJM), RJP : (1/4) * (RIPJP+RIMJP+RIP+RIM),
RK : (1/4) * (RIP+RIM+RIPKM+RIMKM), RKP : (1/4) * (RIPKP+RIMKP+RIP+RIM))$

FOR N:31 THRU 45 DO ( LPP[N] : LPP0[N] )$
FOR N:1 THRU 75 DO ( DEPENDS(CONCAT(PO,N),LPP[N]) )$
FOR L:1 THRU LENGTH(SRIP) DO ( DRIP[L]: DIFF(RIP,SRIP[L]) )$
FOR L:1 THRU LENGTH(SRIM) DO ( DRIM[L]: DIFF(RIM,SRIM[L]) )$
FOR L:1 THRU LENGTH(SRJ ) DO ( DRJ [L]: DIFF(RJ ,SRJ [L]) )$
FOR L:1 THRU LENGTH(SRK ) DO ( DRK [L]: DIFF(RK ,SRK [L]) )$
FOR L:1 THRU LENGTH(SRJP) DO ( DRJP[L]: DIFF(RJP,SRJP[L]) )$
FOR L:1 THRU LENGTH(SRKP) DO ( DRKP[L]: DIFF(RKP,SRKP[L]) )$

( R1K : SUBST(PF1, R1K ()), R1K : SUBST(LUJI,R1K ),
R1KU: SUBST(PF2, R1KU()), R1KU: SUBST(LUJI,R1KU),
R2KW: SUBST(PF3, R2KW()), R2KW: SUBST(LUJI,R2KW),
R2KP: SUBST(PF4, R2KP()), R2KP: SUBST(LUJI,R2KP),
DDPU: SUBST(RTT1,DDPU()), DDPU: SUBST(LUJI,DDPU),
DDPL: SUBST(RTT2,DDPL()), DDPL: SUBST(LUJI,DDPL), CIR: SUBST(RTTW,CI(J)) )$

FOR N:31 THRU 45 DO ( LPP[N] : LPP1[N] )$
FOR N:1 THRU 75 DO ( DEPENDS(CONCAT(PA,N),LPP[N]) )$
FOR N:31 THRU 45 DO ( LPP[N] : LPP2[N] )$
FOR N:1 THRU 75 DO ( DEPENDS(CONCAT(PB,N),LPP[N]) )$
FOR N:31 THRU 45 DO ( LPP[N] : LPP3[N] )$
FOR N:1 THRU 75 DO ( DEPENDS([CONCAT(PC,N),CONCAT(PD,N)],LPP[N]) )$

FOR L:1 THRU LENGTH(SR1K ) DO ( DR1K [L] : DIFF(R1K ,SR1K [L]) )$
FOR L:1 THRU LENGTH(SR1KU) DO ( DR1KU[L] : DIFF(R1KU,SR1KU[L]) )$
FOR L:1 THRU LENGTH(SR2KW) DO ( DR2KW[L] : DIFF(R2KW,SR2KW[L]) )$
FOR L:1 THRU LENGTH(SR2KP) DO ( DR2KP[L] : DIFF(R2KP,SR2KP[L]) )$
FOR L:1 THRU LENGTH(SDPU ) DO ( DDDPU[L] : DIFF(DDPU,SDPU [L]) )$
FOR L:1 THRU LENGTH(SDPLO) DO ( DDDPL[L] : DIFF(DDPL,SDPLO[L]) )$
FOR L:1 THRU LENGTH(SCIR ) DO ( DCIR [L] : DIFF(CIR ,SCIR [L]) )$
/*-----*/

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FOR N:1 THRU 75 DO DEPENDS
  ([CONCAT(PO,N),CONCAT(PA,N),CONCAT(PB,N),CONCAT(PC,N),CONCAT(PD,N)],SDES1)$

FOR L:1 THRU LENGTH(SDES1) DO ( DNRIP [L]: DIFF(RIP , SDDES1[L]),
                                DNRIM [L]: DIFF(RIM , SDDES1[L]),
                                DNRJ [L]: DIFF(RJ , SDDES1[L]),
                                DNRK [L]: DIFF(RK , SDDES1[L]),
                                DNRJP [L]: DIFF(RJP , SDDES1[L]),
                                DNRKP [L]: DIFF(RKP , SDDES1[L]),
                                DNR1K [L]: DIFF(R1K , SDDES1[L]),
                                DNR1KU[L]: DIFF(R1KU, SDDES1[L]),
                                DNR2KW[L]: DIFF(R2KW, SDDES1[L]),
                                DNR2KP[L]: DIFF(R2KP, SDDES1[L]) )$

FOR L:1 THRU LENGTH(SDES ) DO ( DNDPU [L]: DIFF(DDPU, SDES [L]),
                                DNDPLO[L]: DIFF(DDPL, SDES [L]) )$

KILL(RULES)$
/*-----*/
PPSUB(I) := FOR N: 1 THRU 75 DO ( FOR M: 1 THRU LENGTH(LPP[N])
                                DO (TD:PART(LPP[N],M), PP[I,N]:SUBST(TD,EV(TD),PP[I,N])) )$

(FOR N :31 THRU 45 DO (LPP [N] : LPPO [N] ),
 FOR L : 1 THRU LENGTH(RTTO) DO (RHS(RTTO[L]) :: LHS(RTTO[L])), PPSUB(0))$
(FOR N :31 THRU 45 DO (LPP [N] : LPP1 [N] ),
 FOR L : 1 THRU LENGTH(RTT1) DO (RHS(RTT1[L]) :: LHS(RTT1[L])), PPSUB(1))$
(FOR N :31 THRU 45 DO (LPP [N] : LPP2 [N] ),
 FOR L : 1 THRU LENGTH(RTT2) DO (RHS(RTT2[L]) :: LHS(RTT2[L])), PPSUB(2))$
(FOR N :31 THRU 45 DO (LPP [N] : LPP3 [N] ),
 FOR L : 1 THRU LENGTH(RTT3) DO (RHS(RTT3[L]) :: LHS(RTT3[L])), PPSUB(3))$
(FOR L : 1 THRU LENGTH(RTT4) DO (RHS(RTT4[L]) :: LHS(RTT4[L])), PPSUB(4))$

FOR L:0 THRU 4 DO (FOR N:1 THRU 75 DO (PP[L,N]:SUBST(LJKI,PP[L,N])))$

FOR L:1 THRU LENGTH(RTTO) DO ( RTTO[L] : SUBST(LJKI,RTTO[L]) )$
FOR L:1 THRU LENGTH(RTT1) DO ( RTT1[L] : SUBST(LJKI,RTT1[L]) )$
FOR L:1 THRU LENGTH(RTT2) DO ( RTT2[L] : SUBST(LJKI,RTT2[L]) )$
FOR L:1 THRU LENGTH(RTT3) DO ( RTT3[L] : SUBST(LJKI,RTT3[L]) )$
FOR L:1 THRU LENGTH(RTT4) DO ( RTT4[L] : SUBST(LJKI,RTT4[L]) )$
/*-----*/
/* DEFINE FUNCTIONS USED IN WRITING SOURCE OUTPUT */
/*-----*/
TITLET(ST1,ST2,ST3) :=
  ( GENTRAN(LITERAL(TAB,EVAL(ST1),CR)),
    GENTRAN(LITERAL("C",TAB,EVAL(ST2),CR,"C",CR,TAB,EVAL(ST3),CR)) )$
TITLEB() :=
  GENTRAN(LITERAL("C",CR,TAB,"RETURN",CR,TAB,"END",CR))$
TITLEC(ST1) :=
  GENTRAN(LITERAL("C",CR,TAB,EVAL(ST1),CR))$
TITLE1(LNR,RTT) :=
  ( GENTRAN(LITERAL("C",CR,"C",TAB,"P",CR,"C",CR)),
    FOR L:1 THRU LNR DO
      GENTRAN(LITERAL(TAB,EVAL(RHS(RTT[L])), " = ",EVAL(LHS(RTT[L])),CR)) )$
TITLE2(ST1,I) :=
  ( GENTRAN(LITERAL("C",CR,"C",TAB,EVAL(ST1),CR,"C",CR)), M: 0,
    FOR NN:1 THRU 5 DO (FOR N:1 THRU 15 DO (M:M+1, IF PART(NT[I],N)=1 THEN
      GENTRAN(LITERAL(TAB,EVAL(ST1),EVAL(M)," = ",EVAL(PP[I,M]),CR)))) )$
TITLE3(ST1,I,RRTT) :=
  ( GENTRANOPT: FALSE,
    (FOR N:1 THRU 75 DO (PD:DIFF(PP[I,N],RRTT), IF PD#0 THEN
      GENTRAN(LITERAL(TAB,EVAL(ST1),EVAL(N),EVAL(RRTT)," = ",EVAL(PD),CR))),
    GENTRANOPT: TRUE )$
TITLE4(ST1,RRTT,DRD) :=
  GENTRAN(LRSETQ(EVAL(CONCAT(ST1,RRTT)),DRD))$
TITLE5(ST1,I,XDL) :=
  ( MATCHDECLARE([DIFF,A,B],TRUE), TELLSIMP('DIFF(A,B),CONCAT(A,B)),
    GENTRAN(LITERAL("C",EVAL(XDL),CR)), TITLE3(ST1,I,XDL), KILL(RULES) )$
EXEC1(PIJKP) :=
  IF L=1 THEN
    GENTRAN(LITERAL(TAB,"IF (CND(II,JJ,KK," ,EVAL(PART(EV(PIJKP),3))," ,",
      EVAL(PART(EV(PIJKP),1))," ,",EVAL(PART(EV(PIJKP),2)),")) THEN",CR))
  ELSE
    GENTRAN(LITERAL(TAB,"ELSEIF (CND(II,JJ,KK," ,EVAL(PART(EV(PIJKP),3))," ,",
      EVAL(PART(EV(PIJKP),1))," ,",EVAL(PART(EV(PIJKP),2)),")) THEN",CR))$
EXEC2() :=
  ( GENTRANOPT: FALSE, MAXEXPPRINT: 3200 )$
EXEC3(RTT) :=
  IF L=LENGTH(RTT) THEN GENTRAN(LITERAL(TAB,"ENDIF",CR))$
/*-----*/

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/*-----*/
GENTRANOUT("RMDER.FOR")$ /* START WRITING FORTRAN SOURCE OUTPUT */
/*-----*/
/**/TITLET("SUBROUTINE R(J,I,K,JJ,II,KK,DER)","RMDER.FOR","INCLUDE (INTRO)")$
/**/(TITLE1(LENGTH(RTTO),RTTO),TITLE2("PO",O))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"RIP,RIM,RJ,RK,RJP,RKP",CR,"C",CR))$
GENTRANOPT:TRUES$
(GENTRAN(RSETQ(RIP,RIP)),GENTRAN(RSETQ(RIM,RIM)),GENTRAN(RSETQ(RJ,RJ)),
GENTRAN(RSETQ(RK,RK)),GENTRAN(RSETQ(RJP,RJP)),GENTRAN(RSETQ(RKP,RKP)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DER",CR))$
(LRIP:O,LRIM:O,LRJ:O,LRK:O,LRJP:O,LRKP:O)$
FOR L:1 THRU LENGTH(RTTO) DO (PRINT(L),RRTTO:RHS(RTTO[L]),LRTTO:LHS(RTTO[L]),
GENTRAN(LITERAL("C",EVAL(RRTTO),CR)),EXEC1(LRTTO),TITLE3("PO",O,RRTTO),
(IF MEMBER(RRTTO,SRIP) THEN (LRIP:LRIP+1,TITLE4("RIP",RRTTO,DRIP[LRIP]))),
(IF MEMBER(RRTTO,SRIM) THEN (LRIM:LRIM+1,TITLE4("RIM",RRTTO,DRIM[LRIM]))),
(IF MEMBER(RRTTO,SRJ) THEN (LRJ:LRJ+1,TITLE4("RJ",RRTTO,DRJ[LRJ]))),
(IF MEMBER(RRTTO,SRK) THEN (LRK:LRK+1,TITLE4("RK",RRTTO,DRK[LRK]))),
(IF MEMBER(RRTTO,SRJP) THEN (LRJP:LRJP+1,TITLE4("RJP",RRTTO,DRJP[LRJP]))),
(IF MEMBER(RRTTO,SRKP) THEN (LRKP:LRKP+1,TITLE4("RKP",RRTTO,DRKP[LRKP]))),
EXEC2(),TITLE4("RES",RRTTO,DER[L]),
GENTRAN(LITERAL(TAB,"DER =", "RES",EVAL(RRTTO),CR)),EXEC3(RTTO))$
/*-----*/TITLET("SUBROUTINE R1(J,I,K,JJ,II,KK,DAN)","RMDER1.FOR","INCLUDE (INTRO)")$
/**/(TITLE1(LENGTH(RTT1),RTT1),TITLE2("PA",1))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R1K,DPU",CR,"C",CR)),GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R1K,R1K)),GENTRAN(LITERAL(TAB,"DDPU=DPU(J,I)",CR)))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"DER1",CR)),LR1K:O,LDPU:O)$
FOR L:1 THRU LENGTH(RTT1) DO (PRINT(L),RRTT1:RHS(RTT1[L]),LRTT1:LHS(RTT1[L]),
GENTRAN(LITERAL("C",EVAL(RRTT1),CR)),EXEC1(LRTT1),TITLE3("PA",1,RRTT1),
(IF MEMBER(RRTT1,SR1K) THEN (LR1K:LR1K+1,TITLE4("R1K",RRTT1,DR1K[LR1K]))),
(IF MEMBER(RRTT1,SDPU) THEN (LDPU:LDPU+1,TITLE4("DDPU",RRTT1,DDPU[LDPU]))),
EXEC2(),TITLE4("DAN",RRTT1,DER1[L]),
GENTRAN(LITERAL(TAB,"DAN =", "DAN",EVAL(RRTT1),CR)),EXEC3(RTT1))$
/*-----*/TITLET("SUBROUTINE R2(J,I,K,JJ,II,KK,DAN)","RMDER2.FOR","INCLUDE (INTRO)")$
/**/(TITLE1(LENGTH(RTT2),RTT2),TITLE2("PB",2))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R1KU,DPLO",CR,"C",CR)),GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R1KU,R1KU)),GENTRAN(LITERAL(TAB,"DDPL=DPLO(J,I)",CR)))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"DER2",CR)),LR1KU:O,LDPLO:O)$
FOR L:1 THRU LENGTH(RTT2) DO (PRINT(L),RRTT2:RHS(RTT2[L]),LRTT2:LHS(RTT2[L]),
GENTRAN(LITERAL("C",EVAL(RRTT2),CR)),EXEC1(LRTT2),TITLE3("PB",2,RRTT2),
(IF MEMBER(RRTT2,SR1KU) THEN (LR1KU:LR1KU+1,TITLE4("R1KU",RRTT2,DR1KU[LR1KU]))),
(IF MEMBER(RRTT2,SDPLO) THEN (LDPLO:LDPLO+1,TITLE4("DDPL",RRTT2,DDPL[LDPLO]))),
EXEC2(),TITLE4("DAN",RRTT2,DER2[L]),
GENTRAN(LITERAL(TAB,"DAN =", "DAN",EVAL(RRTT2),CR)),EXEC3(RTT2))$
/*-----*/TITLET("SUBROUTINE R3(J,I,K,JJ,II,KK,DAN)","RMDER3.FOR","INCLUDE (INTRO)")$
/**/(TITLE1(LENGTH(RTT3),RTT3),TITLE2("PC",3))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R2KW,CIR",CR,"C",CR)),GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R2KW,R2KW)),GENTRAN(LITERAL(TAB,"CIR=CIRC(J)",CR)))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"DER3",CR)),LR2KW:O,LCIR:O)$
FOR L:1 THRU LENGTH(RTT3) DO (PRINT(L),RRTT3:RHS(RTT3[L]),LRTT3:LHS(RTT3[L]),
GENTRAN(LITERAL("C",EVAL(RRTT3),CR)),EXEC1(LRTT3),TITLE3("PC",3,RRTT3),
(IF MEMBER(RRTT3,SR2KW) THEN (LR2KW:LR2KW+1,TITLE4("R2KW",RRTT3,DR2KW[LR2KW]))),
(IF MEMBER(RRTT3,SCIR) THEN (LCIR:LCIR+1,TITLE4("CIR",RRTT3,DCIR[LCIR]))),
EXEC2(),TITLE4("DAN",RRTT3,DER3[L]),
GENTRAN(LITERAL(TAB,"DAN =", "DAN",EVAL(RRTT3),CR)),EXEC3(RTT3))$
/*-----*/TITLET("SUBROUTINE R4(J,I,K,JJ,II,KK,DAN)","RMDER4.FOR","INCLUDE (INTRO)")$
/**/(TITLE1(LENGTH(RTT4),RTT4),TITLE2("PD",4))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R2KP,CIR",CR,"C",CR)),GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R2KP,R2KP)),GENTRAN(LITERAL(TAB,"CIR=CIRC(J)",CR)))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"DER4",CR)),LR2KP:O,LCIR:O)$
FOR L:1 THRU LENGTH(RTT4) DO (PRINT(L),RRTT4:RHS(RTT4[L]),LRTT4:LHS(RTT4[L]),
GENTRAN(LITERAL("C",EVAL(RRTT4),CR)),EXEC1(LRTT4),TITLE3("PD",4,RRTT4),
(IF MEMBER(RRTT4,SR2KP) THEN (LR2KP:LR2KP+1,TITLE4("R2KP",RRTT4,DR2KP[LR2KP]))),
(IF MEMBER(RRTT4,SCIR) THEN (LCIR:LCIR+1,TITLE4("CIR",RRTT4,DCIR[LCIR]))),
EXEC2(),TITLE4("DAN",RRTT4,DER4[L]),
GENTRAN(LITERAL(TAB,"DAN =", "DAN",EVAL(RRTT4),CR)),EXEC3(RTT4))$
/*-----*/TITLET("SUBROUTINE R5(J,I,K,JJ,II,KK,DAN)","RMDER5.FOR","INCLUDE (INTRO)")$

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/*-----*/
/*          RIGHT HAND SIDES          */
/*          */
/*          XD = [XD1 , XD2 , XD3, XD4, XD5]          */
/*          */
/*          [MACH, AOAR, T , C , L ]          */
/*-----*/
/**/TITLET("SUBROUTINE RS(J,I,K,RHSM,RHSA,RHST,RHSC,RHSL)",
          "RMDERS.FOR","INCLUDE (INTROS)")$
/**/(TITLE1(LENGTH(RTTO),RTTO), TITLE2("PO",O))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"RIP,RIM,RJ,RK,RJP,RKP",CR,"C",CR))$
GENTRANOPT: TRUES
(GENTRAN(RSETQ(RIP,RIP)), GENTRAN(RSETQ(RIM,RIM)), GENTRAN(RSETQ(RJ ,RJ )),
 GENTRAN(RSETQ(RK ,RK )), GENTRAN(RSETQ(RJP,RJP)), GENTRAN(RSETQ(RKP,RKP)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DRESIDUAL",CR))$
FOR L:1 THRU LENGTH(SDES1) DO ( PRINT(L), XDL: SDES1[L], TITLES("PO",O,XDL),
  TITLE4("RIP",XDL,DNRIP[L]), TITLE4("RIM",XDL,DNRIM[L]),
  TITLE4("RJ" ,XDL,DNRJ [L]), TITLE4("RK" ,XDL,DNRK [L]),
  TITLE4("RJP",XDL,DNRJP[L]), TITLE4("RKP",XDL,DNRKP[L]),
  TITLE4("RES",XDL,DRS [L]) )$
/*-----*/
TITLEC("IF (K.EQ.KUP.AND.I.GE.ILE.AND.I.LE.ITE.AND.J.LE.JTPM1) THEN")$
/**/(TITLE1(LENGTH(RTT1),RTT1), TITLE2("PA",1))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R1K,DPU",CR,"C",CR)), GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R1K,R1K)), GENTRAN(LITERAL(TAB,"DDPU=OPU(J,I)",CR)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DANOFI1",CR))$
FOR L:1 THRU LENGTH(SDES) DO ( PRINT(L), XDL: SDES[L], TITLES("PA",1,XDL),
  IF L<=LENGTH(SDES1) THEN TITLE4("R1K" ,XDL,DNR1K[L]),
  TITLE4("DDPU",XDL,DNDPU[L]),
  TITLE4("AN1" ,XDL,DRS1 [L]) )$
GENTRAN( LITERAL("C",CR,TAB,"ENDIF",CR) )$
/*-----*/
TITLEC("IF (K.EQ.KLOW.AND.I.GE.ILE.AND.I.LE.ITE.AND.J.LE.JTPM1) THEN")$
/**/(TITLE1(LENGTH(RTT2),RTT2), TITLE2("PB",2))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R1KU,DPLO",CR,"C",CR)), GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R1KU,R1KU)), GENTRAN(LITERAL(TAB,"DDPL=DPLO(J,I)",CR)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DANOFI2",CR))$
FOR L:1 THRU LENGTH(SDES) DO ( PRINT(L), XDL: SDES[L], TITLES("PB",2,XDL),
  IF L<=LENGTH(SDES1) THEN TITLE4("R1KU",XDL,DNR1KU[L]),
  TITLE4("DDPL",XDL,DNDPLO[L]),
  TITLE4("AN2" ,XDL,DRS2 [L]) )$
GENTRAN( LITERAL("C",CR,TAB,"ENDIF",CR) )$
/*-----*/
TITLEC("IF (K.EQ.KUP.AND.I.GT.ITE.AND.J.LE.JTPM1) THEN")$
/**/(TITLE1(LENGTH(RTT3),RTT3), TITLE2("PC",3))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R2KW,CIR",CR,"C",CR)), GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R2KW,R2KW)), GENTRAN(LITERAL(TAB,"CIR=CIRC(J)",CR)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DANOFI3",CR))$
FOR L:1 THRU LENGTH(SDES1) DO ( PRINT(L), XDL: SDES1[L], TITLES("PC",3,XDL),
  TITLE4("R2KW",XDL,DNR2KW[L]),
  TITLE4("AN3" ,XDL,DRS3 [L]) )$
GENTRAN( LITERAL("C",CR,TAB,"ENDIF",CR) )$
/*-----*/
TITLEC("IF (K.EQ.KLOW.AND.I.GT.ITE.AND.J.LE.JTPM1) THEN")$
/**/(TITLE1(LENGTH(RTT4),RTT4), TITLE2("PD",4))$

/**/(GENTRAN(LITERAL("C",CR,"C",TAB,"R2KP,CIR",CR,"C",CR)), GENTRANOPT:TRUE)$
(GENTRAN(RSETQ(R2KP,R2KP)), GENTRAN(LITERAL(TAB,"CIR=CIRC(J)",CR)))$

/**/GENTRAN(LITERAL("C",CR,"C",TAB,"DANOFI4",CR))$
FOR L:1 THRU LENGTH(SDES1) DO ( PRINT(L), XDL: SDES1[L], TITLES("PD",4,XDL),
  TITLE4("R2KP",XDL,DNR2KP[L]),
  TITLE4("AN4" ,XDL,DRS4 [L]) )$
GENTRAN( LITERAL("C",CR,TAB,"ENDIF",CR,"C",CR) )$
/*-----*/
( GENTRAN( LITERAL(TAB,"RHSM = RESXD1 + AN1XD1 + AN2XD1 + AN3XD1 + AN4XD1",CR,
  TAB,"RHSA = RESXD2 + AN1XD2 + AN2XD2 + AN3XD2 + AN4XD2",CR,
  TAB,"RHST = AN1XD3 + AN2XD3",CR,
  TAB,"RHSC = AN1XD4 + AN2XD4",CR,
  TAB,"RHSL = AN1XD5 + AN2XD5",CR) ), TITLES() )$
/*-----*/

```

```

/*-----*/
/*                               WRITE SYMBOLIC PART FOR JACOBIAN                               */
/*-----*/
/**/TITLET("SUBROUTINE RE(J,I,K, JJ,II, KK,M)", "RE.FOR", "INCLUDE (INTROM)")$

FOR L:1 THRU LENGTH(RTTO) DO ( PRINT(L), RRTTO:RHS(RTTO[L]), LRTTO:LHS(RTTO[L]),
  GENTRAN(LITERAL("C ", EVAL(RRTTO), CR)), EXEC1(LRTTO),
  GENTRAN(LITERAL(TAB, "M = 1", CR)), EXEC3(RTTO) )$
/*-----*/ TITLET()$
/**/TITLET("SUBROUTINE R1E(J,I,K, JJ,II, KK,MM)", "R1E.FOR", "INCLUDE (INTROM)")$

FOR L:1 THRU LENGTH(RTT1) DO ( PRINT(L), RRTT1:RHS(RTT1[L]), LRTT1:LHS(RTT1[L]),
  GENTRAN(LITERAL("C ", EVAL(RRTT1), CR)), EXEC1(LRTT1),
  GENTRAN(LITERAL(TAB, "MM = 1", CR)), EXEC3(RTT1) )$
/*-----*/ TITLET()$
/**/TITLET("SUBROUTINE R2E(J,I,K, JJ,II, KK,MM)", "R2E.FOR", "INCLUDE (INTROM)")$

FOR L:1 THRU LENGTH(RTT2) DO ( PRINT(L), RRTT2:RHS(RTT2[L]), LRTT2:LHS(RTT2[L]),
  GENTRAN(LITERAL("C ", EVAL(RRTT2), CR)), EXEC1(LRTT2),
  GENTRAN(LITERAL(TAB, "MM = 1", CR)), EXEC3(RTT2) )$
/*-----*/ TITLET()$
/**/TITLET("SUBROUTINE R3E(J,I,K, JJ,II, KK,MM)", "R3E.FOR", "INCLUDE (INTROM)")$

FOR L:1 THRU LENGTH(RTT3) DO ( PRINT(L), RRTT3:RHS(RTT3[L]), LRTT3:LHS(RTT3[L]),
  GENTRAN(LITERAL("C ", EVAL(RRTT3), CR)), EXEC1(LRTT3),
  GENTRAN(LITERAL(TAB, "MM = 1", CR)), EXEC3(RTT3) )$
/*-----*/ TITLET()$
/**/TITLET("SUBROUTINE R4E(J,I,K, JJ,II, KK,MM)", "R4E.FOR", "INCLUDE (INTROM)")$

FOR L:1 THRU LENGTH(RTT4) DO ( PRINT(L), RRTT4:RHS(RTT4[L]), LRTT4:LHS(RTT4[L]),
  GENTRAN(LITERAL("C ", EVAL(RRTT4), CR)), EXEC1(LRTT4),
  GENTRAN(LITERAL(TAB, "MM = 1", CR)), EXEC3(RTT4) )$
/*-----*/ TITLET()$

```

# APPENDIX C

FORTRAN SOURCE CODE (MACSYMA OUTPUT)

```

1      SUBROUTINE R(J,I,K, JJ, II, KK, DER)
2      RMDR.FOR
3
4      INCLUDE [INTRD]
5
6      C
7      C
8      C
9      C
10     P
11
12     P36 = P(J, KM2, IM2)
13     P37 = P(J, KM2, IM1)
14     P38 = P(J, KM2, I)
15     P39 = P(J, KM2, IP1)
16     P56 = P(JM1, KM1, IM2)
17     P57 = P(JM1, KM1, IM1)
18     P58 = P(JM1, KM1, I)
19     P59 = P(JM1, KM1, IP1)
20     P61 = P(J, KM1, IM2)
21     P62 = P(J, KM1, IM1)
22     P63 = P(J, KM1, I)
23     P64 = P(J, KM1, IP1)
24     P65 = P(JP1, KM1, IM2)
25     P66 = P(JP1, KM1, IM1)
26     P67 = P(JP1, KM1, I)
27     P68 = P(JP1, KM1, IP1)
28     P76 = P(JM2, K, IM2)
29     P77 = P(JM2, K, IM1)
30     P78 = P(JM2, K, I)
31     P79 = P(JM2, K, IP1)
32     P81 = P(JM1, K, IM2)
33     P82 = P(JM1, K, IM1)
34     P83 = P(JM1, K, I)
35     P84 = P(JM1, K, IP1)
36     P86 = P(J, K, IM2)
37     P87 = P(J, K, IM1)
38     P88 = P(J, K, I)
39     P89 = P(J, K, IP1)
40     P91 = P(JP1, K, IM2)
41     P92 = P(JP1, K, IM1)
42     P93 = P(JP1, K, I)
43     P94 = P(JP1, K, IP1)
44     P96 = P(JP2, K, IM2)
45     P97 = P(JP2, K, IM1)
46     P98 = P(JP2, K, I)
47     P99 = P(JP2, K, IP1)
48     P106 = P(JM1, KP1, IM2)
49     P107 = P(JM1, KP1, IM1)
50     P108 = P(JM1, KP1, I)
51     P109 = P(JM1, KP1, IP1)
52     P111 = P(J, KP1, IM2)
53     P112 = P(J, KP1, IM1)
54     P113 = P(J, KP1, I)
55     P114 = P(J, KP1, IP1)
56     P116 = P(JP1, KP1, IM2)
57     P117 = P(JP1, KP1, IM1)
58     P118 = P(JP1, KP1, I)
59     P119 = P(JP1, KP1, IP1)
60     P136 = P(J, KP2, IM2)
61     P137 = P(J, KP2, IM1)
62     P138 = P(J, KP2, I)
63     P139 = P(J, KP2, IP1)
64
65     C
66     C
67     C
68     PD
69
70     PD1 = DXII[IM1] = (P87+S+P88)+OXINF/XIXIP(J, I)
71     PD2 = DXII[IM2] = (P87+S+P88)+OXINF/XIXIP(J, IM1)
72     PD3 = DXII[IM2] = (P86+S+P87)+OXINF/XIXIP(J, IM2)
73     PD4 = DXII[I] = (P83+S+P84)+OXINF/XIXIP(JM1, I)
74     PD5 = DXII[IM1] = (P82+S+P83)+OXINF/XIXIP(JM1, IM1)
75     PD6 = DXII[IM2] = (P81+S+P82)+OXINF/XIXIP(JM1, IM2)
76     PD7 = DXII[I] = (P63+S+P64)+OXINF/XIXIP(J, I)
77     PD8 = DXII[IM1] = (P62+S+P63)+OXINF/XIXIP(J, IM1)
78     PD9 = DXII[IM2] = (P61+S+P62)+OXINF/XIXIP(J, IM2)
79     PD10 = DXII[I] = (P93+S+P94)+OXINF/XIXIP(JP1, I)
80     PD11 = DXII[IM1] = (P92+S+P93)+OXINF/XIXIP(JP1, IM1)
81     PD12 = DXII[IM2] = (P91+S+P92)+OXINF/XIXIP(JP1, IM2)
82     PD13 = DXII[I] = (P113+S+P114)+OXINF/XIXIP(J, I)
83     PD14 = DXII[IM1] = (P112+S+P113)+OXINF/XIXIP(J, IM1)
84     PD15 = DXII[IM2] = (P111+S+P112)+OXINF/XIXIP(J, IM2)
85     PD16 = XIYIP(J, I) = OXINF*S/XIXIP(J, I) + (AJ2(J) = (P94+P93-P99-P86)+AJ1
86     (J) = (P89+P88-P84-P83))/2.0
87     PD17 = XIYIP(J, IM1) = OXINF*S/XIXIP(J, IM1) + (AJ2(J) = (P93+P92-P88-P87)
88     +AJ1(J) = (P88+P87-P83-P82))/2.0
89     PD18 = XIYIP(J, IM2) = OXINF*S/XIXIP(J, IM2) + (AJ2(J) = (P92+P91-P87-P86)
90     +AJ1(J) = (P87+P86-P82-P81))/2.0
91     PD19 = XIYIP(JM1, I) = OXINF*S/XIXIP(JM1, I) + (AJ2(JM1) = (P89+P88-P84-
92     P83)+AJ1(JM1) = (P84+P83-P79-P78))/2.0
93     PD20 = XIYIP(JM1, IM1) = OXINF*S/XIXIP(JM1, IM1) + (AJ2(JM1) = (P88+P87-
94     P83-P82)+AJ1(JM1) = (P83+P82-P78-P77))/2.0
95     PD21 = XIYIP(JM1, IM2) = OXINF*S/XIXIP(JM1, IM2) + (AJ2(JM1) = (P87+P86-
96     P82-P81)+AJ1(JM1) = (P82+P81-P77-P76))/2.0
97     PD22 = XIYIP(J, I) = OXINF*S/XIXIP(J, I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1
98     (J) = (P84+P83-P89-P88))/2.0
99     PD23 = XIYIP(J, IM1) = OXINF*S/XIXIP(J, IM1) + (AJ2(J) = (P88+P87-P83-P82)
100    +AJ1(J) = (P83+P82-P88-P87))/2.0
101     PD24 = XIYIP(J, IM2) = OXINF*S/XIXIP(J, IM2) + (AJ2(J) = (P87+P86-P82-P81)
102    +AJ1(J) = (P82+P81-P87-P86))/2.0
103     PD25 = XIYIP(JP1, I) = OXINF*S/XIXIP(JP1, I) + (AJ2(JP1) = (P99+P98-P94-
104     P93)+AJ1(JP1) = (P94+P93-P89-P88))/2.0
105     PD26 = XIYIP(JP1, IM1) = OXINF*S/XIXIP(JP1, IM1) + (AJ2(JP1) = (P98+P97-
106     P93-P92)+AJ1(JP1) = (P93+P92-P88-P87))/2.0
107     PD27 = XIYIP(JP1, IM2) = OXINF*S/XIXIP(JP1, IM2) + (AJ2(JP1) = (P87+P86-
108     P82-P81)+AJ1(JP1) = (P82+P81-P87-P86))/2.0
109     PD28 = XIYIP(J, I) = OXINF*S/XIXIP(J, I) + (AJ2(J) = (P119+P118-P114-P113)
110    +AJ1(J) = (P114+P113-P108-P106))/2.0
111     PD29 = XIYIP(J, IM1) = OXINF*S/XIXIP(J, IM1) + (AJ2(J) = (P118+P117-P113-
112     P112)+AJ1(J) = (P113+P112-P108-P107))/2.0
113     PD30 = XIYIP(J, IM2) = OXINF*S/XIXIP(J, IM2) + (AJ2(J) = (P117+P116-P112-
114     P111)+AJ1(J) = (P112+P111-P107-P106))/2.0
115     PD31 = OZINF*(A1K(K) = (P89+P88-P84-P83)+A2K(K) = (-P89-P88+P114+P113)
116     )/2.0
117     PD32 = OZINF*(A1K(K) = (P88+P87-P83-P82)+A2K(K) = (-P88-P87+P113+P112)
118     )/2.0
119     PD33 = OZINF*(A1K(K) = (P87+P86-P82-P81)+A2K(K) = (-P87-P86+P112+P111)
120     )/2.0
121     PD34 = OZINF*(A1K(K) = (P84+P83-P89-P88)+A2K(K) = (-P84-P83+P109+P108)
122     )/2.0
123     PD35 = OZINF*(A1K(K) = (P83+P82-P88-P87)+A2K(K) = (-P83-P82+P108+P107)
124     )/2.0
125     PD36 = OZINF*(A1K(K) = (P82+P81-P87-P86)+A2K(K) = (-P82-P81+P107+P106)
126     )/2.0
127     PD37 = OZINF*(A2K(KM1) = (P89+P88-P84-P83)+A1K(KM1) = (P84+P83-P39-P38
128     )/2.0
129     PD38 = OZINF*(A2K(KM1) = (P88+P87-P83-P82)+A1K(KM1) = (P83+P82-P38-P37
130     )/2.0
131     PD39 = OZINF*(A2K(KM1) = (P87+P86-P82-P81)+A1K(KM1) = (P82+P81-P37-P36
132     )/2.0
133     PD40 = OZINF*(A1K(K) = (P84+P83-P89-P88)+A2K(K) = (-P84-P83+P119+P118)
134     )/2.0
135     PD41 = OZINF*(A1K(K) = (P93+P92-P88-P87)+A2K(K) = (-P93-P92+P116+P117)
136     )/2.0
137     PD42 = OZINF*(A1K(K) = (P92+P91-P87-P86)+A2K(K) = (-P92-P91+P117+P116)
138     )/2.0

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P043 = QZINF\*(A1K(KP1))=(-P89-P88-P114+P113)+A2K(KP1)\*(P133+P138-  
P114-P113))/2.0  
P044 = QZINF\*(A1K(KP1))=(-P88-P87-P113+P112)+A2K(KP1)\*(P138+P137-  
P113-P112))/2.0  
P045 = QZINF\*(A1K(KP1))=(-P87-P86-P112+P111)+A2K(KP1)\*(P137+P136-  
P112-P111))/2.0  
P046 = A1R(J,I)\*(DXII(I))=(P88+S+P89)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(XIYIP(J,I)+OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P84+P83-P89-P88)+AJ1(J))=  
(P89+P88-P84-P83))/2.0  
P047 = A1R(J,IM1)\*(DXII(IM1))=(P87+S+P88)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(XIYIP(J,IM1)+OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P83+P82-  
P88-P87)+AJ1(J))=(P88+P87-P83-P82))/2.0  
P048 = A1R(J,IM2)\*(DXII(IM2))=(P88+S+P87)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(XIYIP(J,IM2)+OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P82+P81-  
P87-P86)+AJ1(J))=(P87+P86-P82-P81))/2.0  
P049 = A1R(JM1,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JM1,I)+XIYIP(JM1,I)  
=(XIYIP(JM1,I)+OXINF\*S/XIXIP(JM1,I)+(AJ2(JM1))=(P89+P88-P84-  
P83)+AJ1(JM1))=(P84+P83-P79-P78))/2.0  
P050 = A1R(JM1,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JM1,IM1)+  
XIYIP(JM1,IM1)=(XIYIP(JM1,IM1)+OXINF\*S/XIXIP(JM1,IM1)+(AJ2(JM1))=(  
P88+P87-P83-P82)+AJ1(JM1))=(P83+P82-P78-P77))/2.0  
P051 = A1R(JM1,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JM1,IM2)+  
XIYIP(JM1,IM2)=(XIYIP(JM1,IM2)+OXINF\*S/XIXIP(JM1,IM2)+(AJ2(JM1))=(  
P87+P86-P82-P81)+AJ1(JM1))=(P82+P81-P77-P76))/2.0  
P052 = A1R(J,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(XIYIP(J,I)+OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P89+P88-P84-P83)+AJ1(J))=  
(P89+P88-P84-P83))/2.0  
P053 = A1R(J,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(XIYIP(J,IM1)+OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P88+P87-  
P83-P82)+AJ1(J))=(P83+P82-P84-P81))/2.0  
P054 = A1R(J,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(XIYIP(J,IM2)+OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P87+P86-  
P82-P81)+AJ1(J))=(P82+P81-P87-P86))/2.0  
P055 = A1R(JP1,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JP1,I)+XIYIP(JP1,I)  
=(XIYIP(JP1,I)+OXINF\*S/XIXIP(JP1,I)+(AJ2(JP1))=(P89+P88-P84-  
P83)+AJ1(JP1))=(P84+P83-P89-P88))/2.0  
P056 = A1R(JP1,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JP1,IM1)+  
XIYIP(JP1,IM1)=(XIYIP(JP1,IM1)+OXINF\*S/XIXIP(JP1,IM1)+(AJ2(JP1))=(  
P88+P87-P83-P82)+AJ1(JP1))=(P83+P82-P88-P87))/2.0  
P057 = A1R(JP1,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JP1,IM2)+  
XIYIP(JP1,IM2)=(XIYIP(JP1,IM2)+OXINF\*S/XIXIP(JP1,IM2)+(AJ2(JP1))=(  
P87+P86-P82-P81)+AJ1(JP1))=(P82+P81-P87-P86))/2.0  
P058 = A1R(J,I)\*(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(XIYIP(J,I)+OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P119+P118-P114-P113)+  
AJ1(J))=(P114+P113-P109-P108))/2.0  
P059 = A1R(J,IM1)\*(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(XIYIP(J,IM1)+OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P118+  
P117-P113-P112)+AJ1(J))=(P113+P112-P108-P107))/2.0  
P060 = A1R(J,IM2)\*(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(XIYIP(J,IM2)+OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P117+  
P116-P112-P111)+AJ1(J))=(P112+P111-P107-P106))/2.0  
P061 = XIYIP(J,I)\*(DXII(I))=(P88+S+P89)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P84+P83-P89-P88)+AJ1(J))=(P89+P88-  
P84-P83))/2.0  
P062 = XIYIP(J,IM1)\*(DXII(IM1))=(P87+S+P88)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P83+P82-P88-P87)+AJ1(J))=  
(P88+P87-P83-P82))/2.0  
P063 = XIYIP(J,IM2)\*(DXII(IM2))=(P86+S+P87)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P82+P81-P87-P86)+AJ1(J))=  
(P87+P86-P82-P81))/2.0  
P064 = XIYIP(JM1,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JM1,I)+XIYIP(JM1,I)  
=(OXINF\*S/XIXIP(JM1,I)+(AJ2(JM1))=(P89+P88-P84-P83)+AJ1(JM1))=  
(P84+P83-P79-P78))/2.0  
P065 = XIYIP(JM1,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JM1,IM1)+  
XIYIP(JM1,IM1)=(OXINF\*S/XIXIP(JM1,IM1)+(AJ2(JM1))=(P88+P87-P83-P82)  
)AJ1(JM1))=(P83+P82-P78-P77))/2.0  
P066 = XIYIP(JM1,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JM1,IM2)+  
XIYIP(JM1,IM2)=(OXINF\*S/XIXIP(JM1,IM2)+(AJ2(JM1))=(P87+P86-P82-P81)  
)AJ1(JM1))=(P82+P81-P77-P76))/2.0  
P067 = XIYIP(J,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P89+P88-P84-P83)+AJ1(J))=(P84+P83-  
P89-P88))/2.0  
P068 = XIYIP(J,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P88+P87-P83-P82)+AJ1(J))=  
(P83+P82-P88-P87))/2.0  
P069 = XIYIP(J,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P87+P86-P82-P81)+AJ1(J))=  
(P82+P81-P87-P86))/2.0  
P070 = XIYIP(JP1,I)\*(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JP1,I)+XIYIP(JP1,I)  
=(OXINF\*S/XIXIP(JP1,I)+(AJ2(JP1))=(P89+P88-P84-P83)+AJ1(JP1))=  
(P84+P83-P89-P88))/2.0  
P071 = XIYIP(JP1,IM1)\*(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JP1,IM1)+  
XIYIP(JP1,IM1)=(OXINF\*S/XIXIP(JP1,IM1)+(AJ2(JP1))=(P88+P87-P83-P82)  
)AJ1(JP1))=(P83+P82-P88-P87))/2.0  
P072 = XIYIP(JP1,IM2)\*(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JP1,IM2)+  
XIYIP(JP1,IM2)=(OXINF\*S/XIXIP(JP1,IM2)+(AJ2(JP1))=(P87+P86-P82-P81)  
)AJ1(JP1))=(P82+P81-P87-P86))/2.0  
P073 = XIYIP(J,I)\*(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIYIP(J,I)  
=(OXINF\*S/XIXIP(J,I)+(AJ2(J))=(P119+P118-P114-P113)+AJ1(J))=(P114  
+P113-P109-P108))/2.0  
P074 = XIYIP(J,IM1)\*(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+  
XIYIP(J,IM1)=(OXINF\*S/XIXIP(J,IM1)+(AJ2(J))=(P118+P117-P113-P112)+  
AJ1(J))=(P113+P112-P108-P107))/2.0  
P075 = XIYIP(J,IM2)\*(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+  
XIYIP(J,IM2)=(OXINF\*S/XIXIP(J,IM2)+(AJ2(J))=(P117+P116-P112-P111)+  
AJ1(J))=(P112+P111-P107-P106))/2.0

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RIP,RIM,RJ, RK, RJP, RKP

T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2  
RIP+SG(I,J,K)=(T0+S+(G1=(P018+P083+P01+P048+P031+2)+1)==G2)+T0  
T0=(G1=(P018+P083+P03+P048+P033+2)+1)==G2  
RIM+SG(IM1,J,K)=(T0+S+(G1=(P017+P082+P02+P047+P032+2)+1)==G2)+T0  
T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2  
T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2  
T2=(G1=(P020+P088+P05+P050+P035+2)+1)==G2  
T3=(G1=(P021+P088+P05+P08+P036+2)+1)==G2  
RJ=(SG(IM1,JM1,K)=(T3+S+T2)+SG(I,JM1,K)=(T2+S+(G1=(P019+P084+P04+  
P049+P034+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=(  
P018+P083+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0  
T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2  
T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2  
T2=(G1=(P053+P08+P023+P088+P038+2)+1)==G2  
T3=(G1=(P054+P09+P024+P089+P039+2)+1)==G2  
RK=(SG(IM1,J,KM1)=(T3+S+T2)+SG(I,J,KM1)=(T2+S+(G1=(P052+P07+P022+  
P087+P037+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=(  
P018+P083+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0  
T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2  
T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2  
T2=(G1=(P028+P071+P011+P058+P041+2)+1)==G2  
T3=(G1=(P027+P072+P012+P087+P042+2)+1)==G2  
RJP=(SG(IM1,JP1,K)=(T3+S+T2)+SG(I,JP1,K)=(T2+S+(G1=(P025+P070+P010  
+P055+P040+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=  
P018+P083+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0  
T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2  
T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2  
T2=(G1=(P029+P07+P014+P059+P044+2)+1)==G2  
T3=(G1=(P030+P075+P015+P080+P045+2)+1)==G2  
RKP=(SG(IM1,J,KP1)=(T3+S+T2)+SG(I,J,KP1)=(T2+S+(G1=(P028+P073+P013  
+P058+P043+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=  
P018+P083+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0

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264. C DER
265. C P36
266. IF (CND(I1,JJ,KK,IM2,J,KM2)) THEN
267. P039P36 = -(1.0/2.0*A1K(KM1))
268. TO*(G1=(P054+P09+P024+P069+P039**2)+1)**(G2-1)
269. RKP36=(2*G1+G2+SG(IM1,J,KM1)+P039+P039P36+TO*S+2*G1+G2+P039+
270. P039P36+TO)/4.0
271. RESP36=((P88-P83)*RKP36+TA33M+2*XIXXI(J,I)=OZINF=RKP36/DZETAC(K))
272. V2
273. DER = RESP36
274.
275. C P37
276. ELSEIF (CND(I1,JJ,KK,IM1,J,KM2)) THEN
277. P038P37 = -(1.0/2.0*A1K(KM1))
278. P039P37 = -(1.0/2.0*A1K(KM1))
279. TO*G2-1
280. T1=(G1=(P053+P08+P023+P068+P038**2)+1)**TO
281. T2=2*G1+G2+P038+P038P37+T1
282. T3=(G1=(P054+P09+P024+P069+P039**2)+1)**TO
283. RKP37=(SG(IM1,J,KM1)+[2*G1+G2+P039+P039P37+T3+S+T2]+2*G1+G2+SG(I,J
284. ,KM1))+P038+P038P37+T1+S-2*G1+G2+P039+P039P37+T3+T2)/4.0
285. RESP37=((P88-P83)*RKP37+TA33M+2*XIXXI(J,I)=OZINF=RKP37/DZETAC(K))
286. V2
287. DER = RESP37
288.
289. C P38
290. ELSEIF (CND(I1,JJ,KK,I,J,KM2)) THEN
291. P037P38 = -(1.0/2.0*A1K(KM1))
292. P038P38 = -(1.0/2.0*A1K(KM1))
293. TO*G2-1
294. T1=(G1=(P053+P08+P023+P068+P038**2)+1)**TO
295. RKP38=(SG(I,J,KM1)+[2*G1+G2+P038+P038P38+T1+S+2*G1+G2+P037+P037P38
296. +G1=(P052+P07+P022+P067+P037**2)+1)**TO]+2*G1+G2+SG(IM1,J,KM1))+
297. P038+P038P38+T1+2*G1+G2+P038+P038P38+T1)/4.0
298. RESP38=((P88-P83)*RKP38+TA33M+2*XIXXI(J,I)=OZINF=RKP38/DZETAC(K))
299. V2
300. DER = RESP38
301.
302. C P39
303. ELSEIF (CND(I1,JJ,KK,IP1,J,KM2)) THEN
304. P037P39 = -(1.0/2.0*A1K(KM1))
305. RKP39=G1+G2+SG(I,J,KM1)+P037+P037P39+(G1=(P052+P07+P022+P067+P037
306. **2)+1)**(G2-1)/2.0
307. RESP39=((P88-P83)*RKP39+TA33M+2*XIXXI(J,I)=OZINF=RKP39/DZETAC(K))
308. V2
309. DER = RESP39
310.
311. C P56
312. ELSEIF (CND(I1,JJ,KK,IM2,IM1,KM1)) THEN
313. P024P56 = -(1.0/2.0*AJ1(J))
314. P036P56 = -(1.0/2.0*A1K(K))
315. P054P56 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM2))
316. P059P56 = -(1.0/2.0*AJ1(J))
317. TO*(G1=(P021+P066+P051+P06+P036**2)+1)**(G2-1)
318. RJP56=[2*G1+G2+SG(IM1,IM1,KM1)+P036+P036P56+TO*S+2*G1+G2+P036+
319. P036P56+TO]/4.0
320. TO*(P054P56+P09+P024+P069P56+P024P56+P069
321. T1=(G1=(P054+P09+P024+P069+P039**2)+1)**(G2-1)
322. AKP56=(G1+G2+SG(IM1,J,KM1)+TO*T1+S+G1+G2+TO*T1)/4.0
323. RESP56=((P88-P83)*RKP56+TA33M+2*XIXXI(J,I)=OZINF=RKP56/DZETAC(K))
324. V2+S=(RJP56+TA21M+((P89-P88+P84-P83)=TA12+(P88-P87+P83-P82)=TA11)
325. +(P88-P83)=RJP56+TA22M)
326. DER = RESP56
327.
328. C P57
329. ELSEIF (CND(I1,JJ,KK,IM1,IM1,KM1)) THEN
330. P023P57 = -(1.0/2.0*AJ1(J))
331. P024P57 = -(1.0/2.0*AJ1(J))
332. P036P57 = -(1.0/2.0*A1K(K))
333. P038P57 = -(1.0/2.0*A1K(K))
334. P063P57 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
335. P084P57 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM2))
336. P088P57 = -(1.0/2.0*AJ1(J))
337. P089P57 = -(1.0/2.0*AJ1(J))
338. TO*G2-1
339. T1=(G1=(P020+P065+P05+P050+P035**2)+1)**TO
340. T2=2*G1+G2+P035+P035P57+T1
341. T3=(G1=(P021+P066+P051+P06+P036**2)+1)**TO
342. RJP57=(SG(IM1,IM1,KM1)+[2*G1+G2+P036+P036P57+T3+S+T2]+2*G1+G2+SG(I,
343. JM1,KM1)+P035+P035P57+T1+S-2*G1+G2+P036+P036P57+T3+T2)/4.0
344. TO*(P053P57+P08+P023+P068P57+P023P57+P068
345. T1+G2-1
346. T2=(G1=(P053+P08+P023+P068+P038**2)+1)**T1
347. T3+G1+G2+TO=T2
348. T4+P054P57+P09+P024+P069P57+P024P57+P069
349. T5=(G1=(P054+P09+P024+P069+P039**2)+1)**T1
350. RKP57=(SG(IM1,J,KM1)+[G1+G2+T4+T5+S+T3]+G1+G2+SG(I,J,KM1)+TO+T2+S+
351. G1+G2+T4+T5+T3)/4.0
352. RESP57=((P88-P83)*RKP57+TA33M+2*XIXXI(J,I)=OZINF=RKP57/DZETAC(K))
353. V2+S=(RJP57+TA21M+((P89-P88+P84-P83)=TA12+(P88-P87+P83-P82)=TA11)
354. +(P88-P83)=RJP57+TA22M)
355. DER = RESP57
356.
357. C P58
358. ELSEIF (CND(I1,JJ,KK,I,IM1,KM1)) THEN
359. P022P58 = -(1.0/2.0*AJ1(J))
360. P023P58 = -(1.0/2.0*AJ1(J))
361. P034P58 = -(1.0/2.0*A1K(K))
362. P035P58 = -(1.0/2.0*A1K(K))
363. P052P58 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
364. P053P58 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
365. P067P58 = -(1.0/2.0*AJ1(J))
366. P068P58 = -(1.0/2.0*AJ1(J))
367. TO*G2-1
368. T1=(G1=(P020+P065+P05+P050+P035**2)+1)**TO
369. RJP58=(SG(I,IM1,KM1)+[2*G1+G2+P035+P035P58+T1+S+2*G1+G2+P034+P034P58
370. +G1=(P019+P064+P04+P049+P034**2)+1)**TO]+2*G1+G2+SG(IM1,IM1,KM1)+
371. P035+P035P58+T1+2*G1+G2+P035+P035P58+T1)/4.0
372. TO*(P053P58+P06+P023+P068P58+P023P58+P068
373. T1+G2-1
374. T2=(G1=(P053+P08+P023+P068+P038**2)+1)**T1
375. RKP58=(SG(I,J,KM1)+[G1+G2+TO+T2+S+G1+G2+(P052P58+P07+P022+P067P58+
376. P022P58+P067)+G1=(P052+P07+P022+P067+P037**2)+1)**T1]+G1+G2+SG(
377. IM1,IM1,KM1)+TO+T2+G1+G2+TO+T2)/4.0
378. RJP59=(G1+G2+SG(I,IM1,KM1)+[P052P58+P07+P022+P067P58+P022P58+P067]+(
379. G1=(P052+P07+P022+P067+P037**2)+1)**T1)/4.0
380. RESP58=((P88-P83)*RKP58+TA33M+2*XIXXI(J,I)=OZINF=RKP58/DZETAC(K))
381. V2+S=(RJP58+TA21M+((P89-P88+P84-P83)=TA12+(P88-P87+P83-P82)=TA11)
382. +(P88-P83)=RJP58+TA22M)
383. DER = RESP58
384.
385. C P59
386. ELSEIF (CND(I1,JJ,KK,IP1,IM1,KM1)) THEN
387. P022P59 = -(1.0/2.0*AJ1(J))
388. P034P59 = -(1.0/2.0*A1K(K))
389. P052P59 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
390. P067P59 = -(1.0/2.0*AJ1(J))
391. RJP59=(G1+G2+SG(I,IM1,KM1)+[P034+P034P59+(G1=(P019+P064+P04+P049+P034
392. **2)+1)**(G2-1)]/2.0
393. RKP59=(SG(I,J,KM1)+[P052P59+P07+P022+P067P59+P022P59+P067]+(
394. G1=(P052+P07+P022+P067+P037**2)+1)**T1)/4.0
395. RESP59=((P88-P83)*RKP59+TA33M+2*XIXXI(J,I)=OZINF=RKP59/DZETAC(K))
396. V2+S=(RJP59+TA21M+((P89-P88+P84-P83)=TA12+(P88-P87+P83-P82)=TA11)
397. +(P88-P83)=RJP59+TA22M)
398. DER = RESP59
399.
400. C P61
401. ELSEIF (CND(I1,JJ,KK,IM2,J,KM1)) THEN
402. P08P61 = OX1(IM2)=S
403. P024P61 = [-AJ2(J)+AJ1(J)]/2.0
404. P033P61 = -(1.0/2.0*A1K(K))
405. P039P61 = [-A2K(KM1)+A1K(KM1)]/2.0

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395. P054P61 = DXII(IM2)=A11R(J,IM2)+S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/
396. 2.0
397. P069P61 = DXII(IM2)=XIYIP(J,IM2)+S+(-AJ2(J)+AJ1(J))/2.0
398. To: (G1=[P018+P063+P03=P048+P033**2+1])=(G2-1)
399. RIMP61+2=G1+G2+SG(IM1,J,K)=P033+P033P61+TO+S+2=G1+G2+P033+P033P61+
400. TO
401. To: (G1=[P018+P063+P03=P048+P033**2+1])=(G2-1)
402. RJPP61+2=G1+G2+SG(IM1,J,K)=P033+P033P61+TO+S+2=G1+G2+P033+P033P61+
403. TO/4.0
404. To:G2-1
405. T1: (G1=[P018+P063+P03=P048+P033**2+1])=TO
406. T2: (G1=[P054+P09+P024=P088+P039**2+1])=TO
407. T3: P054+P09P61+P054P61+P09+P024+P088P61+P024P61+P088+2*P039+
408. P039P61
409. RKP61+ (G1+G2+SG(IM1,J,KM1)=T2+T3+S+2=G1+G2+SG(IM1,J,K)=P033+
410. P033P61+T1+S+G1+G2+T2+T3+2=G1+G2+P033+P033P61+T1)/4.0
411. To: (G1=[P018+P063+P03=P048+P033**2+1])=(G2-1)
412. RJPP61+2=G1+G2+SG(IM1,J,K)=P033+P033P61+TO+S+2=G1+G2+P033+P033P61
413. +TO)/4.0
414. To: (G1=[P018+P063+P03=P048+P033**2+1])=(G2-1)
415. RKP61+2=G1+G2+SG(IM1,J,K)=P033+P033P61+TO+S+2=G1+G2+P033+P033P61
416. +TO)/4.0
417. RESP61+ ((P88-P83)=RKP61+TA33M+2*XIXI(J,I)=OXINF=RKP61/DZETAC(K))=
418. V2+((-P88+P113)=RKP61+TA33P+2*XIXI(J,I)=OXINF=RKP61/DZETAC(K))=
419. V1+S+ (RIMP61+TA12M+((P93+P92-P88-P87)=TAJ2+ (P88+P87-P83-P82)=
420. TAJ1)+ (P88-P87)=RIMP61+TA11M+2*OXINF=RIMP61/DXIC(I))+S+ (RJPP61+
421. TA21M+ ((P89-P88-P84-P83)=TAI2+ (P88-P87+P83-P82)=TAI1)+ (P88-P83)=
422. RJP61+TA22M)+RJPP61+TA21P+ ((P94-P93+P89-P88)=TAI2+ (P93-P92+P88-
423. P87)=TAI1)+ (P93-P88)=RJPP61+TA22P
424. DER = RESP61
425.
426. C P62
427. ELSEIF (CND(I1,JJ,KK,IM1,J,KM1)) THEN
428. P08P62 = DXII(IM1)=S
429. P09P62 = DXII(IM2)
430. P023P62 = (-AJ2(J)+AJ1(J))/2.0
431. P024P62 = (-AJ2(J)+AJ1(J))/2.0
432. P032P62 = -(1.0/2.0*A1K(K))
433. P033P62 = -(1.0/2.0*A1K(K))
434. P036P62 = (-A2K(KM1)+A1K(KM1))/2.0
435. P038P62 = (-A2K(KM1)+A1K(KM1))/2.0
436. P053P62 = DXII(IM1)+A11R(J,IM1)+S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/
437. 2.0
438. P054P62 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/2.0+DXII(IM2)+A11R(J,IM2)
439. P068P62 = DXII(IM1)*XIYIP(J,IM1)+S+(-AJ2(J)+AJ1(J))/2.0
440. P069P62 = DXII(IM2)*XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
441. To: (G1=[P017+P062+P02=P047+P032**2+1])=(G2-1)
442. RIPP62+2=G1+G2+SG(I,J,K)=P032+P032P62+TO+S+2=G1+G2+P032+P032P62+TO
443. +G2-1
444. T1: (G1=[P018+P062+P03=P048+P033**2+1])=TO
445. RIMP62+SG(IM1,J,K)= (2=G1+G2+P033+P033P62+T1+S+2=G1+G2+P032+P032P62
446. + (G1=[P017+P062+P02=P047+P032**2+1])=TO)+2=G1+G2+P033+P033P62+T1
447. +G2-1
448. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
449. T2+2=G1+G2+P032+P032P62+T1
450. T3: (G1=[P018+P062+P03=P048+P033**2+1])=TO
451. RJPP62+ (SG(IM1,J,K)= (2=G1+G2+P033+P033P62+T3+S+T2)+2=G1+G2+SG(I,J,K
452. )+P032+P032P62+T1+S+2=G1+G2+P033+P033P62+T3+T2)/4.0
453. To:G2-1
454. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
455. T2+2=G1+G2+P032+P032P62+T1
456. T3: (G1=[P018+P062+P03=P048+P033**2+1])=TO
457. T4: (G1=[P053+P08+P023=P088+P038**2+1])=TO
458. T5: P053+P08P62+P053P62+P08+P023+P088P62+P023P62+P088+2*P038+
459. P038P62
460. T8+G1+G2+T4+T5
461. T7: (G1=[P054+P09+P024=P088+P039**2+1])=TO
462. T8: P054+P09P62+P054P62+P09+P024+P088P62+P024P62+P088+2*P039+
463. P039P62
464. RKP62+ (SG(IM1,J,KM1)= (G1+G2+T7+T8+S+T8)+SG(IM1,J,K)= (2=G1+G2+P033+
465. P033P62+T3+S+T2)+G1+G2+SG(I,J,KM1)=T4+T5+S+2=G1+G2+SG(I,J,K)=P032
466. +P032P62+T1+S+G1+G2+T7+T8+T8+2=G1+G2+P033+P033P62+T3+T2)/4.0
467. To:G2-1
468. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
469. T2+2=G1+G2+P032+P032P62+T1
470. T3: (G1=[P018+P062+P03=P048+P033**2+1])=TO
471. RJPP62+ (SG(IM1,J,K)= (2=G1+G2+P033+P033P62+T3+S+T2)+2=G1+G2+SG(I,J,
472. K)=P032+P032P62+T1+S+2=G1+G2+P033+P033P62+T3+T2)/4.0
473. To:G2-1
474. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
475. T2+2=G1+G2+P032+P032P62+T1
476. T3: (G1=[P018+P062+P03=P048+P033**2+1])=TO
477. RKP62+ (SG(IM1,J,K)= (2=G1+G2+P033+P033P62+T3+S+T2)+2=G1+G2+SG(I,J,
478. K)=P032+P032P62+T1+S+2=G1+G2+P033+P033P62+T3+T2)/4.0
479. RESP62+ ((P88-P83)=RKP62+TA33M+2*XIXI(J,I)=OXINF=RKP62/DZETAC(K))=
480. V2+((-P88+P113)=RKP62+TA33P+2*XIXI(J,I)=OXINF=RKP62/DZETAC(K))=
481. V1+S+ (RIMP62+TA12M+((P93+P92-P88-P87)=TAJ2+ (P88+P87-P83-P82)=
482. TAJ1)+ (P88-P87)=RIMP62+TA11M+2*OXINF=RIMP62/DXIC(I))+S+ (RIPP62+TA21P+
483. ((P94-P93+P89-P88)=TAI2+ (P88-P87+P83-P82)=TAI1)+S+ (RJP62+TA21M+ (
484. P88-P88+P84-P83)=TAI2+ (P88-P87+P83-P82)=TAI1)+ (P88-P83)+RJP62+
485. TA22M)+RIPP62+TA21P+ ((P94-P93+P89-P88)=TAI2+ (P93-P92+P88-P87)=
486. TAI1)+ (P93-P88)=RIPP62+TA22P+ (P89-P88)=RIPP62+TA11P+2*OXINF+
487. RIPP62/DXIC(I)
488. DER = RESP62
489.
490. C P63
491. ELSEIF (CND(I1,JJ,KK,I,J,KM1)) THEN
492. P07P63 = DXII(I)=S
493. P08P63 = DXII(IM1)
494. P022P63 = (-AJ2(J)+AJ1(J))/2.0
495. P023P63 = (-AJ2(J)+AJ1(J))/2.0
496. P031P63 = -(1.0/2.0*A1K(K))
497. P032P63 = -(1.0/2.0*A1K(K))
498. P037P63 = (-A2K(KM1)+A1K(KM1))/2.0
499. P038P63 = (-A2K(KM1)+A1K(KM1))/2.0
500. P052P63 = DXII(I)+A11R(J,I)+S+(-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0
501. P053P63 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/2.0+DXII(IM1)+A11R(J,IM1)
502. P067P63 = DXII(I)*XIYIP(J,I)+S+(-AJ2(J)+AJ1(J))/2.0
503. P068P63 = DXII(IM1)*XIYIP(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
504. To:G2-1
505. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
506. RIPP63+SG(I,J,K)= (2=G1+G2+P032+P032P63+T1+S+2=G1+G2+P031+P031P63+ (
507. G1=[P018+P061+P01=P048+P031**2+1])=TO)+2=G1+G2+P032+P032P63+T1
508. RIMP63+2=G1+G2+SG(IM1,J,K)=P032+P032P63+ (G1=[P017+P062+P02=P047+
509. P032**2+1])=(G2-1)
510. To:G2-1
511. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
512. RJP63+ (SG(I,J,K)= (2=G1+G2+P032+P032P63+T1+S+2=G1+G2+P031+P031P63+ (
513. G1=[P018+P061+P01=P048+P031**2+1])=TO)+2=G1+G2+SG(IM1,J,K)+P032+
514. P032P63+T1+2=G1+G2+P032+P032P63+T1)/4.0
515. To:G2-1
516. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
517. T2: (G1=[P053+P08+P023=P088+P038**2+1])=TO
518. T3: P053+P08P63+P053P63+P08+P023+P088P63+P023P63+P088+2*P038+
519. P038P63
520. RKP63+ (SG(I,J,KM1)= (G1+G2+T2+T3+S+G1+G2= (G1=[P052+P07+P022=P067+
521. P037**2+1])=TO+ (P052+P07P63+P052P63+P07+P022+P067P63+P022P63+
522. P067+2*P037+P037P63))+SG(I,J,K)= (2=G1+G2+P032+P032P63+T1+S+2=G1+
523. G2+P031+P031P63+ (G1=[P018+P061+P01=P048+P031**2+1])=TO)+G1+G2+SG
524. (IM1,J,KM1)=T2+T3+G1+G2+T2+T3+2=G1+G2+SG(IM1,J,K)=P032+P032P63+T1+
525. +2=G1+G2+P032+P032P63+T1)/4.0
526. To:G2-1
527. T1: (G1=[P017+P062+P02=P047+P032**2+1])=TO
528. RJPP63+ (SG(I,J,K)= (2=G1+G2+P032+P032P63+T1+S+2=G1+G2+P031+P031P63+ (
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528 . [G1=(P018+P051+P01+P048+P031==2)+1]==TO)+2*G1+G2+SG(IM1,J,K)+P032
529 . +P032P63+T1+2*G1+G2+P032+P032P63+T1)/4.0
530 . TO+G2-1
531 . T1:[G1=(P017+P052+P02+P047+P032==2)+1]==TO
532 . RKPP63:[SG(I,J,K)]=(2*G1+G2+P032+P032P63+T1+5+2*G1+G2+P031+P031P63+
533 . [G1=(P018+P051+P01+P048+P031==2)+1]==TO)+2*G1+G2+SG(IM1,J,K)+P032
534 . +P032P63+T1+2*G1+G2+P032+P032P63+T1)/4.0
535 . RESP63:[(P68-P63)+RKPP63+TA33M-[RK-TA33M]+2*XIXXI(J,I)+OZINF+RKP63/
536 . DZETAC(K)]+Y2-[(-P68+P113)+RKPP63+TA33P+2*XIXXI(J,I)+OZINF+RKP63
537 . /DZETAC(K)]+Y1+5*[RIMP63+TA12M+((P93+P82-P68-P67)+TAJ2+(P88+P87-
538 . P83-P82)+TAJ1)+(P88-P67)+RIMP63+TA11M+2*OXINF+RIMP63/DXIC(I)]+
539 . RIPP63+TA12P+((P94+P83-P68-P68)+TAJ2+(P88+P88-P68-P63)+TAJ1)+S-[
540 . RJP63+TA21M+((P88+P88+P84-P63)+TA12-(P88+P87+P83-P62)+TA11)+(P88-
541 . P83)+RJP63+TA22M)+RJP63+TA21P+((P94+P83+P88-P68)+TA12-(P93+P82+
542 . P88+P87)+TA11)+(P93+P88)+RJP63+TA22P+(P88+P88)+RIPP63+TA11P+2*
543 . OXINF+RIPP63/DXIC(I)
544 . DER = RESP63
545 .
546 . C P64
547 . ELSEIF [CND(II,JJ,KK,IP1,J,KM1)] THEN
548 . P022P64 = AJ2(J)/2.0
549 . P031P64 = -(1.0/2.0*A1K(K))
550 . P037P64 = (-A2K(KM1)+A1K(KM1))/2.0
551 . P052P64 = (-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0+DXII(I)*A1R(J,I)
552 . P087P64 = DXII(I)*XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
553 . R1PP64+2*G1+G2+SG(I,J,K)+P031+P031P64+[G1=(P018+P051+P01+P048+P031
554 . ==2)+1]==(G2-1)
555 . RJP64+G1+G2+SG(I,J,K)+P031+P031P64+[G1=(P018+P051+P01+P048+P031==2
556 . )+1]==(G2-1)/2.0
557 . TO+G2-1
558 . RKP64:[G1=G2+SG(I,J,KM1)]=(G1+[P052+P07+P022+P067+P037==2)+1]==TO+(
559 . P052+P07P64+P052P64+P07+P022+P067P64+P022P64+P067+2*P037+P037P64+
560 . +2*G1+G2+SG(I,J,K)+P031+P031P64+[G1=(P018+P051+P01+P048+P031==2)+
561 . ])+TO)/4.0
562 . RJP64+G1+G2+SG(I,J,K)+P031+P031P64+[G1=(P018+P051+P01+P048+P031==
563 . 2)+1]==(G2-1)/2.0
564 . RKPP64+G1+G2+SG(I,J,K)+P031+P031P64+[G1=(P018+P051+P01+P048+P031==
565 . 2)+1]==(G2-1)/2.0
566 . RESP64:[(P68-P63)+RKPP64+TA33M+2*XIXXI(J,I)+OZINF+RKP64/DZETAC(K)]+
567 . Y2-[(-P68+P113)+RKPP64+TA33P+2*XIXXI(J,I)+OZINF+RKP64/DZETAC(K)]+
568 . Y1+RJP64+TA12P+((P94+P83-P68-P68)+TAJ2+(P88+P88-P68-P63)+TAJ1)+
569 . S=[RJP64+TA21M+((P88+P88+P84-P63)+TA12-(P88+P87+P83-P62)+TA11)+
570 . P88-P63)+RJP64+TA22M)+RJP64+TA21P+((P94+P83+P88-P68)+TA12+(P93-
571 . P82+P88-P87)+TA11)+(P93+P88)+RJP64+TA22P+(P88+P88)+RIPP64+TA11P+
572 . 2*OXINF+RIPP64/DXIC(I)
573 . DER = RESP64
574 .
575 . C P66
576 . ELSEIF [CND(II,JJ,KK,IM2,JP1,KM1)] THEN
577 . P042P66 = AJ2(J)/2.0
578 . P042P66 = -(1.0/2.0*A1K(K))
579 . P054P66 = AJ2(J)*XIYIP(J,IM2)/2.0
580 . P089P66 = AJ2(J)/2.0
581 . TO+P054P66+P05+P024+P069P66+P024P66+P055
582 . T1:[G1=(P054+P09+P024+P069+P038==2)+1]==(G2-1)
583 . RKPP66:[G1=G2+SG(IM1,J,KM1)]=(G1+TO+T1+5+2*G1+G2+TO+T1)/4.0
584 . TO:[G1=(P027+P072+P012+P057+P042==2)+1]==(G2-1)
585 . RJP66:[2*G1+G2+SG(IM1,JP1,K)+P042+P042P66+TO+5+2*G1+G2+P042+
586 . P042P66+TO)/4.0
587 . RESP66:[(P68-P63)+RKPP66+TA33M+2*XIXXI(J,I)+OZINF+RKP66/DZETAC(K)]+
588 . Y2+RJP66+TA21P+((P84+P83+P89-P68)+TA12-(P93+P92+P88-P87)+TA11)+[
589 . P83-P88)+RJP66+TA22P
590 . DER = RESP66
591 .
592 . C P67
593 . ELSEIF [CND(II,JJ,KK,IM1,JP1,KM1)] THEN
594 . P023P67 = AJ2(J)/2.0
595 . P024P67 = AJ2(J)/2.0
596 . P041P67 = -(1.0/2.0*A1K(K))
597 . P042P67 = -(1.0/2.0*A1K(K))
598 . P083P67 = AJ2(J)*XIYIP(J,IM1)/2.0
599 . P054P67 = AJ2(J)*XIYIP(J,IM2)/2.0
600 . P088P67 = AJ2(J)/2.0
601 . TO+P053P67+P08+P023+P088P67+P023P67+P088
602 . T1+G2-1
603 . T2:[G1=(P053+P08+P023+P088+P038==2)+1]==T1
604 . T3+G1+G2+TO+T2
605 . T4+P054P67+P08+P024+P088P67+P024P67+P088
606 . T5:[G1=(P054+P08+P024+P088+P038==2)+1]==T1
607 . RKPP67:[SG(IM1,J,KM1)]=(G1+G2+T4+T5+5+T3)+G1+G2+SG(I,J,KM1)+TO+T2+5+
608 . G1+G2+T4+T5+T3)/4.0
609 . TO+G2-1
610 . T1:[G1=(P028+P071+P011+P058+P041==2)+1]==TO
611 . T2+2*G1+G2+P041+P041P67+T1
612 . T3+[G1=(P027+P072+P012+P057+P042==2)+1]==TO
613 . RJP67:[SG(IM1,JP1,K)]=(2*G1+G2+P042+P042P67+T3+5+T2)+2*G1+G2+SG(I,
614 . JP1,K)+P041+P041P67+T1+5+2*G1+G2+P042+P042P67+T3+T2)/4.0
615 . RESP67:[(P68-P63)+RKPP67+TA33M+2*XIXXI(J,I)+OZINF+RKP67/DZETAC(K)]+
616 . Y2+RJP67+TA21P+((P94+P83+P89-P68)+TA12-(P93+P82+P88-P87)+TA11)+[
617 . P83-P88)+RJP67+TA22P
618 . DER = RESP67
619 .
620 . C P68
621 . ELSEIF [CND(II,JJ,KK,I,JP1,KM1)] THEN
622 . P022P68 = AJ2(J)/2.0
623 . P023P68 = AJ2(J)/2.0
624 . P040P68 = -(1.0/2.0*A1K(K))
625 . P041P68 = -(1.0/2.0*A1K(K))
626 . P052P68 = AJ2(J)*XIYIP(J,I)/2.0
627 . P083P68 = AJ2(J)*XIYIP(J,IM1)/2.0
628 . P087P68 = AJ2(J)/2.0
629 . P088P68 = AJ2(J)/2.0
630 . TO+P053P68+P08+P023+P088P68+P023P68+P058
631 . T1+G2-1
632 . T2:[G1=(P053+P08+P023+P088+P038==2)+1]==T1
633 . RKPP68:[SG(I,J,KM1)]=(G1+G2+TO+T2+5+G1+G2+(P052P68+P07+P022+P067P68+
634 . P022P68+P067)+[G1=(P052+P07+P022+P067+P037==2)+1]==T1]+G1+G2+SG(
635 . IM1,J,KM1)+TO+T2+G1+G2+TO+T2)/4.0
636 . TO+G2-1
637 . T1:[G1=(P028+P071+P011+P058+P041==2)+1]==TO
638 . RJP68:[SG(I,JP1,K)]=(2*G1+G2+P041+P041P68+T1+5+2*G1+G2+P040+
639 . P040P68+[G1=(P025+P070+P010+P058+P040==2)+1]==TO)+2*G1+G2+SG(IM1,
640 . JP1,K)+P041+P041P68+T1+2*G1+G2+P041+P041P68+T1)/4.0
641 . RESP68:[(P68-P63)+RKPP68+TA33M+2*XIXXI(J,I)+OZINF+RKP68/DZETAC(K)]+
642 . Y2+RJP68+TA21P+((P84+P83+P89-P68)+TA12-(P93+P92+P88-P87)+TA11)+[
643 . P83-P88)+RJP68+TA22P
644 . DER = RESP68
645 .
646 . C P69
647 . ELSEIF [CND(II,JJ,KK,IP1,JP1,KM1)] THEN
648 . P022P69 = AJ2(J)/2.0
649 . P040P69 = -(1.0/2.0*A1K(K))
650 . P052P69 = AJ2(J)*XIYIP(J,I)/2.0
651 . P087P69 = AJ2(J)/2.0
652 . RKP69+G1+G2+SG(I,J,KM1)]=(P052P69+P07+P022+P067P69+P022P69+P087)+[
653 . G1=(P052+P07+P022+P067+P037==2)+1]==(G2-1)/4.0
654 . RJP69+G1+G2+SG(I,JP1,K)+P040+P040P69+[G1=(P028+P070+P010+P058+
655 . P040==2)+1]==(G2-1)/2.0
656 . RESP69:[(P68-P63)+RKPP69+TA33M+2*XIXXI(J,I)+OZINF+RKP69/DZETAC(K)]+
657 . Y2+RJP69+TA21P+((P84+P83+P89-P68)+TA12-(P93+P92+P88-P87)+TA11)+[
658 . P83-P88)+RJP69+TA22P
659 . DER = RESP69
660 .
661 . C P70
662 . ELSEIF [CND(II,JJ,KK,IM2,JP1,KM1)] THEN
663 . P021P70 = -(1.0/2.0*A1K(KM1))

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860. POS1P76 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1,IM2))
861. PO6P76 = -[1.0/2.0*AJ1(JM1)]
862. TO1(G1=[P020+P065+P05+P050+P035==2)+1]==(G2-1)
863. T1=[G1=[P020+P065+P05+P050+P035==2)+1]==(G2-1)
864. RJP77=[SG(IM1, JM1, K)]*(G1=G2+T4+T5+S+T3)+G1=G2+SG(I, JM1, K)+T1+T2+S+
865. RESP78+S=[RJP77+TA21M]=([P89-P88+P84-P83]=TAI2+(P88-P87+P83-P82)=
866. TA11)+[P88-P83]+RJP77+TA22M)
867. DER = RESP76
868.
869. C P77
870. ELSEIF [CND(I, JJ, KK, IM1, JM2, K)] THEN
871. PO20P77 = -[1.0/2.0*AJ1(JM1)]
872. PO21P77 = -[1.0/2.0*AJ1(JM1)]
873. PO50P77 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1, IM1)]
874. PO51P77 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1, IM2)]
875. PO65P77 = -[1.0/2.0*AJ1(JM1)]
876. PO66P77 = -[1.0/2.0*AJ1(JM1)]
877. TO=G2-1
878. T1=[G1=[P020+P065+P05+P050+P035==2)+1]==TO
879. T2=[P020+P065P77+P020P77+P065+P05+P050P77
880. T3=G1+G2+T1+T2
881. T4=[G1=[P021+P066+P051+P06+P038==2)+1]==TO
882. T5=[P021+P066P77+P021P77+P066+P051P77+P06
883. RJP77=[SG(IM1, JM1, K)]*(G1=G2+T4+T5+S+T3)+G1=G2+SG(I, JM1, K)+T1+T2+S+
884. G1+G2+T4+T5+T3)/4.0
885. RESP77+S=[RJP77+TA21M]=([P89-P88+P84-P83]=TAI2+(P88-P87+P83-P82)=
886. TA11)+[P88-P83]+RJP77+TA22M)
887. DER = RESP77
888.
889. C P78
890. ELSEIF [CND(I, JJ, KK, I, JM2, K)] THEN
891. PO19P78 = -[1.0/2.0*AJ1(JM1)]
892. PO20P78 = -[1.0/2.0*AJ1(JM1)]
893. PO49P78 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1, I)]
894. PO50P78 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1, IM1)]
895. PO84P78 = -[1.0/2.0*AJ1(JM1)]
896. PO85P78 = -[1.0/2.0*AJ1(JM1)]
897. TO=G2-1
898. T1=[G1=[P020+P065+P05+P050+P035==2)+1]==TO
899. T2=[P020+P065P78+P020P78+P065+P05+P050P78
900. RJP78=[SG(I, JM1, K)]*(G1=G2+T1+T2+S+G1+G2+(G1=[P019+P064+P04+P049+
901. P034==2)+1]==TO+(P019+P064P78+P019P78+P064+P04+P049P78)+G1+G2+S+
902. [IM1, JM1, K)+T1+T2+G1+G2+T1+T2)/4.0
903. RESP78+S=[RJP78+TA21M]=([P89-P88+P84-P83]=TAI2+(P88-P87+P83-P82)=
904. TA11)+[P88-P83]+RJP78+TA22M)
905. DER = RESP78
906.
907. C P79
908. ELSEIF [CND(I, JJ, KK, IP1, JM2, K)] THEN
909. PO19P79 = -[1.0/2.0*AJ1(JM1)]
910. PO49P79 = -[1.0/2.0*AJ1(JM1)]*XIYIP(JM1, I)]
911. PO84P79 = -[1.0/2.0*AJ1(JM1)]
912. RJP79=[G1=G2+SG(I, JM1, K)]*(G1=[P019+P064+P04+P049+P034==2)+1]==(G2-1
913. )+[P019+P064P79+P019P79+P064+P04+P049P79]/4.0
914. RESP79+S=[RJP79+TA21M]=([P89-P88+P84-P83]=TAI2+(P88-P87+P83-P82)=
915. TA11)+[P88-P83]+RJP79+TA22M)
916. DER = RESP79
917.
918. C P81
919. ELSEIF [CND(I, JJ, KK, IM2, JM1, K)] THEN
920. PO81P81 = DXII(IM2)*S
921. PO18P81 = -[1.0/2.0*AJ1(J)]
922. PO21P81 = [-AJ2(JM1)+AJ1(JM1)]/2.0
923. PO38P81 = [-A2K(K)+A1K(K)]/2.0
924. PO48P81 = -[1.0/2.0*AJ1(J)]*XIYIP(J, IM2)]
925. PO51P81 = DXII(IM2)=A11R(JM1, IM2)+S+[-AJ2(JM1)+AJ1(JM1)]*XIYIP(JM1
926. , IM2)/2.0
927. PO83P81 = -[1.0/2.0*AJ1(J)]
928. PO86P81 = DXII(IM2)=XIYIP(JM1, IM2)+S+[-AJ2(JM1)+AJ1(JM1)]/2.0
929. TO=[G1=[P018+P063+P03+P048+P033==2)+1]==(G2-1)
930. T1=[P018+P063P81+P018P81+P063+P03+P048P81
931. RIMP81+G1+G2+SG(IM1, J, K)+TO+T1+S+G1+G2+TO+T1
932. TO+G2-1
933. T1=[G1=[P018+P063+P03+P048+P033==2)+1]==TO
934. T2=[P018+P063P81+P018P81+P063+P03+P048P81
935. T3=[G1=[P021+P066+P051+P06+P038==2)+1]==TO
936. T4=[P051+P066P81+P021+P066P81+P021P81+P066+P051P81+P06+2+P035+
937. P038P81
938. RJP81=[G1=G2+SG(IM1, JM1, K)+T3+T4+S+G1+G2+SG(IM1, J, K)+T1+T2+S+G1+G2
939. +T3+T4+G1+G2+T1+T2)/4.0
940. TO=[G1=[P018+P063+P03+P048+P033==2)+1]==(G2-1)
941. T1=[P018+P063P81+P018P81+P063+P03+P048P81
942. RKP81=[G1+G2+SG(IM1, J, K)+TO+T1+S+G1+G2+TO+T1)/4.0
943. TO=[G1=[P018+P063+P03+P048+P033==2)+1]==(G2-1)
944. T1=[P018+P063P81+P018P81+P063+P03+P048P81
945. RKP81=[G1+G2+SG(IM1, J, K)+TO+T1+S+G1+G2+TO+T1)/4.0
946. RESP81=[(P84-P83)=RKP81+TA33M+2+X[IXI(J, I)]=OZINF+RKP81/DZETAC(K)]+
947. V2+[-P88+RIMP81]=RKP81+TA33P+2+X[IXI(J, I)]=OZINF+RKP81/DZETAC(K)]
948. +Y1+S+[RIMP81+TA21M]=([P83+P82-P88-P87]=TAJ2+(P88+P87+P83-P82)=
949. TAJ1)+[P88+P87]+RIMP81+TA11M+2+OZINF+RIMP81/OXIC(I)]+S+[RJP81+
950. TA21M]=([P89-P88+P84-P83]=TAI2+(P88-P87+P83-P82)=TAI1)+[P88+P83]=
951. RJP81+TA22M)+RJP81+TA21P+([P84+P83+P85+P86]=TAI2+(P83+P82+P88-
952. P87)=TAI1)+[P83+P88]=RJP81+TA22P)
953. DER = RESP81
954.
955. C P82
956. ELSEIF [CND(I, JJ, KK, IM1, JM1, K)] THEN
957. PO5P82 = DXII(IM1)*S
958. PO6P82 = DXII(IM2)
959. PO17P82 = -[1.0/2.0*AJ1(J)]
960. PO18P82 = -[1.0/2.0*AJ1(J)]
961. PO20P82 = [-AJ2(JM1)+AJ1(JM1)]/2.0
962. PO21P82 = [-AJ2(JM1)+AJ1(JM1)]/2.0
963. PO35P82 = [-A2K(K)+A1K(K)]/2.0
964. PO38P82 = [-A2K(K)+A1K(K)]/2.0
965. PO47P82 = -[1.0/2.0*AJ1(J)]*XIYIP(J, IM1)]
966. PO48P82 = -[1.0/2.0*AJ1(J)]*XIYIP(J, IM2)]
967. PO62P82 = DXII(IM1)=A11R(JM1, IM1)+S+[-AJ2(JM1)+AJ1(JM1)]*XIYIP(JM1
968. , IM1)/2.0
969. PO51P82 = [-AJ2(JM1)+AJ1(JM1)]*XIYIP(JM1, IM2)/2.0+DXII(IM2)=A11R(
970. JM1, IM2)
971. PO62P82 = -[1.0/2.0*AJ1(J)]
972. PO63P82 = -[1.0/2.0*AJ1(J)]
973. PO65P82 = DXII(IM1)=XIYIP(JM1, IM1)+S+[-AJ2(JM1)+AJ1(JM1)]/2.0
974. PO68P82 = DXII(IM2)=XIYIP(JM1, IM2)+[-AJ2(JM1)+AJ1(JM1)]/2.0
975. TO=[G1=[P017+P062+P02+P047+P032==2)+1]==(G2-1)
976. T1=[P017+P062P82+P017P82+P062+P02+P047P82
977. RIPP82+G1+G2+SG(I, J, K)+TO+T1+S+G1+G2+TO+T1
978. TO+G2-1
979. T1=[G1=[P018+P063+P03+P048+P033==2)+1]==TO
980. T2=[P018+P063P82+P018P82+P063+P03+P048P82
981. RIMP82+SG(IM1, J, K)+[G1+G2+T1+T2+S+G1+G2+(G1=[P017+P062+P02+P047+
982. P032==2)+1]==TO+(P017+P062P82+P017P82+P062+P02+P047P82)+G1+G2+T1
983. +T2
984. TO+G2-1
985. T1=[G1=[P017+P062+P02+P047+P032==2)+1]==TO
986. T2=[P017+P062P82+P017P82+P062+P02+P047P82
987. T3+G1+G2+T1+T2
988. T4=[G1=[P018+P063+P03+P048+P033==2)+1]==TO
989. T5=[P018+P063P82+P018P82+P063+P03+P048P82
990. T6=[G1=[P020+P065+P05+P050+P035==2)+1]==TO
991. T7=[P020+P065P82+P020P82+P065+P050+P05P82+P05+P050P82+2+P035+
992. P035P82
993. T8+G1+G2+T6+T7

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792 T8=(G1*(P021+P066+P051+P05+P036+2)+1)==TO
793 T10=P051+P06P82+P021+P066P82+P021P82+P066+P051P82+P06+2+P036+
794 P036P82
795 RJP82=(SG(IM1, JM1, K))=(G1+G2+T8+T10+S+TA)+SG(IM1, J, K)=(G1+G2+T4+T5+
796 S+T3)+G1+G2+SG(I, JM1, K)+T6+T7+S+G1+G2+SG(I, J, K)+T1+T2+S+G1+G2+T8+
797 T10+T4+G1+G2+T4+T5+T3)/4.0
798 TO=G2-1
799 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
800 T2=P017+P062P82+P017P82+P062+P02+P047P82
801 T3=G1+G2+T1+T2
802 T4=(G1*(P018+P063+P03+P048+P033+2)+1)==TO
803 T5=P018+P063P82+P018P82+P063+P03+P048P82
804 RKP82=(SG(IM1, J, K))=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I, J, K)+T1+T2+S+G1+
805 G2+T4+T5+T3)/4.0
806 TO=G2-1
807 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
808 T2=P017+P062P82+P017P82+P062+P02+P047P82
809 T3=G1+G2+T1+T2
810 T4=(G1*(P018+P063+P03+P048+P033+2)+1)==TO
811 T5=P018+P063P82+P018P82+P063+P03+P048P82
812 RJP82=(SG(IM1, J, K))=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I, J, K)+T1+T2+S+G1+
813 G2+T4+T5+T3)/4.0
814 TO=G2-1
815 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
816 T2=P017+P062P82+P017P82+P062+P02+P047P82
817 T3=G1+G2+T1+T2
818 T4=(G1*(P018+P063+P03+P048+P033+2)+1)==TO
819 T5=P018+P063P82+P018P82+P063+P03+P048P82
820 RKP82=(SG(IM1, J, K))=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I, J, K)+T1+T2+S+G1+
821 G2+T4+T5+T3)/4.0
822 RESP82=((P88-P83)*RKP82+TA33M+2*XIXX1(J, I)+OZINF+RKP82/DZETAC(K))+
823 Y2+((-P88+P113)=RKP82+TA33P+2*XIXX1(J, I)+OZINF+RKP82/DZETAC(K))
824 Y1+S+(RIMP82+TA12M+((P83+P82-P88-P87)+TAJ2+(P88+P87-P83-P82)+
825 TAJ1)-(RIM+TA12M+TAJ1)+[P88-P87]*RIMP82+TA11M+2*OXINF+RIMP82/DXIC
826 (I))+RIPP82+TA12P+((P84+P83-P89-P88)+TAJ2+(P88+P88-P84-P83)+TAJ1)-
827 S+(RJP82+TA21M+((P88-P88+P84-P83)+TAI2-(P88-P87-P84-P82)+TAI1))-
828 R+TA21M+TAI1)+[P88-P83]*RJP82+TA22M+RJP82+TA21P+((P84-P83+P89-
829 P88)+TAI2+[P83-P82+P88-P87]+TAI1)+[P83-P88]*RJP82+TA22P+(P88-P88
830 )+RIPP82+TA11P+2*OXINF+RIPP82/DXIC(I)
831 DER = RESP82
832
833 C P83
834 ELSEIF (CND(I1, JJ, KK, I, JM1, K)) THEN
835 P04P83 = DXII(I1)S
836 P05P83 = DXII(IM1)
837 P018P83 = -(1.0/2.0*AJ1(J))
838 P017P83 = -(1.0/2.0*AJ1(J))
839 P019P83 = (-AJ2(JM1)+AJ1(JM1))/2.0
840 P020P83 = (-AJ2(JM1)+AJ1(JM1))/2.0
841 P034P83 = (-AZK(K)+A1K(K))/2.0
842 P035P83 = (-AZK(K)+A1K(K))/2.0
843 P048P83 = -(1.0/2.0*AJ1(J)+X1YIP(J, I))
844 P047P83 = -(1.0/2.0*AJ1(J)+X1YIP(J, IM1))
845 P049P83 = DXII(I1)+A11R(JM1, I)+S+(-AJ2(JM1)+AJ1(JM1))+X1YIP(JM1, I)/
846 2.0
847 P060P83 = (-AJ2(JM1)+AJ1(JM1))+X1YIP(JM1, IM1)/2.0+DXII(IM1)+A11R(
848 JM1, IM1)
849 P061P83 = -(1.0/2.0*AJ1(J))
850 P062P83 = -(1.0/2.0*AJ1(J))
851 P064P83 = DXII(I1)+X1YIP(JM1, I)+S+(-AJ2(JM1)+AJ1(JM1))/2.0
852 P065P83 = DXII(IM1)+X1YIP(JM1, IM1)+(-AJ2(JM1)+AJ1(JM1))/2.0
853 TO=G2-1
854 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
855 T2=P017+P062P83+P017P83+P062+P02+P047P83
856 RIPP83=SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2+(G1*(P018+P061+P01+P046+P031
857 +2)+1)==TO*(P018+P061P83+P018P83+P061+P01+P046P83))+G1+G2+T1+T2
858 RIMP83=G1+G2+SG(IM1, J, K)=(G1*(P017+P062+P02+P047+P032+2)+1)==(G2-
859 1)*(P017+P062P83+P017P83+P062+P02+P047P83)
860 TO=G2-1
861 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
862 T2=P017+P062P83+P017P83+P062+P02+P047P83
863 T3=(G1*(P020+P065+P05+P050+P035+2)+1)==TO
864 T4=P020+P065P83+P020P83+P065+P050+P05P83+P05+P050P83+2+P035+
865 P035P83
866 RJP83=(SG(I, JM1, K))=(G1+G2+T3+T4+S+G1+G2+(G1*(P018+P064+P04+P048+
867 P034+2)+1)==TO*(P018+P064P83+P018P83+P064+P04+P048P83+P04+
868 P048P83+2+P034+P034P83))+SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2+(G1*(P018
869 +P061+P01+P046+P031+2)+1)==TO*(P018+P061P83+P018P83+P061+P01+
870 P046P83))+G1+G2+SG(IM1, JM1, K)+T3+T4+G1+G2+T3+T4+G1+G2+SG(IM1, J, K)
871 +T1+T2+G1+G2+T1+T2)/4.0
872 TO=G2-1
873 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
874 T2=P017+P062P83+P017P83+P062+P02+P047P83
875 RKP83=(SG(I, J, K))=(G1+G2+T1+T2+S+G1+G2+(G1*(P018+P061+P01+P046+P031
876 +2)+1)==TO*(P018+P061P83+P018P83+P061+P01+P046P83))+G1+G2+SG(IM1
877 , J, K)+T1+T2+G1+G2+T1+T2)/4.0
878 TO=G2-1
879 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
880 T2=P017+P062P83+P017P83+P062+P02+P047P83
881 RJP83=(SG(I, J, K))=(G1+G2+T1+T2+S+G1+G2+(G1*(P018+P061+P01+P046+
882 P031+2)+1)==TO*(P018+P061P83+P018P83+P061+P01+P046P83))+G1+G2+SG
883 (IM1, J, K)+T1+T2+G1+G2+T1+T2)/4.0
884 TO=G2-1
885 T1=(G1*(P017+P062+P02+P047+P032+2)+1)==TO
886 T2=P017+P062P83+P017P83+P062+P02+P047P83
887 RKP83=(SG(I, J, K))=(G1+G2+T1+T2+S+G1+G2+(G1*(P018+P061+P01+P046+
888 P031+2)+1)==TO*(P018+P061P83+P018P83+P061+P01+P046P83))+G1+G2+SG
889 (IM1, J, K)+T1+T2+G1+G2+T1+T2)/4.0
890 RESP83=((P88-P83)*RKP83+TA33M+2*XIXX1(J, I)+OZINF+RKP83/DZETAC(K))+
891 Y2+((-P88+P113)=RKP83+TA33P+2*XIXX1(J, I)+OZINF+RKP83/DZETAC(K))
892 Y1+S+(RIMP83+TA12M+((P83+P82-P88-P87)+TAJ2+(P88+P87-P83-P82)+
893 TAJ1)-(RIM+TA12M+TAJ1)+[P88-P87]*RIMP83+TA11M+2*OXINF+RIMP83/DXIC
894 (I))+RIPP83+TA12P+((P84+P83-P89-P88)+TAJ2+(P88+P88-P84-P83)+TAJ1)-
895 S+(RJP83+TA21M+((P88-P88+P84-P83)+TAI2-(P88-P87-P84-P82)+TAI1))-
896 R+TA21M+TAI1)+[P88-P83]*RJP83+TA22M+(RJP83+TA22M)-(RJP83+
897 TA22M)+RJP83+TA21P+((P84-P83+P89-P88)+TAI2-(P83-P82+P88-P87)+
898 TAI1)+[P83-P88]*RJP83+TA22P+(P88-P88)+RIPP83+TA11P+2*OXINF+
899 RIPP83/DXIC(I)
900 DER = RESP83
901
902 C P84
903 ELSEIF (CND(I1, JJ, KK, I, JM1, K)) THEN
904 P04P84 = DXII(I1)
905 P018P84 = -(1.0/2.0*AJ1(J))
906 P019P84 = (-AJ2(JM1)+AJ1(JM1))/2.0
907 P034P84 = (-AZK(K)+A1K(K))/2.0
908 P048P84 = -(1.0/2.0*AJ1(J)+X1YIP(J, I))
909 P047P84 = -(1.0/2.0*AJ1(J)+X1YIP(JM1, I))/2.0+DXII(I1)+A11R(JM1, I)
910 P061P84 = -(1.0/2.0*AJ1(J))
911 P064P84 = DXII(I1)+X1YIP(JM1, I)+(-AJ2(JM1)+AJ1(JM1))/2.0
912 RIPP84+G1+G2+SG(I, J, K)=(G1*(P018+P061+P01+P046+P031+2)+1)==(G2-1)
913 *(P018+P061P84+P018P84+P061+P01+P046P84)
914 TO=G2-1
915 RJP84=(G1+G2+SG(I, JM1, K))=(G1*(P018+P064+P04+P048+P034+2)+1)==TO*(
916 P018+P064P84+P018P84+P064+P04+P048P84+P04+P048P84+2+P034+P034P84)
917 +G1+G2+SG(I, J, K)=(G1*(P018+P061+P01+P046+P031+2)+1)==TO*(P018+
918 P061P84+P018P84+P061+P01+P046P84))/4.0
919 RKP84=G1+G2+SG(I, J, K)=(G1*(P018+P061+P01+P046+P031+2)+1)==(G2-1)+
920 (P018+P061P84+P018P84+P061+P01+P046P84)/4.0
921 RJP84+G1+G2+SG(I, J, K)=(G1*(P018+P061+P01+P046+P031+2)+1)==(G2-1)
922 *(P018+P061P84+P018P84+P061+P01+P046P84)/4.0
923 RKP84+G1+G2+SG(I, J, K)=(G1*(P018+P061+P01+P046+P031+2)+1)==(G2-1)
924 *(P018+P061P84+P018P84+P061+P01+P046P84)/4.0
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824. RESP84=((P86-P83)*RKP84+TA33M*2+X1XX1(J,I)*QZINF+RKP84/DZETAC(K))
825. Y2+((-P86+P113)*RKP84+TA33P*2+X1XX1(J,I)*QZINF+RKP84/DZETAC(K))
826. Y1+RIPP84+TA12P*((P84+P93-P89-P88)*TAJ2+P89+P88-P84-P83)+TAJ1+
827. (RIP+TA12P+TAJ1)*S+(RJP84+TA21M*((P88-P86+P84-P83)*TAI2+P88+P87+
828. P83-P82)*TAI1)+RJP+TA21M+TAI2+(P88-P83)*RJP84+TA22M)+RJP84+TA21P+
829. ((P84+P93+P89-P88)*TAI2+(P83-P82+P88-P87)*TAI1)+(P83-P88)*RJP84+
830. TA22P+(P89-P88)*RIPP84+TA11P*2+QXINF+RIPP84/DXIC(I))
831. DER = RESP84
832.
833. C P86
834. ELSEIF (CND[I,J,K,IM2,J,K]) THEN
835. P03P86 = DXI[IM2]*S
836. P018P86 = (-AJ2[J]+AJ1[J])/2.0
837. P021P86 = AJ2(JM1)/2.0
838. P027P86 = -(1.0/2.0*AJ1(JP1))
839. P033P86 = (-A2K[K]+A1K[K])/2.0
840. P038P86 = A2K(KM1)/2.0
841. P045P86 = -(1.0/2.0*A1K(KP1))
842. P048P86 = DXI[IM2]*A1R(J,IM2)*S+(-AJ2[J]+AJ1[J])*XIYIP(J,IM2)/
843. 2.0
844. P051P86 = AJ2(JM1)*XIYIP(JM1,IM2)/2.0
845. P057P86 = -(1.0/2.0*AJ1(JP1))*XIYIP(JP1,IM2)
846. P063P86 = DXI[IM2]*XIYIP(J,IM2)*S+(-AJ2[J]+AJ1[J])/2.0
847. P068P86 = AJ2(JM1)/2.0
848. P072P86 = -(1.0/2.0*AJ1(JP1))
849. T0=(G1*(P018+P063+P03+P048+P033==2)+1)==(G2-1)
850. T1=P018+P063P86+P018P86+P063+P03+P048P86+P03P86+P048+2*P033+
851. P033P86
852. RIMP86=G1+G2+SG(IM1,J,K)*T0+T1+S+G1+G2+T0+T1
853. T0=G2-1
854. T1=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
855. T2=P018+P063P86+P018P86+P063+P03+P048P86+P03P86+P048+2*P033+
856. P033P86
857. T3=(G1*(P021+P068+P051+P08+P038==2)+1)==T0
858. T4=P021+P068P86+P021P86+P068+P051+P08+P08
859. RJP86=(G1+G2+SG(IM1,JM1,K))*T3+T4+S+G1+G2+SG(IM1,J,K)*T1+T2+S+G1+G2
860. +T3+T4+G1+G2+T1+T2)/4.0
861. T0=G2-1
862. T1=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
863. T2=P018+P063P86+P018P86+P063+P03+P048P86+P03P86+P048+2*P033+
864. P033P86
865. T3=(G1*(P054+P09+P024+P069+P039==2)+1)==T0
866. RKP86=(2+G1+G2+SG(IM1,J,KM1))*P039+P039P86+T3+S+G1+G2+SG(IM1,J,K)*
867. T1+T2+S+2*G1+G2+P039+P039P86+T3+G1+G2+T1+T2)/4.0
868. T0=G2-1
869. T1=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
870. T2=P018+P063P86+P018P86+P063+P03+P048P86+P03P86+P048+2*P033+
871. P033P86
872. T3=(G1*(P027+P072+P012+P057+P042==2)+1)==T0
873. T4=P027+P072P86+P027P86+P072+P012+P057P86
874. RJP86=(G1+G2+SG(IM1,JP1,K))*T3+T4+S+G1+G2+SG(IM1,J,K)*T1+T2+S+G1+
875. G2+T3+T4+G1+G2+T1+T2)/4.0
876. T0=G2-1
877. T1=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
878. T2=P018+P063P86+P018P86+P063+P03+P048P86+P03P86+P048+2*P033+
879. P033P86
880. T3=(G1*(P030+P075+P015+P050+P045==2)+1)==T0
881. RKP86=(2+G1+G2+SG(IM1,J,KP1))*P045+P045P86+T3+S+G1+G2+SG(IM1,J,K)*
882. T1+T2+S+2*G1+G2+P045+P045P86+T3+G1+G2+T1+T2)/4.0
883. RESP87=((P86-P83)*RKP87+TA33M*2+X1XX1(J,I)*QZINF+RKP87/DZETAC(K))
884. Y2+((-P86+P113)*RKP87+TA33P*2+X1XX1(J,I)*QZINF+RKP87/DZETAC(K))
885. Y1+S+(RIMP87+TA12M*((P83+P82-P88-P87)*TAJ2+(P88+P87-P83-P82)*
886. TAJ1)+P88+P87)*RIMP87+TA11M*2+QXINF+RIMP87/DXIC(I))+S+(RJP87+
887. TA21M*((P89+P88+P84-P83)*TAI2+(P88+P87+P83-P82)*TAI1)+(P88+P83)*
888. RJP87+TA22M)+RJP87+TA21P+((P84+P93+P89-P88)*TAI2+(P83-P82+P88-
889. P87)*TAI1)+(P83-P88)*RJP87+TA22P
890. DER = RESP87
891.
892. C P87
893. ELSEIF (CND[I,J,K,IM1,J,K]) THEN
894. P02P87 = DXI[IM1]*S
895. P03P87 = DXI[IM2]
896. P017P87 = (-AJ2[J]+AJ1[J])/2.0
897. P018P87 = (-AJ2[J]+AJ1[J])/2.0
898. P020P87 = AJ2(JM1)/2.0
899. P021P87 = AJ2(JM1)/2.0
900. P026P87 = -(1.0/2.0*AJ1(JP1))
901. P027P87 = -(1.0/2.0*AJ1(JP1))
902. P032P87 = (-A2K[K]+A1K[K])/2.0
903. P033P87 = (-A2K[K]+A1K[K])/2.0
904. P038P87 = A2K(KM1)/2.0
905. P039P87 = A2K(KM1)/2.0
906. P044P87 = -(1.0/2.0*A1K(KP1))
907. P045P87 = -(1.0/2.0*A1K(KP1))
908. P047P87 = DXI[IM1]*A1R(J,IM1)*S+(-AJ2[J]+AJ1[J])*XIYIP(J,IM1)/
909. 2.0
910. P048P87 = (-AJ2[J]+AJ1[J])*XIYIP(J,IM2)/2.0+DXI[IM2]*A1R(J,IM2)
911. P050P87 = AJ2(JM1)*XIYIP(JM1,IM1)/2.0
912. P051P87 = AJ2(JM1)*XIYIP(JM1,IM2)/2.0
913. P056P87 = -(1.0/2.0*AJ1(JP1))*XIYIP(JP1,IM1)
914. P057P87 = -(1.0/2.0*AJ1(JP1))*XIYIP(JP1,IM2)
915. P062P87 = DXI[IM1]*XIYIP(J,IM1)*S+(-AJ2[J]+AJ1[J])/2.0
916. P063P87 = DXI[IM2]*XIYIP(J,IM2)+(-AJ2[J]+AJ1[J])/2.0
917. P065P87 = AJ2(JM1)/2.0
918. P066P87 = AJ2(JM1)/2.0
919. P071P87 = -(1.0/2.0*AJ1(JP1))
920. P072P87 = -(1.0/2.0*AJ1(JP1))
921. T0=(G1*(P017+P062+P02+P047+P032==2)+1)==(G2-1)
922. T1=P017+P062P87+P017P87+P062+P02+P047P87+P02P87+P047+2*P032+
923. P032P87
924. RIPP87=G1+G2+SG(I,J,K)*T0+T1+S+G1+G2+T0+T1
925. T0=G2-1
926. T1=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
927. T2=P018+P063P87+P018P87+P063+P03+P048P87+P03P87+P048+2*P033+
928. P033P87
929. RIMP87=SG(IM1,J,K)*(G1+G2+T1+T2+S+G1+G2)+(G1*(P017+P062+P02+P047+
930. P032==2)+1)==T0*(P017+P062P87+P017P87+P062+P02+P047P87+P02P87+
931. P047+2*P032+P032P87))+G1+G2+T1+T2
932. T0=G2-1
933. T1=(G1*(P017+P062+P02+P047+P032==2)+1)==T0
934. T2=P017+P062P87+P017P87+P062+P02+P047P87+P02P87+P047+2*P032+
935. P032P87
936. T3=G1+G2+T1+T2
937. T4=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
938. T5=P018+P063P87+P018P87+P063+P03+P048P87+P03P87+P048+2*P033+
939. P033P87
940. T6=(G1*(P020+P065+P05+P050+P035==2)+1)==T0
941. T7=P020+P065P87+P020P87+P065+P05+P050P87
942. T8=G1+G2+T5+T7
943. T9=(G1*(P021+P066+P051+P08+P038==2)+1)==T0
944. T10=P021+P066P87+P021P87+P066+P051+P08+P08
945. RJP87=(SG(IM1,JM1,K)*(G1+G2+T9+T10+S+T8)+SG(IM1,J,K)*(G1+G2+T4+T5+
946. S+T3)+G1+G2+SG(I,JM1,K))*T6+T7+S+G1+G2+SG(I,J,K)*T1+T2+S+G1+G2+T9+
947. T10+T8+G1+G2+T4+T5+T3)/4.0
948. T0=G2-1
949. T1=(G1*(P017+P062+P02+P047+P032==2)+1)==T0
950. T2=P017+P062P87+P017P87+P062+P02+P047P87+P02P87+P047+2*P032+
951. P032P87
952. T3=G1+G2+T1+T2
953. T4=(G1*(P018+P063+P03+P048+P033==2)+1)==T0
954. T5=P018+P063P87+P018P87+P063+P03+P048P87+P03P87+P048+2*P033+
955. P033P87
956. T6=(G1*(P053+P08+P023+P068+P038==2)+1)==T0
957. T7=2+G1+G2+P038+P038P87+T6

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1056. T8: [G1=[P054+P09+P024+P068+P039**2)+1]**=TO
1057. RKPA7:[SG[IM1,J,KM1]=[2*G1+G2+P039+P039P87+T8+S+T7]+SG[IM1,J,K]=[
1058. G1+G2+T8+T5+S+T3]+2*G1+G2+SG[I,J,KM1]=P038+P038P87+T8+S+G1+G2+SG[
1059. I,J,K]=T1+T2+S+2*G1+G2+P039+P039P87+T8+T7+G1+G2+T4+T5+T3]/4.0
1060. T0+G2-1
1061. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1062. T2+P017+P062P87+P017P87+P062+P02+P047P87+P02P87+P047+2*P032+
1063. P032P87
1064. T3+G1+G2+T1+T2
1065. T4:[G1=[P018+P063+P03+P048+P033**2)+1]**=TO
1066. T5+P018+P063P87+P018P87+P063+P03+P048P87+P03P87+P048+2*P033+
1067. P033P87
1068. T6:[G1=[P028+P071+P011+P058+P041**2)+1]**=TO
1069. T7+P028+P071P87+P028P87+P071+P011+P058P87
1070. T8+G1+G2+T6+T7
1071. T9:[G1=[P027+P072+P012+P057+P042**2)+1]**=TO
1072. T10+P027+P072P87+P027P87+P072+P012+P057P87
1073. RJPP87:[SG[IM1,JP1,K]=[G1+G2+T8+T10+S+T8]+SG[IM1,J,K]=[G1+G2+T4+T5
1074. +S+T3]+G1+G2+SG[I,JP1,K]=T8+T7+S+G1+G2+SG[I,J,K]=T1+T2+S+G1+G2+T8
1075. +T10+T8+G1+G2+T4+T5+T3]/4.0
1076. T0+G2-1
1077. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1078. T2+P017+P062P87+P017P87+P062+P02+P047P87+P02P87+P047+2*P032+
1079. P032P87
1080. T3+G1+G2+T1+T2
1081. T4:[G1=[P018+P063+P03+P048+P033**2)+1]**=TO
1082. T5+P018+P063P87+P018P87+P063+P03+P048P87+P03P87+P048+2*P033+
1083. P033P87
1084. T6:[G1=[P029+P074+P014+P059+P044**2)+1]**=TO
1085. T7+2*G1+G2+P044+P044P87+T6
1086. T8:[G1=[P030+P075+P015+P080+P045**2)+1]**=TO
1087. RKPP87:[SG[IM1,J,KP1]=[2*G1+G2+P045+P045P87+T8+S+T7]+SG[IM1,J,K]=[
1088. G1+G2+T4+T5+S+T3]+2*G1+G2+SG[I,J,KP1]=P044+P044P87+T8+S+G1+G2+SG[
1089. I,J,K]=T1+T2+S+2*G1+G2+P045+P045P87+T8+T7+G1+G2+T4+T5+T3]/4.0
1090. RESP87:[(P88-P83)=RKPP87+TA33M+2*X1XXI[J,I]=OZINF+RKPP87/DZETAC(K)]=
1091. V2+[(P88+P113)=RKPP87+TA33P+2*X1XXI[J,I]=OZINF+RKPP87/DZETAC(K)]=
1092. Y1+S*(RIMP87+TA12M+[(P93+P92-P88-P87)=TAJ2+(P88+P87-P83-P82)=
1093. TAJ1)+RIMP87+TA12M+[(P88-P87)=RIMP87+TA11M+(RIMP87+TA11M)+2
1094. =OXINF+RIMP87/DXIC(I)]=RIMP87+TA12P+[(P94+P93+P89-P88)=TAJ2+(P88+
1095. P88-P84-P83)=TAJ1]+S*(RJP87+TA21M+[(P89-P88+P84-P83)=TAI2+(P88+
1096. P87+P82-P82)=TAI1)-(RJP87+TA21M+TAI1)+(P88-P83)=RJP87+TA22M+RJP87=
1097. TA21P+[(P84-P93+P89-P88)=TAI2+(P93-P92-P88-P87)=TAI1)-(RJP87+TA21P=
1098. TAI1)+[(P93-P88)=RJP87+TA22P+(P89-P88)=RIMP87+TA11P+2*OXINF=
1099. RIPP87/DXIC(I)
1100. DER = RESP87
1101.
1102. C P88
1103. ELSEIF [CND[I,J,K,I,J,K]] THEN
1104. P01P88 = DXI[I]**S
1105. P02P88 = DXI[I]IM1
1106. P018P88 = (-AJ2[J]+AJ1[J])/2.0
1107. P017P88 = (-AJ2[J]+AJ1[J])/2.0
1108. P019P88 = AJ2[JMI]/2.0
1109. P020P88 = AJ2[JMI]/2.0
1110. P025P88 = -[1.0/2.0=AJ1[JP1]]
1111. P026P88 = -[1.0/2.0=AJ1[JP1]]
1112. P031P88 = [-A2K[K]+A1K[K]]/2.0
1113. P032P88 = [-A2K[K]+A1K[K]]/2.0
1114. P037P88 = A2K[KM1]/2.0
1115. P038P88 = A2K[KM1]/2.0
1116. P043P88 = -[1.0/2.0=A1K[KP1]]
1117. P044P88 = -[1.0/2.0=A1K[KP1]]
1118. P048P88 = DXI[I]**S+AJ1R[J,I]**S+(-AJ2[J]+AJ1[J])=X1YIP[J,I]/2.0
1119. P047P88 = (-AJ2[J]+AJ1[J])=X1YIP[J,IM1]/2.0+DXI[I]IM1=A11R[J,IM1]
1120. P049P88 = AJ2[JMI]=X1YIP[JMI,I]/2.0
1121. P050P88 = AJ2[JMI]=X1YIP[JMI,IM1]/2.0
1122. P058P88 = -[1.0/2.0=AJ1[JP1]+X1YIP[JP1,I]]
1123. P059P88 = -[1.0/2.0=AJ1[JP1]+X1YIP[JP1,IM1]]
1124. P061P88 = DXI[I]**S+X1YIP[J,I]**S+(-AJ2[J]+AJ1[J])/2.0
1125. P062P88 = DXI[I]IM1=X1YIP[J,IM1]+(-AJ2[J]+AJ1[J])/2.0
1126. P064P88 = AJ2[JMI]/2.0
1127. P065P88 = AJ2[JMI]/2.0
1128. P070P88 = -[1.0/2.0=AJ1[JP1]]
1129. P071P88 = -[1.0/2.0=AJ1[JP1]]
1130. T0+G2-1
1131. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1132. T2+P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1133. P032P88
1134. R1PP88:[SG[I,J,K]=[G1+G2+T1+T2+S+G1+G2=[G1=[P018+P061+P01+P048+P031
1135. =2)+1]**=TO=[P018+P061P88+P018P88+P061+P01+P048P88+P01P88+P048+2*
1136. P031+P031P88]+G1+G2+T1+T2
1137. RIMP88:[G1+G2+SG[IM1,J,K]=[G1=[P017+P062+P02+P047+P032**2)+1]**=[G2-
1138. 1]=[P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1139. P032P88]
1140. T0+G2-1
1141. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1142. T2+P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1143. P032P88
1144. T3:[G1=[P020+P065+P05+P050+P035**2)+1]**=TO
1145. T4+P020+P065P88+P020P88+P065+P05+P050P88
1146. RJPA8:[SG[I,JM1,K]=[G1+G2+T3+T4+S+G1+G2=[G1=[P019+P064+P04+P049+
1147. P034**2)+1]**=TO=[P019+P064P88+P019P88+P064+P04+P049P88]+SG[I,J,K
1148. ]=[G1+G2+T1+T2+S+G1+G2=[G1=[P018+P061+P01+P048+P031**2)+1]**=TO=[
1149. P018+P061P88+P018P88+P061+P01+P048P88+P01P88+P048+2*P031+P031P88]
1150. ]+G1+G2+SG[IM1,J,K]=T3+T4+G1+G2+T3+T4+G1+G2+SG[IM1,J,K]=T1+T2+
1151. G1+G2+T1+T2]/4.0
1152. T0+G2-1
1153. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1154. T2+P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1155. P032P88
1156. T3:[G1=[P063+P04+P023+P068+P038**2)+1]**=TO
1157. RKPA8:[SG[I,J,KM1]=[2*G1+G2+P038+P038P88+T3+S+2*G1+G2+P037+P037P88
1158. +G1+G2+P07+P022+P067+P037**2)+1]**=TO]+SG[I,J,K]=[G1+G2+T1+T2+
1159. S+G1+G2=[G1=[P016+P061+P01+P048+P031**2)+1]**=TO=[P016+P061P88+
1160. P016P88+P061+P01+P048P88+P01P88+P048+2*P031+P031P88]+2*G1+G2+SG[
1161. IM1,J,KM1]=P038+P038P88+T3+2*G1+G2+P038+P038P88+T3+G1+G2+SG[IM1,J
1162. K]=T1+T2+G1+G2+T1+T2]/4.0
1163. T0+G2-1
1164. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1165. T2+P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1166. P032P88
1167. T3:[G1=[P028+P071+P011+P058+P041**2)+1]**=TO
1168. T4+P028+P071P87+P028P88+P071+P011+P058P88
1169. RJPP88:[SG[I,JP1,K]=[G1+G2+T3+T4+S+G1+G2=[G1=[P025+P070+P010+P055+
1170. P040**2)+1]**=TO=[P025+P070P88+P025P88+P070+P010+P055P88]+SG[I,J,
1171. K]=[G1+G2+T1+T2+S+G1+G2=[G1=[P018+P061+P01+P048+P031**2)+1]**=TO=[
1172. P018+P061P88+P018P88+P061+P01+P048P88+P01P88+P048+2*P031+P031P88]
1173. ]+G1+G2+SG[IM1,JP1,K]=T3+T4+G1+G2+T3+T4+G1+G2+SG[IM1,J,K]=T1+T2+
1174. G1+G2+T1+T2]/4.0
1175. T0+G2-1
1176. T1:[G1=[P017+P062+P02+P047+P032**2)+1]**=TO
1177. T2+P017+P062P88+P017P88+P062+P02+P047P88+P02P88+P047+2*P032+
1178. P032P88
1179. T3:[G1=[P029+P074+P014+P059+P044**2)+1]**=TO
1180. RKPP88:[SG[I,J,KP1]=[2*G1+G2+P044+P044P88+T3+S+2*G1+G2+P043+
1181. P043P88]=[G1=[P028+P073+P013+P058+P043**2)+1]**=TO]+SG[I,J,K]=[G1+
1182. G2+T1+T2+S+G1+G2=[G1=[P016+P061+P01+P048+P031**2)+1]**=TO=[P016+
1183. P061P88+P016P88+P061+P01+P048P88+P01P88+P048+2*P031+P031P88]+2*
1184. G1+G2+SG[IM1,J,KP1]=P044+P044P88+T3+2*G1+G2+P044+P044P88+T3+G1+G2
1185. +SG[IM1,J,K]=T1+T2+G1+G2+T1+T2]/4.0
1186. RESP88:[(P88-P83)=RKPP88+TA33M+RK+TA33M+2*X1XXI[J,I]=OZINF+RKPP88/
1187. DZETAC(K)]=V2+[(P88+P113)=RKPP88+TA33P+(RK+TA33P)+2*X1XXI[J,I]=
OZINF+RKPP88/DZETAC(K)]=Y1+S*(RIMP88+TA12M+[(P93+P92-P88-P87)=

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1188. . TAJ2+(P88+P87-P83-P82)+TAJ1)+RIM+TA12M*(-TAJ2+TAJ1)+(P88-P87)+
1189. . RIMP88+TA11M+RIM+TA11M+2*DXINF+RIMP88/DXIC(I))+RIPP88+TA12P+((P84
1190. . +P93-P83-P88)+TAJ2+(P88+P88-P84-P83)+TAJ1)+RIP+TA12P+(-TAJ2+TAJ1)
1191. . +S+(RJP88+TA21M+((P88-P88-P84-P83)+TAJ2+((P88-P87-P83-P82)+TA11)+
1192. . +RJT+TA21M+(-TA12+TA11)+(P88-P83)+RJP88+TA22M+RJT+TA22M)+RJP88+
1193. . TA21P+((P88-P88+P84-P83)+TA12+(P88-P87-P83-P82)+TA11)+RJP+TA21P+
1194. . -TA12+TA11)+(P93-P88)+RJP88+TA22P+(-RJP+TA22P)+(P88-P88)+RIPP88+
1195. . TA11P+(-RIP+TA11P)+2*DXINF+RIPP88/DXIC(I)
1196. DER = RESP88
1197.
1198. C P89
1199. ELSEIF (CND(I1,JJ,KK,IP1,J,K)) THEN
1200. P01P89 = DXI(I1)
1201. P018P89 = [-AJ2(J)+AJ1(J)]/2.0
1202. P019P89 = AJ2(JM1)/2.0
1203. P025P89 = [-1.0/2.0+AJ1(JP1)]
1204. P031P89 = [-A2K(K)+A1K(K)]/2.0
1205. P037P89 = A2K(KM1)/2.0
1206. P043P89 = [-1.0/2.0+A1K(KP1)]
1207. P048P89 = [-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0+DXI(I1)+A11R(J,I)
1208. P049P89 = AJ2(JM1)*XIYIP(JM1,I)/2.0
1209. P055P89 = [-1.0/2.0+AJ1(JP1)*XIYIP(JP1,I)]
1210. P051P89 = DXI(I1)*XIYIP(J,I)+[-AJ2(J)+AJ1(J)]/2.0
1211. P064P89 = AJ2(JM1)/2.0
1212. P070P89 = [-1.0/2.0+AJ1(JP1)]
1213. RIPP89+G1+G2+SG(I,J,K)=(G1+(P018+P061+P01+P048+P031==2)+1)==(G2-1)
1214. =(P018+P061P89+P018P89+P061+P01+P048P89+P01P89+P048+2+P031=
1215. P031P89)
1216. TO=G2-1
1217. RJP89=(G1+G2+SG(I,JM1,K)=(G1+(P019+P084+P04+P048+P034==2)+1)==TO+(
1218. P019+P084P89+P019P89+P084+P04+P048P89)+G1+G2+SG(I,J,K)=(G1+(P018+
1219. P061+P01+P048+P031==2)+1)==TO+(P018+P061P89+P018P89+P061+P01+
1220. P048P89+P01P89+P048+2+P031+P031P89))/4.0
1221. TO=G2-1
1222. RKP89=(2+G1+G2+SG(I,J,KM1)+P037+P037P89+(G1+(P052+P07+P022+P087+
1223. P037==2)+1)==TO+G1+G2+SG(I,J,K)=(G1+(P018+P061+P01+P048+P031==2)+
1224. 1)==TO+(P018+P061P89+P018P89+P061+P01+P048P89+P01P89+P048+2+P031=
1225. P031P89))/4.0
1226. TO=G2-1
1227. RJP89=(G1+G2+SG(I,JP1,K)=(G1+(P025+P070+P010+P055+P040==2)+1)==TO
1228. =(P025+P070P89+P025P89+P070+P010+P055P89)+G1+G2+SG(I,J,K)=(G1+(
1229. P018+P061+P01+P048+P031==2)+1)==TO+(P018+P061P89+P018P89+P061+P01
1230. +P048P89+P01P89+P048+2+P031+P031P89))/4.0
1231. TO=G2-1
1232. RKP89=(2+G1+G2+SG(I,J,KP1)+P043+P043P89+(G1+(P028+P073+P013+P058+
1233. P043==2)+1)==TO+G1+G2+SG(I,J,K)=(G1+(P018+P061+P01+P048+P031==2)+
1234. 1)==TO+(P018+P061P89+P018P89+P061+P01+P048P89+P01P89+P048+2+P031=
1235. P031P89))/4.0
1236. RESP89=((P88-P83)+RKP89+TA33M+2*XIXI(J,I)+QZINF+RKP89/DZETAC(K))=
1237. V2+((-P88+P113)+RKP89+TA33P+2*XIXI(J,I)+QZINF+RKP89/DZETAC(K))
1238. +Y1+RIPP88+TA12P+((P84-P93-P89-P88)+TAJ2+((P88-P88-P84-P83)+TAJ1)+
1239. RIP+TA12P+(-TAJ2+TAJ1)+S+(RJP89+TA21M+((P88-P88+P84-P83)+TA12+
1240. P88+P87-P83-P82)+TA11)+RJT+TA21M+TA12+(P88-P83)+RJP89+TA22M)+
1241. RJP89+TA21P+((P84-P93+P89-P88)+TA12+(P93-P92+P88-P87)+TA11)+RJP+
1242. TA21P+TA12+(P93-P88)+RJP89+TA22P+(P88-P88)+RIPP89+TA11P+RIP+
1243. TA11P+2*DXINF+RIPP89/DXIC(I)
1244. DER = RESP89

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1245. C P91
1246. ELSEIF (CND(I1,JJ,KK,IM2,JP1,K)) THEN
1247. P012P91 = DXI(I1)IM2)=5
1248. P018P91 = AJ2(J)/2.0
1249. P027P91 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1250. P042P91 = [-A2K(K)+A1K(K)]/2.0
1251. P048P91 = AJ2(J)*XIYIP(J,IM2)/2.0
1252. P057P91 = DXI(I1)IM2)+A11R(JP1,IM2)+S+[-AJ2(JP1)+AJ1(JP1)]*XIYIP(JP1
1253. ,IM2)/2.0
1254. P063P91 = AJ2(J)/2.0
1255. P072P91 = DXI(I1)IM2)*XIYIP(JP1,IM2)+S+[-AJ2(JP1)+AJ1(JP1)]/2.0
1256. TO=(G1+(P018+P063+P03+P048+P033==2)+1)==(G2-1)
1257. T1=P018+P063P91+P018P91+P063+P03+P048P91
1258. RIMP91+G1+G2+SG(IM1,J,K)=TO+T1+S+G1+G2+TO=T1
1259. TO=(G1+(P018+P063+P03+P048+P033==2)+1)==(G2-1)
1260. T1=P018+P063P91+P018P91+P063+P03+P048P91
1261. RJP91=(G1+G2+SG(IM1,J,K)=TO+T1+S+G1+G2+TO=T1)/4.0
1262. TO=(G1+(P018+P063+P03+P048+P033==2)+1)==(G2-1)
1263. T1=P018+P063P91+P018P91+P063+P03+P048P91
1264. RKP91=(G1+G2+SG(IM1,J,K)=TO+T1+S+G1+G2+TO=T1)/4.0
1265. TO=G2-1
1266. T1=(G1+(P018+P063+P03+P048+P033==2)+1)==TO
1267. T2=P018+P063P91+P018P91+P063+P03+P048P91
1268. T3=(G1+(P027+P072+P012+P057+P042==2)+1)==TO
1269. T4=P027+P072P91+P027P91+P072+P012+P057P91+P012P91+P057+2+P042+
1270. P042P91
1271. RJP91=(G1+G2+SG(IM1,JP1,K)=T3+T4+S+G1+G2+SG(IM1,J,K)=T1+T2+S+G1+
1272. G2+T3+T4+S+G1+G2+T1+T2)/4.0
1273. TO=(G1+(P018+P063+P03+P048+P033==2)+1)==(G2-1)
1274. T1=P018+P063P91+P018P91+P063+P03+P048P91
1275. RKP91=(G1+G2+SG(IM1,J,K)=TO+T1+S+G1+G2+TO=T1)/4.0
1276. RESP91=((P88-P83)+RKP91+TA33M+2*XIXI(J,I)+QZINF+RKP91/DZETAC(K))=
1277. V2+((-P88+P113)+RKP91+TA33P+2*XIXI(J,I)+QZINF+RKP91/DZETAC(K))
1278. +Y1+S+(RIMP91+TA21M+((P93-P92-P88-P87)+TAJ2+((P88-P87-P83-P82)+
1279. TAJ1))+RIMP91+TA11M+2*DXINF+RIMP91/DXIC(I))+S+(RJP91+
1280. TA21M+((P88-P88+P84-P83)+TA12+(P88-P87-P83-P82)+TA11)+(P88-P83)+
1281. RJP91+TA22M)+RJP91+TA21P+((P84-P93+P89-P88)+TA12+(P93-P92+P88-
1282. P87)+TA11)+(P93-P88)+RJP91+TA22P
1283. DER = RESP91

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1284. C P92
1285. ELSEIF (CND(I1,JJ,KK,IM1,JP1,K)) THEN
1286. P011P92 = DXI(I1)IM1)=5
1287. P012P92 = DXI(I1)IM2)
1288. P017P92 = AJ2(J)/2.0
1289. P018P92 = AJ2(J)/2.0
1290. P026P92 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1291. P027P92 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1292. P041P92 = [-A2K(K)+A1K(K)]/2.0
1293. P042P92 = [-A2K(K)+A1K(K)]/2.0
1294. P047P92 = AJ2(J)*XIYIP(J,IM1)/2.0
1295. P048P92 = AJ2(J)*XIYIP(J,IM2)/2.0
1296. P058P92 = DXI(I1)IM1)+A11R(JP1,IM1)+S+[-AJ2(JP1)+AJ1(JP1)]*XIYIP(JP1
1297. ,IM1)/2.0
1298. P057P92 = (-AJ2(JP1)+AJ1(JP1))*XIYIP(JP1,IM2)/2.0+DXI(I1)IM2)+A11R(
1299. JP1,IM2)
1300. P062P92 = AJ2(J)/2.0
1301. P063P92 = AJ2(J)/2.0
1302. P071P92 = DXI(I1)IM1)*XIYIP(JP1,IM1)+S+[-AJ2(JP1)+AJ1(JP1)]/2.0
1303. P072P92 = DXI(I1)IM2)*XIYIP(JP1,IM2)+[-AJ2(JP1)+AJ1(JP1)]/2.0
1304. TO=(G1+(P017+P062+P02+P047+P032==2)+1)==(G2-1)
1305. T1=P017+P062P92+P017P92+P062+P02+P047P92
1306. RIPP92+G1+G2+SG(I,J,K)=TO+T1+S+G1+G2+TO=T1
1307. TO=G2-1
1308. T1=(G1+(P018+P063+P03+P048+P033==2)+1)==TO
1309. T2=P018+P063P92+P018P92+P063+P03+P048P92
1310. RIMP92+SG(IM1,J,K)=(G1+G2+T1+T2+S+G1+G2=(G1+(P017+P062+P02+P047+
1311. P032==2)+1)==TO+(P017+P062P92+P017P92+P062+P02+P047P92))+G1+G2+T1
1312. +T2
1313. TO=G2-1
1314. T1=(G1+(P017+P062+P02+P047+P032==2)+1)==TO
1315. T2=P017+P062P92+P017P92+P062+P02+P047P92
1316. T3=G1+G2+T1+T2
1317. T4=(G1+(P018+P063+P03+P048+P033==2)+1)==TO
1318. T5=P018+P063P92+P018P92+P063+P03+P048P92
1319. RJP92=(SG(IM1,J,K)=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,K)=T1+T2+S+G1+
1320. G2+T4+T5+T3)/4.0

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1320. TO=G2-1
1321. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1322. T2+P017+P082P82+P017P82+P082+P02+P047P82
1323. T3+G1+G2+T1=T2
1324. T4=[G1={P018+P083+P03+P048+P033==2)+1}]==TO
1325. T5+P018+P083P82+P018P82+P083+P03+P048P82
1326. RKP82=[SG(IM1, J, K)={G1+G2+T4+T5+S+T3)+G1+G2+SG(I, J, K)+T1+T2+S+G1+
1327. G2+T4+T5+T3}/4.0
1328. TO=G2-1
1329. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1330. T2+P017+P082P82+P017P82+P082+P02+P047P82
1331. T3+G1+G2+T1=T2
1332. T4=[G1={P018+P083+P03+P048+P033==2)+1}]==TO
1333. T5+P018+P083P82+P018P82+P083+P03+P048P82
1334. T6=[G1={P026+P071+P011+P058+P041==2)+1}]==TO
1335. T7+P026+P071P82+P026P82+P071+P011+P058P82+P011P82+P058+2+P041+
1336. P041P82
1337. T8+G1+G2+T6=T7
1338. T8=[G1={P027+P072+P012+P057+P042==2)+1}]==TO
1339. T10+P027+P072P82+P027P82+P072+P012+P057P82+P012P82+P057+2+P042+
1340. P042P82
1341. RJPP82=[SG(IM1, JP1, K)={G1+G2+T8+T10+S+T8)+SG(IM1, J, K)={G1+G2+T4+T5
1342. +S+T3)+G1+G2+SG(I, JP1, K)={T8+T7+S+G1+G2+SG(I, J, K)+T1+T2+S+G1+G2+T8
1343. +T10+T8+G1+G2+T4+T5+T3}/4.0
1344. TO=G2-1
1345. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1346. T2+P017+P082P82+P017P82+P082+P02+P047P82
1347. T3+G1+G2+T1=T2
1348. T4=[G1={P018+P083+P03+P048+P033==2)+1}]==TO
1349. T5+P018+P083P82+P018P82+P083+P03+P048P82
1350. RKP82=[SG(IM1, J, K)={G1+G2+T4+T5+S+T3)+G1+G2+SG(I, J, K)+T1+T2+S+G1+
1351. G2+T4+T5+T3}/4.0
1352. RESP82=[(P88-P83)=RKP82+TA33M+2+XIXI(J, I)=OZINF=RKP82/DZETAC(K)]+
1353. Y2+[(P88+P113)=RKP82+TA33P+2+XIXI(J, I)=OZINF=RKP82/DZETAC(K)]+
1354. +V1+S+[(RIMP82+TA12M)=[(P83+P82-P88-P87)+TAJ2+(P88+P87-P83-P82)+
1355. TAJ1+R1M+TA12M+TAJ2+(P88-P87)=RIMP82+TA11M+2+OXINF=RIMP82/DXIC(I
1356. )]+RIPP82+TA12P=[(P84+P83-P88-P88)=TAJ2+(P89+P88-P84-P83)=TAJ1]+S
1357. +[(RJP82+TA21M)=[(P89-P88+P84-P83)=TA12+(P88-P87-P83-P82)+TA11]+(
1358. P88-P83)+RJP82+TA22M)+RJP82+TA21P=[(P84-P83+P89-P88)=TA12+(P83-
1359. P82+P88-P87)+TA11]+(RJP+TA21P+TA11)+[(P83-P88)=RJP82+TA22P+(P89-
1360. P88)=RIPP82+TA11P+2+OXINF=RIPP82/DXIC(I)
1361. DER = RESP82
1362.
1363. C P83
1364. ELSEIF (CND(II, JJ, KK, I, JP1, K)) THEN
1365. P010P83 = DXII(I)=S
1366. P011P83 = DXII(IM1)
1367. P018P83 = AJ2(J)/2.0
1368. P017P83 = AJ2(J)/2.0
1369. P025P83 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1370. P028P83 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1371. P040P83 = [-A2K(K)+A1K(K)]/2.0
1372. P041P83 = [-A2K(K)+A1K(K)]/2.0
1373. P048P83 = AJ2(J)=XIYIP(J, I)/2.0
1374. P047P83 = AJ2(J)=XIYIP(J, IM1)/2.0
1375. P065P83 = DXI(I)+A11R(JP1, I)=S+(-AJ2(JP1)+AJ1(JP1))=XIYIP(JP1, I)/
1376. 2.0
1377. P068P83 = [-AJ2(JP1)+AJ1(JP1)]=XIYIP(JP1, IM1)/2.0+OXII(IM1)+A11R(
1378. JP1, IM1)
1379. P061P83 = AJ2(J)/2.0
1380. P062P83 = AJ2(J)/2.0
1381. P070P83 = DXII(I)=XIYIP(JP1, I)+S+(-AJ2(JP1)+AJ1(JP1))/2.0
1382. P071P83 = DXII(IM1)=XIYIP(JP1, IM1)+(-AJ2(JP1)+AJ1(JP1))/2.0
1383. TO=G2-1
1384. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1385. T2+P017+P082P83+P017P83+P082+P02+P047P83
1386. R1PP83=[SG(I, J, K)={G1+G2+T1+T2+S+G1+G2+(G1={P016+P061+P01+P046+P031
1387. ==2)+1}]==TO+(P018+P061P83+P018P83+P061+P01+P046P83)]+G1+G2+T1+T2
1388. R1MP83=[G1+G2+SG(IM1, J, K)={G1={P017+P082+P02+P047+P032==2)+1}]==(G2-
1389. 1)+[P017+P082P83+P017P83+P082+P02+P047P83]
1390. TO=G2-1
1391. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1392. T2+P017+P082P83+P017P83+P082+P02+P047P83
1393. RJPP83=[SG(I, J, K)={G1+G2+T1+T2+S+G1+G2+(G1={P016+P061+P01+P046+P031
1394. ==2)+1}]==TO+(P018+P061P83+P018P83+P061+P01+P046P83)]+G1+G2+SG(IM1
1395. , J, K)+T1+T2+G1+G2+T1+T2)/4.0
1396. TO=G2-1
1397. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1398. T2+P017+P082P83+P017P83+P082+P02+P047P83
1399. RKP83=[SG(I, J, K)={G1+G2+T1+T2+S+G1+G2+(G1={P016+P061+P01+P046+P031
1400. ==2)+1}]==TO+(P018+P061P83+P018P83+P061+P01+P046P83)]+G1+G2+SG(IM1
1401. , J, K)+T1+T2+G1+G2+T1+T2)/4.0
1402. TO=G2-1
1403. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1404. T2+P017+P082P83+P017P83+P082+P02+P047P83
1405. T3=[G1={P026+P071+P011+P058+P041==2)+1}]==TO
1406. T4+P026+P071P83+P026P83+P071+P011+P058P83+P011P83+P058+2+P041+
1407. P041P83
1408. RJPP83=[SG(I, JP1, K)={G1+G2+T3+T4+S+G1+G2+(G1={P025+P070+P010+P055+
1409. P040==2)+1}]==TO+(P025+P070P83+P025P83+P070+P010+P055P83+P010P83+
1410. P055+2+P040+P040P83)]+SG(I, J, K)={G1+G2+T1+T2+S+G1+G2+(G1={P016+
1411. P061+P01+P046+P031==2)+1}]==TO+(P018+P061P83+P018P83+P061+P01+
1412. P046P83)]+G1+G2+SG(IM1, JP1, K)+T3+T4+G1+G2+T3+T4+G1+G2+SG(IM1, J, K)
1413. +T1+T2+G1+G2+T1+T2)/4.0
1414. TO=G2-1
1415. T1=[G1={P017+P082+P02+P047+P032==2)+1}]==TO
1416. T2+P017+P082P83+P017P83+P082+P02+P047P83
1417. RKP83=[SG(I, J, K)={G1+G2+T1+T2+S+G1+G2+(G1={P016+P061+P01+P046+
1418. P031==2)+1}]==TO+(P018+P061P83+P018P83+P061+P01+P046P83)]+G1+G2+SG
1419. (IM1, J, K)+T1+T2+G1+G2+T1+T2)/4.0
1420. RESP83=[(P88-P83)=RKP83+TA33M+2+XIXI(J, I)=OZINF=RKP83/DZETAC(K)]+
1421. Y2+[(P88+P113)=RKP83+TA33P+2+XIXI(J, I)=OZINF=RKP83/DZETAC(K)]+
1422. +V1+S+[(RIMP83+TA12M)=[(P83+P82-P88-P87)+TAJ2+(P88+P87-P83-P82)+
1423. TAJ1+R1M+TA12M+TAJ2+(P88-P87)=RIMP83+TA11M+2+OXINF=RIMP83/DXIC(I
1424. )]+RIPP83+TA12P=[(P84+P83-P88-P88)=TAJ2+(P89+P88-P84-P83)=TAJ1]+S
1425. +[(RJP83+TA21M)=[(P89-P88+P84-P83)=TA12+(P88-P87-P83-P82)+TA11]+(
1426. P88-P82)+TA11]+(P88-P83)+RJP83+TA22M)+RJP83+TA21P=[(P84-P83+P89-
1427. P88)=TA12+(P83-P82+P88-P87)+TA11]+(RJP+TA21P+TA11)+[(P83-P88)=
1428. RJP83+TA22P+(P89-P88)=RIPP83+TA11P+2+OXINF=RIPP83/
1429. DXIC(I)
1430. DER = RESP83
1431.
1432. C P84
1433. ELSEIF (CND(II, JJ, KK, IP1, JP1, K)) THEN
1434. P010P84 = DXII(I)
1435. P018P84 = AJ2(J)/2.0
1436. P025P84 = [-AJ2(JP1)+AJ1(JP1)]/2.0
1437. P040P84 = [-A2K(K)+A1K(K)]/2.0
1438. P048P84 = AJ2(J)=XIYIP(J, I)/2.0
1439. P065P84 = [-AJ2(JP1)+AJ1(JP1)]=XIYIP(JP1, I)/2.0+DXII(I)+A11R(JP1, I
1440. )
1441. P061P84 = AJ2(J)/2.0
1442. P070P84 = DXII(I)=XIYIP(JP1, I)+(-AJ2(JP1)+AJ1(JP1))/2.0
1443. R1PP84=[G1+G2+SG(I, J, K)={G1={P016+P061+P01+P046+P031==2)+1}]==(G2-1)
1444. +[(P018+P061P84+P018P84+P061+P01+P046P84)
1445. +SG(I, J, K)={G1={P017+P082+P02+P047+P032==2)+1}]==(G2-1)+
1446. [(P018+P061P84+P018P84+P061+P01+P046P84)/4.0
1447. RKP84=[G1+G2+SG(I, J, K)={G1={P016+P061+P01+P046+P031==2)+1}]==(G2-1)+
1448. [(P018+P061P84+P018P84+P061+P01+P046P84)/4.0
1449. TO=G2-1
1450. RJPP84=[G1+G2+SG(I, JP1, K)={G1={P025+P070+P010+P055+P040==2)+1}]==TO
1451. +[(P025+P070P84+P025P84+P070+P010+P055P84+P010P84+P055+2+P040+
1452. P040P84)+G1+G2+SG(I, J, K)={G1={P016+P061+P01+P046+P031==2)+1}]==TO+
1453. [(P016+P061P84+P016P84+P061+P01+P046P84)/4.0

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1452. RKPP94=G1+G2+SG(I,J,K)*[G1*(P018+P061+P01+P048+P031**2)+1]**[G2-1]
1453. = (P018+P061P94+P016P94+P061+P01+P048P94)/4.0
1454. RESP94=[(P88-P83)*RKPP94+TA22M+2*XIXXI(J,I)+OZINF+RKPP94/DZETAC(K)]+
1455. V2+[-P88+P113]*RKPP94+TA22P+2*XIXXI(J,I)+OZINF+RKPP94/DZETAC(K)]+
1456. =V1+RIPP94+TA12P*[(P84+P93-P89-P88)*TAJ2+(P89+P88-P84-P83)*TAJ1]+
1457. R1P+TA12P+TAJ2+S*[(RJP94+TA21M)*[(P89-P88+P84-P83)*TA12+(P88-P87+
1458. P83-P82)*TA11]+(P88-P83)*RJP94+TA22M]+RJPP94+TA21P*[(P84-P93+P89-
1459. P88)*TA12+(P93-P92+P88-P87)*TA11]+RJP+TA21P+TA12*[(P84-P88)*RJP94
1460. +TA22P*(P89-P88)*RIPP94+TA11P+2*OXINF+RIPP94/DXIC(I)]
1461. DER = RESP94
1462.
1463. C P86
1464. ELSEIF (CND(I1,JJ,KK,IM2,JP2,K)) THEN
1465. P027P86 = AJ2(JP1)/2.0
1466. P057P86 = AJ2(JP1)*XIYIP(JP1,IM2)/2.0
1467. P072P86 = AJ2(JP1)/2.0
1468. T0=[G1*(P027+P072+P012+P057+P042**2)+1]**[G2-1]
1469. T1=P027+P072P86+P027P86+P072+P012+P057P86
1470. RJPP86=[G1+G2+SG(IM1,JP1,K)*T0+T1+S+G1+G2+T0+T1]/4.0
1471. RESP86=RJPP86+TA21P*[(P84-P93+P89-P88)*TA12+(P93-P92+P88-P87)*TA11
1472. ]+(P83-P88)*RJPP86+TA22P
1473. DER = RESP86
1474.
1475. C P87
1476. ELSEIF (CND(I1,JJ,KK,IM1,JP2,K)) THEN
1477. P028P87 = AJ2(JP1)/2.0
1478. P058P87 = AJ2(JP1)*XIYIP(JP1,IM1)/2.0
1479. P073P87 = AJ2(JP1)*XIYIP(JP1,IM2)/2.0
1480. P071P87 = AJ2(JP1)/2.0
1481. P072P87 = AJ2(JP1)/2.0
1482. T0=G2-1
1483. T1=[G1*(P028+P071+P011+P058+P041**2)+1]**T0
1484. T2=P028+P071P87+P028P87+P071+P011+P058P87
1485. T3=G1+G2+T1+T2
1486. T4=[G1*(P027+P072+P012+P057+P042**2)+1]**T0
1487. T5=P027+P072P87+P027P87+P072+P012+P057P87
1488. RJPP87=[SG(IM1,JP1,K)*[G1+G2+T4+T5+S+T3]+G1+G2+SG(I,JP1,K)*T1+T2+S
1489. +G1+G2+T4+T5+T3]/4.0
1490. RESP87=RJPP87+TA21P*[(P84-P93+P89-P88)*TA12+(P93-P92+P88-P87)*TA11
1491. ]+(P83-P88)*RJPP87+TA22P
1492. DER = RESP87
1493.
1494. C P88
1495. ELSEIF (CND(I1,JJ,KK,I,JP2,K)) THEN
1496. P025P88 = AJ2(JP1)/2.0
1497. P055P88 = AJ2(JP1)*XIYIP(JP1,I)/2.0
1498. P070P88 = AJ2(JP1)*XIYIP(JP1,IM1)/2.0
1499. P071P88 = AJ2(JP1)/2.0
1500. T0=G2-1
1501. T1=[G1*(P025+P071+P011+P055+P041**2)+1]**T0
1502. T2=P025+P071P88+P025P88+P071+P011+P055P88
1503. RJPP88=[SG(I,JP1,K)*[G1+G2+T1+T2+S+G1+G2*(G1+P025+P070+P010+P055+
1504. P040**2)+1]**T0+(P025+P070P88+P025P88+P070+P010+P055P88)]+G1+G2+
1505. SG(IM1,JP1,K)*T1+T2+G1+G2+T1+T2]/4.0
1506. RESP88=RJPP88+TA21P*[(P84-P93+P89-P88)*TA12+(P93-P92+P88-P87)*TA11
1507. ]+(P83-P88)*RJPP88+TA22P
1508. DER = RESP88
1509.
1510. C P89
1511. ELSEIF (CND(I1,JJ,KK,IP1,JP2,K)) THEN
1512. P025P89 = AJ2(JP1)/2.0
1513. P055P89 = AJ2(JP1)*XIYIP(JP1,I)/2.0
1514. P070P89 = AJ2(JP1)/2.0
1515. RJPP89=G1+G2+SG(I,JP1,K)*[G1*(P025+P070+P010+P055+P040**2)+1]**[G2
1516. -1]+[P025+P070P89+P025P89+P070+P010+P055P89]/4.0
1517. RESP89=RJPP89+TA21P*[(P84-P93+P89-P88)*TA12+(P93-P92+P88-P87)*TA11
1518. ]+(P83-P88)*RJPP89+TA22P
1519. DER = RESP89
1520.
1521. C P106
1522. ELSEIF (CND(I1,JJ,KK,IM2,JP1,KP1)) THEN
1523. P030P106 = -[1.0/2.0*AJ1(J)]
1524. P038P106 = A2K(K)/2.0
1525. P080P106 = -[1.0/2.0*AJ1(J)*XIYIP(J,IM2)]
1526. P075P106 = -[1.0/2.0*AJ1(J)]
1527. T0=[G1*(P021+P068+P051+P08+P036**2)+1]**[G2-1]
1528. RJPP106=[2*G1+G2+SG(IM1,JP1,K)*P036+P038P106+T0+S+2*G1+G2+P036+
1529. P038P106+T0]/4.0
1530. T1=[G1*(P030+P075+P015+P080+P045**2)+1]**[G2-1]
1531. T2=P030+P075P106+P030P106+P075+P015+P060P106
1532. RKPP106=[G1+G2+SG(IM1,J,KP1)*T0+T1+S+G1+G2+T0+T1]/4.0
1533. RESP106=[(-P88+P113)*RKPP106+TA22P+2*XIXXI(J,I)+OZINF+RKPP106/
1534. DZETAC(K)]+V1+S*[(RJP106+TA21M)*[(P88-P88+P84-P83)*TA12+(P88-P87+
1535. P83-P82)*TA11]+(P88-P83)*RJP106+TA22M]
1536. DER = RESP106
1537.
1538. C P107
1539. ELSEIF (CND(I1,JJ,KK,IM1,JP1,KP1)) THEN
1540. P028P107 = -[1.0/2.0*AJ1(J)]
1541. P030P107 = -[1.0/2.0*AJ1(J)]
1542. P035P107 = A2K(K)/2.0
1543. P038P107 = A2K(K)/2.0
1544. P059P107 = -[1.0/2.0*AJ1(J)*XIYIP(J,IM1)]
1545. P080P107 = -[1.0/2.0*AJ1(J)*XIYIP(J,IM2)]
1546. P074P107 = -[1.0/2.0*AJ1(J)]
1547. P075P107 = -[1.0/2.0*AJ1(J)]
1548. T0=G2-1
1549. T1=[G1*(P020+P065+P05+P050+P035**2)+1]**T0
1550. T2=2*G1+G2+P035+P038P107+T1
1551. T3=[G1*(P021+P068+P051+P08+P036**2)+1]**T0
1552. RJPP107=[SG(IM1,JP1,K)*[2*G1+G2+P036+P038P107+T3+S+T2]+2*G1+G2+SG(I
1553. ,JP1,K)*P035+P038P107+T1+S+2*G1+G2+P036+P038P107+T3+T2]/4.0
1554. T0=G2-1
1555. T1=[G1*(P028+P074+P014+P069+P044**2)+1]**T0
1556. T2=P028+P074P107+P028P107+P074+P014+P069P107
1557. T3=G1+G2+T1+T2
1558. T4=[G1*(P030+P075+P015+P080+P045**2)+1]**T0
1559. T5=P030+P075P107+P030P107+P075+P015+P060P107
1560. RKPP107=[SG(IM1,J,KP1)*[G1+G2+T4+T5+S+T3]+G1+G2+SG(I,J,KP1)*T1+T2+
1561. S+G1+G2+T4+T5+T3]/4.0
1562. RESP107=[(-P88+P113)*RKPP107+TA22P+2*XIXXI(J,I)+OZINF+RKPP107/
1563. DZETAC(K)]+V1+S*[(RJP107+TA21M)*[(P88-P88+P84-P83)*TA12+(P88-P87+
1564. P83-P82)*TA11]+(P88-P83)*RJP107+TA22M]
1565. DER = RESP107
1566.
1567. C P108
1568. ELSEIF (CND(I1,JJ,KK,I,JP1,KP1)) THEN
1569. P028P108 = -[1.0/2.0*AJ1(J)]
1570. P029P108 = -[1.0/2.0*AJ1(J)]
1571. P034P108 = A2K(K)/2.0
1572. P035P108 = A2K(K)/2.0
1573. P058P108 = -[1.0/2.0*AJ1(J)*XIYIP(J,I)]
1574. P059P108 = -[1.0/2.0*AJ1(J)*XIYIP(J,IM1)]
1575. P073P108 = -[1.0/2.0*AJ1(J)]
1576. P074P108 = -[1.0/2.0*AJ1(J)]
1577. T0=G2-1
1578. T1=[G1*(P020+P065+P05+P050+P035**2)+1]**T0
1579. RJPP108=[SG(I,JP1,K)*[2*G1+G2+P035+P035P108+T1+S+2*G1+G2+P034+
1580. P035P108*(G1+[P019+P084+P04+P049+P034**2)+1]**T0]+2*G1+G2+SG(IM1,
1581. JP1,K)*P035+P035P108+T1+2*G1+G2+P035+P035P108+T1]/4.0
1582. T0=G2-1
1583. T1=[G1*(P028+P074+P014+P069+P044**2)+1]**T0
1584. T2=P028+P074P108+P028P108+P074+P014+P069P108
1585. RKPP108=[SG(I,J,KP1)*[G1+G2+T1+T2+S+G1+G2*(G1+P028+P073+P013+P068
1586. +P043**2)+1]**T0+(P028+P073P108+P028P108+P073+P013+P068P108)]+G1+
1587. G2+SG(IM1,J,KP1)*T1+T2+G1+G2+T1+T2]/4.0

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1544. RESP108:=[P88+P113]=RKPP108+TA33P+2\*XIXI1[J,I]+OZINF+RKPP108/  
1545. DZETAC(K)+Y1+S=[RJP108+TA21M]+(P88-P84-P84-P83)=TA12+(P88-P87+  
1546. P83-P82)+TA11)+(P88-P83)=RJP108+TA22M  
1547. DER = RESP108  
1548. C P108  
1549. ELSEIF [CND[II,JJ,KK,IP1,JM1,KP1]] THEN  
1550. P028P108 = -[1.0/2.0+AJ1(J)]  
1551. P033P108 = A2K(K)/2.0  
1552. P058P108 = -[1.0/2.0+AJ1(J)+XIYIP(J,I)]  
1553. P073P108 = -[1.0/2.0+AJ1(J)]  
1554. RJP108+G1+G2+SG[I, JM1, K]+P034+P034P108 = (G1=[P018+P084+P04+P048+  
1555. P034+P2]+1)+[(G2-1)/2.0  
1556. RKPP108+G1+G2+SG[I, J, KP1] = (G1=[P028+P073+P013+P058+P043+P2]+1)+[(G2-1)  
1557. (G2-1)=[P028+P073P108+P028P108+P073+P013+P058P108]/4.0  
1558. RESP109:=[P88+P113]=RKPP109+TA33P+2\*XIXI1[J,I]+OZINF+RKPP109/  
1559. DZETAC(K)+Y1+S=[RJP109+TA21M]+(P88-P84-P84-P83)=TA12+(P88-P87+  
1600. P83-P82)+TA11)+(P88-P83)=RJP109+TA22M  
1601. DER = RESP109  
1602. C P111  
1603. ELSEIF [CND[II,JJ,KK,IM2,J,KP1]] THEN  
1604. P015P111 = DXI1[IM2]+S  
1605. P030P111 = [-AJ2(J)+AJ1(J)]/2.0  
1606. P033P111 = A2K(K)/2.0  
1607. P045P111 = [-A2K(KP1)+A1K(KP1)]/2.0  
1608. P080P111 = DXI1[IM2]+A11R[J,IM2]+S+[-AJ2(J)+AJ1(J)]=XIYIP(J,IM2)/  
1609. 2.0  
1610. P075P111 = DXI1[IM2]+XIYIP(J,IM2)+S+[-AJ2(J)+AJ1(J)]/2.0  
1611. TO+(G1=[P018+P083+P03+P048+P033+P2]+1)+[(G2-1)  
1612. RIMP111+2+G1+G2+SG[IM1, J, K]+P033+P033P111+TO+S+2+G1+G2+P033+  
1613. P033P111+TO  
1614. TO+(G1=[P018+P083+P03+P048+P033+P2]+1)+[(G2-1)  
1615. RJP111+(2+G1+G2+SG[IM1, J, K]+P033+P033P111+TO+S+2+G1+G2+P033+  
1616. P033P111+TO)/4.0  
1617. TO+(G1=[P018+P083+P03+P048+P033+P2]+1)+[(G2-1)  
1618. RKP111+(2+G1+G2+SG[IM1, J, K]+P033+P033P111+TO+S+2+G1+G2+P033+  
1619. P033P111+TO)/4.0  
1620. TO+(G1=[P018+P083+P03+P048+P033+P2]+1)+[(G2-1)  
1621. RJP111+(2+G1+G2+SG[IM1, J, K]+P033+P033P111+TO+S+2+G1+G2+P033+  
1622. P033P111+TO)/4.0  
1623. TO+G2-1  
1624. T1:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1625. T2:=(G1=[P030+P075+P015+P060+P045+P2]+1)+TO  
1626. T3:P030+P075P111+P030P111+P075+P015+P060P111+P015P111+P060+2+P045+  
1627. P045P111  
1628. RKPP111+G1+G2+SG[IM1, J, KP1]=T2+T3+S+2+G1+G2+SG[IM1, J, K]+P033+  
1629. P033P111+T1+S+G1+G2+T2+T3+2+G1+G2+P033+P033P111+T1)/4.0  
1630. RESP111:=[P88-P83]=RKP111+TA33M+2\*XIXI1[J,I]+OZINF+RKP111/DZETAC(K  
1631. )+Y2+[-P88+P113]=RKPP111+TA33P+2\*XIXI1[J,I]+OZINF+RKPP111/  
1632. DZETAC(K)+Y1+S=[RIMP111+TA12M]+(P83+P82-P88-P87)=TAJ2+(P88+P87-  
1633. P83-P82)+TAJ1)+(P88-P87)=RIMP111+TA11M+2+OXINF+RIMP111/DXIC[I]+S  
1634. =[RJP111+TA21M]+(P88-P88+P84-P83)=TA12+(P88-P87-P83-P82)+TA11)+(P88-  
1635. P83-P83)=RJP111+TA22M)+RJP111+TA21P+[(P84-P83+P89-P88)=TA12+(P83-  
1636. P82+P88-P87)+TA11)+(P83-P88)+RJP111+TA22P  
1637. DER = RESP111  
1638. C P112  
1639. ELSEIF [CND[II,JJ,KK,IM1,J,KP1]] THEN  
1640. P014P112 = DXI1[IM1]+S  
1641. P015P112 = DXI1[IM2]  
1642. P029P112 = [-AJ2(J)+AJ1(J)]/2.0  
1643. P030P112 = [-AJ2(J)+AJ1(J)]/2.0  
1644. P032P112 = A2K(K)/2.0  
1645. P033P112 = A2K(K)/2.0  
1646. P044P112 = [-A2K(KP1)+A1K(KP1)]/2.0  
1647. P045P112 = [-A2K(KP1)+A1K(KP1)]/2.0  
1648. P059P112 = DXI1[IM1]+A11R[J,IM1]+S+[-AJ2(J)+AJ1(J)]=XIYIP(J,IM1)/  
1649. 2.0  
1650. P080P112 = [-AJ2(J)+AJ1(J)]=XIYIP(J,IM2)/2.0+DXI1[IM2]=A11R[J,IM2]  
1651. P074P112 = DXI1[IM1]+XIYIP(J,IM1)+S+[-AJ2(J)+AJ1(J)]/2.0  
1652. P075P112 = DXI1[IM2]+XIYIP(J,IM2)+[-AJ2(J)+AJ1(J)]/2.0  
1653. TO+(G1=[P017+P082+P02+P047+P032+P2]+1)+[(G2-1)  
1654. RIPP112+2+G1+G2+SG[I, J, K]+P032+P032P112+TO+S+2+G1+G2+P032+P032P112  
1655. +TO  
1656. TO+G2-1  
1657. T1:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1658. RIMP112+SG[IM1, J, K]=(2+G1+G2+P033+P033P112+T1+S+2+G1+G2+P032+  
1659. P032P112+(G1=[P017+P082+P02+P047+P032+P2]+1)+TO)+2+G1+G2+P033+  
1660. P033P112+T1  
1661. TO+G2-1  
1662. T1:=(G1=[P017+P082+P02+P047+P032+P2]+1)+TO  
1663. T2:2+G1+G2+P032+P032P112+T1  
1664. T3:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1665. RJP112+(SG[IM1, J, K]+(2+G1+G2+P033+P033P112+T3+S+T2)+2+G1+G2+SG[I, J  
1666. , K]+P032+P032P112+T1+S+2+G1+G2+P033+P033P112+T3+T2)/4.0  
1667. TO+G2-1  
1668. T1:=(G1=[P017+P082+P02+P047+P032+P2]+1)+TO  
1669. T2:2+G1+G2+P032+P032P112+T1  
1670. T3:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1671. RKP112+(SG[IM1, J, K]+(2+G1+G2+P033+P033P112+T3+S+T2)+2+G1+G2+SG[I, J  
1672. , K]+P032+P032P112+T1+S+2+G1+G2+P033+P033P112+T3+T2)/4.0  
1673. TO+G2-1  
1674. T1:=(G1=[P017+P082+P02+P047+P032+P2]+1)+TO  
1675. T2:2+G1+G2+P032+P032P112+T1  
1676. T3:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1677. RJP112+(SG[IM1, J, K]+(2+G1+G2+P033+P033P112+T3+S+T2)+2+G1+G2+SG[I, J  
1678. , K)+P032+P032P112+T1+S+2+G1+G2+P033+P033P112+T3+T2)/4.0  
1679. TO+G2-1  
1680. T1:=(G1=[P017+P082+P02+P047+P032+P2]+1)+TO  
1681. T2:2+G1+G2+P032+P032P112+T1  
1682. T3:=(G1=[P018+P083+P03+P048+P033+P2]+1)+TO  
1683. T4:=(G1=[P029+P074+P014+P059+P044+P2]+1)+TO  
1684. T5:P029+P074P112+P029P112+P074+P014+P059P112+P014P112+P059+2+P044+  
1685. P044P112  
1686. T8:G1+G2+T4+T5  
1687. T7:=(G1=[P030+P075+P015+P060+P045+P2]+1)+TO  
1688. T8:P030+P075P112+P030P112+P075+P015+P060P112+P015P112+P060+2+P045+  
1689. P045P112  
1690. RKPP112+(SG[IM1, J, KP1]+(G1+G2+T7+T8+S+T8)+SG[IM1, J, K]+(2+G1+G2+  
1691. P033+P033P112+T3+S+T2)+G1+G2+SG[I, J, KP1]+T4+T5+S+2+G1+G2+SG[I, J, K  
1692. ]+P032+P032P112+T1+S+G1+G2+T7+T8+T8+2+G1+G2+P033+P033P112+T3+T2)/  
1693. 4.0  
1694. RESP112:=[P88-P83]=RKP112+TA33M+2\*XIXI1[J,I]+OZINF+RKP112/DZETAC(K  
1695. )+Y2+[-P88+P113]=RKPP112+TA33P+2\*XIXI1[J,I]+OZINF+RKPP112/  
1696. DZETAC(K)+Y1+S=[RIMP112+TA12M]+(P83+P82-P88-P87)=TAJ2+(P88+P87-  
1697. P83-P82)+TAJ1)+(P88-P87)=RIMP112+TA11M+2+OXINF+RIMP112/DXIC[I]+S  
1698. =[RJP112+TA21M]+(P88-P88+P84-P83)=TA12+(P88-P87-P83-P82)+TA11)+(P88-  
1699. P83)+RJP112+TA22M)+RJP112+TA21P+[(P84-P83+P89-P88)=TA12+(P83-  
1700. P82+P88-P87)+TA11)+(P83-P88)+RJP112+TA22P+(P88-P88)=RIPP112+  
1701. TA11P+2+OXINF+RIPP112/DXIC[I]  
1702. DER = RESP112  
1703. C P113  
1704. ELSEIF [CND[II,JJ,KK,I,J,KP1]] THEN  
1705. P013P113 = DXI1[IM1]+S  
1706. P014P113 = DXI1[IM2]  
1707. P026P113 = [-AJ2(J)+AJ1(J)]/2.0  
1708. P029P113 = [-AJ2(J)+AJ1(J)]/2.0  
1709. P031P113 = A2K(K)/2.0  
1710. P032P113 = A2K(K)/2.0  
1711. P043P113 = [-A2K(KP1)+A1K(KP1)]/2.0  
1712. P044P113 = [-A2K(KP1)+A1K(KP1)]/2.0  
1713. P058P113 = DXI1[IM1]+A11R[J,I]+S+[-AJ2(J)+AJ1(J)]=XIYIP(J,I)/2.0  
1714. P059P113 = [-AJ2(J)+AJ1(J)]=XIYIP(J,IM1)/2.0+DXI1[IM1]+A11R[J,IM1]  
1715.

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1716. P073P113 = DX11(I)*XIYIP(J,I)*S+[-AJ2(J)+AJ1(J)]/2.0
1717. P074P113 = DX11(IM1)*XIYIP(J,IM1)*[-AJ2(J)+AJ1(J)]/2.0
1718. TO=G2-1
1719. T1=[G1*(P017+P062+P02+P047+P032==2)+1]==TO
1720. RJP113=[SG(I,J,K)]*(2+G1+G2+P032+P032P113+T1)*S+2+G1+G2+P031+
1721. P031P113=[G1*(P016+P061+P01+P046+P031==2)+1]==TO)+2+G1+G2+P032+
1722. P032P113+T1
1723. RIMP113=2+G1+G2+SG(IM1,J,K)*P032+P032P113=[G1*(P017+P062+P02+P047+
1724. P032==2)+1]==[G2-1]
1725. TO=G2-1
1726. T1=[G1*(P017+P062+P02+P047+P032==2)+1]==TO
1727. RJP113=[SG(I,J,K)]*(2+G1+G2+P032+P032P113+T1)*S+2+G1+G2+P031+
1728. P031P113=[G1*(P016+P061+P01+P046+P031==2)+1]==TO)+2+G1+G2+SG(IM1,
1729. J,K)*P032+P032P113+T1+2+G1+G2+P032+P032P113+T1)/4.0
1730. TO=G2-1
1731. T1=[G1*(P017+P062+P02+P047+P032==2)+1]==TO
1732. RKP113=[SG(I,J,K)]*(2+G1+G2+P032+P032P113+T1)*S+2+G1+G2+P031+
1733. P031P113=[G1*(P016+P061+P01+P046+P031==2)+1]==TO)+2+G1+G2+SG(IM1,
1734. J,K)*P032+P032P113+T1+2+G1+G2+P032+P032P113+T1)/4.0
1735. TO=G2-1
1736. T1=[G1*(P017+P062+P02+P047+P032==2)+1]==TO
1737. RJP113=[SG(I,J,K)]*(2+G1+G2+P032+P032P113+T1)*S+2+G1+G2+P031+
1738. P031P113=[G1*(P016+P061+P01+P046+P031==2)+1]==TO)+2+G1+G2+SG(IM1,
1739. J,K)*P032+P032P113+T1+2+G1+G2+P032+P032P113+T1)/4.0
1740. TO=G2-1
1741. T1=[G1*(P017+P062+P02+P047+P032==2)+1]==TO
1742. T2=[G1*(P029+P074+P014+P059+P044==2)+1]==TO
1743. T3=[P029+P074P113+P029P113+P074+P014+P059P113+P014P113+P059+2+P044+
1744. P044P113
1745. RKPP113=[SG(I,J,KP1)]*(G1+G2+T2+T3)*S+G1+G2=[G1*(P028+P073+P013+P058
1746. +P043==2)+1]==TO*(P028+P073P113+P028P113+P073+P013+P058P113+
1747. P013P113+P058+2+P043+P043P113)]*SG(I,J,K)+[2+G1+G2+P032+P032P113+
1748. T1]*S+2+G1+G2+P031+P031P113=[G1*(P016+P061+P01+P046+P031==2)+1]==
1749. TO)+G1+G2+SG(IM1,J,KP1)*T2+T3+G1+G2+T2+T3+2+G1+G2+SG(IM1,J,K)+
1750. P032+P032P113+T1+2+G1+G2+P032+P032P113+T1)/4.0
1751. RESP113=[(P88-P83)*RKPP113+TA33M+2*XIXXI(J,I)*OZINF+RKP113/DZETAC(K
1752. )]+Y2+[(P88-P113)*RKPP113+TA33P+RKP+TA33P+2*XIXXI(J,I)*OZINF+
1753. RKP113/DZETAC(K)]*Y1+S=[RIMP113+TA12M+[(P83+P82-P88-P87)*TAJ2+
1754. P88+P87-P83-P82]*TAJ1]+(P88-P87)*RIMP113+TA11M+2*OXINF+RIMP113/
1755. DXIC(I)]+RJP113+TA12P+[(P84+P83-P89-P86)*TAJ2+(P85+P88-P84-P83)*
1756. TAJ1]+S=[RJP113+TA21M+[(P85-P88+P84-P83)*TAI2+(P85-P87+P83-P82)*
1757. TAI1]+(P86-P83)*RJP113+TA22M]+RJP113+TA21P+[(P84+P83+P89-P88)*
1758. TAI2+(P83+P82+P88-P87)*TAI1]+(P83-P88)*RJP113+TA22P+(P89-P88)*
1759. RIMP113+TA11P+2*OXINF+RIMP113/DXIC(I)
1760. DER = RESP113
1761. C P114
1762. ELSEIF [CND[I,J,K,IP1,J,KP1]] THEN
1763. P013P114 = DX11(I)
1764. P028P114 = [-AJ2(J)+AJ1(J)]/2.0
1765. P031P114 = A2K(K)/2.0
1766. P043P114 = [-A2K(KP1)+A1K(KP1)]/2.0
1767. P058P114 = [-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0+DX11(I)*A11R(J,I)
1768. P073P114 = DX11(I)*XIYIP(J,I)*[-AJ2(J)+AJ1(J)]/2.0
1769. RIPP114=2+G1+G2+SG(I,J,K)*P031+P031P114=[G1*(P016+P061+P01+P046+
1770. P031==2)+1]==[G2-1]
1771. RJP114=G1+G2+SG(I,J,K)*P031+P031P114=[G1*(P016+P061+P01+P046+P031
1772. ==2)+1]==[G2-1]/2.0
1773. RKP114=G1+G2+SG(I,J,K)*P031+P031P114=[G1*(P016+P061+P01+P046+P031
1774. ==2)+1]==[G2-1]/2.0
1775. RJP114=G1+G2+SG(I,J,K)*P031+P031P114=[G1*(P016+P061+P01+P046+P031
1776. ==2)+1]==[G2-1]/2.0
1777. TO=G2-1
1778. RKPP114=[G1+G2+SG(I,J,KP1)]*(G1*(P028+P073+P013+P058+P043==2)+1]==
1779. TO*(P028+P073P114+P028P114+P073+P013+P058P114+P013P114+P058+2+
1780. P043+P043P113)+2+G1+G2+SG(I,J,K)*P031+P031P114+[G1*(P016+P061+P01
1781. +P046+P031==2)+1]==TO)/4.0
1782. RESP114=[(P88-P83)*RKPP114+TA33M+2*XIXXI(J,I)*OZINF+RKP114/DZETAC(K
1783. )]+Y2+[(P88-P113)*RKPP114+TA33P+2*XIXXI(J,I)*OZINF+RKP114/
1784. DZETAC(K)]*Y1+RJP114+TA12P+[(P84+P83-P89-P86)*TAJ2+(P85+P88-P84-
1785. P83)*TAJ1]+S=[RJP114+TA21M+[(P85-P88+P84-P83)*TAI2+(P85-P87+P83-
1786. P82)*TAI1]+(P86-P83)*RJP114+TA22M]+RJP114+TA21P+[(P84+P83+P89-
1787. P88)*TAI2+(P83+P82+P88-P87)*TAI1]+(P83-P88)*RJP114+TA22P+(P89-
1788. P88)*RIMP114+TA11P+2*OXINF+RIMP114/DXIC(I)
1789. DER = RESP114
1790. C P116
1791. ELSEIF [CND[I,J,K,IM2,JP1,KP1]] THEN
1792. P030P116 = AJ2(J)/2.0
1793. P042P116 = A2K(K)/2.0
1794. P060P116 = AJ2(J)*XIYIP(J,IM2)/2.0
1795. P075P116 = AJ2(J)/2.0
1796. TO=[G1*(P027+P072+P012+P057+P042==2)+1]==[G2-1]
1797. RJP116=[2+G1+G2+SG(IM1,JP1,K)*P042+P042P116+TO]*S+2+G1+G2+P042+
1798. P042P116+TO)/4.0
1799. TO=[G1*(P030+P075+P015+P060+P045==2)+1]==[G2-1]
1800. T1=[P030+P075P116+P030P116+P075+P015+P060P116
1801. RKPP116=[G1+G2+SG(IM1,J,KP1)]*(G1*(P028+P073+P013+P058+P043==2)+1]==
1802. TO*(P028+P073P116+P028P116+P073+P013+P058P116+P013P116+P058+2+
1803. P043+P043P113)+2+G1+G2+SG(IM1,J,KP1)*T2+T3+G1+G2+T2+T3+2+G1+G2+SG
1804. (IM1,JP1,K)*P042+P042P116+T1)*S+2+G1+G2+P042+P042P116+T1+2+G1+G2+
1805. P042+P042P116+T1)/4.0
1806. RESP116=[(P88-P83)*RKPP116+TA33M+2*XIXXI(J,I)*OZINF+RKP116/DZETAC(K
1807. )]+Y2+[(P88-P113)*RKPP116+TA33P+2*XIXXI(J,I)*OZINF+RKP116/
1808. DZETAC(K)]*Y1+RJP116+TA12P+[(P84+P83-P89-P86)*TAJ2+(P85+P88-P84-
1809. P83)*TAJ1]+S=[RJP116+TA21M+[(P85-P88+P84-P83)*TAI2+(P85-P87+P83-
1810. P82)*TAI1]+(P86-P83)*RJP116+TA22M]+RJP116+TA21P+[(P84+P83+P89-
1811. P88)*TAI2+(P83+P82+P88-P87)*TAI1]+(P83-P88)*RJP116+TA22P+(P89-
1812. P88)*RIMP116+TA11P+2*OXINF+RIMP116/DXIC(I)
1813. DER = RESP116
1814. C P117
1815. ELSEIF [CND[I,J,K,IM1,JP1,KP1]] THEN
1816. P029P117 = AJ2(J)/2.0
1817. P030P117 = AJ2(J)/2.0
1818. P041P117 = A2K(K)/2.0
1819. P042P117 = A2K(K)/2.0
1820. P059P117 = AJ2(J)*XIYIP(J,IM1)/2.0
1821. P080P117 = AJ2(J)*XIYIP(J,IM2)/2.0
1822. P074P117 = AJ2(J)/2.0
1823. P075P117 = AJ2(J)/2.0
1824. TO=G2-1
1825. T1=[G1*(P028+P071+P011+P058+P041==2)+1]==TO
1826. T2=2+G1+G2+P041+P041P117+T1
1827. T3=[G1*(P027+P072+P012+P057+P042==2)+1]==TO
1828. RJP117=[SG(IM1,JP1,K)]*(2+G1+G2+P042+P042P117+T3)*S+2+G1+G2+SG(
1829. I,JP1,K)*P041+P041P117+T1)*S+2+G1+G2+P042+P042P117+T3+T2)/4.0
1830. TO=G2-1
1831. T1=[G1*(P029+P074+P014+P059+P044==2)+1]==TO
1832. T2=[P029+P074P117+P029P117+P074+P014+P059P117
1833. T3=[G1+G2+T1+T2
1834. T4=[G1*(P030+P075+P015+P060+P045==2)+1]==TO
1835. T5=[P030+P075P117+P030P117+P075+P015+P060P117
1836. RKPP117=[SG(IM1,J,KP1)]*(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,KP1)*T1+T2+
1837. S+G1+G2+T4+T5+T3)/4.0
1838. RESP117=[(P88-P113)*RKPP117+TA33P+2*XIXXI(J,I)*OZINF+RKP117/
1839. DZETAC(K)]*Y1+RJP117+TA21P+[(P84+P83+P89-P88)*TAI2+(P85+P88-P84-
1840. P83)*TAI1]+(P86-P83)*RJP117+TA22M]+RJP117+TA21P+[(P84+P83+P89-
1841. P88)*TAI2+(P83+P82+P88-P87)*TAI1]+(P83-P88)*RJP117+TA22P+(P89-
1842. P88)*RIMP117+TA11P+2*OXINF+RIMP117/DXIC(I)
1843. DER = RESP117
1844. C P118
1845. ELSEIF [CND[I,J,K,I,JP1,KP1]] THEN
1846. P028P118 = AJ2(J)/2.0
1847. P029P118 = AJ2(J)/2.0
1848. P040P118 = A2K(K)/2.0
1849. P041P118 = A2K(K)/2.0
1850. P058P118 = AJ2(J)*XIYIP(J,I)/2.0
1851. P059P118 = AJ2(J)*XIYIP(J,IM1)/2.0
1852. P073P118 = AJ2(J)/2.0
1853. P074P118 = AJ2(J)/2.0
1854. TO=G2-1
1855. T1=[G1*(P028+P071+P011+P058+P041==2)+1]==TO
1856. RJP118=[SG(I,JP1,K)]*(2+G1+G2+P041+P041P118+T1)*S+2+G1+G2+P040+
1857. P040P118=[G1*(P029+P074+P014+P059+P044==2)+1]==TO)+2+G1+G2+SG(IM1

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1844.      ,JP1,K)=P041*P041P118*T1+2*G1*G2*P041*P041P118*T1/4.0
1845.      TO=G2-1
1850.      T1=[G1*(P029*P074+P014*P059+P044**2)+1]==TO
1851.      T2=P029*P074+P014*P059+P044**2+1
1852.      RKPP118=[SG(I,J,KP1)]*(G1*G2+T1+T2)*S+G1*G2*(G1*(P028*P073+P013*P058
1853.      +P043**2)+1)+TO*(P028*P073+P013*P058*P118*P073+P013*P058*P118)]+G1*
1854.      G2*SG(IM1,J,KP1)*T1+T2*G1*G2*T1+T2/4.0
1855.      RESP118=[(-P88+P113)*RKPP118+TA33P+2*XIXI(J,I)*OZINF*RKPP118/
1856.      DZETAC(K)]*V1+RJPP118*TA21P+[(P84-P93+P89-P88)*TAI2+(P93-P92+P88-
1857.      P87)*TAI1]+(P93-P88)*RJPP118*TA22P
1858.      DER = RESP118
1859.
1860. C P119
1861. ELSEIF (CND[I,J,KK,IP1,JP1,KP1]) THEN
1862. P028P119 = AJ2(J)/2.0
1863. P040P119 = A2K(K)/2.0
1864. P058P119 = AJ2(J)*XIYIP(J,I)/2.0
1865. P073P119 = AJ2(J)/2.0
1866. RJPP119=G1*G2*SG(I,JP1,K)+P040*P040P119=(G1*(P028*P070+P010*P055+
1867. P040**2)+1)==(G2-1)/2.0
1868. RKPP119=G1*G2*SG(I,J,KP1)*[G1*(P028*P073+P013*P058+P043**2)+1]==[
1869. G2-1]*(P028*P073+P013*P058*P119*P073+P013*P058*P119)/4.0
1870. RESP119=[(-P88+P113)*RKPP119+TA33P+2*XIXI(J,I)*OZINF*RKPP119/
1871. DZETAC(K)]*V1+RJPP119*TA21P+[(P84-P93+P89-P88)*TAI2+(P93-P92+P88-
1872. P87)*TAI1]+(P93-P88)*RJPP119*TA22P
1873. DER = RESP119
1874.
1875. C P138
1876. ELSEIF (CND[I,J,KK,IM2,J,KP2]) THEN
1877. P045P138 = A2K(KP1)/2.0
1878. TO=[G1*(P030*P075+P015*P060+P045**2)+1]==(G2-1)
1879. RKPP138=[2*G1*G2*SG(IM1,J,KP1)+P045*P045P138*TO*S+2*G1*G2*P045*
1880. P045P138*TO]/4.0
1881. RESP138=[(-P88+P113)*RKPP138+TA33P+2*XIXI(J,I)*OZINF*RKPP138/
1882. DZETAC(K)]*V1
1883. DER = RESP138
1884.
1885. C P137
1886. ELSEIF (CND[I,J,KK,IM1,J,KP2]) THEN
1887. P044P137 = A2K(KP1)/2.0
1888. P045P137 = A2K(KP1)/2.0
1889. TO=G2-1
1890. T1=[G1*(P029*P074+P014*P059+P044**2)+1]==TO
1891. T2=2*G1*G2*P044*P044P137*T1
1892. T3=[G1*(P030*P075+P015*P060+P045**2)+1]==TO
1893. RKPP137=[SG(IM1,J,KP1)]*(2*G1*G2*P045*P045P137+T3*S+T2)+2*G1*G2*SG(
1894. I,J,KP1)+P044*P044P138*T1+2*G1*G2*P045*P045P137*T3+T2)/4.0
1895. RESP137=[(-P88+P113)*RKPP137+TA33P+2*XIXI(J,I)*OZINF*RKPP137/
1896. DZETAC(K)]*V1
1897. DER = RESP137
1898.
1899. C P138
1900. ELSEIF (CND[I,J,KK,I,J,KP2]) THEN
1901. P043P138 = A2K(KP1)/2.0
1902. P044P138 = A2K(KP1)/2.0
1903. TO=G2-1
1904. T1=[G1*(P029*P074+P014*P059+P044**2)+1]==TO
1905. RKPP138=[SG(I,J,KP1)]*(2*G1*G2*P044*P044P138*T1*S+2*G1*G2*P043*
1906. P043P138*(G1*(P028*P073+P013*P058+P043**2)+1)+TO)+2*G1*G2*SG(IM1
1907. ,J,KP1)+P044*P044P138*T1+2*G1*G2*P045*P045P138*T1)/4.0
1908. RESP138=[(-P88+P113)*RKPP138+TA33P+2*XIXI(J,I)*OZINF*RKPP138/
1909. DZETAC(K)]*V1
1910. DER = RESP138
1911.
1912. C P139
1913. ELSEIF (CND[I,J,KK,IP1,J,KP2]) THEN
1914. P043P139 = A2K(KP1)/2.0
1915. RKPP139=G1*G2*SG(I,J,KP1)*P043*P043P139=(G1*(P028*P073+P013*P058+
1916. P043**2)+1)==(G2-1)/2.0
1917. RESP139=[(-P88+P113)*RKPP139+TA33P+2*XIXI(J,I)*OZINF*RKPP139/
1918. DZETAC(K)]*V1
1919. DER = RESP139
1920. ENDF
1921.
1922. C
1923. RETURN
1924. END
1925. SUBROUTINE R1(J,I,K,JJ,II,KK,DAN)
1926. RMDER1.FOR
1927.
1928. C
1929. INCLUDE [INTRD]
1930.
1931. C
1932. P
1933.
1934. P81 = P(JM1,K,IM2)
1935. P82 = P(JM1,K,IM1)
1936. P83 = P(JM1,K,I)
1937. P84 = P(JM1,K,IP1)
1938. P85 = P(J,K,IM2)
1939. P86 = P(J,K,IM1)
1940. P87 = P(J,K,I)
1941. P88 = P(J,K,IP1)
1942. P89 = P(J,K,IP1)
1943. P91 = P(JP1,K,IM2)
1944. P92 = P(JP1,K,IM1)
1945. P93 = P(JP1,K,I)
1946. P94 = P(JP1,K,IP1)
1947.
1948. P106 = P(JM1,KP1,IM2)
1949. P107 = P(JM1,KP1,IM1)
1950. P108 = P(JM1,KP1,I)
1951. P109 = P(JM1,KP1,IP1)
1952.
1953. P111 = P(J,KP1,IM2)
1954. P112 = P(J,KP1,IM1)
1955. P113 = P(J,KP1,I)
1956. P114 = P(J,KP1,IP1)
1957. P116 = P(JP1,KP1,IM2)
1958. P117 = P(JP1,KP1,IM1)
1959. P118 = P(JP1,KP1,I)
1960. P119 = P(JP1,KP1,IP1)
1961.
1962. P133 = P(JM1,KP2,I)
1963. P136 = P(J,KP2,IM2)
1964. P137 = P(J,KP2,IM1)
1965. P138 = P(J,KP2,I)
1966. P139 = P(J,KP2,IP1)
1967. P143 = P(JP1,KP2,I)
1968. P161 = P(J,K+3,IM2)
1969. P162 = P(J,K+3,IM1)
1970. P163 = P(J,K+3,I)
1971. P184 = P(J,K+3,IP1)
1972.
1973. C
1974. PA
1975.
1976. PA1 = DXII(I)=(P88+S+P88)*OXINF/XIXIP(J,I)
1977. PA2 = DXII(IM1)=(P87+S+P88)*OXINF/XIXIP(J,IM1)
1978. PA3 = DXII(IM2)=(P86+S+P87)*OXINF/XIXIP(J,IM2)
1979. PA13 = DXII(I)*(P113+S+P114)*OXINF/XIXIP(J,I)
1980. PA14 = DXII(IM1)*(P112+S+P113)*OXINF/XIXIP(J,IM1)
1981. PA15 = DXII(IM2)*(P111+S+P112)*OXINF/XIXIP(J,IM2)
1982. PA16 = XIYIP(J,I)*OXINF*S/XIXIP(J,I)+(AJ2(J)=(P84+P93-P89-P88)+AJ1
1983. (J)=(P89+P86-P84-P83))/2.0
1984. PA17 = XIYIP(J,IM1)*OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P93+P92-P88-P87)
1985. +AJ1(J)=(P88+P87-P83-P82))/2.0
1986. PA18 = XIYIP(J,IM2)*OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P92+P91-P87-P86)
1987. +AJ1(J)=(P87+P86-P82-P81))/2.0
1988. PA28 = XIYIP(J,I)*OXINF*S/XIXIP(J,I)+(AJ2(J)=(P119+P118-P114-P113)
1989. +AJ1(J)=(P114+P113-P109-P108))/2.0
1990. PA29 = XIYIP(J,IM1)*OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P118+P117-P113-
1991. P112)+AJ1(J)=(P113+P112-P108-P107))/2.0
1992. PA30 = XIYIP(J,IM2)*OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P117+P116-P112-

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1980. . P111)+AJ1(J)=(P112+P111-P107-P106))/2.0
1981. PA31 = OZINF+(DC1*P89+DC1*P86+DC3*P139+DC3*P138+DC2*P114+DC2*P113)
1982. /2.0
1983. PA32 = OZINF+(DC1*P88+DC1*P87+DC3*P138+DC3*P137+DC2*P113+DC2*P112)
1984. /2.0
1985. PA33 = OZINF+(DC1*P87+DC1*P86+DC3*P137+DC3*P136+DC2*P112+DC2*P111)
1986. /2.0
1987. PA43 = OZINF+(DC3*P184+DC3*P183+DC2*P139+DC2*P138+DC1*P114+DC1*
1988. P113)/2.0
1989. PA44 = OZINF+(DC3*P183+DC3*P182+DC2*P138+DC2*P137+DC1*P113+DC1*
1990. P112)/2.0
1991. PA45 = OZINF+(DC3*P182+DC3*P181+DC2*P137+DC2*P136+DC1*P112+DC1*
1992. P111)/2.0
1993. PA46 = A11R(J,I)+(DXII(I))=(P88+S+P89)+OXINF/XIYIP(J,I)+XIYIP(J,I)
1994. *(XIYIP(J,I)+OXINF*S/XIYIP(J,I)+(AJ2(J)=(P94+P93-P89-P88)+AJ1(J)=
1995. IP89+P88-P84-P83))/2.0
1996. PA47 = A11R(J,IM1)+(DXII(IM1))=(P87+S+P88)+OXINF/XIYIP(J,IM1)+
1997. XIYIP(J,IM1)+(XIYIP(J,IM1)+OXINF*S/XIYIP(J,IM1)+(AJ2(J)=(P93+P92-
1998. P88-P87)+AJ1(J)=(P88+P87-P83-P82))/2.0
1999. PA48 = A11R(J,IM2)+(DXII(IM2))=(P86+S+P87)+OXINF/XIYIP(J,IM2)+
2000. XIYIP(J,IM2)+(XIYIP(J,IM2)+OXINF*S/XIYIP(J,IM2)+(AJ2(J)=(P92+P91-
2001. P87-P86)+AJ1(J)=(P87+P86-P82-P81))/2.0
2002. PA58 = A11R(J,I)+(DXII(I))=(P113+S+P114)+OXINF/XIYIP(J,I)+XIYIP(J,
2003. I)+(XIYIP(J,I)+OXINF*S/XIYIP(J,I)+(AJ2(J)=(P119+P118-P114-P113)+
2004. AJ1(J)=(P114+P113-P109-P108))/2.0
2005. PA59 = A11R(J,IM1)+(DXII(IM1))=(P112+S+P113)+OXINF/XIYIP(J,IM1)+
2006. XIYIP(J,IM1)+(XIYIP(J,IM1)+OXINF*S/XIYIP(J,IM1)+(AJ2(J)=(P118+
2007. P117-P113-P112)+AJ1(J)=(P113+P112-P108-P107))/2.0
2008. PA60 = A11R(J,IM2)+(DXII(IM2))=(P111+S+P112)+OXINF/XIYIP(J,IM2)+
2009. XIYIP(J,IM2)+(XIYIP(J,IM2)+OXINF*S/XIYIP(J,IM2)+(AJ2(J)=(P117+
2010. P116-P112-P111)+AJ1(J)=(P112+P111-P107-P106))/2.0
2011. PA61 = XIYIP(J,I)+(DXII(I))=(P86+S+P89)+OXINF/XIYIP(J,I)+XIYIP(J,I
2012. )+OXINF*S/XIYIP(J,I)+(AJ2(J)=(P94+P93-P89-P88)+AJ1(J)=(P89+P88-
2013. P84-P83))/2.0
2014. PA62 = XIYIP(J,IM1)+(DXII(IM1))=(P87+S+P88)+OXINF/XIYIP(J,IM1)+
2015. XIYIP(J,IM1)+OXINF*S/XIYIP(J,IM1)+(AJ2(J)=(P93+P92-P88-P87)+AJ1(J)
2016. )=(P88+P87-P83-P82))/2.0
2017. PA63 = XIYIP(J,IM2)+(DXII(IM2))=(P88+S+P87)+OXINF/XIYIP(J,IM2)+
2018. XIYIP(J,IM2)+OXINF*S/XIYIP(J,IM2)+(AJ2(J)=(P92+P91-P87-P86)+AJ1(J)
2019. )=(P87+P86-P82-P81))/2.0
2020. PA75 = XIYIP(J,I)+(DXII(I))=(P113+S+P114)+OXINF/XIYIP(J,I)+XIYIP(J
2021. ,I)+OXINF*S/XIYIP(J,I)+(AJ2(J)=(P119+P118-P114-P113)+AJ1(J)=(P114
2022. +P113-P108-P107))/2.0
2023. PA74 = XIYIP(J,IM1)+(DXII(IM1))=(P112+S+P113)+OXINF/XIYIP(J,IM1)+
2024. XIYIP(J,IM1)+OXINF*S/XIYIP(J,IM1)+(AJ2(J)=(P118+P117-P113-P112)+
2025. AJ1(J)=(P113+P112-P108-P107))/2.0
2026. PA75 = XIYIP(J,IM2)+(DXII(IM2))=(P111+S+P112)+OXINF/XIYIP(J,IM2)+
2027. XIYIP(J,IM2)+OXINF*S/XIYIP(J,IM2)+(AJ2(J)=(P117+P116-P112-P111)+
2028. AJ1(J)=(P112+P111-P107-P106))/2.0
2029.
2030. C R1K,DPU
2031. C
2032. TO:(G1=(PA17+PA62+PA2+PA47+PA32==2)+1)==G2
2033. T1=(G1=(PA18+PA63+PA3+PA48+PA33==2)+1)==G2
2034. T2=(G1=(PA29+PA74+PA14+PA59+PA44==2)+1)==G2
2035. T3=(G1=(PA30+PA75+PA15+PA60+PA45==2)+1)==G2
2036. R1K=(S=(SG(IM1,J,KP1))=(T3+S+T2)+T3)+S*(SG(I,J,KP1))=(T2+S+(G1=(PA28
2037. +PA73+PA13+PA58+PA43==2)+1)==G2)+T2)+3*(SG(IM1,J,K)+T1)+S*(T1+S+T0)+T1)
2038. +3*(SG(I,J,K)+(T0+S+(G1=(PA18+PA61+PA1+PA46+PA31==2)+1)==G2)+T0)
2039. /4.0
2040. DDPU=DPU(J,I)
2041. C
2042. C DER1
2043. C P&1
2044. IF (CND(I,J,K,IM2,IM1,K)) THEN
2045. PA48P81 = -(1.0/2.0*AJ1(J))
2046. PA48P81 = -(1.0/2.0*AJ1(J)+XIYIP(J,IM2))
2047. PA63P81 = -(1.0/2.0*AJ1(J))
2048. TO:(G1=(PA18+PA63+PA3+PA48+PA33==2)+1)==G2-1
2049. T1=PA18+PA63P81+PA18P81+PA63+PA3+PA48P81
2050. R1KP81=3.0/4.0*(G1=G2+SG(IM1,J,K)+T0+T1+S+G1+G2+T0+T1)
2051. DANP81=S*(DDPU=R1KP81+TA33M+2*XIXI(J,I)=OZINF=R1KP81/DZETAC(K))
2052. DAN = DANP81
2053. C P&2
2054. ELSEIF (CND(I,J,K,IM1,IM1,K)) THEN
2055. PA17P82 = -(1.0/2.0*AJ1(J))
2056. PA18P82 = -(1.0/2.0*AJ1(J))
2057. PA47P82 = -(1.0/2.0*AJ1(J)+XIYIP(J,IM1))
2058. PA48P82 = -(1.0/2.0*AJ1(J)+XIYIP(J,IM2))
2059. PA62P82 = -(1.0/2.0*AJ1(J))
2060. PA63P82 = -(1.0/2.0*AJ1(J))
2061. TO=G2-1
2062. T1=(G1=(PA17+PA62+PA2+PA47+PA32==2)+1)==TO
2063. T2=PA17+PA62P82+PA17P82+PA62+PA2+PA47P82
2064. T3=G1+G2+T1+T2
2065. T4=(G1=(PA18+PA63+PA3+PA48+PA33==2)+1)==TO
2066. T5=PA18+PA63P82+PA18P82+PA63+PA3+PA48P82
2067. R1KP82=(3*(SG(IM1,J,K))=(G1+G2+T4+T5)+G1+G2+T4+T5)+3*(G1+G2+SG
2068. (I,J,K)+T1+T2+S+T3))/4.0
2069. DANP82=S*(DDPU=R1KP82+TA33M+2*XIXI(J,I)=OZINF=R1KP82/DZETAC(K))
2070. DAN = DANP82
2071. C P&3
2072. ELSEIF (CND(I,J,K,I,IM1,K)) THEN
2073. PA18P83 = -(1.0/2.0*AJ1(J))
2074. PA17P83 = -(1.0/2.0*AJ1(J))
2075. PA48P83 = -(1.0/2.0*AJ1(J)+XIYIP(J,I))
2076. PA47P83 = -(1.0/2.0*AJ1(J)+XIYIP(J,IM1))
2077. PA61P83 = -(1.0/2.0*AJ1(J))
2078. PA62P83 = -(1.0/2.0*AJ1(J))
2079. TO=G2-1
2080. T1=(G1=(PA17+PA62+PA2+PA47+PA32==2)+1)==TO
2081. T2=PA17+PA62P83+PA17P83+PA62+PA2+PA47P83
2082. R1KP83=(3*(SG(I,J,K))=(G1+G2+T1+T2+S+G1+G2=(G1=(PA18+PA61+PA1+PA46+
2083. PA31==2)+1)==TO)+PA18+PA61P83+PA18P83+PA61+PA1+PA46P83)+G1+G2+T1
2084. +T2)+3*(G1+G2+SG(IM1,J,K)+T1+T2))/4.0
2085. DDPUP83=DZETAC(KLOW)*(CC1=DDZUX=XIYIP(J,I)=S+TAJ1+CC1=DDZYU=S+TAJ1)
2086. DANP83=S*(DDPU=R1KP83+TA33M+DDPU83=R1K+TA33M+2*XIXI(J,I)=OZINF=
2087. R1KP83/DZETAC(K))
2088. DAN = DANP83
2089. C P&4
2090. ELSEIF (CND(I,J,K,I,P1,IM1,K)) THEN
2091. PA16P84 = -(1.0/2.0*AJ1(J))
2092. PA46P84 = -(1.0/2.0*AJ1(J)+XIYIP(J,I))
2093. PA61P84 = -(1.0/2.0*AJ1(J))
2094. R1KP84=3.0/4.0*(G1+G2+SG(I,J,K))=(G1=(PA18+PA61+PA1+PA46+PA31==2)+1)
2095. )=(G2-1)=(PA18+PA61P84+PA16P84+PA61+PA1+PA46P84)
2096. DANP84=S*(DDPU=R1KP84+TA33M+2*XIXI(J,I)=OZINF=R1KP84/DZETAC(K))
2097. DAN = DANP84
2098. C P&5
2099. ELSEIF (CND(I,J,K,IM2,J,K)) THEN
2100. PA3P85 = DXII(IM2)+S
2101. PA18P85 = (-AJ2(J)+AJ1(J))/2.0
2102. PA33P85 = DC1/2.0
2103. PA48P85 = DXII(IM2)+A11R(J,IM2)+S+(-AJ2(J)+AJ1(J))+XIYIP(J,IM2)/
2104. 2.0
2105. PA63P85 = DXII(IM2)+XIYIP(J,IM2)+S+(-AJ2(J)+AJ1(J))/2.0
2106. TO:(G1=(PA18+PA63+PA3+PA48+PA33==2)+1)==G2-1
2107. T1=PA18+PA63P85+PA18P85+PA63+PA3+PA48P85+PA33P85+PA48+2*PA33=
2108. PA33P85
2109. R1KP85=3.0/4.0*(G1+G2+SG(IM1,J,K)+T0+T1+S+G1+G2+T0+T1)
2110. DANP85=S*(DDPU=R1KP85+TA33M+2*XIXI(J,I)=OZINF=R1KP85/DZETAC(K))
2111. DAN = DANP85

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2112. C P87
2113. ELSEIF [CND[I,J,J,K,IM1,J,K]] THEN
2114. PA2P87 = DXII(IM1)*S
2115. PA3P87 = DXII(IM2)
2116. PA17P87 = [-AJ2(J)+AJ1(J)]/2.0
2117. PA18P87 = [-AJ2(J)+AJ1(J)]/2.0
2118. PA32P87 = DC1/2.0
2119. PA33P87 = DC1/2.0
2120. PA47P87 = DXII(IM1)*A11R(J,IM1)*S+[-AJ2(J)+AJ1(J)]*XIYIP(J,IM1)/
2121. 2.0
2122. PA48P87 = [-AJ2(J)+AJ1(J)]*XIYIP(J,IM2)/2.0+DXII(IM2)*A11R(J,IM2)
2123. PA62P87 = DXII(IM1)*XIYIP(J,IM1)*S+[-AJ2(J)+AJ1(J)]/2.0
2124. PA63P87 = DXII(IM2)*XIYIP(J,IM2)+[-AJ2(J)+AJ1(J)]/2.0
2125. TO=G2-1
2126. T1=[G1=(PA17+PA62+PA2+PA47+PA32**2)+1]**TO
2127. T2=PA17+PA62P87+PA17P87+PA62+PA2+PA47P87+PA2P87+PA47+2*PA32+
2128. PA32P87
2129. T3=G1+G2+T1+T2
2130. T4=[G1=(PA18+PA63+PA3+PA48+PA33**2)+1]**TO
2131. T5=PA18+PA63P87+PA18P87+PA63+PA3+PA48P87+PA3P87+PA48+2*PA33+
2132. PA33P87
2133. R1KP87=[3=(SG(IM1,J,K))*(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5]+3*(G1+G2+SG
2134. [I,J,K]*T1+T2+S+T3)]/4.0
2135. TO=XIYX(J,I)
2136. DDPUP87=DZETA(KLOW)=(CC1+DDZXU*(TO**2+XIXX(J,I)**2)+S*TAI1+CC1+
2137. DDZYU*TO+S*TAI1)
2138. DANP87=S*(DDPU+R1KP87+TA33M+DDPUP87+R1K+TA33M+2*XIXX(J,I)+OZINF+
2139. R1KP87/DZETAC(K))
2140. DAN = DANP87
2141. C P88
2142. ELSEIF [CND[I,J,J,K,I,J,K]] THEN
2143. PA1P88 = DXII(I)*S
2144. PA2P88 = DXII(IM1)
2145. PA18P88 = [-AJ2(J)+AJ1(J)]/2.0
2146. PA17P88 = [-AJ2(J)+AJ1(J)]/2.0
2147. PA31P88 = DC1/2.0
2148. PA32P88 = DC1/2.0
2149. PA48P88 = DXII(I)*A11R(J,I)*S+[-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0
2150. PA47P88 = [-AJ2(J)+AJ1(J)]*XIYIP(J,IM1)/2.0+DXII(IM1)*A11R(J,IM1)
2151. PA51P88 = DXII(I)*XIYIP(J,I)*S+[-AJ2(J)+AJ1(J)]/2.0
2152. PA62P88 = DXII(IM1)*XIYIP(J,IM1)+[-AJ2(J)+AJ1(J)]/2.0
2153. TO=G2-1
2154. T1=[G1=(PA17+PA62+PA2+PA47+PA32**2)+1]**TO
2155. T2=PA17+PA62P88+PA17P88+PA62+PA2+PA47P88+PA2P88+PA47+2*PA32+
2156. PA32P88
2157. R1KP88=[3=(SG(I,J,K))*(G1+G2+T1+T2+S+G1+G2+(G1+(PA18+PA51+PA1+PA48+
2158. PA31**2)+1)**TO+(PA18+PA51P88+PA18P88+PA51+PA1+PA48P88+PA1P88+
2159. PA48+2*PA31+PA31P88))+G1+G2+T1+T2)+3*(G1+G2+SG(IM1,J,K)*T1+T2)]/4.0
2160. TO=XIYX(J,I)
2161. T1=CC1+S*TAI2+CC1+TAI1
2162. T2=CC1+TAJ1
2163. T3=CC1+S*TAJ2
2164. DDPUP88=DZETA(KLOW)=(DDZXU*(TO*(T3+T2)+(TO**2+XIXX(J,I)**2)+T1)+
2165. DDZYU*(T3+T2+TO+T1))
2166. DANP88=S*(DDPU+R1KP88+TA33M+DDPUP88+R1K+TA33M+2*XIXX(J,I)+OZINF+
2167. R1KP88/DZETAC(K))
2168. DAN = DANP88
2169. C P89
2170. ELSEIF [CND[I,J,J,K,IP1,J,K]] THEN
2171. PA1P89 = DXII(I)
2172. PA18P89 = [-AJ2(J)+AJ1(J)]/2.0
2173. PA31P89 = DC1/2.0
2174. PA48P89 = [-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0+DXII(I)*A11R(J,I)
2175. PA47P89 = DXII(I)*XIYIP(J,I)+[-AJ2(J)+AJ1(J)]/2.0
2176. R1KP89=3.0/4.0*(G1+G2+SG(I,J,K))*([G1+(PA18+PA51+PA1+PA48+PA31**2)+1]
2177. *(G2-1)+(PA18+PA51P89+PA18P89+PA51+PA1+PA48P89+PA1P89+PA48+2*
2178. PA31+PA31P89)
2179. TO=XIYX(J,I)
2180. DDPUP89=DZETA(KLOW)=(CC1+DDZXU*(TO**2+XIXX(J,I)**2)+TAI2+CC1+DDZYU
2181. *TO+TAI2)
2182. DANP89=S*(DDPU+R1KP89+TA33M+DDPUP89+R1K+TA33M+2*XIXX(J,I)+OZINF+
2183. R1KP89/DZETAC(K))
2184. DAN = DANP89
2185. C P91
2186. ELSEIF [CND[I,J,J,K,IM2,JP1,K]] THEN
2187. PA18P91 = AJ2(J)/2.0
2188. PA48P91 = AJ2(J)*XIYIP(J,IM2)/2.0
2189. PA63P91 = AJ2(J)/2.0
2190. TO=(G1=(PA18+PA63+PA3+PA48+PA33**2)+1)**(G2-1)
2191. T1=PA18+PA63P91+PA18P91+PA63+PA3+PA48P91
2192. R1KP91=3.0/4.0*(G1+G2+SG(IM1,J,K))*TO+T1+S+G1+G2+TO+T1)
2193. DANP91=S*(DDPU+R1KP91+TA33M+2*XIXX(J,I)+OZINF+R1KP91/DZETAC(K))
2194. DAN = DANP91
2195. C P92
2196. ELSEIF [CND[I,J,J,K,IM1,JP1,K]] THEN
2197. PA17P92 = AJ2(J)/2.0
2198. PA18P92 = AJ2(J)/2.0
2199. PA47P92 = AJ2(J)*XIYIP(J,IM1)/2.0
2200. PA48P92 = AJ2(J)*XIYIP(J,IM2)/2.0
2201. PA62P92 = AJ2(J)/2.0
2202. PA63P92 = AJ2(J)/2.0
2203. TO=G2-1
2204. T1=[G1=(PA17+PA62+PA2+PA47+PA32**2)+1]**TO
2205. T2=PA17+PA62P92+PA17P92+PA62+PA2+PA47P92
2206. T3=G1+G2+T1+T2
2207. T4=[G1=(PA18+PA63+PA3+PA48+PA33**2)+1]**TO
2208. T5=PA18+PA63P92+PA18P92+PA63+PA3+PA48P92
2209. R1KP92=[3=(SG(IM1,J,K))*(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5]+3*(G1+G2+SG
2210. [I,J,K]*T1+T2+S+T3)]/4.0
2211. DANP92=S*(DDPU+R1KP92+TA33M+2*XIXX(J,I)+OZINF+R1KP92/DZETAC(K))
2212. DAN = DANP92
2213. C P93
2214. ELSEIF [CND[I,J,J,K,I,JP1,K]] THEN
2215. PA18P93 = AJ2(J)/2.0
2216. PA17P93 = AJ2(J)/2.0
2217. PA48P93 = AJ2(J)*XIYIP(J,I)/2.0
2218. PA47P93 = AJ2(J)*XIYIP(J,IM1)/2.0
2219. PA61P93 = AJ2(J)/2.0
2220. PA62P93 = AJ2(J)/2.0
2221. TO=G2-1
2222. T1=[G1=(PA17+PA62+PA2+PA47+PA32**2)+1]**TO
2223. T2=PA17+PA62P93+PA17P93+PA62+PA2+PA47P93
2224. R1KP93=[3=(SG(I,J,K))*(G1+G2+T1+T2+S+G1+G2+(G1+(PA18+PA61+PA1+PA48+
2225. PA31**2)+1)**TO+(PA18+PA61P93+PA18P93+PA61+PA1+PA48P93))+G1+G2+T1
2226. +T2)+3*(G1+G2+SG(IM1,J,K)*T1+T2)]/4.0
2227. DDPUP93=DZETA(KLOW)=(CC1+DDZXU*(TO*(T1+T2)+TAJ2+CC1+DDZYU+TAJ2)
2228. +DDPU+R1KP93+TA33M+DDPUP93+R1K+TA33M+2*XIXX(J,I)+OZINF+
2229. R1KP93/DZETAC(K))
2230. DAN = DANP93
2231. C P94
2232. ELSEIF [CND[I,J,J,K,IP1,JP1,K]] THEN
2233. PA18P94 = AJ2(J)/2.0
2234. PA48P94 = AJ2(J)*XIYIP(J,I)/2.0
2235. PA61P94 = AJ2(J)/2.0
2236. R1KP94=3.0/4.0*(G1+G2+SG(I,J,K))*([G1+(PA18+PA61+PA1+PA48+PA31**2)+1]
2237. *(G2-1)+(PA18+PA61P94+PA18P94+PA61+PA1+PA48P94)
2238. DANP94=S*(DDPU+R1KP94+TA33M+2*XIXX(J,I)+OZINF+R1KP94/DZETAC(K))
2239. DAN = DANP94
2240. C P106
2241. ELSEIF [CND[I,J,J,K,IM2,JP1,KP1]] THEN
2242. PA30P106 = [-1.0/2.0+AJ1(J)]
2243. PA80P106 = [-1.0/2.0+AJ1(J)*XIYIP(J,IM2)]

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2244. PA75P106 = -(1.0/2.0*AJ1(J))
2245. TO=(G1+(PA30+PA75+PA15+PA80+PA45+2)+1)**(G2-1)
2246. T1=PA30+PA75P106+PA30P106+PA75+PA15+PA80P106
2247. R1KP106S=(G1+G2+SG(IM1,J,KP1))*TO*(1+S+G1+G2+T1)/4.0
2248. DANP106S=(DDPU+R1KP106+TA33M+2*XIXI(J,I))*OZINF+R1KP106/DZETAC(K)
2249. )
2250. DAN = DANP106
2251. C P107
2252. ELSEIF (CND(II,JJ,KK,IM1,JP1)) THEN
2253. PA29P107 = -(1.0/2.0*AJ1(J))
2254. PA30P107 = -(1.0/2.0*AJ1(J))
2255. PA59P107 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
2256. PA80P107 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM2))
2257. PA74P107 = -(1.0/2.0*AJ1(J))
2258. PA75P107 = -(1.0/2.0*AJ1(J))
2259. TO=G2-1
2260. T1=(G1+(PA29+PA74+PA14+PA59+PA44+2)+1)**TO
2261. T2=PA29+PA74P107+PA29P107+PA74+PA14+PA59P107
2262. T3=G1+G2+T1+T2
2263. T4=(G1+(PA30+PA75+PA15+PA80+PA45+2)+1)**TO
2264. T5=PA30+PA75P107+PA30P107+PA75+PA15+PA80P107
2265. R1KP107S=(S*(SG(IM1,J,KP1))+(G1+G2+T4+T5)+S*(G1+G2
2266. +SG(IM1,J,KP1))*T1+T2+S+T3)/4.0
2267. DANP107S=(DDPU+R1KP107+TA33M+2*XIXI(J,I))*OZINF+R1KP107/DZETAC(K)
2268. )
2269. DAN = DANP107
2270. C P108
2271. ELSEIF (CND(II,JJ,KK,I,JP1,KP1)) THEN
2272. PA29P108 = -(1.0/2.0*AJ1(J))
2273. PA29P108 = -(1.0/2.0*AJ1(J))
2274. PA59P108 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
2275. PA59P108 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
2276. PA73P108 = -(1.0/2.0*AJ1(J))
2277. PA74P108 = -(1.0/2.0*AJ1(J))
2278. TO=G2-1
2279. T1=(G1+(PA29+PA74+PA14+PA59+PA44+2)+1)**TO
2280. T2=PA29+PA74P108+PA29P108+PA74+PA14+PA59P108
2281. R1KP108S=(S*(SG(I,J,KP1))+(G1+G2+T1+T2+S+G1+G2+(G1+(PA28+PA73+PA13
2282. +PA58+PA43+2)+1)**TO+(PA28+PA73P108+PA28P108+PA73+PA13+PA58P108))
2283. +G1+G2+T1+T2)+G1+G2+SG(IM1,J,KP1))*T1+T2+S)/4.0
2284. TO=S+2
2285. DDPU108=DZETA(KLOW)*(CC2+DDZHU+XIYX(J,I))*TO+TAJ1-CC2+DDZYU+TO
2286. TAJ1)
2287. DANP108S=(DDPU+R1KP108+TA33M+DDPU108+R1K+TA33M+2*XIXI(J,I)*
2288. OZINF+R1KP108/DZETAC(K))
2289. DAN = DANP108
2290. C P109
2291. ELSEIF (CND(II,JJ,KK,I,JP1,JP1,KP1)) THEN
2292. PA28P109 = -(1.0/2.0*AJ1(J))
2293. PA58P109 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
2294. PA73P109 = -(1.0/2.0*AJ1(J))
2295. R1KP109S=(S*(SG(I,J,KP1))+(G1+(PA28+PA73+PA13+PA58+PA43+2)+1)**(
2296. G2-1)+(PA28+PA73P109+PA28P109+PA73+PA13+PA58P109))/4.0
2297. DANP109S=(DDPU+R1KP109+TA33M+2*XIXI(J,I))*OZINF+R1KP109/DZETAC(K)
2298. )
2299. DAN = DANP109
2300. C P111
2301. ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN
2302. PA15P111 = DX1(IM2)+S
2303. PA30P111 = (-AJ2(J)+AJ1(J))/2.0
2304. PA33P111 = DC2/2.0
2305. PA45P111 = DC1/2.0
2306. PA80P111 = DX1(IM2)+A11R(J,IM2)+S*(-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/
2307. 2.0
2308. PA75P111 = DX1(IM2)*XIYIP(J,IM2)+S*(-AJ2(J)+AJ1(J))/2.0
2309. TO=G2-1
2310. T1=(G1+(PA18+PA63+PA3+PA48+PA33+2)+1)**TO
2311. T2=(G1+(PA30+PA75+PA15+PA80+PA45+2)+1)**TO
2312. T3=PA30+PA75P111+PA30P111+PA75+PA15+PA80P111+PA15P111+PA80+2+PA45+
2313. PA48P111
2314. R1KP111S=(S*(SG(IM1,J,KP1))*T1+T2+T3+S+G1+G2+T2+T3)+3*(2+G1+G2+SG
2315. (IM1,J,K)+PA33+PA33P111+T1+S+2+G1+G2+PA33+PA33P111+T1)/4.0
2316. DANP111S=(DDPU+R1KP111+TA33M+2*XIXI(J,I))*OZINF+R1KP111/DZETAC(K)
2317. )
2318. DAN = DANP111
2319. C P112
2320. ELSEIF (CND(II,JJ,KK,IM1,J,KP1)) THEN
2321. PA14P112 = DX1(IM1)+S
2322. PA15P112 = DX1(IM2)
2323. PA29P112 = (-AJ2(J)+AJ1(J))/2.0
2324. PA30P112 = (-AJ2(J)+AJ1(J))/2.0
2325. PA32P112 = DC2/2.0
2326. PA33P112 = DC2/2.0
2327. PA44P112 = DC1/2.0
2328. PA45P112 = DC1/2.0
2329. PA59P112 = DX1(IM1)+A11R(J,IM1)+S*(-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/
2330. 2.0
2331. PA80P112 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/2.0+DX1(IM2)+A11R(J,IM2)
2332. PA74P112 = DX1(IM1)*XIYIP(J,IM1)+S*(-AJ2(J)+AJ1(J))/2.0
2333. PA75P112 = DX1(IM2)*XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
2334. TO=G2-1
2335. T1=(G1+(PA17+PA62+PA2+PA47+PA32+2)+1)**TO
2336. T2=2+G1+G2+PA32+PA32P112+T1
2337. T3=(G1+(PA29+PA74+PA14+PA59+PA44+2)+1)**TO
2338. T4=PA29+PA74P112+PA29P112+PA74+PA14+PA59P112+PA14P112+PA59+2+PA44+
2339. PA47P112
2340. T5=G1+G2+T3+T4
2341. T6=(G1+(PA18+PA63+PA3+PA48+PA33+2)+1)**TO
2342. T7=(G1+(PA30+PA75+PA15+PA80+PA45+2)+1)**TO
2343. T8=PA30+PA75P112+PA30P112+PA75+PA15+PA80P112+PA15P112+PA80+2+PA45+
2344. PA48P112
2345. R1KP112S=(S*(SG(IM1,J,KP1))+(G1+G2+T7+T8+S+T5)+G1+G2+T7+T8)+3*(SG(
2346. IM1,J,K)+2+G1+G2+PA33+PA33P112+T8+S+T2)+2+G1+G2+PA33+PA33P112+T8
2347. )+S*(G1+G2+SG(I,J,KP1))*T3+T4+S+T5)+3*(2+G1+G2+SG(I,J,K)+PA32+
2348. PA32P112+T1+S+T2))/4.0
2349. TO=XIYX(J,I)
2350. T1=S+2
2351. DDPU112=DZETA(KLOW)*(CC2+DDZHU+(TO+2*XIX(J,I))*2)+T1+TAI1+CC2+
2352. DDZYU+TO+TAI1)
2353. DANP112S=(DDPU+R1KP112+TA33M+DDPU112+R1K+TA33M+2*XIXI(J,I)*
2354. OZINF+R1KP112/DZETAC(K))
2355. DAN = DANP112
2356. C P113
2357. ELSEIF (CND(II,JJ,KK,I,J,KP1)) THEN
2358. PA13P113 = DX1(I)+S
2359. PA14P113 = DX1(IM1)
2360. PA26P113 = (-AJ2(J)+AJ1(J))/2.0
2361. PA28P113 = (-AJ2(J)+AJ1(J))/2.0
2362. PA31P113 = DC2/2.0
2363. PA32P113 = DC2/2.0
2364. PA43P113 = DC1/2.0
2365. PA44P113 = DC1/2.0
2366. PA59P113 = DX1(I)+A11R(J,I)+S*(-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0
2367. PA59P113 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/2.0+DX1(IM1)+A11R(J,IM1)
2368. PA73P113 = DX1(I)*XIYIP(J,I)+S*(-AJ2(J)+AJ1(J))/2.0
2369. PA74P113 = DX1(IM1)*XIYIP(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
2370. TO=G2-1
2371. T1=(G1+(PA17+PA62+PA2+PA47+PA32+2)+1)**TO
2372. T2=(G1+(PA29+PA74+PA14+PA59+PA44+2)+1)**TO
2373. T3=PA29+PA74P113+PA29P113+PA74+PA14+PA59P113+PA14P113+PA59+2+PA44+
2374. PA47P113
2375. R1KP113S=(S*(SG(I,J,KP1))+(G1+G2+T2+T3+S+G1+G2+(G1+(PA28+PA73+PA13

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2376. . PA58+PA43==2)-1]==TO*(PA28+PA73P113+PA28P113+PA73+PA13+PA58P113+
2377. . PA13P113+PA58+2+PA43+PA43P113))+G1+G2+T2+T3)+3*(SG(I,J,K)=(2+G1+
2378. . G2+PA32+PA32P113+T1+S+2+G1+G2+PA31+PA31P113)=(G1+PA16+PA61+PA1+
2379. . PA46+PA31==2)+1]==TO)+2+G1+G2+PA32+PA32P113+T1)+G1+G2+SG(IM1,J,
2380. . KP1)+T2+T3+S+G1+G2+SG(IM1,J,K)+PA32+PA32P113+T1)/4.0
2381. . TO=XIYX(J,I)
2382. . T1=S**2
2383. . T2=CC2+T1+TA12-CC2+S+TA11
2384. . T3=CC2+S+TAJ1
2385. . T4=CC2+T1+TAJ2
2386. . DDPUP113+DZETA(KLOW)=(DDZXU*(TO=(T4+T3)+(TO==2*XIXX(J,I))==2)+T2)+
2387. . DDZYU*(T4+T3+TO+T2))
2388. . DANP113+S=(DDPU+R1KP113+TA33M+DDPUP113+R1K+TA33M+2*XIXX(J,I)+
2389. . QZINF+R1KP113/DZETAC(K))
2390. . DAN = DANP113
2391.
2392. C P114
2393. . ELSEIF (CND(II,JJ,KK,IP1,J,KP1)) THEN
2394. . PA28P114 = DX1(I)
2395. . PA28P114 = (-AJ2(J)+AJ1(J))/2.0
2396. . PA31P114 = DC2/2.0
2397. . PA43P114 = DC1/2.0
2398. . PA58P114 = (-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0+DX1(I)=A11R(J,I)
2399. . PA73P114 = DX1(I)*XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
2400. . TO=G2-1
2401. . R1KP114=(G1+G2+SG(I,J,KP1))=(G1+(PA28+PA73+PA13+PA58+PA43==2)+1)**
2402. . TO*(PA28+PA73P114+PA28P114+PA73+PA13+PA58P114+PA13P114+PA58+2+
2403. . PA43+PA43P114)+S+G1+G2+SG(I,J,K)+PA31+PA31P114=(G1+(PA16+PA61+
2404. . PA1+PA46+PA31==2)+1)**TO)/4.0
2405. . TO=XIYX(J,I)
2406. . DDPUP114+DZETA(KLOW)=(CC2+DDZXU*(TO==2*XIXX(J,I))==2)+S+TA12+CC2+
2407. . DDZYU+TO+S+TA12)
2408. . DANP114+S=(DDPU+R1KP114+TA33M+DDPUP114+R1K+TA33M+2*XIXX(J,I)+
2409. . QZINF+R1KP114/DZETAC(K))
2410. . DAN = DANP114
2411.
2412. C P115
2413. . ELSEIF (CND(II,JJ,KK,IM2,JP1,KP1)) THEN
2414. . PA30P115 = AJ2(J)/2.0
2415. . PA80P115 = AJ2(J)*XIYIP(J,IM2)/2.0
2416. . PA75P115 = AJ2(J)/2.0
2417. . TO=(G1+(PA30+PA75+PA15+PA80+PA45==2)+1)**(G2-1)
2418. . T1=PA30+PA75P115+PA30P115+PA75+PA15+PA80P115
2419. . R1KP115+S=(G1+G2+SG(IM1,J,KP1))*TO+T1+S+G1+G2+TO+T1)/4.0
2420. . DANP115+S=(DDPU+R1KP115+TA33M+2*XIXX(J,I)+QZINF+R1KP115/DZETAC(K)
2421. . )
2422. . DAN = DANP115
2423.
2424. C P117
2425. . ELSEIF (CND(II,JJ,KK,IM1,JP1,KP1)) THEN
2426. . PA29P117 = AJ2(J)/2.0
2427. . PA30P117 = AJ2(J)/2.0
2428. . PA59P117 = AJ2(J)*XIYIP(J,IM1)/2.0
2429. . PA80P117 = AJ2(J)*XIYIP(J,IM2)/2.0
2430. . PA74P117 = AJ2(J)/2.0
2431. . PA75P117 = AJ2(J)/2.0
2432. . TO=G2-1
2433. . T1=(G1+(PA28+PA74+PA14+PA59+PA44==2)+1)**TO
2434. . T2=PA29+PA74P117+PA29P117+PA74+PA14+PA59P117
2435. . T3=G1+G2+T1+T2
2436. . T4=(G1+(PA30+PA75+PA15+PA80+PA45==2)+1)**TO
2437. . T5=PA30+PA75P117+PA30P117+PA75+PA15+PA80P117
2438. . R1KP117+S=(SG(IM1,J,KP1))=(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+S+(G1+G2
2439. . +SG(I,J,KP1)+T1+T2+S+T3))/4.0
2440. . DANP117+S=(DDPU+R1KP117+TA33M+2*XIXX(J,I)+QZINF+R1KP117/DZETAC(K)
2441. . )
2442. . DAN = DANP117
2443.
2444. C P118
2445. . ELSEIF (CND(II,JJ,KK,I,JP1,KP1)) THEN
2446. . PA28P118 = AJ2(J)/2.0
2447. . PA29P118 = AJ2(J)/2.0
2448. . PA58P118 = AJ2(J)*XIYIP(J,I)/2.0
2449. . PA59P118 = AJ2(J)*XIYIP(J,IM1)/2.0
2450. . PA73P118 = AJ2(J)/2.0
2451. . PA74P118 = AJ2(J)/2.0
2452. . TO=G2-1
2453. . T1=(G1+(PA28+PA74+PA14+PA58+PA44==2)+1)**TO
2454. . T2=PA29+PA74P118+PA29P118+PA74+PA14+PA58P118
2455. . R1KP118+S=(SG(I,J,KP1))=(G1+G2+T1+T2+S+G1+G2+T1+T2+S+G1+G2+PA45+
2456. . PA59+PA43==2)+1)**TO*(PA28+PA73P118+PA28P118+PA73+PA13+PA58P118))
2457. . (G1+G2+T1+T2)+G1+G2+SG(IM1,J,KP1)+T1+T2+S)/4.0
2458. . DDPUP118+DZETA(KLOW)=(CC2+DDZXU*XIXX(J,I)+S+TAJ2+CC2+DDZYU+S+TAJ2)
2459. . DANP118+S=(DDPU+R1KP118+TA33M+DDPUP118+R1K+TA33M+2*XIXX(J,I)+
2460. . QZINF+R1KP118/DZETAC(K))
2461. . DAN = DANP118
2462.
2463. C P119
2464. . ELSEIF (CND(II,JJ,KK,IP1,JP1,KP1)) THEN
2465. . PA28P119 = AJ2(J)/2.0
2466. . PA58P119 = AJ2(J)*XIYIP(J,I)/2.0
2467. . PA73P119 = AJ2(J)/2.0
2468. . R1KP119+S=(G1+G2+SG(I,J,KP1))=(G1+(PA28+PA73+PA13+PA58+PA43==2)+1)**(
2469. . G2-1)=(PA28+PA73P119+PA28P119+PA73+PA13+PA58P119)+S/4.0
2470. . DANP119+S=(DDPU+R1KP119+TA33M+2*XIXX(J,I)+QZINF+R1KP119/DZETAC(K)
2471. . )
2472. . DAN = DANP119
2473.
2474. C P133
2475. . ELSEIF (CND(II,JJ,KK,I,JP1,KP2)) THEN
2476. . DDPUP133+DZETA(KLOW)=(CC3+DDZXU*XIXX(J,I)+S+TAJ1+CC3+DDZYU+S+TAJ1)
2477. . DANP133+DDPUP133+R1K+S+TA33M
2478. . DAN = DANP133
2479.
2480. C P136
2481. . ELSEIF (CND(II,JJ,KK,IM2,J,KP2)) THEN
2482. . PA33P136 = DC3/2.0
2483. . PA45P136 = DC2/2.0
2484. . TO=G2-1
2485. . T1=(G1+(PA18+PA63+PA3+PA48+PA33==2)+1)**TO
2486. . T2=(G1+(PA30+PA75+PA15+PA80+PA45==2)+1)**TO
2487. . R1KP136+S=(2+G1+G2+SG(IM1,J,KP1))+PA45+PA45P136+T2+S+2+G1+G2+PA45+
2488. . PA45P136+T2)+3*(2+G1+G2+SG(IM1,J,K)+PA33+PA33P136+T1+S+2+G1+G2+
2489. . PA33+PA33P136+T1))/4.0
2490. . DANP136+S=(DDPU+R1KP136+TA33M+2*XIXX(J,I)+QZINF+R1KP136/DZETAC(K)
2491. . )
2492. . DAN = DANP136
2493.
2494. C P137
2495. . ELSEIF (CND(II,JJ,KK,IM1,J,KP2)) THEN
2496. . PA32P137 = DC3/2.0
2497. . PA33P137 = DC3/2.0
2498. . PA44P137 = DC2/2.0
2499. . PA45P137 = DC2/2.0
2500. . TO=G2-1
2501. . T1=(G1+(PA17+PA82+PA2+PA47+PA32==2)+1)**TO
2502. . T2=2+G1+G2+PA32+PA32P137+T1
2503. . T3=(G1+(PA29+PA74+PA14+PA59+PA44==2)+1)**TO
2504. . T4=2+G1+G2+PA44+PA44P137+T3
2505. . T5=(G1+(PA18+PA63+PA3+PA48+PA33==2)+1)**TO
2506. . T6=(G1+(PA30+PA75+PA15+PA80+PA45==2)+1)**TO
2507. . R1KP137+S=(SG(IM1,J,KP1))=(2+G1+G2+PA45+PA45P137+T6+S+T4)+2+G1+G2+
2508. . PA45+PA45P137+T6)+3*(SG(IM1,J,K)+(2+G1+G2+PA33+PA33P137+T5+S+T2)+
2509. . 2+G1+G2+PA33+PA33P137+T5)+S+(2+G1+G2+SG(I,J,KP1))+PA44+PA44P137+T3
2510. . +S+T4)+3*(2+G1+G2+SG(I,J,K)+PA32+PA32P137+T1+S+T2))/4.0
2511. . TO=XIYX(J,I)
2512. . DDPUP137+DZETA(KLOW)=(CC3+DDZXU*(TO==2*XIXX(J,I))==2)+S+TA11+CC3+
2513. . DDZYU+TO+S+TA11)
2514. . DANP137+S=(DDPU+R1KP137+TA33M+DDPUP137+R1K+TA33M+2*XIXX(J,I)+
2515. . QZINF+R1KP137/DZETAC(K))

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2508. DAN = DANP137
2509. C P138
2510. ELSEIF (CND(I1,JJ,KK,I,J,KP2)) THEN
2511. PA31P138 = DC3/2.0
2512. PA32P138 = DC3/2.0
2513. PA43P138 = DC2/2.0
2514. PA44P138 = DC2/2.0
2515. TO=G2-1
2516. T1=[G1=[PA17+PA62+PA2+PA47+PA32**2)+1]**=TO
2517. T2=[G1=[PA29+PA74+PA14+PA59+PA44**2)+1]**=TO
2518. R1KP138=[S=[SG(I,J,KP1)=[2*G1+G2+PA44+PA44P138+T2+S+2*G1+G2+PA43+
2519. PA43P138*(G1=[PA28+PA73+PA13+PA58+PA43**2)+1]**=TO]+2*G1+G2+PA44+
2520. PA44P138+T2)+3*(SG(I,J,K)=[2*G1+G2+PA32+PA32P138+T1+S+2*G1+G2+
2521. PA31+PA31P138*(G1=[PA16+PA61+PA1+PA48+PA31**2)+1]**=TO)+2*G1+G2+
2522. PA32+PA32P138+T1)+2*G1+G2+SG(IM1,J,KP1)+PA44+PA44P138+T2+S+6*G1+
2523. G2+SG(IM1,J,K)+PA32+PA32P138+T1)/4.0
2524. TO=XIYX(J,I)
2525. T1+CC3=S*TA12+CC3=TA11
2526. T2+CC3=TAJ1
2527. T3+CC3=S*TAJ2
2528. DDPUP138=DZETA(KLOW)=(DDZXU=(TO=(T3+T2)+(TO**2+XIXX(J,I)**2)=T1)+
2529. DDZYU=(T3+T2+TO+T1))
2530. DANP138=S*(DDPU=R1KP138+TA33M+DDPUP138=R1K+TA33M+2*XIXX(J,I)+
2531. OZINF=R1KP138/DZETAC(K))
2532. DAN = DANP138
2533.
2534. C P139
2535. ELSEIF (CND(I1,JJ,KK,IP1,J,KP2)) THEN
2536. PA31P139 = DC3/2.0
2537. PA43P139 = DC2/2.0
2538. TO=G2-1
2539. R1KP139=[2*G1+G2+SG(I,J,KP1)+PA43+PA43P138*(G1=[PA28+PA73+PA13+
2540. PA58+PA43**2)+1]**=TO+S+6*G1+G2+SG(I,J,K)+PA31+PA31P139*(G1=[PA16+
2541. PA61+PA1+PA48+PA31**2)+1]**=TO)/4.0
2542. TO=XIYX(J,I)
2543. DDPUP139=DZETA(KLOW)=(CC3=DDZXU=(TO**2+XIXX(J,I)**2)=TA12+CC3+
2544. DDZYU=TO+TA12)
2545. DANP139=S*(DDPU=R1KP139+TA33M+DDPUP139=R1K+TA33M+2*XIXX(J,I)+
2546. OZINF=R1KP139/DZETAC(K))
2547. DAN = DANP139
2548.
2549. C P143
2550. ELSEIF (CND(I1,JJ,KK,I,JP1,KP2)) THEN
2551. DDPUP143=DZETA(KLOW)=(CC3=DDZXU=XIYX(J,I)+TAJ2+CC3+DDZYU=TAJ2)
2552. DANP143=DDPUP143+R1K+S+TA33M
2553. DAN = DANP143
2554.
2555. C P181
2556. ELSEIF (CND(I1,JJ,KK,IM2,J,K+3)) THEN
2557. PA45P181 = DC3/2.0
2558. TO=[G1=[PA30+PA75+PA15+PA60+PA45**2)+1]**=[G2-1]
2559. R1KP181=S=[2*G1+G2+SG(IM1,J,KP1)+PA45+PA45P181+TO+S+2*G1+G2+PA45+
2560. PA45P181+TO)/4.0
2561. DANP181=S*(DDPU=R1KP181+TA33M+2*XIXX(J,I)+OZINF=R1KP181/DZETAC(K))
2562. DAN = DANP181
2563.
2564. C P182
2565. ELSEIF (CND(I1,JJ,KK,IM1,J,K+3)) THEN
2566. PA44P182 = DC3/2.0
2567. PA45P182 = DC3/2.0
2568. TO=G2-1
2569. T1=[G1=[PA29+PA74+PA14+PA59+PA44**2)+1]**=TO
2570. T2=2*G1+G2+PA44+PA44P182+T1
2571. T3=[G1=[PA30+PA75+PA15+PA60+PA45**2)+1]**=TO
2572. R1KP182=[S=[SG(IM1,J,KP1)=[2*G1+G2+PA45+PA45P182+T3+S+T2)+2*G1+G2+
2573. PA45+PA45P182+T3)+S=[2*G1+G2+SG(I,J,KP1)+PA44+PA44P182+T1+S+T2)]/
2574. 4.0
2575. DANP182=S*(DDPU=R1KP182+TA33M+2*XIXX(J,I)+OZINF=R1KP182/DZETAC(K))
2576. DAN = DANP182
2577.
2578. C P183
2579. ELSEIF (CND(I1,JJ,KK,I,J,K+3)) THEN
2580. PA43P183 = DC3/2.0
2581. PA44P183 = DC3/2.0
2582. TO=G2-1
2583. T1=[G1=[PA29+PA74+PA14+PA59+PA44**2)+1]**=TO
2584. R1KP183=[S=[SG(I,J,KP1)=[2*G1+G2+PA44+PA44P183+T1+S+2*G1+G2+PA43+
2585. PA43P183*(G1=[PA28+PA73+PA13+PA58+PA43**2)+1]**=TO)+2*G1+G2+PA44+
2586. PA44P183+T1)+2*G1+G2+SG(IM1,J,KP1)+PA44+PA44P183+T1+S)/4.0
2587. DANP183=S*(DDPU=R1KP183+TA33M+2*XIXX(J,I)+OZINF=R1KP183/DZETAC(K))
2588. DAN = DANP183
2589.
2590. C P184
2591. ELSEIF (CND(I1,JJ,KK,IP1,J,K+3)) THEN
2592. PA43P184 = DC3/2.0
2593. R1KP184=G1+G2+SG(I,J,KP1)+PA43+PA43P184*(G1=[PA28+PA73+PA13+PA58+
2594. PA43**2)+1]**=[G2-1]*S/2.0
2595. DANP184=S*(DDPU=R1KP184+TA33M+2*XIXX(J,I)+OZINF=R1KP184/DZETAC(K))
2596. DAN = DANP184
2597.
2598. C
2599. ENDIF
2600. RETURN
2601. END
2602. SUBROUTINE R2(J,I,K,JJ,II,KK,DAN)
2603. RMDER2.FOR
2604.
2605. C
2606. INCLUDE (INTRO)
2607.
2608. C
2609. P
2610. P11 = P(J,K-3,IM2)
2611. P12 = P(J,K-3,IM1)
2612. P13 = P(J,K-3,I)
2613. P14 = P(J,K-3,IP1)
2614. P33 = P(JM1,KM2,I)
2615. P36 = P(J,KM2,IM2)
2616. P37 = P(J,KM2,IM1)
2617. P38 = P(J,KM2,I)
2618. P39 = P(J,KM2,IP1)
2619. P43 = P(JP1,KM2,I)
2620. P55 = P(JM1,KM1,IM2)
2621. P57 = P(JM1,KM1,IM1)
2622. P58 = P(JM1,KM1,I)
2623. P59 = P(JM1,KM1,IP1)
2624. P61 = P(J,KM1,IM2)
2625. P62 = P(J,KM1,IM1)
2626. P63 = P(J,KM1,I)
2627. P64 = P(J,KM1,IP1)
2628. P66 = P(JP1,KM1,IM2)
2629. P67 = P(JP1,KM1,IM1)
2630. P68 = P(JP1,KM1,I)
2631. P69 = P(JP1,KM1,IP1)
2632. P81 = P(JM1,K,IM2)
2633. P82 = P(JM1,K,IM1)
2634. P83 = P(JM1,K,I)
2635. P84 = P(JM1,K,IP1)
2636. P66 = P(J,K,IM2)
2637. P67 = P(J,K,IM1)
2638. P68 = P(J,K,I)
2639. P69 = P(J,K,IP1)
2640. P91 = P(JP1,K,IM2)
2641. P92 = P(JP1,K,IM1)
2642. P93 = P(JP1,K,I)
2643. P94 = P(JP1,K,IP1)

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2640. C
2641. C PB
2642.
2643. PB1 = DX11(1) = (P88+S+P89)+OXINF/XIXIP(J, I)
2644. PB2 = DX11(1M1) = (P87+S+P88)+OXINF/XIXIP(J, 1M1)
2645. PB3 = DX11(1M2) = (P86+S+P87)+OXINF/XIXIP(J, 1M2)
2646. PB7 = DX11(1) = (P83+S+P84)+OXINF/XIXIP(J, I)
2647. PB8 = DX11(1M1) = (P82+S+P83)+OXINF/XIXIP(J, 1M1)
2648. PB9 = DX11(1M2) = (P81+S+P82)+OXINF/XIXIP(J, 1M2)
2649. PB16 = XIXIP(J, I) = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1
2650. (J) = (P89+P88-P84-P83))/2.0
2651. PB17 = XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P83+P82-P88-P87)
2652. +AJ1(J) = (P88+P87-P83-P82))/2.0
2653. PB18 = XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P82+P81-P87-P86)
2654. +AJ1(J) = (P87+P86-P82-P81))/2.0
2655. PB22 = XIXIP(J, I) = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P88+P86-P84-P83)+AJ1
2656. (J) = (P84+P83-P89-P88))/2.0
2657. PB23 = XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P86+P87-P83-P82)
2658. +AJ1(J) = (P83+P82-P84-P81))/2.0
2659. PB24 = XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P87+P86-P82-P81)
2660. +AJ1(J) = (P82+P81-P87-P86))/2.0
2661. PB31 = OZINF+(DCA+P89+DCA+P88+DC5+P84+DC5+P83+DC8+P39+DC6+P38)/2.0
2662. PB32 = OZINF+(DCA+P88+DCA+P87+DC5+P83+DC5+P82+DC6+P38+DC6+P37)/2.0
2663. PB33 = OZINF+(DCA+P87+DCA+P86+DC5+P82+DC5+P81+DC6+P37+DC6+P36)/2.0
2664. PB37 = OZINF+(DCA+P84+DCA+P83+DC5+P39+DC5+P38+DC6+P14+DC6+P13)/2.0
2665. PB38 = OZINF+(DCA+P83+DCA+P82+DC5+P38+DC5+P37+DC6+P13+DC6+P12)/2.0
2666. PB39 = OZINF+(DCA+P82+DCA+P81+DC5+P37+DC5+P36+DC6+P12+DC6+P11)/2.0
2667. PB48 = A11R(J, I) = (DX11(1) = (P88+S+P89)+OXINF/XIXIP(J, I)) + XIXIP(J, I)
2668. = (XIXIP(J, I) = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1(J) =
2669. (P89+P88-P84-P83))/2.0)
2670. PB47 = A11R(J, 1M1) = (DX11(1M1) = (P87+S+P88)+OXINF/XIXIP(J, 1M1)) +
2671. XIXIP(J, 1M1) = (XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P93+P92-
2672. P88-P87)+AJ1(J) = (P88+P87-P83-P82))/2.0)
2673. PB48 = A11R(J, 1M2) = (DX11(1M2) = (P86+S+P87)+OXINF/XIXIP(J, 1M2)) +
2674. XIXIP(J, 1M2) = (XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P92+P91-
2675. P87-P86)+AJ1(J) = (P87+P86-P82-P81))/2.0)
2676. PB52 = A11R(J, I) = (DX11(1) = (P83+S+P84)+OXINF/XIXIP(J, I)) + XIXIP(J, I)
2677. = (XIXIP(J, I) = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1(J) =
2678. (P84+P83-P89-P88))/2.0)
2679. PB53 = A11R(J, 1M1) = (DX11(1M1) = (P82+S+P83)+OXINF/XIXIP(J, 1M1)) +
2680. XIXIP(J, 1M1) = (XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P88+P87-
2681. P83-P82)+AJ1(J) = (P83+P82-P88-P87))/2.0)
2682. PB54 = A11R(J, 1M2) = (DX11(1M2) = (P81+S+P82)+OXINF/XIXIP(J, 1M2)) +
2683. XIXIP(J, 1M2) = (XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P87+P86-
2684. P82-P81)+AJ1(J) = (P82+P81-P87-P86))/2.0)
2685. PB61 = XIXIP(J, I) = (DX11(I) = (P88+S+P89)+OXINF/XIXIP(J, I)) + XIXIP(J, I)
2686. = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1(J) = (P89+P88-
2687. P84-P83))/2.0)
2688. PB62 = XIXIP(J, 1M1) = (DX11(1M1) = (P87+S+P88)+OXINF/XIXIP(J, 1M1)) +
2689. XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P93+P92-P88-P87)+AJ1(J)
2690. = (P88+P87-P83-P82))/2.0)
2691. PB63 = XIXIP(J, 1M2) = (DX11(1M2) = (P86+S+P87)+OXINF/XIXIP(J, 1M2)) +
2692. XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P92+P91-P87-P86)+AJ1(J)
2693. = (P87+P86-P82-P81))/2.0)
2694. PB67 = XIXIP(J, I) = (DX11(I) = (P83+S+P84)+OXINF/XIXIP(J, I)) + XIXIP(J, I)
2695. = OXINF/S/XIXIP(J, I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1(J) = (P84+P83-
2696. P89-P88))/2.0)
2697. PB68 = XIXIP(J, 1M1) = (DX11(1M1) = (P82+S+P83)+OXINF/XIXIP(J, 1M1)) +
2698. XIXIP(J, 1M1) = OXINF/S/XIXIP(J, 1M1) + (AJ2(J) = (P88+P87-P83-P82)+AJ1(J)
2699. = (P83+P82-P88-P87))/2.0)
2700. PB69 = XIXIP(J, 1M2) = (DX11(1M2) = (P81+S+P82)+OXINF/XIXIP(J, 1M2)) +
2701. XIXIP(J, 1M2) = OXINF/S/XIXIP(J, 1M2) + (AJ2(J) = (P87+P86-P82-P81)+AJ1(J)
2702. = (P82+P81-P87-P86))/2.0)
2703. C
2704. C RIKU, DPL0
2705.
2706. TO=(G1=(PB17+PB82+PB2+PB47+PB32==2)+1)==G2
2707. T1=(G1=(PB18+PB83+PB3+PB48+PB33==2)+1)==G2
2708. T2=(G1=(PB53+PB8+PB23+PB66+PB38==2)+1)==G2
2709. T3=(G1=(PB54+PB9+PB24+PB69+PB39==2)+1)==G2
2710. RIKU[S=(SG(IM1, J, KM1) = (T3+S+T2)+T3)+S=(SG(I, J, KM1) = (T2+S+(G1=(
2711. PB52+PB7+PB22+PB67+PB37==2)+1)==G2)+T2)+3=(SG(IM1, J, K) = (T1+S+TO)+
2712. T1)+3=(SG(I, J, K) = (TO+S+(G1=(PB18+PB83+PB3+PB48+PB33==2)+1)==G2)+
2713. TO))/4.0
2714. DDPL+DPL0(J, I)
2715. C
2716. C DER2
2717. C P11
2718. IF (CND(II, JJ, KK, IM2, J, K-3)) THEN
2719. PB39P11 = DC8/2.0
2720. TO=(G1=(PB54+PB9+PB24+PB69+PB39==2)+1)==(G2-1)
2721. RIKUP11=S=(2=G1=G2=SG(IM1, J, KM1) = PB38+PB39P11=TO+S+2=G1=G2+PB39+
2722. PB39P11=TO)/4.0
2723. DANP11=DDPL+RIKUP11+TA33P+2*XIXI(J, I)=OXINF*RIKUP11/DZETAC(K)
2724. DAN = DANP11
2725. C P12
2726. ELSEIF (CND(II, JJ, KK, IM1, J, K-3)) THEN
2727. PB38P12 = DC8/2.0
2728. PB39P12 = DC8/2.0
2729. TO=G2-1
2730. T1=(G1=(PB53+PB8+PB23+PB66+PB38==2)+1)==TO
2731. T2=2=G1=G2+PB38+PB38P12=T1
2732. T3=(G1=(PB54+PB9+PB24+PB69+PB39==2)+1)==TO
2733. RIKUP12=(S=(SG(IM1, J, KM1) = (2=G1=G2+PB38+PB39P12=T3+S+T2)+2=G1=G2+
2734. PB39+PB39P12=T3)+S=(2=G1=G2+SG(I, J, KM1) = PB38+PB38P12+T1+S+T2))/
2735. 4.0
2736. DANP12=DDPL+RIKUP12+TA33P+2*XIXI(J, I)=OXINF*RIKUP12/DZETAC(K)
2737. DAN = DANP12
2738. C P13
2739. ELSEIF (CND(II, JJ, KK, I, J, K-3)) THEN
2740. PB37P13 = DC8/2.0
2741. PB38P13 = DC8/2.0
2742. TO=G2-1
2743. T1=(G1=(PB53+PB8+PB23+PB66+PB38==2)+1)==TO
2744. RIKUP13=(S=(SG(I, J, KM1) = (2=G1=G2+PB38+PB38P13=T1+S+2=G1=G2+PB37+
2745. PB37P13=(G1=(PB52+PB7+PB22+PB67+PB37==2)+1)==TO)+2=G1=G2+PB38+
2746. PB38P13+T1)+2=G1=G2+SG(IM1, J, KM1) = PB38+PB38P13+T1+S)/4.0
2747. DANP13=DDPL+RIKUP13+TA33P+2*XIXI(J, I)=OXINF*RIKUP13/DZETAC(K)
2748. DAN = DANP13
2749. C P14
2750. ELSEIF (CND(II, JJ, KK, IP1, J, K-3)) THEN
2751. PB37P14 = DC8/2.0
2752. RIKUP14=(G1=G2=SG(I, J, KM1) = PB37+PB37P14=(G1=(PB52+PB7+PB22+PB67+
2753. PB37==2)+1)=G2-1))/S/2.0
2754. DANP14=DDPL+RIKUP14+TA33P+2*XIXI(J, I)=OXINF*RIKUP14/DZETAC(K)
2755. DAN = DANP14
2756. C P33
2757. ELSEIF (CND(II, JJ, KK, I, JM1, KM2)) THEN
2758. DDPLP33=DZETA(KLOW)=[CC6+DDZL+XIYK(J, I)=S+TAJ1+CC6+DDZYL+S+TAJ1]
2759. DANP33=DDPLP33+RIKU+TA33P
2760. DAN = DANP33
2761. C P36
2762. ELSEIF (CND(II, JJ, KK, IM2, J, KM2)) THEN
2763. PB33P36 = DC8/2.0
2764. PB39P36 = DC5/2.0
2765. TO=G2-1
2766. T1=(G1=(PB18+PB83+PB3+PB48+PB33==2)+1)==TO
2767. T2=(G1=(PB54+PB9+PB24+PB69+PB39==2)+1)==TO
2768. RIKUP36=(S=(2=G1=G2+SG(IM1, J, KM1) = PB39+PB39P36=T2+S+2=G1=G2+PB39+
2769. PB39P36+T2)+3=(2=G1=G2+SG(IM1, J, K) = PB33+PB33P36=T1+S+2=G1=G2+PB33+
2770. PB33P36+T1))/4.0
2771. DANP36=DDPL+RIKUP36+TA33P+2*XIXI(J, I)=OXINF*RIKUP36/DZETAC(K)

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2772. DAN = DANP36
2773.
2774. C P37
2775. ELSEIF [CND[II,JJ,KK,IM1,J,KM2]] THEN
2776. PB32P37 = DC6/2.0
2777. PB33P37 = DC6/2.0
2778. PB34P37 = DC5/2.0
2779. PB35P37 = DC5/2.0
2780. TO=G2-1
2781. T1=[G1=[PB17+PB62+PB2+PB47+PB32**2)+1]**=TO
2782. T2=[G1=[PB32+PB3+PB32P37+T1
2783. T3=[G1=[PB53+PB8+PB23+PB68+PB38**2)+1]**=TO
2784. T4=[G1=[G2+PB38+PB38P37+T3
2785. T5=[G1=[PB18+PB63+PB3+PB48+PB33**2)+1]**=TO
2786. T6=[G1=[PB54+PB9+PB24+PB69+PB39**2)+1]**=TO
2787. R1KUP37=[S=[SG[IM1,J,KM1]]*(2+G1+G2+PB38+PB38P37+T6+S+T4)+2+G1+G2+
2788. PB38+PB38P37+T6]+3*[SG[IM1,J,K]]*(2+G1+G2+PB33+PB33P37+T5+S+T2)+2*
2789. G1+G2+PB33+PB33P37+T5]+S*(2+G1+G2+SG[I,J,KM1])*(PB38+PB38P37+T3+S+
2790. T4)+3*(2+G1+G2+SG[I,J,K])*(PB32+PB32P37+T1+S+T2)]/4.0
2791. TO=XIYX(J,I)
2792. DDPLP37=DZETA(KLOW)=[CC6=DDZXL=(TO**2+XIXX(J,I)**2)=S*TAI1+CC6
2793. DDZYL=TO+S*TAI1)
2794. DANP37=DDPLP37+TA33P+DDPLP37+R1KU=TA33P+2*XIXXI(J,I)=OZINF+
2795. R1KUP37/DZETAC(K)
2796. DAN = DANP37
2797.
2798. C P38
2799. ELSEIF [CND[II,JJ,KK,I,J,KM2]] THEN
2800. PB31P38 = DC6/2.0
2801. PB32P38 = DC6/2.0
2802. PB37P38 = DC5/2.0
2803. PB38P38 = DC5/2.0
2804. TO=G2-1
2805. T1=[G1=[PB17+PB62+PB2+PB47+PB32**2)+1]**=TO
2806. T2=[G1=[PB53+PB8+PB23+PB68+PB38**2)+1]**=TO
2807. R1KUP38=[S=[SG[I,J,KM1]]*(2+G1+G2+PB38+PB38P38+T2+S+2+G1+G2+PB37+
2808. PB37P38+T2)+3*[SG[I,J,K]]*(2+G1+G2+PB32+PB32P38+T1+S+2+G1+G2+PB38+
2809. PB38P38+T2)+3*[SG[I,J,K]]*(2+G1+G2+PB32+PB32P38+T1+S+2+G1+G2+PB37+
2810. PB37P38+T2)+2+G1+G2+SG[IM1,J,KM1]]*(PB38+PB38P38+T2+S+2+G1+G2+SG[
2811. IM1,J,K])*(PB32+PB32P38+T1)]/4.0
2812. TO=XIYX(J,I)
2813. T1=CC6=S*TAI2+CC6*TAI1
2814. T2=CC6*TAJ1
2815. T3=CC6*S*TAJ2
2816. DDPLP38=DZETA(KLOW)=[DDZXL=(TO*(T3+T2)+(TO**2+XIXX(J,I)**2)=T1)+
2817. DDZYL=(T3+T2+TO*T1)]
2818. DANP38=DDPLP38+TA33P+DDPLP38+R1KU=TA33P+2*XIXXI(J,I)=OZINF+
2819. R1KUP38/DZETAC(K)
2820. DAN = DANP38
2821.
2822. C P39
2823. ELSEIF [CND[II,JJ,KK,IP1,J,KM2]] THEN
2824. PB31P39 = DC6/2.0
2825. PB37P39 = DC5/2.0
2826. TO=G2-1
2827. R1KUP39=[2+G1+G2+SG[I,J,KM1]]*(PB37+PB37P39+[G1=[PB52+PB7+PB22+PB67+
2828. PB37**2)+1]**=TO+S+G1+G2+SG[I,J,K])*(PB31+PB31P39+[G1=[PB16+PB61+
2829. PB1+PB46+PB31**2)+1]**=TO)]/4.0
2830. TO=XIYX(J,I)
2831. DDPLP39=DZETA(KLOW)=[CC6=DDZXL=(TO**2+XIXX(J,I)**2)=TAI2+CC6+DDZYL
2832. =TO*TAI2)
2833. DANP39=DDPLP39+TA33P+DDPLP39+R1KU=TA33P+2*XIXXI(J,I)=OZINF+
2834. R1KUP39/DZETAC(K)
2835. DAN = DANP39
2836.
2837. C P43
2838. ELSEIF [CND[II,JJ,KK,I,JP1,KM2]] THEN
2839. DDPLP43=DZETA(KLOW)=[CC6=DDZXL=XIYX(J,I)=TAJ2+CC6+DDZYL=TAJ2)
2840. DANP43=DDPLP43+R1KU=TA33P
2841. DAN = DANP43
2842.
2843. C P56
2844. ELSEIF [CND[II,JJ,KK,IM2,JM1,KM1]] THEN
2845. PB24P56 = -[1.0/2.0*AJ1(J)]
2846. PB54P56 = -[1.0/2.0*AJ1(J)]
2847. PB69P56 = -[1.0/2.0*AJ1(J)]
2848. TO=[PB54P56+PB9+PB24+PB69P56+PB24P56+PB69
2849. T1=[G1=[PB54+PB9+PB24+PB69+PB39**2)+1]**=(G2-1)
2850. R1KUP56=[S=[SG[IM2,JM1,KM1]]*(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5]+S*(G1+G2
2851. +G2+T4+T5)+3*[SG[IM2,JM1,KM1]]*(G1+G2+T4+T5+T3)]/4.0
2852. DANP56=DDPLP56+R1KUP56+TA33P+2*XIXXI(J,I)=OZINF+R1KUP56/DZETAC(K)
2853. DAN = DANP56
2854.
2855. C P57
2856. ELSEIF [CND[II,JJ,KK,IM1,JM1,KM1]] THEN
2857. PB23P57 = -[1.0/2.0*AJ1(J)]
2858. PB24P57 = -[1.0/2.0*AJ1(J)]
2859. PB53P57 = -[1.0/2.0*AJ1(J)]
2860. PB54P57 = -[1.0/2.0*AJ1(J)]
2861. PB69P57 = -[1.0/2.0*AJ1(J)]
2862. TO=[PB53P57+PB8+PB23+PB68P57+PB23P57+PB68
2863. T1=G2-1
2864. T2=[G1=[PB53+PB8+PB23+PB68+PB38**2)+1]**=T1
2865. T3=[G1=[G2+TO+T2
2866. T4=[PB54P57+PB9+PB24+PB69P57+PB24P57+PB69
2867. T5=[G1=[PB54+PB9+PB24+PB69+PB39**2)+1]**=T1
2868. R1KUP57=[S=[SG[IM1,JM1,KM1]]*(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5]+S*(G1+G2
2869. +G2+T4+T5)+3*[SG[IM1,JM1,KM1]]*(G1+G2+T4+T5+T3)]/4.0
2870. DANP57=DDPLP57+R1KUP57+TA33P+2*XIXXI(J,I)=OZINF+R1KUP57/DZETAC(K)
2871. DAN = DANP57
2872.
2873. C P58
2874. ELSEIF [CND[II,JJ,KK,I,JM1,KM1]] THEN
2875. PB22P58 = -[1.0/2.0*AJ1(J)]
2876. PB23P58 = -[1.0/2.0*AJ1(J)]
2877. PB52P58 = -[1.0/2.0*AJ1(J)]
2878. PB53P58 = -[1.0/2.0*AJ1(J)]
2879. PB67P58 = -[1.0/2.0*AJ1(J)]
2880. PB68P58 = -[1.0/2.0*AJ1(J)]
2881. TO=[PB53P58+PB8+PB23+PB68P58+PB23P58+PB68
2882. T1=G2-1
2883. T2=[G1=[PB53+PB8+PB23+PB68+PB38**2)+1]**=T1
2884. R1KUP58=[S=[SG[I,J,KM1]]*(G1+G2+TO+T2+S+G1+G2=[PB52P58+PB7+PB22+PB67+
2885. PB67P58+PB22P58+PB67]=[G1=[PB52+PB7+PB22+PB67+PB37**2)+1]**=T1)+G1
2886. +G2+TO+T2)+G1+G2+SG[IM1,JM1,KM1]]*(TO+T2+S)]/4.0
2887. TO=S**2
2888. DDPLP58=DZETA(KLOW)=[CC5=DDZXL=XIYX(J,I)=TO*TAJ1+CC5+DDZYL=TO*TAJ1
2889. ]
2890. DANP58=DDPLP58+TA33P+DDPLP58+R1KU=TA33P+2*XIXXI(J,I)=OZINF+
2891. R1KUP58/DZETAC(K)
2892. DAN = DANP58
2893.
2894. C P59
2895. ELSEIF [CND[II,JJ,KK,IP1,JM1,KM1]] THEN
2896. PB22P59 = -[1.0/2.0*AJ1(J)]
2897. PB52P59 = -[1.0/2.0*AJ1(J)]
2898. PB67P59 = -[1.0/2.0*AJ1(J)]
2899. PB68P59 = -[1.0/2.0*AJ1(J)]
2900. R1KUP59=[G1+G2+SG[I,J,KM1]]*(PB52P59+PB7+PB22+PB67P59+PB22P59+PB67)+
2901. [G1=[PB52+PB7+PB22+PB67+PB37**2)+1]**=(G2-1)*S/4.0
2902. DANP59=DDPLP59+R1KUP59+TA33P+2*XIXXI(J,I)=OZINF+R1KUP59/DZETAC(K)
2903. DAN = DANP59
2904.
2905. C P61
2906. ELSEIF [CND[II,JJ,KK,IM2,J,KM1]] THEN
2907. PB9P61 = DXI[IM2]=S
2908. PB24P61 = [-AJ2(J)+AJ1(J)]/2.0
2909. PB33P61 = DC5/2.0
2910. PB39P61 = DC4/2.0
2911. PB54P61 = DXI[IM2]+A11R(J,IM2)=S+[-AJ2(J)+AJ1(J)]*XIYIP(J,IM2)/
2912. 2.0

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2904. P859P61 = DX11(IM2)=X1Y1P(J,IM2)+S*(-AJ2(J)+AJ1(J))/2.0
2905. TO=G2-1
2906. T1=(G1+(PB18+PB83+PB3+PB48+PB33+2)+1)==TO
2907. T2=(G1+(PB54+PB9+PB24+PB69+PB39+2)+1)==TO
2908. T3=PB54+PB9P61+PB54P61+PB9+PB24+PB69P61+PB24P61+PB69+2+PB39+
2909. PB39P61
2910. R1KUP61=(S=(G1+G2+SG(IM1,J,KM1))+T2+T3+S+G1+G2+T2+T3)+3*(2+G1+G2+SG
2911. (IM1,J,K)+PB33+PB33P61+T1+S+2+G1+G2+PB33+PB33P61+T1))/4.0
2912. DANP61=DDPL+R1KUP61+TA33P+2+X1XX1(J,I)=OZINF+R1KUP61/DZETAC(K)
2913. DAN = DANP61
C P62
2914. ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
2915. PB4P62 = DX11(IM1)*S
2916. PB9P62 = DX11(IM2)
2917. PB23P62 = (-AJ2(J)+AJ1(J))/2.0
2918. PB24P62 = (-AJ2(J)+AJ1(J))/2.0
2919. PB32P62 = DC5/2.0
2920. PB33P62 = DC5/2.0
2921. PB38P62 = DC4/2.0
2922. PB39P62 = DC4/2.0
2923. PB53P62 = DX11(IM1)=A11R(J,IM1)+S*(-AJ2(J)+AJ1(J))=X1Y1P(J,IM1)/
2924. 2.0
2925. PB54P62 = (-AJ2(J)+AJ1(J))=X1Y1P(J,IM2)/2.0+DX11(IM2)=A11R(J,IM2)
2926. PB68P62 = DX11(IM1)=X1Y1P(J,IM1)+S*(-AJ2(J)+AJ1(J))/2.0
2927. PB89P62 = DX11(IM2)=X1Y1P(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
2928. TO=G2-1
2929. T1=(G1+(PB17+PB82+PB2+PB47+PB32+2)+1)==TO
2930. T2=2+G1+G2+PB32+PB32P62+T1
2931. T3=(G1+(PB53+PB8+PB23+PB68+PB38+2)+1)==TO
2932. T4=PB53+PB8P62+PB53P62+PB8+PB23+PB68P62+PB23P62+PB68+2+PB38+
2933. PB38P62
2934. TS=G1+G2+T3+T4
2935. T8=(G1+(PB18+PB83+PB3+PB48+PB33+2)+1)==TO
2936. T7=(G1+(PB54+PB9+PB24+PB69+PB39+2)+1)==TO
2937. T6=PB54+PB9P62+PB54P62+PB9+PB24+PB69P62+PB24P62+PB69+2+PB39+
2938. PB39P62
2939. R1KUP62=(S=(SG(IM1,J,KM1))=(G1+G2+T7+T8+S+T5)+G1+G2+T7+T8)+3*(SG(
2940. IM1,J,K)=(2+G1+G2+PB33+PB33P62+T8+S+T2)+2+G1+G2+PB33+PB33P62+T6)+
2941. S*(G1+G2+SG(I,J,KM1)+T3+T4+S+T5)+3*(2+G1+G2+SG(I,J,K)+PB32+
2942. PB32P62+T1+S+T2))/4.0
2943. TO=X1YX(J,I)
2944. T1=S+2
2945. DDPLP62=DZETA(KLOW)=(CCS+DDZXL=(TO+2+X1XX(J,I)+2)+T1+TA11+CCS+
2946. DDZYL=TO+T1+TA11)
2947. DANP62=DDPL+R1KUP62+TA33P+DDPLP62+R1KU=TA33P+2+X1XX1(J,I)=OZINF+
2948. R1KUP62/DZETAC(K)
2949. DAN = DANP62
C P63
2950. ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
2951. PB7P63 = DX11(I)*S
2952. PB8P63 = DX11(IM1)
2953. PB22P63 = (-AJ2(J)+AJ1(J))/2.0
2954. PB23P63 = (-AJ2(J)+AJ1(J))/2.0
2955. PB31P63 = DC5/2.0
2956. PB32P63 = DC5/2.0
2957. PB37P63 = DC4/2.0
2958. PB38P63 = DC4/2.0
2959. PB52P63 = DX11(I)=A11R(J,I)+S*(-AJ2(J)+AJ1(J))=X1Y1P(J,I)/2.0
2960. PB53P63 = (-AJ2(J)+AJ1(J))=X1Y1P(J,IM1)/2.0+DX11(IM1)=A11R(J,IM1)
2961. PB67P63 = DX11(I)=X1Y1P(J,I)+S*(-AJ2(J)+AJ1(J))/2.0
2962. PB68P63 = DX11(IM1)=X1Y1P(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
2963. TO=G2-1
2964. T1=(G1+(PB17+PB82+PB2+PB47+PB32+2)+1)==TO
2965. T2=(G1+(PB53+PB8+PB23+PB68+PB38+2)+1)==TO
2966. T3=PB53+PB8P63+PB53P63+PB8+PB23+PB68P63+PB23P63+PB68+2+PB38+
2967. PB38P63
2968. R1KUP63=(S=(SG(I,J,KM1))=(G1+G2+T2+T3+S+G1+G2=(G1+(PB52+PB7+PB22+
2969. PB67+PB37+2)+1)==TO+(PB52+PB7P63+PB52P63+PB7+PB22+PB67P63+
2970. PB22P63+PB67+2+PB37+PB37P63))+G1+G2+T2+T3)+3*(SG(I,J,K)=(2+G1+G2+
2971. PB32+PB32P63+T1+S+2+G1+G2+PB31+PB31P63=(G1+(PB18+PB83+PB3+PB48+
2972. PB31+2)+1)==TO)+2+G1+G2+PB32+PB32P63+T1)+G1+G2+SG(IM1,J,KM1)+T2+
2973. T3+S+G1+G2+SG(IM1,J,K)+PB32+PB32P63+T1))/4.0
2974. TO=X1YX(J,I)
2975. T1=S+2
2976. T2=CCS+T1+TA12+CCS+S+TA11
2977. T3=CCS+S+TAJ1
2978. T4=CCS+T1+TAJ2
2979. DDPLP63=DZETA(KLOW)=(DDZXL=(TO+(T4+T3)+(TO+2+X1XX(J,I)+2)+T2)+
2980. DDZYL=(T4+T3+TO+T2))
2981. DANP63=DDPL+R1KUP63+TA33P+DDPLP63+R1KU=TA33P+2+X1XX1(J,I)=OZINF+
2982. R1KUP63/DZETAC(K)
2983. DAN = DANP63
C P64
2984. ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
2985. PB7P64 = DX11(I)
2986. PB22P64 = (-AJ2(J)+AJ1(J))/2.0
2987. PB31P64 = DC5/2.0
2988. PB37P64 = DC4/2.0
2989. PB52P64 = (-AJ2(J)+AJ1(J))=X1Y1P(J,I)/2.0+DX11(I)=A11R(J,I)
2990. PB67P64 = DX11(I)=X1Y1P(J,I)+(-AJ2(J)+AJ1(J))/2.0
2991. TO=G2-1
2992. R1KUP64=(G1+G2+SG(I,J,KM1))=(G1+(PB52+PB7+PB22+PB67+PB37+2)+1)==TO
2993. +(PB52+PB7P64+PB52P64+PB7+PB22+PB67P64+PB22P64+PB67+2+PB37+
2994. PB37P64)+S+G1+G2+SG(I,J,K)+PB31+PB31P64=(G1+(PB18+PB83+PB3+PB48
2995. +PB31+2)+1)==TO)/4.0
2996. TO=X1YX(J,I)
2997. DDPLP64=DZETA(KLOW)=(CCS+DDZXL=(TO+2+X1XX(J,I)+2)+S+TA12+CCS+
3000. DDZYL=TO+S+TA12)
3001. DANP64=DDPL+R1KUP64+TA33P+DDPLP64+R1KU=TA33P+2+X1XX1(J,I)=OZINF+
3002. R1KUP64/DZETAC(K)
3003. DAN = DANP64
C P65
3004. ELSEIF (CND(II,JJ,KK,IM2,JP1,KM1)) THEN
3005. PB24P65 = AJ2(J)/2.0
3006. PB54P65 = AJ2(J)=X1Y1P(J,IM2)/2.0
3007. PB89P65 = AJ2(J)/2.0
3008. TO=PB54P65+PB9+PB24+PB69P65+PB24P65+PB89
3009. T1=(G1+(PB54+PB9+PB24+PB69+PB39+2)+1)=(G2-1)
3010. R1KUP65=(S=(G1+G2+SG(IM1,J,KM1))+TO+T1+S+G1+G2+TO+T1))/4.0
3011. DANP65=DDPL+R1KUP65+TA33P+2+X1XX1(J,I)=OZINF+R1KUP65/DZETAC(K)
3012. DAN = DANP65
C P67
3013. ELSEIF (CND(II,JJ,KK,IM1,JP1,KM1)) THEN
3014. PB23P67 = AJ2(J)/2.0
3015. PB24P67 = AJ2(J)/2.0
3016. PB53P67 = AJ2(J)=X1Y1P(J,IM1)/2.0
3017. PB54P67 = AJ2(J)=X1Y1P(J,IM2)/2.0
3018. PB68P67 = AJ2(J)/2.0
3019. PB89P67 = AJ2(J)/2.0
3020. TO=PB53P67+PB8+PB23+PB68P67+PB23P67+PB68
3021. T1=G2-1
3022. T2=(G1+(PB53+PB8+PB23+PB68+PB38+2)+1)==T1
3023. T3=G1+G2+TO+T2
3024. T4=PB54P67+PB9+PB24+PB69P67+PB24P67+PB89
3025. TS=(G1+(PB54+PB9+PB24+PB69+PB39+2)+1)==T1
3026. R1KUP67=(S=(SG(IM1,J,KM1))=(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+S*(G1+G2
3027. +SG(I,J,KM1)+TO+T2+S+T3))/4.0
3028. DANP67=DDPL+R1KUP67+TA33P+2+X1XX1(J,I)=OZINF+R1KUP67/DZETAC(K)
3029. DAN = DANP67
C P68
3030. ELSEIF (CND(II,JJ,KK,I,JP1,KM1)) THEN
3031. PB22P68 = AJ2(J)/2.0

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3038. PB23P68 = AJ2(J)/2.0
3037. PB52P68 = AJ2(J)*XIYIP(J,I)/2.0
3036. PB53P68 = AJ2(J)*XIYIP(J,IM1)/2.0
3035. PB67P68 = AJ2(J)/2.0
3040. PB68P68 = AJ2(J)/2.0
3041. TO=PB53P68+PB68+PB23+PB68P68+PB23P68+PB68
3042. T1=G2-1
3043. T2=(G1+(PB53+PB68+PB23+PB68+PB38**2)+1)**T1
3044. R1KUP68=(S*(SG(I,J,KM1))+(G1+G2+TO+T2+S+G1+G2+(PB52P68+PB7+PB22+
3045. PB7P68+PB22P68+PB7)))/(G1+(PB52+PB7+PB22+PB67**2)+1)**T1+G1
3046. G2=TO+T2 G1=G2*SG(IM1,J,KM1)+TO+T2**S/4.0
3047. DDPLP68=DZETA(KLOW)=(CC4+DDZXL*XIXI(J,I)+S*TAJ2+CC5+DDZYL+S*TAJ2)
3048. DANP68=DDPL+R1KUP68+TA33P+DDPLP68+R1KU+TA33P+2*XIXI(J,I)*OZINF
3049. R1KUP68/DZETAC(K)
3050. DAN = DANP68
3051. C P69
3052. ELSEIF (CND(I1,JJ,JK,IP1,JP1,KM1)) THEN
3053. PB22P69 = AJ2(J)/2.0
3054. PB52P69 = AJ2(J)*XIYIP(J,I)/2.0
3055. PB67P69 = AJ2(J)/2.0
3056. R1KUP69=G1+G2+SG(I,J,KM1)+(PB52P69+PB7+PB22+PB67P69+PB22P69+PB67)*
3057. (G1+(PB52+PB7+PB22+PB67**2)+1)**(G2-1)+S/4.0
3058. DANP69=DDPL+R1KUP69+TA33P+2*XIXI(J,I)*OZINF+R1KUP69/DZETAC(K)
3059. DAN = DANP69
3060. C P81
3061. ELSEIF (CND(I1,JJ,KK,IM2,JM1,K)) THEN
3062. PB18P81 = -(1.0/2.0*AJ1(J))
3063. PB48P81 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM2))
3064. PB63P81 = -(1.0/2.0*AJ1(J))
3065. TO=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**(G2-1)
3066. T1+PB18+PB63P81+PB18P81+PB63+PB3+PB48P81
3067. R1KUP81=3.0/4.0*(G1+G2+SG(IM1,J,K)+TO+T1+S+G1+G2+TO+T1)
3068. DANP81=DDPL+R1KUP81+TA33P+2*XIXI(J,I)*OZINF+R1KUP81/DZETAC(K)
3069. DAN = DANP81
3070. C P82
3071. ELSEIF (CND(I1,JJ,KK,IM1,JM1,K)) THEN
3072. PB17P82 = -(1.0/2.0*AJ1(J))
3073. PB18P82 = -(1.0/2.0*AJ1(J))
3074. PB47P82 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
3075. PB48P82 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM2))
3076. PB62P82 = -(1.0/2.0*AJ1(J))
3077. PB63P82 = -(1.0/2.0*AJ1(J))
3078. TO=G2-1
3079. T1=(G1+(PB17+PB62+PB2+PB47+PB32**2)+1)**TO
3080. T2+PB17+PB62P82+PB17P82+PB62+PB2+PB47P82
3081. T3=G1+G2+T1+T2
3082. T4=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**TO
3083. T5+PB18+PB63P82+PB18P82+PB63+PB3+PB48P82
3084. R1KUP82=(S*(SG(IM1,J,K)+(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+3*(G1+G2+
3085. SG(I,J,K)+T1+T2+S+T3))/4.0
3086. DANP82=DDPL+R1KUP82+TA33P+2*XIXI(J,I)*OZINF+R1KUP82/DZETAC(K)
3087. DAN = DANP82
3088. C P83
3089. ELSEIF (CND(I1,JJ,KK,I,JM1,K)) THEN
3090. PB18P83 = -(1.0/2.0*AJ1(J))
3091. PB17P83 = -(1.0/2.0*AJ1(J))
3092. PB48P83 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
3093. PB47P83 = -(1.0/2.0*AJ1(J)*XIYIP(J,IM1))
3094. PB61P83 = -(1.0/2.0*AJ1(J))
3095. PB62P83 = -(1.0/2.0*AJ1(J))
3096. TO=G2-1
3097. T1=(G1+(PB17+PB62+PB2+PB47+PB32**2)+1)**TO
3098. T2+PB17+PB62P83+PB17P83+PB62+PB2+PB47P83
3099. R1KUP83=(S*(SG(I,J,K)+(G1+G2+T1+T2+S+G1+G2+(PB18+PB61+PB1+PB48
3100. +PB31**2)+1)**TO+(PB18+PB61P83+PB18P83+PB61+PB1+PB48P83)+G1+G2+
3101. T1+T2)+3*(G1+G2+SG(IM1,J,K)+T1+T2))/4.0
3102. DDPLP83=DZETA(KLOW)=(CC4+DDZXL*XIXI(J,I)+S*TAJ1+CC4+DDZYL+S*TAJ1)
3103. DANP83=DDPL+R1KUP83+TA33P+DDPLP83+R1KU+TA33P+2*XIXI(J,I)*OZINF+
3104. R1KUP83/DZETAC(K)
3105. DAN = DANP83
3106. C P84
3107. ELSEIF (CND(I1,JJ,KK,IP1,JP1,K)) THEN
3108. PB18P84 = -(1.0/2.0*AJ1(J))
3109. PB48P84 = -(1.0/2.0*AJ1(J)*XIYIP(J,I))
3110. PB61P84 = -(1.0/2.0*AJ1(J))
3111. R1KUP84=3.0/4.0*(G1+G2+SG(I,J,K)+(G1+(PB18+PB61+PB1+PB48+PB31**2)+1)
3112. )*(G2-1)+(PB18+PB61P84+PB18P84+PB61+PB1+PB48P84)
3113. DANP84=DDPL+R1KUP84+TA33P+2*XIXI(J,I)*OZINF+R1KUP84/DZETAC(K)
3114. DAN = DANP84
3115. C P86
3116. ELSEIF (CND(I1,JJ,KK,IM2,J,K)) THEN
3117. PB3P86 = DXI1(IM2)=S
3118. PB18P86 = [-AJ2(J)+AJ1(J)]/2.0
3119. PB33P86 = DC4/2.0
3120. PB48P86 = DXI1(IM2)=A11R(J,IM2)=S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/
3121. 2.0
3122. PB63P86 = DXI1(IM2)=XIYIP(J,IM2)=S+(-AJ2(J)+AJ1(J))/2.0
3123. TO=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**(G2-1)
3124. T1+PB18+PB63P86+PB18P86+PB63+PB3+PB48P86+PB33P86+PB48+2+PB33=
3125. PB33P86
3126. R1KUP86=3.0/4.0*(G1+G2+SG(IM1,J,K)+TO+T1+S+G1+G2+TO+T1)
3127. DANP86=DDPL+R1KUP86+TA33P+2*XIXI(J,I)*OZINF+R1KUP86/DZETAC(K)
3128. DAN = DANP86
3129. C P87
3130. ELSEIF (CND(I1,JJ,KK,IM1,J,K)) THEN
3131. PB2P87 = DXI1(IM1)=S
3132. PB3P87 = DXI1(IM2)
3133. PB17P87 = [-AJ2(J)+AJ1(J)]/2.0
3134. PB18P87 = [-AJ2(J)+AJ1(J)]/2.0
3135. PB32P87 = DC4/2.0
3136. PB33P87 = DC4/2.0
3137. PB47P87 = DXI1(IM1)=A11R(J,IM1)=S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/
3138. 2.0
3139. PB48P87 = [-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/2.0+DXI1(IM2)=A11R(J,IM2)
3140. PB62P87 = DXI1(IM1)*XIYIP(J,IM1)+S+(-AJ2(J)+AJ1(J))/2.0
3141. PB63P87 = DXI1(IM2)*XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
3142. TO=G2-1
3143. T1=(G1+(PB17+PB62+PB2+PB47+PB32**2)+1)**TO
3144. T2+PB17+PB62P87+PB17P87+PB62+PB2+PB47P87+PB2P87+PB47+2+PB32=
3145. PB32P87
3146. T3=G1+G2+T1+T2
3147. T4=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**TO
3148. T5+PB18+PB63P87+PB18P87+PB63+PB3+PB48P87+PB3P87+PB48+2+PB33=
3149. PB33P87
3150. R1KUP87=(S*(SG(IM1,J,K)+(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+3*(G1+G2+
3151. SG(I,J,K)+T1+T2+S+T3))/4.0
3152. TO=XIXI(J,I)
3153. DDPLP87=DZETA(KLOW)=(CC4+DDZXL*(TO**2+XIXI(J,I)**2)+S*TAI1+CC4+
3154. DDZYL+TO+S*TAI1)
3155. DANP87=DDPL+R1KUP87+TA33P+DDPLP87+R1KU+TA33P+2*XIXI(J,I)*OZINF+
3156. R1KUP87/DZETAC(K)
3157. DAN = DANP87
3158. C P88
3159. ELSEIF (CND(I1,JJ,KK,I,J,K)) THEN
3160. PB1P88 = DXI1(I)=S
3161. PB2P88 = DXI1(IM1)
3162. PB18P88 = [-AJ2(J)+AJ1(J)]/2.0
3163. PB17P88 = [-AJ2(J)+AJ1(J)]/2.0
3164. PB31P88 = DC4/2.0
3165. PB32P88 = DC4/2.0
3166. PB48P88 = DXI1(I)=A11R(J,I)=S+(-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0
3167. PB47P88 = [-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/2.0+DXI1(IM1)=A11R(J,IM1)

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3158. PR61P88 = DX11[I]=XIYIP(J,I)=S+(-AJ2(J)+AJ1(J))/2.0
3159. PB62P88 = DX11[IM1]=XIYIP(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
3170. TO=G2-1
3171. T1=(G1=(PB17=PB62+PB2=PB47+PB32==2)+1)==TO
3172. T2=PB17+PB62P88+PB17P88+PB62+PB2+PB47P88+PB2P88+PB47+2+PB32+
3173. PB32P88
3174. R1KUP88=(3*(SG(I,J,K)=(G1+G2+T1+T2+S+G1+G2=(G1=(PB16+PB61+PB1+PB46
3175. +PB31==2)+1)==TO+(PB16+PB61P88+PB16P88+PB61+PB1+PB46P88+PB1P88+
3176. PB46+2+PB31+PB31P88))+G1+G2+T1+T2)+3*(G1+G2+SG(IM1,J,K)+T1+T2))/4.0
3177. TO=XIYX(J,I)
3178. T1=CC4+S+TA12+CC4+TA11
3179. T2=CC4+TAJ1
3180. T3=CC4+S+TAJ2
3181. DDPLP88=DZETA(KLOW)=(DDZXL=(TO+(T3+T2)-(TO==2+XIXX(J,I))==2)+T1)+
3182. DDZYL=(T3+T2+TO+T1))
3183. DANP88=DDPL+R1KUP88+TA33P+DDPLP88+R1KU+TA33P+2+XIXX(J,I)=OZINF+
3184. R1KUP88/DZETAC(K)
3185. DAN = DANP88
3186.
3187. C P88
3188. ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
3189. PB1P88 = DX11[I]
3190. PB16P88 = (-AJ2(J)+AJ1(J))/2.0
3191. PB31P88 = DC4/2.0
3192. PB46P88 = (-AJ2(J)+AJ1(J))=XIYIP(J,I)/2.0+DX11[I]+A11R(J,I)
3193. PB1P88 = DX11[I]=XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
3194. R1KUP88=3.0/4.0*(G1+G2+SG(I,J,K)=(G1=(PB16+PB61+PB1+PB46+PB31==2)+1
3195. )==(G2-1)=(PB16+PB61P88+PB16P88+PB61+PB1+PB46P88+PB1P88+PB46+2+
3196. PB31+PB31P88)
3197. TO=XIYX(J,I)
3198. DDPLP88=DZETA(KLOW)=(CC4+DDZXL=(TO==2+XIXX(J,I))==2)+TA12+CC4+DDZYL
3199. =TO+TA12)
3200. DANP88=DDPL+R1KUP88+TA33P+DDPLP88+R1KU+TA33P+2+XIXX(J,I)=OZINF+
3201. R1KUP88/DZETAC(K)
3202. DAN = DANP88
3203.
3204. C P81
3205. ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
3206. PB18P81 = AJ2(J)/2.0
3207. PB48P81 = AJ2(J)=XIYIP(J,IM2)/2.0
3208. PB63P81 = AJ2(J)/2.0
3209. TO=(G1=(PB18+PB63+PB3+PB48+PB33==2)+1)==(G2-1)
3210. T1=PB18+PB63P81+PB18P81+PB63+PB48P81
3211. R1KUP81=3.0/4.0*(G1+G2+SG(IM1,J,K)=(TO+T1+S+G1+G2+TO+T1))
3212. DANP81=DDPL+R1KUP81+TA33P+2+XIXX(J,I)=OZINF+R1KUP81/DZETAC(K)
3213. DAN = DANP81
3214.
3215. C P82
3216. ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
3217. PB17P82 = AJ2(J)/2.0
3218. PB18P82 = AJ2(J)/2.0
3219. PB47P82 = AJ2(J)=XIYIP(J,IM1)/2.0
3220. PB48P82 = AJ2(J)=XIYIP(J,IM2)/2.0
3221. PB62P82 = AJ2(J)/2.0
3222. PB63P82 = AJ2(J)/2.0
3223. TO=G2-1
3224. T1=(G1=(PB17=PB62+PB2=PB47+PB32==2)+1)==TO
3225. T2=PB17+PB62P82+PB17P82+PB62+PB2+PB47P82
3226. T3=G1+G2+T1+T2
3227. T4=(G1=(PB18+PB63+PB3+PB48+PB33==2)+1)==TO
3228. T5=PB18+PB63P82+PB18P82+PB63+PB48P82
3229. R1KUP82=(3*(SG(IM1,J,K)=(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+3*(G1+G2+
3230. SG(I,J,K)+T1+T2+S+T3))/4.0
3231. DANP82=DDPL+R1KUP82+TA33P+2+XIXX(J,I)=OZINF+R1KUP82/DZETAC(K)
3232. DAN = DANP82
3233.
3234. C P83
3235. ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
3236. PB18P83 = AJ2(J)/2.0
3237. PB17P83 = AJ2(J)/2.0
3238. PB46P83 = AJ2(J)=XIYIP(J,I)/2.0
3239. PB47P83 = AJ2(J)=XIYIP(J,IM1)/2.0
3240. PB61P83 = AJ2(J)/2.0
3241. PB62P83 = AJ2(J)/2.0
3242. TO=G2-1
3243. T1=(G1=(PB17=PB62+PB2=PB47+PB32==2)+1)==TO
3244. T2=PB17+PB62P83+PB17P83+PB62+PB2+PB47P83
3245. R1KUP83=(3*(SG(I,J,K)=(G1+G2+T1+T2+S+G1+G2=(G1=(PB16+PB61+PB1+PB46
3246. +PB31==2)+1)==TO+(PB16+PB61P83+PB16P83+PB61+PB1+PB46P83))+G1+G2+
3247. T1+T2)+3*(G1+G2+SG(IM1,J,K)+T1+T2))/4.0
3248. DDPLP83=DZETA(KLOW)=(CC4+DDZXL=XIYX(J,I)=TAJ2+CC4+DDZYL+TAJ2)
3249. DANP83=DDPL+R1KUP83+TA33P+DDPLP83+R1KU+TA33P+2+XIXX(J,I)=OZINF+
3250. R1KUP83/DZETAC(K)
3251. DAN = DANP83
3252.
3253. C P84
3254. ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
3255. PB18P84 = AJ2(J)/2.0
3256. PB48P84 = AJ2(J)=XIYIP(J,I)/2.0
3257. PB61P84 = AJ2(J)/2.0
3258. R1KUP84=3.0/4.0*(G1+G2+SG(I,J,K)=(G1=(PB16+PB61+PB1+PB46+PB31==2)+1
3259. )==(G2-1)=(PB16+PB61P84+PB16P84+PB61+PB1+PB46P84)
3260. DANP84=DDPL+R1KUP84+TA33P+2+XIXX(J,I)=OZINF+R1KUP84/DZETAC(K)
3261. DAN = DANP84
3262. ENDF
3263.
3264. C
3265. RETURN
3266. END
3267. SUBROUTINE R3(J,I,K,JJ,II,KK,DAN)
3268. C
3269. RMDER3.FOR
3270. C
3271. INCLUDE (INTR0)
3272. C
3273. P
3274. C
3275. P36 = P(J,KM2,IM2)
3276. P37 = P(J,KM2,IM1)
3277. P38 = P(J,KM2,I)
3278. P39 = P(J,KM2,IP1)
3279. P56 = P(JM1,KM1,IM2)
3280. P57 = P(JM1,KM1,IM1)
3281. P58 = P(JM1,KM1,I)
3282. P59 = P(JM1,KM1,IP1)
3283. P61 = P(J,KM1,IM2)
3284. P62 = P(J,KM1,IM1)
3285. P63 = P(J,KM1,I)
3286. P64 = P(J,KM1,IP1)
3287. P66 = P(JP1,KM1,IM2)
3288. P67 = P(JP1,KM1,IM1)
3289. P68 = P(JP1,KM1,I)
3290. P69 = P(JP1,KM1,IP1)
3291. P81 = P(JM1,K,IM2)
3292. P82 = P(JM1,K,IM1)
3293. P83 = P(JM1,K,I)
3294. P84 = P(JM1,K,IP1)
3295. P66 = P(J,K,IM2)
3296. P67 = P(J,K,IM1)
3297. P68 = P(J,K,I)
3298. P69 = P(J,K,IP1)
3299. P51 = P(JP1,K,IM2)
3300. P52 = P(JP1,K,IM1)
3301. P53 = P(JP1,K,I)
3302. P54 = P(JP1,K,IP1)
3303. P111 = P(J,KP1,IM2)
3304. P112 = P(J,KP1,IM1)
3305. P113 = P(J,KP1,I)
3306. P114 = P(J,KP1,IP1)

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3300. P182 = P(J,KLOW-2,ITE)
3301. P183 = P(J,KLOW-1,ITE)
3302. P184 = P(J,KLOW,ITE)
3303. P185 = P(J,KUP,ITE)
3304. P186 = P(J,KUP+1,ITE)
3305. P187 = P(J,KUP+2,ITE)
3306.
3307. C
3308. C
3309. C
3310. PC1 = DX11(I)=[P88+S+P89]+OXINF/XIXIP(J,I)
3311. PC2 = DX11(IM1)=[P87+S+P88]+OXINF/XIXIP(J,IM1)
3312. PC3 = DX11(IM2)=[P84+S+P87]+OXINF/XIXIP(J,IM2)
3313. PC4 = DX11(I)=[P83+S+P84]+OXINF/XIXIP(J,I)
3314. PC5 = DX11(IM1)=[P82+S+P83]+OXINF/XIXIP(J,IM1)
3315. PC6 = DX11(IM2)=[P81+S+P82]+OXINF/XIXIP(J,IM2)
3316. PC16 = XIYIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P94+P93-P89-P88]+AJ1
3317. (J)=[P89+P88-P84-P83]]/2.0
3318. PC17 = XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P93+P92-P86-P87]
3319. +AJ1(J)=[P88+P87-P83-P82]]/2.0
3320. PC18 = XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P92+P91-P87-P86]
3321. +AJ1(J)=[P87+P86-P82-P81]]/2.0
3322. PC22 = XIYIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P69+P68-P64-P63]+AJ1
3323. (J)=[P64+P63-P59-P58]]/2.0
3324. PC23 = XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P68+P67-P63-P62]
3325. +AJ1(J)=[P63+P62-P54-P57]]/2.0
3326. PC24 = XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P67+P66-P62-P61]
3327. +AJ1(J)=[P62+P61-P57-P56]]/2.0
3328. PC31 = -(A1K(K)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3329. P185+CC5+P183])OXINF+(A1K(K)=[P89+P88-P84-P83]+A2K(K)=[-P89-P88+
3330. P114+P113])/2.0
3331. PC32 = -(A1K(K)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3332. P185+CC5+P183])OXINF+(A1K(K)=[P88+P87-P83-P82]+A2K(K)=[-P87-P86+
3333. P113+P112])/2.0
3334. PC33 = -(A1K(K)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3335. P185+CC5+P183])OXINF+(A1K(K)=[P87+P86-P82-P81]+A2K(K)=[-P87-P86+
3336. P112+P111])/2.0
3337. PC37 = -(A1K(KM1)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3338. P185+CC5+P183])OXINF+(A2K(KM1)=[P89+P88-P84-P83]+A1K(KM1)=[P84+
3339. P83-P39-P38])/2.0
3340. PC38 = -(A1K(KM1)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3341. P185+CC5+P183])OXINF+(A2K(KM1)=[P88+P87-P83-P82]+A1K(KM1)=[P63+
3342. P62-P38-P37])/2.0
3343. PC39 = -(A1K(KM1)=[CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
3344. P185+CC5+P183])OXINF+(A2K(KM1)=[P87+P86-P82-P81]+A1K(KM1)=[P62+
3345. P61-P37-P36])/2.0
3346. PC45 = A11R(J,I)=[DX11(I)=[P88+S+P88]+OXINF/XIXIP(J,I)]+XIYIP(J,I)
3347. +[XIYIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P94+P93-P89-P88]+AJ1(J)=[
3348. P89+P88-P84-P83]]/2.0]
3349. PC47 = A11R(J,IM1)=[DX11(IM1)=[P87+S+P88]+OXINF/XIXIP(J,IM1)]+
3350. XIYIP(J,IM1)+[XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P93+P92-
3351. P88-P87]+AJ1(J)=[P88+P87-P83-P82]]/2.0]
3352. PC48 = A11R(J,IM2)=[DX11(IM2)=[P88+S+P87]+OXINF/XIXIP(J,IM2)]+
3353. XIYIP(J,IM2)+[XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P92+P91-
3354. P87-P86]+AJ1(J)=[P87+P86-P82-P81]]/2.0]
3355. PC52 = A11R(J,I)=[DX11(I)=[P83+S+P64]+OXINF/XIXIP(J,I)]+XIYIP(J,I)
3356. +[XIYIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P69+P68-P64-P63]+AJ1(J)=[
3357. P64+P63-P59-P58]]/2.0]
3358. PC53 = A11R(J,IM1)=[DX11(IM1)=[P82+S+P63]+OXINF/XIXIP(J,IM1)]+
3359. XIYIP(J,IM1)+[XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P68+P67-
3360. P63-P62]+AJ1(J)=[P63+P62-P58-P57]]/2.0]
3361. PC54 = A11R(J,IM2)=[DX11(IM2)=[P81+S+P62]+OXINF/XIXIP(J,IM2)]+
3362. XIYIP(J,IM2)+[XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P67+P66-
3363. P62-P61]+AJ1(J)=[P62+P61-P57-P56]]/2.0]
3364. PC61 = XIYIP(J,I)=[DX11(I)=[P88+S+P83]+OXINF/XIXIP(J,I)]+XIYIP(J,I)
3365. +OXINF+S/XIXIP(J,I)+[AJ2(J)=[P94+P93-P89-P88]+AJ1(J)=[P89+P88-
3366. P84-P83]]/2.0]
3367. PC62 = XIYIP(J,IM1)=[DX11(IM1)=[P87+S+P88]+OXINF/XIXIP(J,IM1)]+
3368. XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P93+P92-P86-P87]+AJ1(J)
3369. ]=[P88+P87-P83-P82]]/2.0]
3370. PC63 = XIYIP(J,IM2)=[DX11(IM2)=[P88+S+P87]+OXINF/XIXIP(J,IM2)]+
3371. XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P92+P91-P87-P86]+AJ1(J)
3372. ]=[P87+P86-P82-P81]]/2.0]
3373. PC67 = XIYIP(J,I)=[DX11(I)=[P83+S+P84]+OXINF/XIXIP(J,I)]+XIYIP(J,I)
3374. +OXINF+S/XIXIP(J,I)+[AJ2(J)=[P89+P88-P84-P83]+AJ1(J)=[P84+P83-
3375. P59-P58]]/2.0]
3376. PC68 = XIYIP(J,IM1)=[DX11(IM1)=[P82+S+P83]+OXINF/XIXIP(J,IM1)]+
3377. XIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P68+P67-P63-P62]+AJ1(J)
3378. ]=[P63+P62-P58-P57]]/2.0]
3379. PC69 = XIYIP(J,IM2)=[DX11(IM2)=[P81+S+P82]+OXINF/XIXIP(J,IM2)]+
3380. XIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P67+P66-P62-P61]+AJ1(J)
3381. ]=[P62+P61-P57-P56]]/2.0]
3382. C
3383. C
3384. R2KW,CIR
3385. T0=[G1=(PC17+PC62+PC2+PC47+PC32**2)-1]**G2
3386. T1=[G1=(PC18+PC63+PC3+PC48+PC33**2)-1]**G2
3387. T2=[G1=(PC53+PC8+PC23+PC88+PC38**2)-1]**G2
3388. T3=[G1=(PC54+PC9+PC24+PC89+PC39**2)-1]**G2
3389. R2KW=[SG(IM1,J,KM1)=[T3+S+T2]+SG(I,J,KM1)=[T2+S+G1=(PC52+PC7+PC22
3390. +PC67+PC37**2)+1]**G2]+SG(IM1,J,K)=[T1+S+T0]+SG(I,J,K)=[T0+S+G1=
3391. [PC16+PC61+PC1+PC46+PC31**2)+1]**G2]+T3+T2+T1+T0]/4.0
3392. CIR=CIR*(J)
3393. C
3394. C
3395. C
3396. DER3
3397. C
3398. C
3399. C
3400. P36
3401. DAN = DANP36
3402. C
3403. C
3404. C
3405. C
3406. C
3407. C
3408. C
3409. C
3410. C
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3597. C
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3600. C
3601. C
3602. C
3603. C
3604. C
3605. C
3606. C
3607. C
3608. C
3609. C
3610. C
3611. C
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3432 C P56
3433 ELSEIF (CND[I1,JJ,KK,IM2,JM1,KM1]) THEN
3434 PC24P56 = -(1.0/2.0*AJ1[J])
3435 PC54P56 = -(1.0/2.0*AJ1[J]*XIYIP[J,IM2])
3436 PC89P56 = -(1.0/2.0*AJ1[J])
3437 TO=PC54P56+PC9+PC24+PC89P56+PC24P56+PC69
3438 T1=(G1+(PC54+PC9+PC24+PC89+PC39**2)+1)**(G2-1)
3439 R2KWP56=(G1+G2*SG[IM1,J,KM1])*TO*T1=S+G1+G2*TO*T1/4.0
3440 DANP56=CIR=R2KWP56+TA33M
3441 DAN = DANP56
3442
3443 C P57
3444 ELSEIF (CND[I1,JJ,KK,IM1,JM1,KM1]) THEN
3445 PC23P57 = -(1.0/2.0*AJ1[J])
3446 PC24P57 = -(1.0/2.0*AJ1[J])
3447 PC53P57 = -(1.0/2.0*AJ1[J]*XIYIP[J,IM1])
3448 PC54P57 = -(1.0/2.0*AJ1[J]*XIYIP[J,IM2])
3449 PC89P57 = -(1.0/2.0*AJ1[J])
3450 PC89P57 = -(1.0/2.0*AJ1[J])
3451 TO=PC53P57+PC8+PC23+PC89P57+PC23P57+PC68
3452 T1=G2-1
3453 T2=(G1+(PC53+PC8+PC23+PC89+PC38**2)+1)**T1
3454 T3=G1+G2*TO*T2
3455 T4=PC54P57+PC8+PC24+PC89P57+PC24P57+PC69
3456 T5=(G1+(PC54+PC9+PC24+PC89+PC39**2)+1)**T1
3457 R2KWP57=(SG[IM1,J,KM1]+[G1+G2+T4+T5+S+T3]+G1+G2*SG[I,J,KM1])*TO*T2
3458 S+G1+G2+T4+T5+T3/4.0
3459 DANP57=CIR=R2KWP57+TA33M
3460 DAN = DANP57
3461
3462 C P58
3463 ELSEIF (CND[I1,JJ,KK,I,JM1,KM1]) THEN
3464 PC22P58 = -(1.0/2.0*AJ1[J])
3465 PC23P58 = -(1.0/2.0*AJ1[J])
3466 PC52P58 = -(1.0/2.0*AJ1[J]*XIYIP[J,I])
3467 PC53P58 = -(1.0/2.0*AJ1[J]*XIYIP[J,IM1])
3468 PC67P58 = -(1.0/2.0*AJ1[J])
3469 PC89P58 = -(1.0/2.0*AJ1[J])
3470 TO=PC53P58+PC8+PC23+PC67P58+PC23P58+PC68
3471 T1=G2-1
3472 T2=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**T1
3473 R2KWP58=(SG[I,J,KM1]+(G1+G2*TO*T2+S+G1+G2*(PC52P58+PC7+PC22+
3474 PC67P58+PC22P58+PC67))=[G1+G2+T2+T3+G1+G2*SG[I,J,KM1])*TO*T2
3475 S+G2*SG[IM1,J,KM1])*TO*T2-G1+G2*TO*T2/4.0
3476 DANP58=CIR=R2KWP58+TA33M
3477 DAN = DANP58
3478
3479 C P59
3480 ELSEIF (CND[I1,JJ,KK,IP1,JM1,KM1]) THEN
3481 PC22P59 = -(1.0/2.0*AJ1[J])
3482 PC52P59 = -(1.0/2.0*AJ1[J]*XIYIP[J,I])
3483 PC87P59 = -(1.0/2.0*AJ1[J])
3484 R2KWP59=(G1+G2*SG[I,J,KM1]+[PC52P59+PC7+PC22+PC87P59+PC22P59+PC87])
3485 *(G1+(PC52+PC7+PC22+PC87+PC37**2)+1)**(G2-1)/4.0
3486 DANP59=CIR=R2KWP59+TA33M
3487 DAN = DANP59
3488
3489 C P61
3490 ELSEIF (CND[I1,JJ,KK,IM2,J,KM1]) THEN
3491 PC9P61 = DXII[IM2]=S
3492 PC24P61 = [-AJ2[J]+AJ1[J]]/2.0
3493 PC33P61 = [-1.0/2.0*A1K[K]]
3494 PC39P61 = [-A2K[KM1]+A1K[KM1]]/2.0
3495 PC54P61 = DXII[IM2]=A11R[J,IM2]=S+[-AJ2[J]+AJ1[J]]*XIYIP[J,IM2]/
3496 2.0
3497 PC89P61 = DXII[IM2]=XIYIP[J,IM2]=S+[-AJ2[J]+AJ1[J]]/2.0
3498 TO=G2-1
3499 T1=(G1+(PC18+PC83+PC3+PC48+PC33**2)+1)**TO
3500 T2=(G1+(PC54+PC9+PC24+PC89+PC39**2)+1)**TO
3501 T3=PC54+PC9P61+PC54P61+PC9+PC24+PC89P61+PC24P61+PC89+2*PC39+
3502 PC39P61
3503 R2KWP61=(G1+G2*SG[IM1,J,KM1])*T2*T3+S+2*G1+G2*SG[IM1,J,K]=PC33+
3504 PC39P61+T1+S+G1+G2*T2+T3+2*G1+G2*PC33+PC39P61+T1/4.0
3505 DANP61=CIR=R2KWP61+TA33M
3506 DAN = DANP61
3507
3508 C P62
3509 ELSEIF (CND[I1,JJ,KK,IM1,J,KM1]) THEN
3510 PC89P62 = DXII[IM1]=S
3511 PC9P62 = DXII[IM2]
3512 PC23P62 = [-AJ2[J]+AJ1[J]]/2.0
3513 PC24P62 = [-AJ2[J]+AJ1[J]]/2.0
3514 PC32P62 = [-1.0/2.0*A1K[K]]
3515 PC33P62 = [-1.0/2.0*A1K[K]]
3516 PC38P62 = [-A2K[KM1]+A1K[KM1]]/2.0
3517 PC39P62 = [-A2K[KM1]+A1K[KM1]]/2.0
3518 PC53P62 = DXII[IM1]=A11R[J,IM1]=S+[-AJ2[J]+AJ1[J]]*XIYIP[J,IM1]/
3519 2.0
3520 PC54P62 = [-AJ2[J]+AJ1[J]]*XIYIP[J,IM2]/2.0+DXII[IM2]=A11R[J,IM2]
3521 PC68P62 = DXII[IM1]*XIYIP[J,IM1]=S+[-AJ2[J]+AJ1[J]]/2.0
3522 PC89P62 = DXII[IM2]*XIYIP[J,IM2]+[-AJ2[J]+AJ1[J]]/2.0
3523 TO=G2-1
3524 T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3525 T2=2*G1+G2+PC32+PC32P62+T1
3526 T3=(G1+(PC18+PC83+PC3+PC48+PC33**2)+1)**TO
3527 T4=(G1+(PC63+PC8+PC23+PC68+PC38**2)+1)**TO
3528 T5=PC53+PC8P62+PC53P62+PC8+PC23+PC68P62+PC23P62+PC68+2*PC38+
3529 PC38P62
3530 T6=G1+G2+T4+T5
3531 T7=(G1+(PC54+PC9+PC24+PC89+PC39**2)+1)**TO
3532 T8=PC54+PC9P62+PC54P62+PC9+PC24+PC89P62+PC24P62+PC89+2*PC39+
3533 PC39P62
3534 R2KWP62=(SG[IM1,J,KM1]+[G1+G2+T7+T8+S+T6]+SG[IM1,J,K]+[2*G1+G2+
3535 PC33+PC39P62+T3+S+T2]+G1+G2*SG[I,J,KM1]+T4+T5+S+2*G1+G2*SG[I,J,K]
3536 +PC32+PC32P62+T1+S+G1+G2+T7+T8+T6+2*G1+G2+PC33+PC39P62+T3+T2)/4.0
3537 DANP62=CIR=R2KWP62+TA33M
3538 DAN = DANP62
3539
3540 C P63
3541 ELSEIF (CND[I1,JJ,KK,I,J,KM1]) THEN
3542 PC7P63 = DXII[I]=S
3543 PC8P63 = DXII[IM1]
3544 PC22P63 = [-AJ2[J]+AJ1[J]]/2.0
3545 PC23P63 = [-AJ2[J]+AJ1[J]]/2.0
3546 PC31P63 = [-1.0/2.0*A1K[K]]
3547 PC32P63 = [-1.0/2.0*A1K[K]]
3548 PC37P63 = [-A2K[KM1]+A1K[KM1]]/2.0
3549 PC38P63 = [-A2K[KM1]+A1K[KM1]]/2.0
3550 PC52P63 = DXII[I]=A11R[J,I]=S+[-AJ2[J]+AJ1[J]]*XIYIP[J,I]/2.0
3551 PC53P63 = [-AJ2[J]+AJ1[J]]*XIYIP[J,IM1]/2.0+DXII[IM1]=A11R[J,IM1]
3552 PC87P63 = DXII[I]*XIYIP[J,I]=S+[-AJ2[J]+AJ1[J]]/2.0
3553 PC89P63 = DXII[IM1]*XIYIP[J,IM1]+[-AJ2[J]+AJ1[J]]/2.0
3554 TO=G2-1
3555 T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3556 T2=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**TO
3557 T3=PC53+PC8P63+PC53P63+PC8+PC23+PC68P63+PC23P63+PC68+2*PC38+
3558 PC38P63
3559 R2KWP63=(SG[I,J,KM1]+[G1+G2+T2+T3+S+G1+G2+(G1+(PC52+PC7+PC22+PC67+
3560 PC37**2)+1)**TO+(PC52+PC7P63+PC52P63+PC7+PC22+PC87P63+PC22P63+
3561 PC87+2*PC37+PC37P63)]+SG[I,J,K]+(2*G1+G2+PC32+PC29P63+TO)*G1+
3562 G2+PC3+PC31P63+(G1+(PC18+PC8+PC1+PC1+PC48+PC31**2)+1)**TO+G1+G2+SG
3563 [(IM1,J,KM1)+T2+T3+(G1+G2+T2+T3+2*G1+G2+SG[IM1,J,K]+PC32+PC32P63+T1
3564 +2*G1+G2+PC3+PC32P63+T1)]/4.0
3565 DANP63=CIR=R2KWP63+TA33M
3566 DAN = DANP63
3567
3568 C P64
3569 ELSEIF (CND[I1,JJ,KK,IP1,J,KM1]) THEN
3570 PC7P64 = DXII[I]

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3564. PC22P64 = (-AJ2(J)+AJ1(J))/2.0
3565. PC31P64 = -(1.0/2.0*A1K(K))
3566. PC37P64 = (-A2K(KM1)+A1K(KM1))/2.0
3567. PC52P64 = (-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0+DXII(I)+A11R(J,I)
3568. PC67P64 = DXII(I)*XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
3569. TO=G2-1
3570. R2KWP64=(G1+G2+SG(I,J,KM1))*(G1*(PC52+PC7+PC22+PC67+PC37**2)+1)**TO
3571. =[(PC52+PC7P64+PC52P64+PC7+PC22+PC67P64+PC22P64+PC67+PC37
3572. +PC37P64)+2+G1+G2+SG(I,J,K)+PC31+PC31P64]*(G1*(PC16+PC61+PC1+PC46+
3573. +PC31**2)+1)**TO/4.0
3574. DANP64=CIR=R2KWP64+TA33M
3575. DAN = DANP64
3576.
3577. C P65
3578. ELSEIF [CND(II,JJ,KK,IM2,JP1,KM1)] THEN
3579. PC24P65 = AJ2(J)/2.0
3580. PC54P65 = AJ2(J)*XIYIP(J,IM2)/2.0
3581. PC69P65 = AJ2(J)/2.0
3582. TO=PC54P65+PC9+PC24+PC69P65+PC24P65+PC69
3583. T1=(G1*(PC54+PC9+PC24+PC69+PC39**2)+1)**(G2-1)
3584. R2KWP65=(G1+G2+SG(IM1,J,KM1))*TO*T1+S+G1+G2+TO*T1/4.0
3585. DANP65=CIR=R2KWP65+TA33M
3586. DAN = DANP65
3587.
3588. C P67
3589. ELSEIF [CND(III,JJ,KK,IM1,JP1,KM1)] THEN
3590. PC23P67 = AJ2(J)/2.0
3591. PC24P67 = AJ2(J)/2.0
3592. PC53P67 = AJ2(J)*XIYIP(J,IM1)/2.0
3593. PC54P67 = AJ2(J)*XIYIP(J,IM2)/2.0
3594. PC68P67 = AJ2(J)/2.0
3595. PC69P67 = AJ2(J)/2.0
3596. TO=PC53P67+PC4+PC23+PC68P67+PC23P67+PC68
3597. T1=G2-1
3598. T2=(G1*(PC53+PC4+PC23+PC68+PC38**2)+1)**T1
3599. T3=G1+G2+TO*T2
3600. T4=PC64P67+PC9+PC24+PC69P67+PC24P67+PC69
3601. T5=(G1*(PC54+PC9+PC24+PC69+PC39**2)+1)**T1
3602. R2KWP67=(SG(IM1,J,KM1))*(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,KM1)+TO*T2+
3603. S+G1+G2+T4+T5+T3/4.0
3604. DANP67=CIR=R2KWP67+TA33M
3605. DAN = DANP67
3606.
3607. C P68
3608. ELSEIF [CND(II,JJ,KK,I,JP1,KM1)] THEN
3609. PC22P68 = AJ2(J)/2.0
3610. PC23P68 = AJ2(J)/2.0
3611. PC52P68 = AJ2(J)*XIYIP(J,I)/2.0
3612. PC53P68 = AJ2(J)*XIYIP(J,IM1)/2.0
3613. PC67P68 = AJ2(J)/2.0
3614. PC68P68 = AJ2(J)/2.0
3615. TO=PC53P68+PC9+PC23+PC68P68+PC23P68+PC68
3616. T1=G2-1
3617. T2=(G1*(PC53+PC9+PC23+PC68+PC38**2)+1)**T1
3618. R2KWP68=(SG(I,J,KM1))*(G1+G2+TO*T2+S+G1+G2*(PC52P68+PC7+PC22+
3619. +PC67P68+PC22P68+PC67))*(G1*(PC52+PC7+PC22+PC67+PC37**2)+1)**T1+G1
3620. +G2+SG(IM1,J,KM1)+TO*T2+G1+G2+TO*T2/4.0
3621. DANP68=CIR=R2KWP68+TA33M
3622. DAN = DANP68
3623.
3624. C P69
3625. ELSEIF [CND(II,JJ,KK,IP1,JP1,KM1)] THEN
3626. PC22P69 = AJ2(J)/2.0
3627. PC52P69 = AJ2(J)*XIYIP(J,I)/2.0
3628. PC67P69 = AJ2(J)/2.0
3629. R2KWP69=(G1+G2+SG(I,J,KM1))*(PC52P69+PC7+PC22+PC67P69+PC22P69+PC67)*
3630. (G1*(PC52+PC7+PC22+PC67+PC37**2)+1)**(G2-1)/4.0
3631. DANP69=CIR=R2KWP69+TA33M
3632. DAN = DANP69
3633.
3634. C P81
3635. ELSEIF [CND(II,JJ,KK,IM2,JM1,K)] THEN
3636. PC18P81 = -(1.0/2.0*AJ1(J))
3637. PC48P81 = -(1.0/2.0*AJ1(J))*XIYIP(J,IM2)
3638. PC63P81 = -(1.0/2.0*AJ1(J))
3639. TO=(G1*(PC18+PC48+PC3+PC48+PC33**2)+1)**(G2-1)
3640. T1=PC18+PC63P81+PC18P81+PC63+PC3+PC48P81
3641. R2KWP81=(G1+G2+SG(IM1,J,K))*TO*T1+S+G1+G2+TO*T1/4.0
3642. DANP81=CIR=R2KWP81+TA33M
3643. DAN = DANP81
3644.
3645. C P82
3646. ELSEIF [CND(II,JJ,KK,IM1,JM1,K)] THEN
3647. PC17P82 = -(1.0/2.0*AJ1(J))
3648. PC18P82 = -(1.0/2.0*AJ1(J))
3649. PC47P82 = -(1.0/2.0*AJ1(J))*XIYIP(J,IM1)
3650. PC48P82 = -(1.0/2.0*AJ1(J))*XIYIP(J,IM2)
3651. PC62P82 = -(1.0/2.0*AJ1(J))
3652. PC63P82 = -(1.0/2.0*AJ1(J))
3653. TO=G2-1
3654. T1=(G1*(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3655. T2=PC17+PC62P82+PC17P82+PC62+PC2+PC47P82
3656. T3=G1+G2+T1*T2
3657. T4=(G1*(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3658. T5=PC18+PC63P82+PC18P82+PC63+PC3+PC48P82
3659. R2KWP82=(SG(IM1,J,K))*(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,K)*T1+T2+S+G1
3660. +G2+T4+T5+T3/4.0
3661. DANP82=CIR=R2KWP82+TA33M
3662. DAN = DANP82
3663.
3664. C P83
3665. ELSEIF [CND(II,JJ,KK,I,JM1,K)] THEN
3666. PC16P83 = -(1.0/2.0*AJ1(J))
3667. PC17P83 = -(1.0/2.0*AJ1(J))
3668. PC46P83 = -(1.0/2.0*AJ1(J))*XIYIP(J,I)
3669. PC47P83 = -(1.0/2.0*AJ1(J))*XIYIP(J,IM1)
3670. PC61P83 = -(1.0/2.0*AJ1(J))
3671. PC62P83 = -(1.0/2.0*AJ1(J))
3672. TO=G2-1
3673. T1=(G1*(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3674. T2=PC17+PC62P83+PC17P83+PC62+PC2+PC47P83
3675. R2KWP83=(SG(I,J,K))*(G1+G2+T1+T2+S+G1+G2*(G1*(PC16+PC61+PC1+PC46+
3676. +PC31**2)+1)**TO*(PC16+PC61P83+PC16P83+PC61+PC1+PC46P83))+G1+G2+S+G1
3677. *(IM1,J,K)*T1+T2+G1+G2+T1+T2/4.0
3678. DANP83=CIR=R2KWP83+TA33M
3679. DAN = DANP83
3680.
3681. C P84
3682. ELSEIF [CND(II,JJ,KK,IP1,JM1,K)] THEN
3683. PC18P84 = -(1.0/2.0*AJ1(J))
3684. PC48P84 = -(1.0/2.0*AJ1(J))*XIYIP(J,I)
3685. PC61P84 = -(1.0/2.0*AJ1(J))
3686. R2KWP84=(G1+G2+SG(I,J,K))*(G1*(PC18+PC61+PC1+PC48+PC31**2)+1)**(G2-1
3687. )+[(PC18+PC61P84+PC18P84+PC61+PC1+PC48P84)/4.0
3688. DANP84=CIR=R2KWP84+TA33M
3689. DAN = DANP84
3690.
3691. C P85
3692. ELSEIF [CND(II,JJ,KK,IM2,J,K)] THEN
3693. PC3P85 = DXII(IM2)*S
3694. PC18P85 = (-AJ2(J)+AJ1(J))/2.0
3695. PC33P85 = (-A2K(K)+A1K(K))/2.0
3696. PC39P85 = A2K(KM1)/2.0
3697. PC48P85 = DXII(IM2)*A11R(J,IM2)*S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/
3698. 2.0
3699. PC63P85 = DXII(IM2)*XIYIP(J,IM2)*S+(-AJ2(J)+AJ1(J))/2.0
3700. TO=G2-1
3701. T1=(G1*(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3702. T2=PC18+PC63P85+PC18P85+PC63+PC3+PC48P85+PC3P85+PC48+2+PC33+
3703. +PC3P85
3704. T3=(G1*(PC54+PC9+PC24+PC69+PC39**2)+1)**TO

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3686. R2KWP86=(2*G1+G2+SG(IM1,J,KM1))+PC39=PC39P86+T3+S+G1+G2+SG(IM1,J,K)
3687. *T1+T2+S+G1+G2+PC39=PC39P86+T3+S+G1+G2+T1+T2)/4.0
3688. DANP86=CIR=R2KWP86+TA33M
3689. DAN = DANP86
3700.
C P87
3701. ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
3702. PC2P87 = DXII(IM1)*S
3703. PC3P87 = DXII(IM2)
3704. PC17P87 = (-AJ2(J)+AJ1(J))/2.0
3705. PC18P87 = (-AJ2(J)+AJ1(J))/2.0
3706. PC32P87 = (-A2K(K)+A1K(K))/2.0
3707. PC33P87 = (-A2K(K)+A1K(K))/2.0
3708. PC38P87 = A2K(KM1)/2.0
3709. PC39P87 = A2K(KM1)/2.0
3710. PC47P87 = DXII(IM1)=A11R(J,IM1)+S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/
3711. 2.0
3712. PC48P87 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/2.0+DXII(IM2)=A11R(J,IM2)
3713. PC62P87 = DXII(IM1)*XIYIP(J,IM1)+S+(-AJ2(J)+AJ1(J))/2.0
3714. PC63P87 = DXII(IM2)*XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
3715. TO=G2-1
3716. T1=(G1+(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3717. T2=PC17+PC62P87+PC17P87+PC62+PC2+PC47P87+PC2P87+PC47+2+PC32=
3718. PC32P87
3719. T3=G1+G2+T1+T2
3720. T4=(G1+(PC18+PC63+PC3+PC48+PC33==2)+1)==TO
3721. T5=PC18+PC63P87+PC18P87+PC63+PC3+PC48P87+PC3P87+PC48+2+PC33=
3722. PC33P87
3723. T6=(G1+(PC53+PC8+PC23+PC68+PC36==2)+1)==TO
3724. T7+2=G1+G2+PC38+PC38P87+T8
3725. T8=(G1+(PC54+PC9+PC24+PC69+PC39==2)+1)==TO
3726. R2KWP87=(SG(IM1,J,KM1)+[2*G1+G2+PC39+PC39P87+T8+S+T7]+SG(IM1,J,K)+
3727. (G1+G2+T4+T5+S+T3)+2*G1+G2+SG(I,J,KM1)+PC38+PC38P87+T8+S+G1+G2+SG
3728. (I,J,K)+T1+T2+S+2*G1+G2+PC39+PC39P87+T8+T7+G1+G2+T4+T5+T3)/4.0
3729. DANP87=CIR=R2KWP87+TA33M
3730. DAN = DANP87
3731.
C P88
3732. ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
3733. PC1P88 = DXII(I)*S
3734. PC2P88 = DXII(IM1)
3735. PC16P88 = (-AJ2(J)+AJ1(J))/2.0
3736. PC17P88 = (-AJ2(J)+AJ1(J))/2.0
3737. PC31P88 = (-A2K(K)+A1K(K))/2.0
3738. PC32P88 = (-A2K(K)+A1K(K))/2.0
3739. PC37P88 = A2K(KM1)/2.0
3740. PC38P88 = A2K(KM1)/2.0
3741. PC48P88 = DXII(I)=A11R(J,I)+S+(-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0
3742. PC47P88 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM1)+DXII(IM1)=A11R(J,IM1)
3743. PC81P88 = DXII(I)*XIYIP(J,I)+S+(-AJ2(J)+AJ1(J))/2.0
3744. PC82P88 = DXII(IM1)*XIYIP(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
3745. TO=G2-1
3746. T1=(G1+(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3747. T2=PC17+PC62P88+PC17P88+PC62+PC2+PC47P88+PC2P88+PC47+2+PC32=
3748. PC32P88
3749. T3=(G1+(PC53+PC8+PC23+PC68+PC36==2)+1)==TO
3750. R2KWP88=(SG(I,J,KM1)+[2*G1+G2+PC38+PC38P88+T3+S+2*G1+G2+PC37=
3751. PC37P88+(G1+PC52+PC7+PC22+PC67+PC37==2)+1]==TO]+SG(I,J,K)+(G1+G2
3752. *T1+T2+S+G1+G2+(G1+(PC16+PC61+PC1+PC46+PC31==2)+1)==TO+(PC16=
3753. PC61P88+PC16P88+PC61+PC1+PC46P88+PC1P88+PC46+2+PC31+PC31P88))+2*
3754. G1+G2+SG(IM1,J,KM1)+PC38+PC38P88+T3+2*G1+G2+PC38+PC38P88+T3+G1+G2
3755. *SG(IM1,J,K)+T1+T2+G1+G2+T1+T2)/4.0
3756. DANP88=CIR=R2KWP88+TA33M
3757. DAN = DANP88
3758.
C P89
3759. ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
3760. PC1P89 = DXII(I)
3761. PC16P89 = (-AJ2(J)+AJ1(J))/2.0
3762. PC31P89 = (-A2K(K)+A1K(K))/2.0
3763. PC37P89 = A2K(KM1)/2.0
3764. PC48P89 = (-AJ2(J)+AJ1(J))*XIYIP(J,I)/2.0+DXII(I)=A11R(J,I)
3765. PC81P89 = DXII(I)*XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
3766. TO=G2-1
3767. R2KWP89=(2*G1+G2+SG(I,J,KM1)+PC37+PC37P89+(G1+(PC52+PC7+PC22+PC67+
3768. PC37==2)+1)==TO+G1+G2+SG(I,J,K)+(G1+(PC16+PC61+PC1+PC46+PC31==2)+
3769. 1]==TO+(PC16=PC61P89+PC16P89+PC61+PC1+PC46P89+PC1P89+PC46+2+PC31+
3770. PC31P89))/4.0
3771. DANP89=CIR=R2KWP89+TA33M
3772. DAN = DANP89
3773.
C P91
3774. ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
3775. PC18P91 = AJ2(J)/2.0
3776. PC48P91 = AJ2(J)=XIYIP(J,IM2)/2.0
3777. PC63P91 = AJ2(J)/2.0
3778. TO=(G1+(PC18+PC63+PC3+PC48+PC33==2)+1)==(G2-1)
3779. T1=PC18+PC63P91+PC18P91+PC63+PC3+PC48P91
3780. R2KWP91=(G1+G2+SG(IM1,J,K)+TO+T1+S+G1+G2+TO+T1)/4.0
3781. DANP91=CIR=R2KWP91+TA33M
3782. DAN = DANP91
3783.
C P92
3784. ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
3785. PC17P92 = AJ2(J)/2.0
3786. PC18P92 = AJ2(J)/2.0
3787. PC47P92 = AJ2(J)+XIYIP(J,IM1)/2.0
3788. PC48P92 = AJ2(J)+XIYIP(J,IM2)/2.0
3789. PC62P92 = AJ2(J)/2.0
3790. PC63P92 = AJ2(J)/2.0
3791. TO=G2-1
3792. T1=(G1+(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3793. T2=PC17+PC62P92+PC17P92+PC62+PC2+PC47P92
3794. T3=G1+G2+T1+T2
3795. T4=(G1+(PC18+PC63+PC3+PC48+PC33==2)+1)==TO
3796. T5=PC18+PC63P92+PC18P92+PC63+PC3+PC48P92
3797. R2KWP92=(SG(IM1,J,K)+(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,K)+T1+T2+S+G1
3798. *G2+T4+T5+T3)/4.0
3799. DANP92=CIR=R2KWP92+TA33M
3800. DAN = DANP92
3801.
C P93
3802. ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
3803. PC16P93 = AJ2(J)/2.0
3804. PC17P93 = AJ2(J)/2.0
3805. PC46P93 = AJ2(J)+XIYIP(J,I)/2.0
3806. PC47P93 = AJ2(J)+XIYIP(J,IM1)/2.0
3807. PC61P93 = AJ2(J)/2.0
3808. PC62P93 = AJ2(J)/2.0
3809. TO=G2-1
3810. T1=(G1+(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3811. T2=PC17+PC62P93+PC17P93+PC62+PC2+PC47P93
3812. R2KWP93=(SG(I,J,K)+(G1+G2+T1+T2+S+G1+G2+(G1+(PC16+PC61+PC1+PC46+
3813. PC31==2)+1)==TO+(PC16=PC61P93+PC16P93+PC61+PC1+PC46P93))+G1+G2+SG
3814. (IM1,J,K)+T1+T2+G1+G2+T1+T2)/4.0
3815. DANP93=CIR=R2KWP93+TA33M
3816. DAN = DANP93
3817.
C P94
3818. ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
3819. PC16P94 = AJ2(J)/2.0
3820. PC46P94 = AJ2(J)+XIYIP(J,I)/2.0
3821. PC81P94 = AJ2(J)/2.0
3822. R2KWP94=(G1+G2+SG(I,J,K)+(G1+(PC16+PC61+PC1+PC46+PC31==2)+1)==(G2-1
3823. )+(PC16=PC61P94+PC16P94+PC61+PC1+PC46P94))/4.0
3824. DANP94=CIR=R2KWP94+TA33M
3825. DAN = DANP94
3826.
C P111
3827. ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN

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3828. PC33P111 = A2K(K)/2.0
3829. TO=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**(G2-1)
3830. R2KWP111=(2+G1+G2+SG(IM1,J,K))*PC33+PC33P111+TO**2+G1+G2+PC33*
3831. PC33P111+TO/4.0
3832. DANP111=CIR+R2KWP111+TA33M
3833. DAN = DANP111
3834.
C P112
3835. ELSEIF (CND[I,J,J,K,IM1,J,KP1]) THEN
3836. PC32P112 = A2K(K)/2.0
3837. PC33P112 = A2K(K)/2.0
3838. TO=G2-1
3839. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3840. T2=2+G1+G2+PC32+PC32P112+T1
3841. T3=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3842. R2KWP112=(SG(IM1,J,K))*((2+G1+G2+PC32+PC33P112+T3)**2+2+G1+G2+SG(I
3843. J,K))*PC32+PC32P112+T1**2+2+G1+G2+PC32+PC33P112+T3+T2)/4.0
3844. DANP112=CIR+R2KWP112+TA33M
3845. DAN = DANP112
3846.
C P113
3847. ELSEIF (CND[I,J,J,K,I,J,KP1]) THEN
3848. PC31P113 = A2K(K)/2.0
3849. PC32P113 = A2K(K)/2.0
3850. TO=G2-1
3851. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3852. R2KWP113=(SG(I,J,K))*((2+G1+G2+PC32+PC32P113+T1**2+2+G1+G2+PC31*
3853. PC31P113+(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO)+2+G1+G2+SG(IM1,
3854. J,K))*PC32+PC32P113+T1**2+2+G1+G2+PC32+PC32P113+T1)/4.0
3855. DANP113=CIR+R2KWP113+TA33M
3856. DAN = DANP113
3857.
C P114
3858. ELSEIF (CND[I,J,J,K,IP1,J,KP1]) THEN
3859. PC31P114 = A2K(K)/2.0
3860. R2KWP114=(G1+G2+SG(I,J,K))*PC31+PC31P114+(G1+(PC18+PC63+PC3+PC48+
3861. PC33**2)+1)**(G2-1)/2.0
3862. DANP114=CIR+R2KWP114+TA33M
3863. DAN = DANP114
3864.
C P182
3865. ELSEIF (CND[I,J,J,K,ITE,J,KLOW-2]) THEN
3866. PC31P182 = -(CC8+A1K(K)*S)
3867. PC32P182 = -(CC8+A1K(K)*S)
3868. PC33P182 = -(CC8+A1K(K)*S)
3869. PC37P182 = -(CC8+A1K(KM1)*S)
3870. PC38P182 = -(CC8+A1K(KM1)*S)
3871. PC39P182 = -(CC8+A1K(KM1)*S)
3872. TO=G2-1
3873. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3874. T2=2+G1+G2+PC32+PC32P182+T1
3875. T3=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3876. T4=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**TO
3877. T5=2+G1+G2+PC38+PC38P182+T4
3878. T6=(G1+(PC54+PC9+PC24+PC69+PC39**2)+1)**TO
3879. R2KWP182=(SG(IM1,J,KM1))*((2+G1+G2+PC38+PC39P182+T6**2+5+T5)+SG(I,J,KM1
3880. ))*(2+G1+G2+PC38+PC38P182+T4**2+5+2+G1+G2+PC37+PC37P182+(G1+(PC52+PC7
3881. +PC22+PC67+PC37**2)+1)**TO)+SG(IM1,J,K)*((2+G1+G2+PC33+PC33P182+T3
3882. +S**2)+SG(I,J,K))*((2+G1+G2+PC32+PC32P182+T1**2+2+G1+G2+PC31*
3883. PC31P182+(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO)+2+G1+G2+PC39*
3884. PC39P182+T6**2+5+2+G1+G2+PC33+PC33P182+T3+T2)/4.0
3885. CIRP182=CC8+S
3886. DANP182=CIR+R2KWP182+TA33M+CIRP182+R2KW+TA33M
3887. DAN = DANP182
3888.
C P183
3889. ELSEIF (CND[I,J,J,K,ITE,J,KLOW-1]) THEN
3890. PC31P183 = -(CC5+A1K(K))
3891. PC32P183 = -(CC5+A1K(K))
3892. PC33P183 = -(CC5+A1K(K))
3893. PC37P183 = -(CC5+A1K(KM1))
3894. PC38P183 = -(CC5+A1K(KM1))
3895. PC39P183 = -(CC5+A1K(KM1))
3896. TO=G2-1
3897. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3898. T2=2+G1+G2+PC32+PC32P183+T1
3899. T3=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3900. T4=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**TO
3901. T5=2+G1+G2+PC38+PC38P183+T4
3902. T6=(G1+(PC54+PC9+PC24+PC69+PC39**2)+1)**TO
3903. R2KWP183=(SG(IM1,J,KM1))*((2+G1+G2+PC38+PC39P183+T6**2+5+T5)+SG(I,J,KM1
3904. ))*(2+G1+G2+PC38+PC38P183+T4**2+5+2+G1+G2+PC37+PC37P183+(G1+(PC52+PC7
3905. +PC22+PC67+PC37**2)+1)**TO)+SG(IM1,J,K)*((2+G1+G2+PC33+PC33P183+T3
3906. +S**2)+SG(I,J,K))*((2+G1+G2+PC32+PC32P183+T1**2+2+G1+G2+PC31*
3907. PC31P183+(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO)+2+G1+G2+PC39*
3908. PC39P183+T6**2+5+2+G1+G2+PC33+PC33P183+T3+T2)/4.0
3909. CIRP183=CC5
3910. DANP183=CIR+R2KWP183+TA33M+CIRP183+R2KW+TA33M
3911. DAN = DANP183
3912.
C P184
3913. ELSEIF (CND[I,J,J,K,ITE,J,KLOW]) THEN
3914. PC31P184 = -(CC4+A1K(K)*S)
3915. PC32P184 = -(CC4+A1K(K)*S)
3916. PC33P184 = -(CC4+A1K(K)*S)
3917. PC37P184 = -(CC4+A1K(KM1)*S)
3918. PC38P184 = -(CC4+A1K(KM1)*S)
3919. PC39P184 = -(CC4+A1K(KM1)*S)
3920. TO=G2-1
3921. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3922. T2=2+G1+G2+PC32+PC32P184+T1
3923. T3=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3924. T4=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**TO
3925. T5=2+G1+G2+PC38+PC38P184+T4
3926. T6=(G1+(PC54+PC9+PC24+PC69+PC39**2)+1)**TO
3927. R2KWP184=(SG(IM1,J,KM1))*((2+G1+G2+PC38+PC39P184+T6**2+5+T5)+SG(I,J,KM1
3928. ))*(2+G1+G2+PC38+PC38P184+T4**2+5+2+G1+G2+PC37+PC37P184+(G1+(PC52+PC7
3929. +PC22+PC67+PC37**2)+1)**TO)+SG(IM1,J,K)*((2+G1+G2+PC33+PC33P184+T3
3930. +S**2)+SG(I,J,K))*((2+G1+G2+PC32+PC32P184+T1**2+2+G1+G2+PC31*
3931. PC31P184+(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO)+2+G1+G2+PC39*
3932. PC39P184+T6**2+5+2+G1+G2+PC33+PC33P184+T3+T2)/4.0
3933. CIRP184=CC4+S
3934. DANP184=CIR+R2KWP184+TA33M+CIRP184+R2KW+TA33M
3935. DAN = DANP184
3936.
C P185
3937. ELSEIF (CND[I,J,J,K,ITE,J,KUP]) THEN
3938. PC31P185 = -(CC1+A1K(K))
3939. PC32P185 = -(CC1+A1K(K))
3940. PC33P185 = -(CC1+A1K(K))
3941. PC37P185 = -(CC1+A1K(KM1))
3942. PC38P185 = -(CC1+A1K(KM1))
3943. PC39P185 = -(CC1+A1K(KM1))
3944. TO=G2-1
3945. T1=(G1+(PC17+PC62+PC2+PC47+PC32**2)+1)**TO
3946. T2=2+G1+G2+PC32+PC32P185+T1
3947. T3=(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO
3948. T4=(G1+(PC53+PC8+PC23+PC68+PC38**2)+1)**TO
3949. T5=2+G1+G2+PC38+PC38P185+T4
3950. T6=(G1+(PC54+PC9+PC24+PC69+PC39**2)+1)**TO
3951. R2KWP185=(SG(IM1,J,KM1))*((2+G1+G2+PC38+PC39P185+T6**2+5+T5)+SG(I,J,KM1
3952. ))*(2+G1+G2+PC38+PC38P185+T4**2+5+2+G1+G2+PC37+PC37P185+(G1+(PC52+PC7
3953. +PC22+PC67+PC37**2)+1)**TO)+SG(IM1,J,K)*((2+G1+G2+PC33+PC33P185+T3
3954. +S**2)+SG(I,J,K))*((2+G1+G2+PC32+PC32P185+T1**2+2+G1+G2+PC31*
3955. PC31P185+(G1+(PC18+PC63+PC3+PC48+PC33**2)+1)**TO)+2+G1+G2+PC39*
3956. PC39P185+T6**2+5+2+G1+G2+PC33+PC33P185+T3+T2)/4.0
3957. CIRP185=CC1
3958. DANP185=CIR+R2KWP185+TA33M+CIRP185+R2KW+TA33M
3959. DAN = DANP185

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3960. C P186
3961. ELSEIF (CND[I1,JJ,KK,ITE,J,KUP+1]) THEN
3962. PC31P186 = -(CC2+A1K(K)+S)
3963. PC32P186 = -(CC2+A1K(K)+S)
3964. PC33P186 = -(CC2+A1K(K)+S)
3965. PC37P186 = -(CC2+A1K(KM1)+S)
3966. PC38P186 = -(CC2+A1K(KM1)+S)
3967. PC39P186 = -(CC2+A1K(KM1)+S)
3968. T0=G2-1
3969. T1=(G1=(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3970. T2=2+G1+G2+PC32+PC32P186+T1
3971. T3=(G1=(PC18+PC63+PC3+PC48+PC33==2)+1)==TO
3972. T4=(G1=(PC53+PC8+PC23+PC68+PC38==2)+1)==TO
3973. T5=2+G1+G2+PC38+PC38P186+T4
3974. T6=(G1=(PC54+PC9+PC24+PC69+PC39==2)+1)==TO
3975. R2KWP186=(SG(IM1,J,KM1)=(2+G1+G2+PC39+PC39P186+T8+S+T5)+SG(I,J,KM1
3976. )=(2+G1+G2+PC38+PC38P186+T4+S+2+G1+G2+PC37+PC37P186+(G1=(PC52+PC7
3977. +PC22+PC67+PC37==2)+1)==TO)+SG(IM1,J,K)=(2+G1+G2+PC33+PC33P186+T3
3978. +S+T2)+SG(I,J,K)=(2+G1+G2+PC32+PC32P186+T1+S+2+G1+G2+PC31+
3979. PC31P186+(G1=(PC18+PC61+PC1+PC48+PC31==2)-1)==TO)+2+G1+G2+PC39+
3980. PC39P186+T6+T5+2+G1+G2+PC33+PC33P186+T3+T2)/4.0
3981. CIRP186+CC2+S
3982. DANP186+CIR=R2KWP186+TA33M+CIRP186+R2KW+TA33M
3983. DAN = DANP186
3984.
3985. C P187
3986. ELSEIF (CND[I1,JJ,KK,ITE,J,KUP+2]) THEN
3987. PC31P187 = -(CC3+A1K(K))
3988. PC32P187 = -(CC3+A1K(K))
3989. PC33P187 = -(CC3+A1K(K))
3990. PC37P187 = -(CC3+A1K(KM1))
3991. PC38P187 = -(CC3+A1K(KM1))
3992. PC39P187 = -(CC3+A1K(KM1))
3993. T0=G2-1
3994. T1=(G1=(PC17+PC62+PC2+PC47+PC32==2)+1)==TO
3995. T2=2+G1+G2+PC32+PC32P187+T1
3996. T3=(G1=(PC18+PC63+PC3+PC48+PC33==2)+1)==TO
3997. T4=(G1=(PC53+PC8+PC23+PC68+PC38==2)+1)==TO
3998. T5=2+G1+G2+PC38+PC38P187+T4
3999. T6=(G1=(PC54+PC9+PC24+PC69+PC39==2)+1)==TO
4000. R2KWP187=(SG(IM1,J,KM1)=(2+G1+G2+PC39+PC39P187+T8+S+T5)+SG(I,J,KM1
4001. )=(2+G1+G2+PC38+PC38P187+T4+S+2+G1+G2+PC37+PC37P187+(G1=(PC52+PC7
4002. +PC22+PC67+PC37==2)+1)==TO)+SG(IM1,J,K)=(2+G1+G2+PC33+PC33P187+T3
4003. +S+T2)+SG(I,J,K)=(2+G1+G2+PC32+PC32P187+T1+S+2+G1+G2+PC31+
4004. PC31P187+(G1=(PC18+PC61+PC1+PC48+PC31==2)-1)==TO)+2+G1+G2+PC39+
4005. PC39P187+T6+T5+2+G1+G2+PC33+PC33P187+T3+T2)/4.0
4006. CIRP187+CC3
4007. DANP187+CIR=R2KWP187+TA33M+CIRP187+R2KW+TA33M
4008. DAN = DANP187
4009. ENDF
4010. C
4011. RETURN
4012. END
4013. SUBROUTINE R4(J,I,K,JJ,II,KK,DAN)
4014. RMDER4 FOR
4015. C
4016. C
4017. C
4018. C
4019. P
4020. P81 = P(J,KM1,IM2)
4021. P82 = P(J,KM1,IM1)
4022. P83 = P(J,KM1,I)
4023. P84 = P(J,KM1,IP1)
4024. P81 = P(JM1,K,IM2)
4025. P82 = P(JM1,K,IM1)
4026. P83 = P(JM1,K,I)
4027. P84 = P(JM1,K,IP1)
4028. P85 = P(J,K,IM2)
4029. P86 = P(J,K,IM1)
4030. P87 = P(J,K,I)
4031. P88 = P(J,K,IP1)
4032. P89 = P(JP1,K,IM2)
4033. P90 = P(JP1,K,IM1)
4034. P91 = P(JP1,K,I)
4035. P92 = P(JP1,K,IP1)
4036. P106 = P(JM1,KP1,IM2)
4037. P107 = P(JM1,KP1,IM1)
4038. P108 = P(JM1,KP1,I)
4039. P109 = P(JM1,KP1,IP1)
4040. P110 = P(J,KP1,IM2)
4041. P111 = P(J,KP1,IM1)
4042. P112 = P(J,KP1,I)
4043. P113 = P(J,KP1,IP1)
4044. P114 = P(J,KP1,IP1)
4045. P115 = P(JP1,KP1,IM2)
4046. P116 = P(JP1,KP1,IM1)
4047. P117 = P(JP1,KP1,I)
4048. P118 = P(JP1,KP1,IP1)
4049. P119 = P(JP1,KP1,IP1)
4050. P120 = P(J,KP2,IM2)
4051. P121 = P(J,KP2,IM1)
4052. P122 = P(J,KP2,I)
4053. P123 = P(J,KP2,IP1)
4054. P124 = P(J,KLOW-2,ITE)
4055. P125 = P(J,KLOW-1,ITE)
4056. P126 = P(J,KLOW,ITE)
4057. P127 = P(J,KUP,ITE)
4058. P128 = P(J,KUP+1,ITE)
4059. P129 = P(J,KUP+2,ITE)
4060. C
4061. C
4062. C
4063. PD
4064. PD1 = DXI(I1)=(P88+S+P89)+OXINF/XIXIP(J,I)
4065. PD2 = DXI(II)=(P87+S+P88)+OXINF/XIXIP(J,IM1)
4066. PD3 = DXI(III)=(P88+S+P87)+OXINF/XIXIP(J,IM2)
4067. PD12 = DXI(I1)=(P113+S+P114)+OXINF/XIXIP(J,I)
4068. PD14 = DXI(II)=(P112+S+P113)+OXINF/XIXIP(J,IM1)
4069. PD15 = DXI(III)=(P111+S+P112)+OXINF/XIXIP(J,IM2)
4070. PD16 = XIXIP(J,I)+OXINF*S/XIXIP(J,I)+(AJ2(J)=(P94+P93-P89-P88)+AJ1
4071. (J)=(P89+P88-P84-P83))/2.0
4072. PD17 = XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P93+P92-P88-P87)
4073. +AJ1(J)=(P88+P87-P83-P82))/2.0
4074. PD18 = XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P92+P91-P87-P86)
4075. +AJ1(J)=(P87+P86-P82-P81))/2.0
4076. PD28 = XIXIP(J,I)+OXINF*S/XIXIP(J,I)+(AJ2(J)=(P118+P118-P114-P113)
4077. +AJ1(J)=(P114+P113-P109-P108))/2.0
4078. PD29 = XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P118+P117-P113-
4079. P112)+AJ1(J)=(P113+P112-P108-P107))/2.0
4080. PD30 = XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P117+P116-P112-
4081. P111)+AJ1(J)=(P112+P111-P107-P106))/2.0
4082. PD31 = -(A2K(K)=(CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
4083. P185+CC5+P183))+OXINF*[A1K(K)=(P89+P88-P83-P82)+A2K(K)=(P89+P88+
4084. P114+P113)]/2.0
4085. PD32 = -(A2K(K)=(CC2+P188+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
4086. P185+CC5+P183))+OXINF*[A1K(K)=(P88+P87-P83-P82)+A2K(K)=(P88+P87+
4087. P113+P112)]/2.0
4088. PD33 = -(A2K(K)=(CC2+P188+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
4089. P185+CC5+P183))+OXINF*[A1K(K)=(P87+P86-P82-P81)+A2K(K)=(P87+P86+
4090. P112+P111)]/2.0
4091. PD43 = -(A2K(KP1)=(CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
4092. P185+CC5+P183))+OXINF*[A1K(KP1)=(P88+P88+P114+P113)+A2K(KP1)=(
4093. P139+P138+P114+P113)]/2.0
4094. PD44 = -(A2K(KP1)=(CC2+P186+S+CC4+P184+S+CC6+P182+S+CC3+P187+CC1+
4095. P185+CC5+P183))+OXINF*[A1K(KP1)=(P88+P87+P113+P112)+A2K(KP1)=(

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4092. . P138+P137-P113-P112)/2.0
4093. PD45 = -(A2K(KP1))=(CC2+P188+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
4094. P185+CC5+P183))/OZINF+(A1K(KP1))=(-P87+P86+P112-P111)+A2K(KP1))=
4095. P137+P138-P112-P111))/2.0
4096. PD48 = A11R(J,I)=(DXII(I))=(P88+S+P83)-OXINF/XIXIP(J,I)+XIIYIP(J,I)
4097. =(XIIYIP(J,I)+OXINF+S/XIXIP(J,I))+AJ2(J)=(P84+P83-P89-P88)+AJ1(J)+
4098. (P89+P88-P84-P83))/2.0
4099. PD47 = A11R(J,IM1)=(DXII(IM1))=(P87+S+P86)+OXINF/XIXIP(J,IM1)+
4100. XIIYIP(J,IM1)=(XIIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1))+AJ2(J)=(P82+P82-
4101. P88-P87)+AJ1(J)=(P88+P87-P83-P82))/2.0
4102. PD48 = A11R(J,IM2)=(DXII(IM2))=(P88+S+P87)+OXINF/XIXIP(J,IM2)+
4103. XIIYIP(J,IM2)=(XIIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2))+AJ2(J)=(P82+P81-
4104. P87-P88)+AJ1(J)=(P87+P86-P82-P81))/2.0
4105. PD50 = A11R(J,I)=(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIIYIP(J,
4106. I)=(XIIYIP(J,I)+OXINF+S/XIXIP(J,I))+AJ2(J)=(P119+P118-P114-P113)+
4107. AJ1(J)=(P119+P118-P109-P108))/2.0
4108. PD59 = A11R(J,IM1)=(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+
4109. XIIYIP(J,IM1)=(XIIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1))+AJ2(J)=(P118+
4110. P117-P113-P112)+AJ1(J)=(P113+P112-P108-P107))/2.0
4111. PD80 = A11R(J,IM2)=(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+
4112. XIIYIP(J,IM2)=(XIIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2))+AJ2(J)=(P117+
4113. P116-P112-P111)+AJ1(J)=(P112+P111-P107-P106))/2.0
4114. PD81 = XIIYIP(J,I)=(DXII(I))=(P88+S+P89)+OXINF/XIXIP(J,I)+XIIYIP(J,I)
4115. )OXINF+S/XIXIP(J,I)+(AJ2(J)=(P84+P83-P89-P88)+AJ1(J)=(P89+P88-
4116. P84-P83))/2.0
4117. PD82 = XIIYIP(J,IM1)=(DXII(IM1))=(P87+S+P86)+OXINF/XIXIP(J,IM1)+
4118. XIIYIP(J,IM1)=(XIIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1))+AJ2(J)=(P82+P82-P88-
4119. P87)+AJ1(J)=(P88+P87-P83-P82))/2.0
4120. PD83 = XIIYIP(J,IM2)=(DXII(IM2))=(P88+S+P87)+OXINF/XIXIP(J,IM2)+
4121. XIIYIP(J,IM2)=(XIIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2))+AJ2(J)=(P82+P81-P87-
4122. P86)+AJ1(J)=(P87+P86-P82-P81))/2.0
4123. PD70 = XIIYIP(J,I)=(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIIYIP(J,
4124. I)=(XIIYIP(J,I)+OXINF+S/XIXIP(J,I))+AJ2(J)=(P119+P118-P114-P113)+AJ1(J)=(P114
4125. +P113-P109-P108))/2.0
4126. PD74 = XIIYIP(J,IM1)=(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+
4127. XIIYIP(J,IM1)=(XIIYIP(J,IM1)+OXINF+S/XIXIP(J,IM1))+AJ2(J)=(P118+P117-P113-
4128. P112)+AJ1(J)=(P113+P112-P108-P107))/2.0
4129. PD75 = XIIYIP(J,IM2)=(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+
4130. XIIYIP(J,IM2)=(XIIYIP(J,IM2)+OXINF+S/XIXIP(J,IM2))+AJ2(J)=(P117+P116-
4131. P112-P111)+AJ1(J)=(P112+P111-P107-P106))/2.0
4132. C
4133. C R2KP, CIR
4134. C
4135. T0=(G1=(PD17+PD62+PD2=PD47+PD32==2)+1)==G2
4136. T1=(G1=(PD18+PD63+PD3=PD48+PD33==2)+1)==G2
4137. T2=(G1=(PD28+PD74+PD14=PD89+PD44==2)+1)==G2
4138. T3=(G1=(PD30+PD75+PD15=PD80+PD45==2)+1)==G2
4139. R2KP=(SG(IM1,J,KP1))=(T3+S+T2)+SG(I,J,KP1)=(T2+S+(G1=(PD28+PD73+
4140. PD13+PD88+PD43==2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+
4141. (G1=(PD16+PD61+PD1=PD46+PD31==2)+1)==G2)+T3+T2+T1+T0)/4.0
4142. CIR=CIRCIJ)
4143. C
4144. C DEN4
4145. C P61
4146. IF (CND(II,JJ,KK,IM2,J,KM1)) THEN
4147. PD33P61 = -(1.0/2.0*A1K(K))
4148. T0=(G1=(PD18+PD63+PD3=PD48+PD33==2)+1)==(G2-1)
4149. R2KPP61=(2+G1=G2+SG(IM1,J,K)=PD33+PD33P61=TO+S+2+G1=G2=PD33+
4150. PD33P61+TO)/4.0
4151. DANP61=CIR=R2KPP61=S+TA33P
4152. DAN = DANP61
4153. C P62
4154. ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
4155. PD32P62 = -(1.0/2.0*A1K(K))
4156. PD33P62 = -(1.0/2.0*A1K(K))
4157. T0=G2-1
4158. T1=(G1=(PD17+PD62+PD2=PD47+PD32==2)+1)==TO
4159. T2=2+G1=G2+PD32=PD32P62+T1
4160. T3=(G1=(PD18+PD63+PD3=PD48+PD33==2)+1)==TO
4161. R2KPP62=(SG(IM1,J,K)=(2+G1=G2+PD33=PD33P62+T3+S+T2)+2+G1=G2+SG(I,J
4162. ,K)=PD32+PD32P62+T1+S+2+G1=G2+PD33+PD33P62+T3+T2)/4.0
4163. DANP62=CIR=R2KPP62=S+TA33P
4164. DAN = DANP62
4165. C P63
4166. ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
4167. PD31P63 = -(1.0/2.0*A1K(K))
4168. PD32P63 = -(1.0/2.0*A1K(K))
4169. T0=G2-1
4170. T1=(G1=(PD17+PD62+PD2=PD47+PD32==2)+1)==TO
4171. R2KPP63=(SG(I,J,K)=(2+G1=G2+PD32=PD32P63+T1+S+2+G1=G2=PD31=PD31P63
4172. =(G1=(PD18+PD61+PD1=PD46+PD31==2)+1)+TO)+2+G1=G2+SG(IM1,J,K)=
4173. PD32+PD32P63+T1+2+G1=G2+PD32+PD32P63+T1)/4.0
4174. DANP63=CIR=R2KPP63=S+TA33P
4175. DAN = DANP63
4176. C P64
4177. ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
4178. PD31P64 = -(1.0/2.0*A1K(K))
4179. R2KPP64=(G1=G2+SG(I,J,K)=PD31+PD31P64=(G1=(PD18+PD61+PD1=PD46+PD31
4180. ==2)+1)+G2-1)/2.0
4181. DANP64=CIR=R2KPP64=S+TA33P
4182. DAN = DANP64
4183. C P61
4184. ELSEIF (CND(II,JJ,KK,IM2,JM1,K)) THEN
4185. PD18P61 = -(1.0/2.0*AJ1(J))
4186. PD48P61 = -(1.0/2.0*AJ1(J)=XIIYIP(J,IM2))
4187. PD63P61 = -(1.0/2.0*AJ1(J))
4188. T0=(G1=(PD18+PD63+PD3=PD48+PD33==2)+1)==(G2-1)
4189. T1=PD18+PD63P61+PD18P61=PD63+PD3=PD48P61
4190. R2KPP61=(G1=G2+SG(IM1,J,K)=TO+T1+S+G1=G2=TO+T1)/4.0
4191. DANP61=CIR=R2KPP61=S+TA33P
4192. DAN = DANP61
4193. C P62
4194. ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
4195. PD17P62 = -(1.0/2.0*AJ1(J))
4196. PD18P62 = -(1.0/2.0*AJ1(J))
4197. PD47P62 = -(1.0/2.0*AJ1(J)=XIIYIP(J,IM1))
4198. PD48P62 = -(1.0/2.0*AJ1(J)=XIIYIP(J,IM2))
4199. PD62P62 = -(1.0/2.0*AJ1(J))
4200. PD63P62 = -(1.0/2.0*AJ1(J))
4201. T0=G2-1
4202. T1=(G1=(PD17+PD62+PD2=PD47+PD32==2)+1)==TO
4203. T2=PD17+PD62P62+PD17P62=PD62+PD2=PD47P62
4204. T3=G1=G2+T1=T2
4205. T4=(G1=(PD18+PD63+PD3=PD48+PD33==2)+1)==TO
4206. T5=PD18+PD63P62+PD18P62=PD63+PD3=PD48P62
4207. R2KPP62=(SG(IM1,J,K)=(G1=G2+T4+T5+S+T3)+G1=G2+SG(I,J,K)=T1+T2+S+G1
4208. =G2+T4+T5+T3)/4.0
4209. DANP62=CIR=R2KPP62=S+TA33P
4210. DAN = DANP62
4211. C P63
4212. ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
4213. PD18P63 = -(1.0/2.0*AJ1(J))
4214. PD17P63 = -(1.0/2.0*AJ1(J))
4215. PD48P63 = -(1.0/2.0*AJ1(J)=XIIYIP(J,I))
4216. PD47P63 = -(1.0/2.0*AJ1(J)=XIIYIP(J,IM1))
4217. PD61P63 = -(1.0/2.0*AJ1(J))
4218. PD62P63 = -(1.0/2.0*AJ1(J))
4219. T0=G2-1
4220. T1=(G1=(PD17+PD62+PD2=PD47+PD32==2)+1)==TO
4221. T2=PD17+PD62P63+PD17P63=PD62+PD2=PD47P63
4222. R2KPP63=(SG(I,J,K)=(G1=G2+T1+T2+S+G1=G2=(G1=(PD18+PD61+PD1=PD48+
4223. PD31==2)+1)+TO=(PD18+PD61P63+PD18P63=PD61+PD1=PD48P63))+G1=G2=SG

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4224.      (IM1,J,K)=T1+T2+G1+G2+T1+T2)/4.0
4225.      DANP83=CIR=R2KPP83+S*TA33P
4226.      DAN = DANP83
4227.
4228.      C P84
4229.      ELSEIF (CND(II,JJ,KK,IP1,IM1,K)) THEN
4230.      PD18P84 = -(1.0/2.0*AJ1[J])
4231.      PD48P84 = -(1.0/2.0*AJ1[J]+XIYIP[J,I])
4232.      PD18P84 = -(1.0/2.0*AJ1[J])
4233.      R2KPP84=G1+G2+SG(I,J,K)=(G1+(PD18+PD61+PD1=PD48+PD31==2)+1)==(G2-1
4234.      )-(PD18+PD61P84+PD18P84+PD61+PD1=PD48P84)/4.0
4235.      DANP84=CIR=R2KPP84+S*TA33P
4236.      DAN = DANP84
4237.
4238.      C P85
4239.      ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
4240.      PD3P85 = DXI(II,IM2)+S
4241.      PD18P85 = (-AJ2(J)+AJ1(J))/2.0
4242.      PD33P85 = (-A2K(K)+A1K(K))/2.0
4243.      PD45P85 = -(1.0/2.0*A1K(KP1))
4244.      PD48P85 = DXI(II,IM2)=A11R(J,IM2)+S+(-AJ2(J)+AJ1(J))+XIYIP(J,IM2)/
4245.      2.0
4246.      PD63P85 = DXI(II,IM2)=XIYIP(J,IM2)+S+(-AJ2(J)+AJ1(J))/2.0
4247.      TO=G2-1
4248.      T1=(G1=(PD18+PD63+PD3+PD48+PD33==2)+1)==TO
4249.      T2=PD18+PD63P85+PD18P85+PD63+PD3+PD48P85+PD3P85+PD48+2=PD33=
4250.      PD33P85
4251.      T3=(G1=(PD30+PD75+PD15+PD80+PD45==2)+1)==TO
4252.      R2KPP86=(2+G1+G2+SG(IM1,J,KP1)=PD45+PD45P86+T3+S+G1+G2+SG(IM1,J,K)
4253.      )=T1+T2+S+2+G1+G2+PD45+PD45P86+T3+G1+G2+T1+T2)/4.0
4254.      DANP86=CIR=R2KPP86+S*TA33P
4255.      DAN = DANP86
4256.
4257.      C P87
4258.      ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
4259.      PD2P87 = DXI(II,IM1)+S
4260.      PD3P87 = DXI(II,IM2)
4261.      PD17P87 = (-AJ2(J)+AJ1(J))/2.0
4262.      PD18P87 = (-AJ2(J)+AJ1(J))/2.0
4263.      PD32P87 = (-A2K(K)+A1K(K))/2.0
4264.      PD33P87 = (-A2K(K)+A1K(K))/2.0
4265.      PD44P87 = -(1.0/2.0*A1K(KP1))
4266.      PD45P87 = -(1.0/2.0*A1K(KP1))
4267.      PD47P87 = DXI(II,IM1)=A11R(J,IM1)+S+(-AJ2(J)+AJ1(J))+XIYIP(J,IM1)/
4268.      2.0
4269.      PD48P87 = (-AJ2(J)+AJ1(J))+XIYIP(J,IM2)/2.0+DXI(II,IM2)=A11R(J,IM2)
4270.      PD62P87 = DXI(II,IM1)=XIYIP(J,IM1)+S+(-AJ2(J)+AJ1(J))/2.0
4271.      PD63P87 = DXI(II,IM2)=XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
4272.      TO=G2-1
4273.      T1=(G1=(PD17+PD62+PD2+PD47+PD32==2)+1)==TO
4274.      T2=PD17+PD62P87+PD17P87+PD62+PD2+PD47P87+PD2P87+PD47+2=PD32=
4275.      PD32P87
4276.      T3=G1+G2+T1+T2
4277.      T4=(G1=(PD18+PD63+PD3+PD48+PD33==2)+1)==TO
4278.      T5=PD18+PD63P87+PD18P87+PD63+PD3+PD48P87+PD3P87+PD48+2=PD33=
4279.      PD33P87
4280.      T6=(G1=(PD28+PD74+PD14+PD58+PD44==2)+1)==TO
4281.      T7=2+G1+G2+PD44+PD44P87+T6
4282.      T8=(G1=(PD30+PD75+PD15+PD80+PD45==2)+1)==TO
4283.      R2KPP87=(SG(IM1,J,KP1)=(2+G1+G2+PD45+PD45P87+T8+S+T7)+SG(IM1,J,K)=
4284.      (G1+G2+T4+T5+S+T3)+2+G1+G2+SG(I,J,KP1)=PD44+PD44P87+T6+S+G1+G2+SG
4285.      (I,J,K)=T1+T2+S+2+G1+G2+PD45+PD45P87+T8+T7+G1+G2+T4+T5+T3)/4.0
4286.      DANP87=CIR=R2KPP87+S*TA33P
4287.      DAN = DANP87
4288.
4289.      C P88
4290.      ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
4291.      PD1P88 = DXI(II,I)+S
4292.      PD2P88 = DXI(II,IM1)
4293.      PD18P88 = (-AJ2(J)+AJ1(J))/2.0
4294.      PD17P88 = (-AJ2(J)+AJ1(J))/2.0
4295.      PD31P88 = (-A2K(K)+A1K(K))/2.0
4296.      PD32P88 = (-A2K(K)+A1K(K))/2.0
4297.      PD43P88 = -(1.0/2.0*A1K(KP1))
4298.      PD44P88 = -(1.0/2.0*A1K(KP1))
4299.      PD46P88 = DXI(II,I)=A11R(J,I)+S+(-AJ2(J)+AJ1(J))+XIYIP(J,I)/2.0
4300.      PD47P88 = (-AJ2(J)+AJ1(J))+XIYIP(J,IM1)/2.0+DXI(II,IM1)=A11R(J,IM1)
4301.      PD61P88 = DXI(II,I)=XIYIP(J,I)+S+(-AJ2(J)+AJ1(J))/2.0
4302.      PD62P88 = DXI(II,IM1)=XIYIP(J,IM1)+(-AJ2(J)+AJ1(J))/2.0
4303.      TO=G2-1
4304.      T1=(G1=(PD17+PD62+PD2+PD47+PD32==2)+1)==TO
4305.      T2=PD17+PD62P88+PD17P88+PD62+PD2+PD47P88+PD2P88+PD47+2=PD32=
4306.      PD32P88
4307.      T3=(G1=(PD29+PD74+PD14+PD58+PD44==2)+1)==TO
4308.      R2KPP88=(SG(I,J,KP1)=(2+G1+G2+PD44+PD44P88+T3+S+2+G1+G2+PD43=
4309.      PD43P88+(G1=(PD28+PD74+PD14+PD58+PD44==2)+1)==TO)+SG(II,J,K)=(G1+
4310.      G2+T1+T2+S+G1+G2+(G1=(PD18+PD61+PD1=PD48+PD31==2)+1)==TO+(PD18=
4311.      PD51P88+PD18P88+PD61+PD1=PD48P88+PD18P88+PD48+2=PD31+PD31P88))+2+
4312.      G1+G2+SG(IM1,J,KP1)=PD44+PD44P88+T3+2+G1+G2+PD44+PD44P88+T3+G1+G2
4313.      )+SG(IM1,J,K)=T1+T2+G1+G2+T1+T2)/4.0
4314.      DANP88=CIR=R2KPP88+S*TA33P
4315.      DAN = DANP88
4316.
4317.      C P89
4318.      ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
4319.      PD1P89 = DXI(II,I)
4320.      PD18P89 = (-AJ2(J)+AJ1(J))/2.0
4321.      PD31P89 = (-A2K(K)+A1K(K))/2.0
4322.      PD43P89 = -(1.0/2.0*A1K(KP1))
4323.      PD46P89 = (-AJ2(J)+AJ1(J))+XIYIP(J,I)/2.0+DXI(II,I)=A11R(J,I)
4324.      PD61P89 = DXI(II,I)=XIYIP(J,I)+(-AJ2(J)+AJ1(J))/2.0
4325.      TO=G2-1
4326.      R2KPP89=(2+G1+G2+SG(I,J,KP1)=PD43+PD43P89+(G1=(PD26+PD73+PD13+PD58
4327.      )+PD43==2)+1)==TO+G1+G2+SG(I,J,K)=(G1=(PD18+PD61+PD1=PD48+PD31==2)
4328.      +1)==TO+(PD18+PD61P89+PD18P89+PD61+PD1=PD48P89+PD18P89+PD48+2=PD31
4329.      )+PD31P89))/4.0
4330.      DANP89=CIR=R2KPP89+S*TA33P
4331.      DAN = DANP89
4332.
4333.      C P91
4334.      ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
4335.      PD18P91 = AJ2(J)/2.0
4336.      PD48P91 = AJ2(J)+XIYIP(J,IM2)/2.0
4337.      PD63P91 = AJ2(J)/2.0
4338.      TO=(G1=(PD18+PD63+PD3+PD48+PD33==2)+1)==(G2-1)
4339.      T1=(PD18+PD63P91+PD18P91+PD63+PD3+PD48P91
4340.      )+SG(IM1,J,K)=TO+T1+S+G1+G2+TO+T1)/4.0
4341.      DANP91=CIR=R2KPP91+S*TA33P
4342.      DAN = DANP91
4343.
4344.      C P92
4345.      ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
4346.      PD17P92 = AJ2(J)/2.0
4347.      PD18P92 = AJ2(J)/2.0
4348.      PD47P92 = AJ2(J)+XIYIP(J,IM1)/2.0
4349.      PD48P92 = AJ2(J)+XIYIP(J,IM2)/2.0
4350.      PD62P92 = AJ2(J)/2.0
4351.      PD63P92 = AJ2(J)/2.0
4352.      TO=G2-1
4353.      T1=(G1=(PD17+PD62+PD2+PD47+PD32==2)+1)==TO
4354.      T2=PD17+PD62P92+PD17P92+PD62+PD2+PD47P92
4355.      T3=G1+G2+T1+T2
4356.      T4=(G1=(PD18+PD63+PD3+PD48+PD33==2)+1)==TO
4357.      T5=PD18+PD63P92+PD18P92+PD63+PD3+PD48P92
4358.      R2KPP92=(SG(IM1,J,K)=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,K)=T1+T2+S+G1
4359.      )=G2+T4+T5+T3)/4.0
4360.      DANP92=CIR=R2KPP92+S*TA33P
4361.      DAN = DANP92
4362.
4363.      C P93

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4356. ELSEIF (CND(I,J,K,I,JP1,K)) THEN
4357. PD16P93 = AJ2(J)/2.0
4358. PD17P93 = AJ2(J)/2.0
4359. PD48P93 = AJ2(J)*XIYIP(J,I)/2.0
4360. PD47P93 = AJ2(J)*XIYIP(J,IM1)/2.0
4361. PD61P93 = AJ2(J)/2.0
4362. PD62P93 = AJ2(J)/2.0
4363. TO=G2-1
4364. T1=(G1*(PD17+PD62+PD2+PD47+PD32**2)+1)**TO
4365. T2=PD17+PD62P93+PD17P93+PD62+PD2+PD47P93
4366. R2KPP93=(SG(I,J,K)=(G1+G2+T1+T2+S+G1+G2*(G1*(PD16+PD61+PD1+PD46+
4367. PD31**2)+1)**TO*(PD16+PD61P93+PD16P93+PD61+PD1+PD46P93))+G1+G2+SG
4368. (IM1,J,K)=T1+T2+G1+G2+T1+T2)/4.0
4369. DANP93=CIR=R2KPP93+S=TA33P
4370. DAN = DANP93
4371.
C P94
4372. ELSEIF (CND(I,J,K,IP1,JP1,K)) THEN
4373. PD16P94 = AJ2(J)/2.0
4374. PD48P94 = AJ2(J)*XIYIP(J,I)/2.0
4375. PD17P94 = AJ2(J)/2.0
4376. R2KPP94=(G1+G2+SG(I,J,K)=(G1*(PD16+PD61+PD1+PD46+PD31**2)+1)**(G2-1
4377. )*(PD16+PD61P94+PD16P94+PD61+PD1+PD46P94))/4.0
4378. DANP94=CIR=R2KPP94+S=TA33P
4379. DAN = DANP94
4380.
C P108
4381. ELSEIF (CND(I,J,K,IM2,JP1,KP1)) THEN
4382. PD30P108 = -(1.0/2.0+AJ1(J))
4383. PD80P108 = -(1.0/2.0+AJ1(J)*XIYIP(J,IM2))
4384. PD75P108 = -(1.0/2.0+AJ1(J))
4385. TO=(G1*(PD30+PD75+PD15+PD80+PD45**2)+1)**(G2-1)
4386. T1=PD30+PD75P108+PD30P108+PD75+PD15+PD80P108
4387. R2KPP108=(G1+G2+SG(IM1,J,KP1)=TO+T1+S+G1+G2+TO+T1)/4.0
4388. DANP108=CIR=R2KPP108+S=TA33P
4389. DAN = DANP108
4390.
C P107
4391. ELSEIF (CND(I,J,K,IM1,JP1,KP1)) THEN
4392. PD29P107 = -(1.0/2.0+AJ1(J))
4393. PD30P107 = -(1.0/2.0+AJ1(J))
4394. PD59P107 = -(1.0/2.0+AJ1(J)*XIYIP(J,IM1))
4395. PD80P107 = -(1.0/2.0+AJ1(J)*XIYIP(J,IM2))
4396. PD74P107 = -(1.0/2.0+AJ1(J))
4397. PD75P107 = -(1.0/2.0+AJ1(J))
4398. TO=G2-1
4399. T1=(G1*(PD29+PD74+PD14+PD59+PD44**2)+1)**TO
4400. T2=PD29+PD74P107+PD29P107+PD74+PD14+PD59P107
4401. T3=G1+G2+T1+T2
4402. T4=(G1*(PD30+PD75+PD15+PD80+PD45**2)+1)**TO
4403. T5=PD30+PD75P107+PD30P107+PD75+PD15+PD80P107
4404. R2KPP107=(SG(IM1,J,KP1)=(G1+G2+T4+T5+S+T3)+G1+G2+SG(I,J,KP1)=T1+T2
4405. +S+G1+G2+T4+T5+T3)/4.0
4406. DANP107=CIR=R2KPP107+S=TA33P
4407. DAN = DANP107
4408.
C P108
4409. ELSEIF (CND(I,J,K,I,JP1,KP1)) THEN
4410. PD28P108 = -(1.0/2.0+AJ1(J))
4411. PD29P108 = -(1.0/2.0+AJ1(J))
4412. PD58P108 = -(1.0/2.0+AJ1(J)*XIYIP(J,I))
4413. PD89P108 = -(1.0/2.0+AJ1(J)*XIYIP(J,IM1))
4414. PD73P108 = -(1.0/2.0+AJ1(J))
4415. PD74P108 = -(1.0/2.0+AJ1(J))
4416. TO=G2-1
4417. T1=(G1*(PD28+PD74+PD14+PD58+PD44**2)+1)**TO
4418. T2=PD28+PD74P108+PD28P108+PD74+PD14+PD58P108
4419. R2KPP108=(SG(I,J,KP1)=(G1+G2+T1+T2+S+G1+G2*(G1*(PD28+PD73+PD13+
4420. PD58+PD43**2)+1)**TO*(PD28+PD73P108+PD28P108+PD73+PD13+PD58P108))+
4421. G1+G2+SG(IM1,J,KP1)=T1+T2+G1+G2+T1+T2)/4.0
4422. DANP108=CIR=R2KPP108+S=TA33P
4423. DAN = DANP108
4424.
C P109
4425. ELSEIF (CND(I,J,K,IP1,JP1,KP1)) THEN
4426. PD28P109 = -(1.0/2.0+AJ1(J))
4427. PD58P109 = -(1.0/2.0+AJ1(J)*XIYIP(J,I))
4428. PD73P109 = -(1.0/2.0+AJ1(J))
4429. R2KPP109=(G1+G2+SG(I,J,KP1)=(G1*(PD28+PD73+PD13+PD58+PD43**2)+1)**(G2-1)
4430. *(PD28+PD73P109+PD28P109+PD73+PD13+PD58P108))/4.0
4431. DANP109=CIR=R2KPP109+S=TA33P
4432. DAN = DANP109
4433.
C P111
4434. ELSEIF (CND(I,J,K,IM2,J,KP1)) THEN
4435. PD15P111 = DXII(IM2)*S
4436. PD30P111 = (-AJ2(J)+AJ1(J))/2.0
4437. PD33P111 = A2K(K)/2.0
4438. PD45P111 = (-A2K(KP1)+A1K(KP1))/2.0
4439. PD80P111 = DXII(IM2)*A11R(J,IM2)*S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/
4440. 2.0
4441. PD75P111 = DXII(IM2)*XIYIP(J,IM2)*S+(-AJ2(J)+AJ1(J))/2.0
4442. TO=G2-1
4443. T1=(G1*(PD18+PD63+PD3+PD48+PD33**2)+1)**TO
4444. T2=(G1*(PD30+PD75+PD15+PD80+PD45**2)+1)**TO
4445. T3=PD30+PD75P111+PD30P111+PD75+PD15+PD80P111+PD15P111+PD80+2+PD45+
4446. PD45P111
4447. R2KPP111=(G1+G2+SG(IM1,J,KP1)=T2+T3+S+2+G1+G2+SG(IM1,J,K)=PD33+
4448. PD33P111+T1+S+G1+G2+T2+T3+2+G1+G2+PD33+PD33P111+T1)/4.0
4449. DANP111=CIR=R2KPP111+S=TA33P
4450. DAN = DANP111
4451.
C P112
4452. ELSEIF (CND(I,J,K,IM1,J,KP1)) THEN
4453. PD14P112 = DXII(IM1)*S
4454. PD15P112 = DXII(IM2)
4455. PD29P112 = (-AJ2(J)+AJ1(J))/2.0
4456. PD30P112 = (-AJ2(J)+AJ1(J))/2.0
4457. PD32P112 = A2K(K)/2.0
4458. PD33P112 = A2K(K)/2.0
4459. PD44P112 = (-A2K(KP1)+A1K(KP1))/2.0
4460. PD45P112 = (-A2K(KP1)+A1K(KP1))/2.0
4461. PD59P112 = DXII(IM1)*A11R(J,IM1)*S+(-AJ2(J)+AJ1(J))*XIYIP(J,IM1)/
4462. 2.0
4463. PD80P112 = (-AJ2(J)+AJ1(J))*XIYIP(J,IM2)/2.0+DXII(IM2)*A11R(J,IM2)
4464. PD74P112 = DXII(IM1)*XIYIP(J,IM1)*S+(-AJ2(J)+AJ1(J))/2.0
4465. PD75P112 = DXII(IM2)*XIYIP(J,IM2)+(-AJ2(J)+AJ1(J))/2.0
4466. TO=G2-1
4467. T1=(G1*(PD17+PD82+PD2+PD47+PD32**2)+1)**TO
4468. T2=2+G1+G2+PD32+PD32P112+T1
4469. T3=(G1*(PD18+PD63+PD3+PD48+PD33**2)+1)**TO
4470. T4=(G1*(PD29+PD74+PD14+PD58+PD44**2)+1)**TO
4471. T5=PD29+PD74P112+PD29P112+PD74+PD14+PD58P112+PD14P112+PD58+2+PD44+
4472. PD44P112
4473. T6=G1+G2+T4+T5
4474. T7=(G1*(PD30+PD75+PD15+PD80+PD45**2)+1)**TO
4475. T8=PD30+PD75P112+PD30P112+PD75+PD15+PD80P112+PD15P112+PD80+2+PD45+
4476. PD45P112
4477. R2KPP112=(SG(IM1,J,KP1)=(G1+G2+T7+T8+S+T6)+SG(IM1,J,K)=(2+G1+G2+
4478. PD33+PD33P112+T3+S+T2)+G1+G2+SG(I,J,KP1)=T4+T5+S+2+G1+G2+SG(I,J,K
4479. )+PD32+PD32P112+T1+S+G1+G2+T7+T8+T6+2+G1+G2+PD33+PD33P112+T3+T2)/
4480. 4.0
4481. DANP112=CIR=R2KPP112+S=TA33P
4482. DAN = DANP112
4483.
C P113
4484. ELSEIF (CND(I,J,K,I,J,KP1)) THEN
4485. PD13P113 = DXII(I)*S
4486. PD14P113 = DXII(IM1)
4487. PD28P113 = (-AJ2(J)+AJ1(J))/2.0

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4488. PD29P113 = [-AJ2(J)+AJ1(J)]/2.0
4489. PD31P113 = A2K(K)/2.0
4490. PD32P113 = A2K(K)/2.0
4491. PD43P113 = [-A2K(KP1)+A1K(KP1)]/2.0
4492. PD44P113 = [-A2K(KP1)+A1K(KP1)]/2.0
4493. PD58P113 = DXI(I)=A11R(J,I)+S+[-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0
4494. PD59P113 = [-AJ2(J)+AJ1(J)]*XIYIP(J,IM1)/2.0+DXI(I)=A11R(J,IM1)
4495. PD73P113 = DXI(I)=XIYIP(J,I)+S+[-AJ2(J)+AJ1(J)]/2.0
4496. PD74P113 = DXI(I)=XIYIP(J,IM1)+[-AJ2(J)+AJ1(J)]/2.0
4497. TO=G2-1
4498. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4499. T2=(G1=(PD29=PD74+PD14=PD59+PD44==2)+1)==TO
4500. T3=PD29+PD74P113+PD29P113+PD74+PD14+PD59P113+PD14P113+PD59+2+PD44+
4501. PD44P113
4502. R2KPP113=(SG(I,J,KP1)=(G1=G2+T2+T3+S+G1=G2=(G1=(PD28=PD73+PD13+
4503. PD58+PD43==2)+1)==TO=(PD28=PD73P113+PD28P113+PD73+PD13+PD58P113+
4504. PD13P113+PD58+2+PD43=PD43P113))=SG(I,J,K)=([2+G1=G2+PD32=PD32P113+
4505. T1+S+2+G1=G2+PD31=PD31P113=(G1=(PD18=PD61+PD1=PD46+PD31==2)+1)==
4506. TO)+G1=G2+SG(IM1,J,KP1)=T2+T3+G1=G2+T2+T3+2+G1=G2+SG(IM1,J,K)=
4507. PD32+PD32P113+T1+2+G1=G2+PD32=PD32P113+T1)/4.0
4508. DANP113=CIR=R2KPP113=S+TA33P
4509. DAN = DANP113
4510.
C P114
4511. ELSEIF (CND(I,J,KK,IP1,J,KP1)) THEN
4512. PD13P114 = DXI(I)
4513. PD28P114 = [-AJ2(J)+AJ1(J)]/2.0
4514. PD31P114 = A2K(K)/2.0
4515. PD43P114 = [-A2K(KP1)+A1K(KP1)]/2.0
4516. PD58P114 = [-AJ2(J)+AJ1(J)]*XIYIP(J,I)/2.0+DXI(I)=A11R(J,I)
4517. PD73P114 = DXI(I)=XIYIP(J,I)+[-AJ2(J)+AJ1(J)]/2.0
4518. TO=G2-1
4519. R2KPP114=(G1=G2+SG(I,J,KP1)=(G1=(PD28=PD73+PD13+PD58+PD43==2)+1)==
4520. TO=(PD28=PD73P114+PD28P114+PD73+PD13+PD58P114+PD13P114+PD58+2+
4521. PD43=PD43P114)+2+G1=G2+SG(I,J,K)=PD31=PD31P114=(G1=(PD18=PD61+PD1+
4522. PD46+PD31==2)+1)==TO)/4.0
4523. DANP114=CIR=R2KPP114=S+TA33P
4524. DAN = DANP114
4525.
C P118
4526. ELSEIF (CND(I,J,KK,IM2,JP1,KP1)) THEN
4527. PD30P118 = AJ2(J)/2.0
4528. PD80P118 = AJ2(J)=XIYIP(J,IM2)/2.0
4529. PD75P118 = AJ2(J)/2.0
4530. TO=(G1=(PD30=PD75+PD15+PD80+PD45==2)+1)==(G2-1)
4531. T1=PD30+PD75P118+PD30P118+PD75+PD15+PD80P118
4532. R2KPP118=(G1=G2+SG(IM1,J,KP1)=TO+T1+S+G1=G2+TO+T1)/4.0
4533. DANP118=CIR=R2KPP118=S+TA33P
4534. DAN = DANP118
4535.
C P117
4536. ELSEIF (CND(I,J,KK,IM1,JP1,KP1)) THEN
4537. PD28P117 = AJ2(J)/2.0
4538. PD30P117 = AJ2(J)/2.0
4539. PD58P117 = AJ2(J)=XIYIP(J,IM1)/2.0
4540. PD80P117 = AJ2(J)=XIYIP(J,IM2)/2.0
4541. PD74P117 = AJ2(J)/2.0
4542. PD75P117 = AJ2(J)/2.0
4543. TO=G2-1
4544. T1=(G1=(PD29=PD74+PD14=PD59+PD44==2)+1)==TO
4545. T2=PD29+PD74P117+PD29P117+PD74+PD14+PD59P117
4546. T3=G1=G2+T1=T2
4547. T4=(G1=(PD30=PD75+PD15+PD80+PD45==2)+1)==TO
4548. T5=PD30+PD75P117+PD30P117+PD75+PD15+PD80P117
4549. R2KPP117=(SG(IM1,J,KP1)=(G1=G2+T4+T5+S+T3)+G1=G2+SG(I,J,KP1)=T1+T2
4550. +S+G1=G2+T4+T5+T3)/4.0
4551. DANP117=CIR=R2KPP117=S+TA33P
4552. DAN = DANP117
4553.
C P116
4554. ELSEIF (CND(I,J,KK,I,JP1,KP1)) THEN
4555. PD28P116 = AJ2(J)/2.0
4556. PD29P116 = AJ2(J)/2.0
4557. PD58P116 = AJ2(J)=XIYIP(J,I)/2.0
4558. PD59P116 = AJ2(J)=XIYIP(J,IM1)/2.0
4559. PD73P116 = AJ2(J)/2.0
4560. PD74P116 = AJ2(J)/2.0
4561. TO=G2-1
4562. T1=(G1=(PD29=PD74+PD14=PD59+PD44==2)+1)==TO
4563. T2=PD29+PD74P116+PD29P116+PD74+PD14+PD59P116
4564. R2KPP116=(SG(I,J,KP1)=(G1=G2+T1+T2+S+G1=G2=(G1=(PD28=PD73+PD13+
4565. PD58+PD43==2)+1)==TO=(PD28=PD73P116+PD28P116+PD73+PD13+PD58P116)+
4566. +G1=G2+SG(IM1,J,KP1)=T1+T2+G1=G2+T1+T2)/4.0
4567. DANP116=CIR=R2KPP116=S+TA33P
4568. DAN = DANP116
4569.
C P119
4570. ELSEIF (CND(I,J,KK,IP1,JP1,KP1)) THEN
4571. PD28P119 = AJ2(J)/2.0
4572. PD58P119 = AJ2(J)=XIYIP(J,I)/2.0
4573. PD73P119 = AJ2(J)/2.0
4574. R2KPP119=(G1=G2+SG(I,J,KP1)=(G1=(PD28=PD73+PD13+PD58+PD43==2)+1)==(
4575. G2-1)=(PD28=PD73P119+PD28P119+PD73+PD13+PD58P119)/4.0
4576. DANP119=CIR=R2KPP119=S+TA33P
4577. DAN = DANP119
4578.
C P136
4579. ELSEIF (CND(I,J,KK,IM2,J,KP2)) THEN
4580. PD48P136 = A2K(KP1)/2.0
4581. TO=(G1=(PD30=PD75+PD15+PD80+PD45==2)+1)==(G2-1)
4582. R2KPP136=(2+G1=G2+SG(IM1,J,KP1)=PD48+PD48P136+TO+S+2+G1=G2+PD45+
4583. PD45P136+TO)/4.0
4584. DANP136=CIR=R2KPP136=S+TA33P
4585. DAN = DANP136
4586.
C P137
4587. ELSEIF (CND(I,J,KK,IM1,J,KP2)) THEN
4588. PD44P137 = A2K(KP1)/2.0
4589. PD48P137 = A2K(KP1)/2.0
4590. TO=G2-1
4591. T1=(G1=(PD29=PD74+PD14=PD59+PD44==2)+1)==TO
4592. T2=2+G1=G2+PD44=PD44P137+T1
4593. T3=(G1=(PD30=PD75+PD15+PD80+PD45==2)+1)==TO
4594. R2KPP137=(SG(IM1,J,KP1)=(2+G1=G2+PD45=PD45P137+T3+S+T2)+2+G1=G2+SG
4595. (I,J,KP1)=PD44=PD44P137+T1+S+2+G1=G2+PD48=PD48P137+T3+T2)/4.0
4596. DANP137=CIR=R2KPP137=S+TA33P
4597. DAN = DANP137
4598.
C P138
4599. ELSEIF (CND(I,J,KK,I,J,KP2)) THEN
4600. PD43P138 = A2K(KP1)/2.0
4601. PD44P138 = A2K(KP1)/2.0
4602. TO=G2-1
4603. T1=(G1=(PD29=PD74+PD14=PD59+PD44==2)+1)==TO
4604. R2KPP138=(SG(I,J,KP1)=(2+G1=G2+PD44=PD44P138+T1+S+2+G1=G2+PD43=
4605. PD43P138+(G1=(PD28=PD73+PD13+PD58+PD43==2)+1)==TO)+2+G1=G2+SG(IM1
4606. ,J,KP1)=PD44+PD44P138+T1+2+G1=G2+PD44=PD44P138+T1)/4.0
4607. DANP138=CIR=R2KPP138=S+TA33P
4608. DAN = DANP138
4609.
C P139
4610. ELSEIF (CND(I,J,KK,IP1,J,KP2)) THEN
4611. PD43P139 = A2K(KP1)/2.0
4612. R2KPP139=(G1=G2+SG(I,J,KP1)=PD43+PD43P139=(G1=(PD28=PD73+PD13+PD58+
4613. PD43==2)+1)==(G2-1))/2.0
4614. DANP139=CIR=R2KPP139=S+TA33P
4615. DAN = DANP139
4616.
C P182
4617. ELSEIF (CND(I,J,KK,ITE,J,KLOW-2)) THEN
4618. PD31P182 = -(CC6=A2K(K)*S)
4619. PD32P182 = -(CC6=A2K(K)*S)

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4620. PD33P182 = -(CC6=A2K(K)+S)
4621. PD43P182 = -(CC6=A2K(KP1)+S)
4622. PD44P182 = -(CC6=A2K(KP1)+S)
4623. PD45P182 = -(CC6=A2K(KP1)+S)
4624. TO+G2-1
4625. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4626. T2=2+G1+G2+PD32=PD32P182+T1
4627. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4628. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4629. T5=2+G1+G2+PD44=PD44P182+T4
4630. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4631. R2KPP182=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P182+T6+S+T5)+SG(I,J,KP1
)=[2+G1+G2+PD44=PD44P182+T4+S+2+G1+G2+PD43=PD43P182=(G1=(PD28=
PD73+PD13=PD58+PD43==2)+1)==TO)+SG(IM1,J,K)=[2+G1+G2+PD33=
PD33P182+T3+S+T2]+SG(I,J,K)=[2+G1+G2+PD32=PD32P182+T1+S+2+G1+G2=
PD31=PD31P182=(G1=(PD16=PD61+PD1=PD46+PD31==2)+1)==TO)+2+G1+G2=
PD45=PD45P182+T6+T5+2+G1+G2+PD33=PD33P182+T3+T2]/4.0
4637. CIRP182=CC6+S
4638. DANP182=CIR=R2KPP182+S+TA33P+CIRP182=R2KP=S+TA33P
4639. DAN = DANP182
4640. C P183
4641. ELSEIF (CND(I1,JJ,KK,ITE,J,KLOW-1)) THEN
4642. PD31P183 = -(CC5=A2K(K))
4643. PD32P183 = -(CC5=A2K(K))
4644. PD33P183 = -(CC5=A2K(K))
4645. PD43P183 = -(CC5=A2K(KP1))
4646. PD44P183 = -(CC5=A2K(KP1))
4647. PD45P183 = -(CC5=A2K(KP1))
4648. TO+G2-1
4649. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4650. T2=2+G1+G2+PD32=PD32P183+T1
4651. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4652. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4653. T5=2+G1+G2+PD44=PD44P183+T4
4654. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4655. R2KPP183=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P183+T6+S+T5)+SG(I,J,KP1
)=[2+G1+G2+PD44=PD44P183+T4+S+2+G1+G2+PD43=PD43P183=(G1=(PD28=
PD73+PD13=PD58+PD43==2)+1)==TO)+SG(IM1,J,K)=[2+G1+G2+PD33=
PD33P183+T3+S+T2]+SG(I,J,K)=[2+G1+G2+PD32=PD32P183+T1+S+2+G1+G2=
PD31=PD31P183=(G1=(PD16=PD61+PD1=PD46+PD31==2)+1)==TO)+2+G1+G2=
PD45=PD45P183+T6+T5+2+G1+G2+PD33=PD33P183+T3+T2]/4.0
4661. CIRP183=CC5
4662. DANP183=CIR=R2KPP183+S+TA33P+CIRP183=R2KP=S+TA33P
4663. DAN = DANP183
4664. C P184
4665. ELSEIF (CND(I1,JJ,KK,ITE,J,KLOW)) THEN
4666. PD31P184 = -(CC4=A2K(K)+S)
4667. PD32P184 = -(CC4=A2K(K)+S)
4668. PD33P184 = -(CC4=A2K(K)+S)
4669. PD43P184 = -(CC4=A2K(KP1)+S)
4670. PD44P184 = -(CC4=A2K(KP1)+S)
4671. PD45P184 = -(CC4=A2K(KP1)+S)
4672. TO+G2-1
4673. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4674. T2=2+G1+G2+PD32=PD32P184+T1
4675. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4676. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4677. T5=2+G1+G2+PD44=PD44P184+T4
4678. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4679. R2KPP184=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P184+T6+S+T5)+SG(I,J,KP1
)=[2+G1+G2+PD44=PD44P184+T4+S+2+G1+G2+PD43=PD43P184=(G1=(PD28=
PD73+PD13=PD58+PD43==2)+1)==TO)+SG(IM1,J,K)=[2+G1+G2+PD33=
PD33P184+T3+S+T2]+SG(I,J,K)=[2+G1+G2+PD32=PD32P184+T1+S+2+G1+G2=
PD31=PD31P184=(G1=(PD16=PD61+PD1=PD46+PD31==2)+1)==TO)+2+G1+G2=
PD45=PD45P184+T6+T5+2+G1+G2+PD33=PD33P184+T3+T2]/4.0
4885. CIRP184=CC4+S
4886. DANP184=CIR=R2KPP184+S+TA33P+CIRP184=R2KP=S+TA33P
4887. DAN = DANP184
4888. C P185
4889. ELSEIF (CND(I1,JJ,KK,ITE,J,KUP)) THEN
4890. PD31P185 = -(CC1=A2K(K))
4891. PD32P185 = -(CC1=A2K(K))
4892. PD33P185 = -(CC1=A2K(K))
4893. PD43P185 = -(CC1=A2K(KP1))
4894. PD44P185 = -(CC1=A2K(KP1))
4895. PD45P185 = -(CC1=A2K(KP1))
4896. TO+G2-1
4897. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4898. T2=2+G1+G2+PD32=PD32P185+T1
4899. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4900. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4901. T5=2+G1+G2+PD44=PD44P185+T4
4902. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4903. R2KPP185=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P185+T6+S+T5)+SG(I,J,KP1
)=[2+G1+G2+PD44=PD44P185+T4+S+2+G1+G2+PD43=PD43P185=(G1=(PD28=
PD73+PD13=PD58+PD43==2)+1)==TO)+SG(IM1,J,K)=[2+G1+G2+PD33=
PD33P185+T3+S+T2]+SG(I,J,K)=[2+G1+G2+PD32=PD32P185+T1+S+2+G1+G2=
PD31=PD31P185=(G1=(PD16=PD61+PD1=PD46+PD31==2)+1)==TO)+2+G1+G2=
PD45=PD45P185+T6+T5+2+G1+G2+PD33=PD33P185+T3+T2]/4.0
4909. CIRP185=CC1
4910. DANP185=CIR=R2KPP185+S+TA33P+CIRP185=R2KP=S+TA33P
4911. DAN = DANP185
4912. C P186
4913. ELSEIF (CND(I1,JJ,KK,ITE,J,KUP-1)) THEN
4914. PD31P186 = -(CC2=A2K(K)+S)
4915. PD32P186 = -(CC2=A2K(K)+S)
4916. PD33P186 = -(CC2=A2K(K)+S)
4917. PD43P186 = -(CC2=A2K(KP1)+S)
4918. PD44P186 = -(CC2=A2K(KP1)+S)
4919. PD45P186 = -(CC2=A2K(KP1)+S)
4920. TO+G2-1
4921. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4922. T2=2+G1+G2+PD32=PD32P186+T1
4923. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4924. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4925. T5=2+G1+G2+PD44=PD44P186+T4
4926. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4927. R2KPP186=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P186+T6+S+T5)+SG(I,J,KP1
)=[2+G1+G2+PD44=PD44P186+T4+S+2+G1+G2+PD43=PD43P186=(G1=(PD28=
PD73+PD13=PD58+PD43==2)+1)==TO)+SG(IM1,J,K)=[2+G1+G2+PD33=
PD33P186+T3+S+T2]+SG(I,J,K)=[2+G1+G2+PD32=PD32P186+T1+S+2+G1+G2=
PD31=PD31P186=(G1=(PD16=PD61+PD1=PD46+PD31==2)+1)==TO)+2+G1+G2=
PD45=PD45P186+T6+T5+2+G1+G2+PD33=PD33P186+T3+T2]/4.0
4933. CIRP186=CC2+S
4934. DANP186=CIR=R2KPP186+S+TA33P+CIRP186=R2KP=S+TA33P
4935. DAN = DANP186
4936. C P187
4937. ELSEIF (CND(I1,JJ,KK,ITE,J,KUP+2)) THEN
4938. PD31P187 = -(CC3=A2K(K))
4939. PD32P187 = -(CC3=A2K(K))
4940. PD33P187 = -(CC3=A2K(K))
4941. PD43P187 = -(CC3=A2K(KP1))
4942. PD44P187 = -(CC3=A2K(KP1))
4943. PD45P187 = -(CC3=A2K(KP1))
4944. TO+G2-1
4945. T1=(G1=(PD17=PD62+PD2=PD47+PD32==2)+1)==TO
4946. T2=2+G1+G2+PD32=PD32P187+T1
4947. T3=(G1=(PD18=PD63+PD3=PD48+PD33==2)+1)==TO
4948. T4=(G1=(PD29=PD74+PD14+PD59+PD44==2)+1)==TO
4949. T5=2+G1+G2+PD44=PD44P187+T4
4950. T6=(G1=(PD30=PD75+PD15+PD60+PD45==2)+1)==TO
4951. R2KPP187=(SG(IM1,J,KP1)=(2+G1+G2+PD45=PD45P187+T6+S+T6)+SG(I,J,KP1
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4752.      )=[2+G1+G2+PD44+PD44P187+T4+S+2+G1+G2+PD43+PD43P187+(G1=[PD28+
4753.      PD73+PD13+PD58+PD43==2)+1]==To)+SG(IM1,J,K)=(2+G1+G2+PD33+
4754.      PD33P187+T3+S+T2)+SG(I,J,K)=(2+G1+G2+PD32+PD32P187+T1+S+2+G1+G2+
4755.      PD31+PD31P187+(G1=[PD18+PD81+PD1+PD46+PD31==2)+1]==To)+2+G1+G2+
4756.      PD45+PD45P187+T8+T5+2+G1+G2+PD33+PD33P187+T3+T2)/4.0
4757.      CIRP187+CCC
4758.      DANP187+CIR=R2KPP187+S+TA33P+CIRP187+R2KP+S+TA33P
4759.      DAN = DANP187
4760.      ENDIF
4761.
4762.      RETURN
4763.      END
4764.      SUBROUTINE RS(J,I,K,RHSM,RHSA,RHST,RHSC,RHSL)
4765.      RMDERS.FOR
4766.
4767.      INCLUDE (INTROS)
4768.
4769.      C
4770.      C
4771.      C
4772.      C
4773.      C
4774.      C
4775.      C
4776.      C
4777.      C
4778.      C
4779.      C
4780.      C
4781.      C
4782.      C
4783.      C
4784.      C
4785.      C
4786.      C
4787.      C
4788.      C
4789.      C
4790.      C
4791.      C
4792.      C
4793.      C
4794.      C
4795.      C
4796.      C
4797.      C
4798.      C
4799.      C
4800.      C
4801.      C
4802.      C
4803.      C
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4843.      C
4844.      C
4845.      C
4846.      C
4847.      C
4848.      C
4849.      C
4850.      C
4851.      C
4852.      C
4853.      C
4854.      C
4855.      C
4856.      C
4857.      C
4858.      C
4859.      C
4860.      C
4861.      C
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4868.      C
4869.      C
4870.      C
4871.      C
4872.      C
4873.      C
4874.      C
4875.      C
4876.      C
4877.      C
4878.      C
4879.      C
4880.      C
4881.      C
4882.      C
4883.      C

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4884. )/2.0
4885. P028 = OZINF+[A2K(KM1)]=(P88+P87-P83-P82)+A1K(KM1)=(P83+P82-P38-P37
4886. )/2.0
4887. P033 = OZINF+[A2K(KM1)]=(P87+P88-P82-P81)+A1K(KM1)=(P82+P81-P37-P36
4888. )/2.0
4889. P040 = OZINF+[A1K(K)]=(P84+P93-P85-P84)+A2K(K)=[-P94-P93+P119+P118]
4890. )/2.0
4891. P041 = OZINF+[A1K(K)]=(P93+P92-P88-P87)+A2K(K)=[-P93-P92+P118+P117]
4892. )/2.0
4893. P042 = OZINF+[A1K(K)]=(P92+P91-P87-P86)+A2K(K)=[-P92-P91+P117+P116]
4894. )/2.0
4895. P043 = OZINF+[A1K(KP1)]=(P88+P88+P114+P113)+A2K(KP1)=(P138+P138-
4896. P114-P113)/2.0
4897. P044 = OZINF+[A1K(KP1)]=(P88+P87+P113+P112)+A2K(KP1)=(P138+P137-
4898. P113-P112)/2.0
4899. P045 = OZINF+[A1K(KP1)]=(P87+P86+P112+P111)+A2K(KP1)=(P137+P136-
4900. P112-P111)/2.0
4901. P046 = A11R(J,I)=(DXII(I))=(P88+S+P89)+OXINF/XIXIP(J,I)+XIXIP(J,I)
4902. =XIXIP(J,I)+OXINF+S/XIXIP(J,I)+AJ2(J)=(P94+P93-P89-P88)+AJ1(J)+
4903. (P89+P88-P84-P83)/2.0
4904. P047 = A11R(J,IM1)=(DXII(IM1))=(P87+S+P88)+OXINF/XIXIP(J,IM1)+
4905. XIXIP(J,IM1)+XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P83+P82-
4906. P88-P87)+AJ1(J)=(P88+P87-P83-P82)/2.0
4907. P048 = A11R(J,IM2)=(DXII(IM2))=(P88+S+P87)+OXINF/XIXIP(J,IM2)+
4908. XIXIP(J,IM2)+XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P92+P91-
4909. P87-P86)+AJ1(J)=(P87+P86-P82-P81)/2.0
4910. P049 = A11R(JM1,I)=(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JM1,I)+XIXIP(
4911. JM1,I)+XIXIP(JM1,I)+OXINF+S/XIXIP(JM1,I)+AJ2(JM1)=(P88+P88-P84-
4912. P83)+AJ1(JM1)=(P84+P83-P79-P78)/2.0
4913. P050 = A11R(JM1,IM1)=(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JM1,IM1)+
4914. XIXIP(JM1,IM1)+XIXIP(JM1,IM1)+OXINF+S/XIXIP(JM1,IM1)+AJ2(JM1)=(
4915. P88+P87-P83-P82)+AJ1(JM1)=(P83+P82-P78-P77)/2.0
4916. P051 = A11R(JM1,IM2)=(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JM1,IM2)+
4917. XIXIP(JM1,IM2)+XIXIP(JM1,IM2)+OXINF+S/XIXIP(JM1,IM2)+AJ2(JM1)=(
4918. P87+P86-P82-P81)+AJ1(JM1)=(P82+P81-P77-P76)/2.0
4919. P052 = A11R(J,I)=(DXII(I))=(P83+S+P84)+OXINF/XIXIP(J,I)+XIXIP(J,I)
4920. =XIXIP(J,I)+OXINF+S/XIXIP(J,I)+AJ2(J)=(P88+P88-P84-P83)+AJ1(J)+
4921. (P64+P63-P59-P58)/2.0
4922. P053 = A11R(J,IM1)=(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(J,IM1)+
4923. XIXIP(J,IM1)+XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P88+P87-
4924. P83-P82)+AJ1(J)=(P83+P82-P58-P57)/2.0
4925. P054 = A11R(J,IM2)=(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(J,IM2)+
4926. XIXIP(J,IM2)+XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P87+P86-
4927. P82-P81)+AJ1(J)=(P82+P81-P57-P56)/2.0
4928. P055 = A11R(JP1,I)=(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JP1,I)+XIXIP(
4929. JP1,I)+XIXIP(JP1,I)+OXINF+S/XIXIP(JP1,I)+AJ2(JP1)=(P89+P88-P94-
4930. P83)+AJ1(JP1)=(P94+P93-P89-P88)/2.0
4931. P056 = A11R(JP1,IM1)=(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JP1,IM1)+
4932. XIXIP(JP1,IM1)+XIXIP(JP1,IM1)+OXINF+S/XIXIP(JP1,IM1)+AJ2(JP1)=(
4933. P88+P87-P83-P82)+AJ1(JP1)=(P93+P92-P88-P87)/2.0
4934. P057 = A11R(JP1,IM2)=(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JP1,IM2)+
4935. XIXIP(JP1,IM2)+XIXIP(JP1,IM2)+OXINF+S/XIXIP(JP1,IM2)+AJ2(JP1)=(
4936. P87+P86-P82-P81)+AJ1(JP1)=(P82+P81-P87-P86)/2.0
4937. P058 = A11R(J,I)=(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIXIP(J,
4938. I)+XIXIP(J,I)+OXINF+S/XIXIP(J,I)+AJ2(J)=(P119+P118-P114-P113)+
4939. AJ1(J)=(P119+P118-P109-P108)/2.0
4940. P059 = A11R(J,IM1)=(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+
4941. XIXIP(J,IM1)+XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P118+
4942. P117-P113-P112)+AJ1(J)=(P113+P112-P108-P107)/2.0
4943. P060 = A11R(J,IM2)=(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+
4944. XIXIP(J,IM2)+XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P117+
4945. P116-P112-P111)+AJ1(J)=(P112+P111-P107-P106)/2.0
4946. P061 = XIXIP(J,I)=(DXII(I))=(P88+S+P89)+OXINF/XIXIP(J,I)+XIXIP(J,I)
4947. =OXINF+S/XIXIP(J,I)+AJ2(J)=(P94+P93-P89-P88)+AJ1(J)=(P89+P88-
4948. P84-P83)/2.0
4949. P062 = XIXIP(J,IM1)=(DXII(IM1))=(P87+S+P88)+OXINF/XIXIP(J,IM1)+
4950. XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P93+P92-P88-P87)+AJ1(J)
4951. =(P88+P87-P83-P82)/2.0
4952. P063 = XIXIP(J,IM2)=(DXII(IM2))=(P86+S+P87)+OXINF/XIXIP(J,IM2)+
4953. XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P92+P91-P87-P86)+AJ1(J)
4954. =(P87+P86-P82-P81)/2.0
4955. P064 = XIXIP(JM1,I)=(DXII(I))=(P83+S+P84)+OXINF/XIXIP(JM1,I)+XIXIP(
4956. JM1,I)+OXINF+S/XIXIP(JM1,I)+AJ2(JM1)=(P89+P88-P84-P83)+AJ1(JM1)
4957. =(P84+P83-P79-P78)/2.0
4958. P065 = XIXIP(JM1,IM1)=(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(JM1,IM1)+
4959. XIXIP(JM1,IM1)+OXINF+S/XIXIP(JM1,IM1)+AJ2(JM1)=(P89+P88-P84-P83)+
4960. AJ1(JM1)=(P83+P82-P78-P77)/2.0
4961. P066 = XIXIP(JM1,IM2)=(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(JM1,IM2)+
4962. XIXIP(JM1,IM2)+OXINF+S/XIXIP(JM1,IM2)+AJ2(JM1)=(P87+P86-P82-P81)
4963. +AJ1(JM1)=(P82+P81-P77-P76)/2.0
4964. P067 = XIXIP(J,I)=(DXII(I))=(P83+S+P84)+OXINF/XIXIP(J,I)+XIXIP(J,I)
4965. =OXINF+S/XIXIP(J,I)+AJ2(J)=(P89+P88-P84-P83)+AJ1(J)=(P84+P83-
4966. P80-P88)/2.0
4967. P068 = XIXIP(J,IM1)=(DXII(IM1))=(P82+S+P83)+OXINF/XIXIP(J,IM1)+
4968. XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P88+P87-P83-P82)+AJ1(J)
4969. =(P83+P82-P58-P57)/2.0
4970. P069 = XIXIP(J,IM2)=(DXII(IM2))=(P81+S+P82)+OXINF/XIXIP(J,IM2)+
4971. XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P87+P86-P82-P81)+AJ1(J)
4972. =(P82+P81-P57-P56)/2.0
4973. P070 = XIXIP(JP1,I)=(DXII(I))=(P93+S+P94)+OXINF/XIXIP(JP1,I)+XIXIP(
4974. JP1,I)+OXINF+S/XIXIP(JP1,I)+AJ2(JP1)=(P89+P88-P94-P83)+AJ1(JP1)
4975. =(P94+P93-P89-P88)/2.0
4976. P071 = XIXIP(JP1,IM1)=(DXII(IM1))=(P92+S+P93)+OXINF/XIXIP(JP1,IM1)+
4977. XIXIP(JP1,IM1)+OXINF+S/XIXIP(JP1,IM1)+AJ2(JP1)=(P88+P87-P83-P82)
4978. +AJ1(JP1)=(P93+P92-P88-P87)/2.0
4979. P072 = XIXIP(JP1,IM2)=(DXII(IM2))=(P91+S+P92)+OXINF/XIXIP(JP1,IM2)+
4980. XIXIP(JP1,IM2)+OXINF+S/XIXIP(JP1,IM2)+AJ2(JP1)=(P93+P92-P88-P87)
4981. +AJ1(JP1)=(P92+P91-P87-P86)/2.0
4982. P073 = XIXIP(J,I)=(DXII(I))=(P113+S+P114)+OXINF/XIXIP(J,I)+XIXIP(J,
4983. I)+OXINF+S/XIXIP(J,I)+AJ2(J)=(P119+P118-P114-P113)+AJ1(J)=(P114
4984. +P113-P109-P108)/2.0
4985. P074 = XIXIP(J,IM1)=(DXII(IM1))=(P112+S+P113)+OXINF/XIXIP(J,IM1)+
4986. XIXIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+AJ2(J)=(P118+P117-P113-P112)+
4987. AJ1(J)=(P113+P112-P108-P107)/2.0
4988. P075 = XIXIP(J,IM2)=(DXII(IM2))=(P111+S+P112)+OXINF/XIXIP(J,IM2)+
4989. XIXIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+AJ2(J)=(P117+P116-P112-P111)+
4990. AJ1(J)=(P112+P111-P107-P106)/2.0
4991.
4992. RIP,RIM,RJ, RK, RJP, RKP
4993.
4994. T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2
4995. RIP=SG(I,J,K)=(T0+S+(G1=(P018+P081+P01+P048+P031+2)+1)==G2)+T0
4996. T0=(G1=(P018+P083+P03+P048+P033+2)+1)==G2
4997. RIM=SG(IM1,J,K)=(T0+S+(G1=(P017+P082+P02+P047+P032+2)+1)==G2)+T0
4998. T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2
4999. T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2
5000. T2=(G1=(P020+P085+P05+P050+P035+2)+1)==G2
5001. T3=(G1=(P021+P086+P051+P08+P038+2)+1)==G2
5002. RJ=(SG(IM1,JM1,K)=(T3+S+T2)+SG(I,JM1,K)=(T2+S+(G1=(P019+P084+P04+
5003. P049+P034+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=(
5004. P018+P081+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0
5005. T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2
5006. T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2
5007. T2=(G1=(P020+P085+P05+P050+P035+2)+1)==G2
5008. T3=(G1=(P021+P086+P051+P08+P038+2)+1)==G2
5009. RK=(SG(IM1,J,KM1)=(T3+S+T2)+SG(I,J,KM1)=(T2+S+(G1=(P052+P07+P022+
5010. P087+P037+2)+1)==G2)+SG(IM1,J,K)=(T1+S+T0)+SG(I,J,K)=(T0+S+(G1=(
5011. P018+P081+P01+P048+P031+2)+1)==G2)+T3+T2+T1+T0)/4.0
5012. T0=(G1=(P017+P082+P02+P047+P032+2)+1)==G2
5013. T1=(G1=(P018+P083+P03+P048+P033+2)+1)==G2
5014. T2=(G1=(P020+P085+P05+P050+P035+2)+1)==G2
5015. T3=(G1=(P021+P086+P051+P08+P038+2)+1)==G2
5016. T3=(G1=(P027+P072+P012+P057+P042+2)+1)==G2

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ORIGINAL PAGE IS  
OF POOR QUALITY

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5018. RJP:=[SG(IM1,JP1,K)]=[T3+S+T2]+SG(I,JP1,K)=[T2+S+(G1=[P025+P070+P010
5019. *P055+P040+2]+1)+G2]+SG(IM1,J,K)=[T1+S+T0]+SG(I,J,K)=[T0+S+(G1=
5020. {P016+P061+P01+P046+P031+2+1)+G2]+T3+T2+T1+T0)/4.0
5021. T0:=[G1={P017+P062+P02+P047+P032+2+1)+G2
5022. T1:=[G1={P018+P063+P03+P048+P033+2+1)+G2
5023. T2:=[G1={P028+P074+P014+P059+P044+2+1)+G2
5024. T3:=[G1={P030+P075+P015+P060+P045+2+1)+G2
5025. RJP:=[SG(IM1,JP1,K)]=[T3+S+T2]+SG(I,J,JP1)=[T2+S+(G1=[P028+P073+P013
5026. *P058+P043+1]+1)+G2]+SG(IM1,J,K)=[T1+S+T0]+SG(I,J,K)=[T0+S+(G1=
5027. {P016+P061+P01+P046+P031+2+1)+G2]+T3+T2+T1+T0)/4.0
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ORIGINAL FILE IS  
OF BETTER QUALITY

5148. T0=G2-1  
5149. T1=(G1=(P017+P062+P02+P047+P032==2)+1)==TO  
5150. T2=P017+P062XD1+P017XD1+P062+P02+P047XD1+P02XD1+P047+2+P032+  
5151. P032XD1  
5152. T3=G1+G2+T1+T2  
5153. T4=(G1=(P018+P063+P03+P048+P033==2)+1)==TO  
5154. T5=P018+P063XD1+P018XD1+P063+P03+P048XD1+P03XD1+P048+2+P033+  
5155. P033XD1  
5156. T6=(G1=(P020+P065+P05+P050+P035==2)+1)==TO  
5157. T7=P020+P065XD1+P020XD1+P065+P050+P05XD1+P05+P050XD1+2+P035+  
5158. P035XD1  
5159. T8=G1+G2+T6+T7  
5160. T9=(G1=(P021+P066+P051+P06+P036==2)+1)==TO  
5161. T10=P051+P066XD1+P021+P066XD1+P021XD1+P066+P051XD1+P06+2+P036+  
5162. P036XD1  
5163. RKXD1=(SG(IM1, JM1, K))=(G1+G2+T9+T10+S+T8)+SG(I, JM1, K)=(G1+G2+T8+T7+  
5164. S+G1+G2=(G1=(P019+P064+P04+P049+P034==2)+1)==TO=(P019+P064XD1+  
5165. P019XD1+P064+P04+P049XD1+P04+P049XD1+2+P034+P034XD1))+SG(IM1, J, K)  
5166. =(G1+G2+T4+T5+S+T3)+SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2=(G1=(P018+P061+  
5167. P01+P048+P031==2)+1)==TO=(P018+P061XD1+P018XD1+P061+P01+P048XD1+  
5168. P01XD1+P048+2+P031+P031XD1))+G1+G2+T9+T10+T8+G1+G2+T4+T5+T3)/4.0  
5169. T0=G2-1  
5170. T1=(G1=(P017+P062+P02+P047+P032==2)+1)==TO  
5171. T2=P017+P062XD1+P017XD1+P062+P02+P047XD1+P02XD1+P047+2+P032+  
5172. P032XD1  
5173. T3=G1+G2+T1+T2  
5174. T4=(G1=(P018+P063+P03+P048+P033==2)+1)==TO  
5175. T5=P018+P063XD1+P018XD1+P063+P03+P048XD1+P03XD1+P048+2+P033+  
5176. P033XD1  
5177. T6=(G1=(P053+P08+P023+P068+P038==2)+1)==TO  
5178. T7=P053+P08XD1+P053XD1+P08+P023+P068XD1+P023XD1+P068+2+P038+  
5179. P038XD1  
5180. T8=G1+G2+T8+T7  
5181. T9=(G1=(P054+P09+P024+P069+P039==2)+1)==TO  
5182. T10=P054+P09XD1+P054XD1+P09+P024+P069XD1+P024XD1+P069+2+P039+  
5183. P039XD1  
5184. RKXD1=(SG(IM1, J, KM1))=(G1+G2+T9+T10+S+T8)+SG(I, J, KM1)=(G1+G2+T8+T7+  
5185. S+G1+G2=(G1=(P052+P07+P022+P067+P037==2)+1)==TO=(P052+P07XD1+  
5186. P052XD1+P07+P022+P067XD1+P022XD1+P067+2+P037+P037XD1))+SG(IM1, J, K)  
5187. =(G1+G2+T4+T5+S+T3)+SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2=(G1=(P018+  
5188. P051+P01+P04+P031==2)+1)==TO=(P018+P051XD1+P018XD1+P051+P01+  
5189. P04XD1+P01XD1+P04+2+P031+P031XD1))+G1+G2+T9+T10+T8+G1+G2+T4+T5+  
5190. T3)/4.0  
5191. T0=G2-1  
5192. T1=(G1=(P017+P062+P02+P047+P032==2)+1)==TO  
5193. T2=P017+P062XD1+P017XD1+P062+P02+P047XD1+P02XD1+P047+2+P032+  
5194. P032XD1  
5195. T3=G1+G2+T1+T2  
5196. T4=(G1=(P018+P063+P03+P048+P033==2)+1)==TO  
5197. T5=P018+P063XD1+P018XD1+P063+P03+P048XD1+P03XD1+P048+2+P033+  
5198. P033XD1  
5199. T6=(G1=(P026+P071+P011+P056+P041==2)+1)==TO  
5200. T7=P026+P071XD1+P026XD1+P071+P011+P056XD1+P011XD1+P056+2+P041+  
5201. P041XD1  
5202. T8=G1+G2+T8+T7  
5203. T9=(G1=(P027+P072+P012+P057+P042==2)+1)==TO  
5204. T10=P027+P072XD1+P027XD1+P072+P012+P057XD1+P012XD1+P057+2+P042+  
5205. P042XD1  
5206. RKJXD1=(SG(IM1, JP1, K))=(G1+G2+T9+T10+S+T8)+SG(I, JP1, K)=(G1+G2+T8+T7+  
5207. S+G1+G2=(G1=(P025+P070+P010+P055+P040==2)+1)==TO=(P025+P070XD1+  
5208. P025XD1+P070+P010+P055XD1+P010XD1+P055+2+P040+P040XD1))+SG(IM1, J, K)  
5209. =(G1+G2+T4+T5+S+T3)+SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2=(G1=(P018+  
5210. P061+P01+P04+P031==2)+1)==TO=(P018+P061XD1+P018XD1+P061+P01+  
5211. P04XD1+P01XD1+P04+2+P031+P031XD1))+G1+G2+T9+T10+T8+G1+G2+T4+T5+  
5212. T3)/4.0  
5213. T0=G2-1  
5214. T1=(G1=(P017+P062+P02+P047+P032==2)+1)==TO  
5215. T2=P017+P062XD1+P017XD1+P062+P02+P047XD1+P02XD1+P047+2+P032+  
5216. P032XD1  
5217. T3=G1+G2+T1+T2  
5218. T4=(G1=(P018+P063+P03+P048+P033==2)+1)==TO  
5219. T5=P018+P063XD1+P018XD1+P063+P03+P048XD1+P03XD1+P048+2+P033+  
5220. P033XD1  
5221. T6=(G1=(P029+P074+P014+P059+P044==2)+1)==TO  
5222. T7=P029+P074XD1+P029XD1+P074+P014+P059XD1+P014XD1+P059+2+P044+  
5223. P044XD1  
5224. T8=G1+G2+T8+T7  
5225. T9=(G1=(P030+P075+P015+P060+P045==2)+1)==TO  
5226. T10=P030+P075XD1+P030XD1+P075+P015+P060XD1+P015XD1+P060+2+P045+  
5227. P045XD1  
5228. RKJXD1=(SG(IM1, J, KP1))=(G1+G2+T9+T10+S+T8)+SG(I, J, KP1)=(G1+G2+T8+T7+  
5229. S+G1+G2=(G1=(P028+P073+P013+P058+P043==2)+1)==TO=(P028+P073XD1+  
5230. P028XD1+P073+P013+P058XD1+P013XD1+P058+2+P043+P043XD1))+SG(IM1, J, K)  
5231. =(G1+G2+T4+T5+S+T3)+SG(I, J, K)=(G1+G2+T1+T2+S+G1+G2=(G1=(P018+  
5232. P061+P01+P04+P031==2)+1)==TO=(P018+P061XD1+P018XD1+P061+P01+  
5233. P04XD1+P01XD1+P04+2+P031+P031XD1))+G1+G2+T9+T10+T8+G1+G2+T4+T5+  
5234. T3)/4.0  
5235. T0=1/DXIC(I)  
5236. T1=-P88  
5237. T2=-P87  
5238. T3=-P83  
5239. T4=-P82  
5240. T5=XIXI(J, I)  
5241. T6=1/DZETAC(K)  
5242. RESXD1=((P88-P83)=RKXD1+TA33M+2+T5+T6+QZINF+RKXD1+2+T5+T8+QZINFXD1  
5243. \*RK)+V2+((T1+P113)=RKFXD1+TA33P+2+T5+T6+QZINF+RKFXD1+2+T5+T6+  
5244. QZINFXD1+RKP)+V1+S\*(RIMXD1+TA12M+((P83+P82+T1+T2)=TAJ2+(P88+P87+  
5245. T3+T4)=TAJ1)+(P88+T2)=RIMXD1+TA11M+2+To+QZINF+RIMXD1+2+To+  
5246. QZINFXD1+RIM)+RIPXD1+TA12P+((P84+P83+P89+T1)=TAJ2+(P89+P88+P84+T3  
5247. )=TAJ1))+S\*(RJD1+TA21M+((P89+T1+P84+T3)=TA12+(P88+T2+P83+T4)=TA11  
5248. )+(P88+T3)=RJD1+TA22M)+RJPXD1+TA21P+((P84+P83+P89+T1)=TA12+(P83+  
5249. P82+P88+T2)=TA11)+((P83+T1)=RJPXD1+TA22P+(P89+T1)=RIPXD1+TA11P+2+  
5250. To+QZINF+RIPXD1+2+To+QZINFXD1+RIP  
5251. C X02  
5252. P01XD2 = QXINFXD2/XIXIP(J, I)  
5253. P02XD2 = QXINFXD2/XIXIP(J, IM1)  
5254. P03XD2 = QXINFXD2/XIXIP(J, IM2)  
5255. P04XD2 = QXINFXD2/XIXIP(JM1, I)  
5256. P05XD2 = QXINFXD2/XIXIP(JM1, IM1)  
5257. P06XD2 = QXINFXD2/XIXIP(JM1, IM2)  
5258. P07XD2 = QXINFXD2/XIXIP(J, I)  
5259. P08XD2 = QXINFXD2/XIXIP(J, IM1)  
5260. P09XD2 = QXINFXD2/XIXIP(J, IM2)  
5261. P010XD2 = QXINFXD2/XIXIP(JP1, I)  
5262. P011XD2 = QXINFXD2/XIXIP(JP1, IM1)  
5263. P012XD2 = QXINFXD2/XIXIP(JP1, IM2)  
5264. P013XD2 = QXINFXD2/XIXIP(J, I)  
5265. P014XD2 = QXINFXD2/XIXIP(J, IM1)  
5266. P015XD2 = QXINFXD2/XIXIP(J, IM2)  
5267. P016XD2 = XIXIP(J, I)+QXINFXD2/S/XIXIP(J, I)  
5268. P017XD2 = XIXIP(J, IM1)+QXINFXD2/S/XIXIP(J, IM1)  
5269. P018XD2 = XIXIP(J, IM2)+QXINFXD2/S/XIXIP(J, IM2)  
5270. P019XD2 = XIXIP(JM1, I)+QXINFXD2/S/XIXIP(JM1, I)  
5271. P020XD2 = XIXIP(JM1, IM1)+QXINFXD2/S/XIXIP(JM1, IM1)  
5272. P021XD2 = XIXIP(JM1, IM2)+QXINFXD2/S/XIXIP(JM1, IM2)  
5273. P022XD2 = XIXIP(J, I)+QXINFXD2/S/XIXIP(J, I)  
5274. P023XD2 = XIXIP(J, IM1)+QXINFXD2/S/XIXIP(J, IM1)  
5275. P024XD2 = XIXIP(J, IM2)+QXINFXD2/S/XIXIP(J, IM2)  
5276. P025XD2 = XIXIP(JP1, I)+QXINFXD2/S/XIXIP(JP1, I)  
5277. P026XD2 = XIXIP(JP1, IM1)+QXINFXD2/S/XIXIP(JP1, IM1)  
5278. P027XD2 = XIXIP(JP1, IM2)+QXINFXD2/S/XIXIP(JP1, IM2)  
5279. P028XD2 = XIXIP(J, I)+QXINFXD2/S/XIXIP(J, I)

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5280. P029XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)
5281. P030XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)
5282. P031XD2 = OZINFXD2
5283. P032XD2 = OZINFXD2
5284. P033XD2 = OZINFXD2
5285. P034XD2 = OZINFXD2
5286. P035XD2 = OZINFXD2
5287. P036XD2 = OZINFXD2
5288. P037XD2 = OZINFXD2
5289. P038XD2 = OZINFXD2
5290. P039XD2 = OZINFXD2
5291. P040XD2 = OZINFXD2
5292. P041XD2 = OZINFXD2
5293. P042XD2 = OZINFXD2
5294. P043XD2 = OZINFXD2
5295. P044XD2 = OZINFXD2
5296. P045XD2 = OZINFXD2
5297. P046XD2 = XIYIP(J,I)==2*OXINFXD2*S/XIXIP(J,I)+A11R(J,I)*OXINFXD2/
5298. .XIXIP(J,I)
5299. P047XD2 = XIYIP(J,IM1)==2*OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)*
5300. .OXINFXD2/XIXIP(J,IM1)
5301. P048XD2 = XIYIP(J,IM2)==2*OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)*
5302. .OXINFXD2/XIXIP(J,IM2)
5303. P049XD2 = XIYIP(JM1,I)==2*OXINFXD2*S/XIXIP(JM1,I)+A11R(JM1,I)*
5304. .OXINFXD2/XIXIP(JM1,I)
5305. P050XD2 = XIYIP(JM1,IM1)==2*OXINFXD2*S/XIXIP(JM1,IM1)+A11R(JM1,IM1)
5306. .OXINFXD2/XIXIP(JM1,IM1)
5307. P051XD2 = XIYIP(JM1,IM2)==2*OXINFXD2*S/XIXIP(JM1,IM2)+A11R(JM1,IM2)
5308. .OXINFXD2/XIXIP(JM1,IM2)
5309. P052XD2 = XIYIP(J,I)==2*OXINFXD2*S/XIXIP(J,I)+A11R(J,I)*OXINFXD2/
5310. .XIXIP(J,I)
5311. P053XD2 = XIYIP(J,IM1)==2*OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)*
5312. .OXINFXD2/XIXIP(J,IM1)
5313. P054XD2 = XIYIP(J,IM2)==2*OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)*
5314. .OXINFXD2/XIXIP(J,IM2)
5315. P055XD2 = XIYIP(JP1,I)==2*OXINFXD2*S/XIXIP(JP1,I)+A11R(JP1,I)*
5316. .OXINFXD2/XIXIP(JP1,I)
5317. P056XD2 = XIYIP(JP1,IM1)==2*OXINFXD2*S/XIXIP(JP1,IM1)+A11R(JP1,IM1)
5318. .OXINFXD2/XIXIP(JP1,IM1)
5319. P057XD2 = XIYIP(JP1,IM2)==2*OXINFXD2*S/XIXIP(JP1,IM2)+A11R(JP1,IM2)
5320. .OXINFXD2/XIXIP(JP1,IM2)
5321. P058XD2 = XIYIP(J,I)==2*OXINFXD2*S/XIXIP(J,I)+A11R(J,I)*OXINFXD2/
5322. .XIXIP(J,I)
5323. P059XD2 = XIYIP(J,IM1)==2*OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)*
5324. .OXINFXD2/XIXIP(J,IM1)
5325. P060XD2 = XIYIP(J,IM2)==2*OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)*
5326. .OXINFXD2/XIXIP(J,IM2)
5327. P061XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)+XIYIP(J,I)*OXINFXD2/
5328. .XIXIP(J,I)
5329. P062XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)+XIYIP(J,IM1)*
5330. .OXINFXD2/XIXIP(J,IM1)
5331. P063XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)+XIYIP(J,IM2)*
5332. .OXINFXD2/XIXIP(J,IM2)
5333. P064XD2 = XIYIP(JM1,I)*OXINFXD2+S/XIXIP(JM1,I)+XIYIP(JM1,I)*
5334. .OXINFXD2/XIXIP(JM1,I)
5335. P065XD2 = XIYIP(JM1,IM1)*OXINFXD2+S/XIXIP(JM1,IM1)+XIYIP(JM1,IM1)*
5336. .OXINFXD2/XIXIP(JM1,IM1)
5337. P066XD2 = XIYIP(JM1,IM2)*OXINFXD2+S/XIXIP(JM1,IM2)+XIYIP(JM1,IM2)*
5338. .OXINFXD2/XIXIP(JM1,IM2)
5339. P067XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)+XIYIP(J,I)*OXINFXD2/
5340. .XIXIP(J,I)
5341. P068XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)+XIYIP(J,IM1)*
5342. .OXINFXD2/XIXIP(J,IM1)
5343. P069XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)+XIYIP(J,IM2)*
5344. .OXINFXD2/XIXIP(J,IM2)
5345. P070XD2 = XIYIP(JP1,I)*OXINFXD2+S/XIXIP(JP1,I)+XIYIP(JP1,I)*
5346. .OXINFXD2/XIXIP(JP1,I)
5347. P071XD2 = XIYIP(JP1,IM1)*OXINFXD2+S/XIXIP(JP1,IM1)+XIYIP(JP1,IM1)*
5348. .OXINFXD2/XIXIP(JP1,IM1)
5349. P072XD2 = XIYIP(JP1,IM2)*OXINFXD2+S/XIXIP(JP1,IM2)+XIYIP(JP1,IM2)*
5350. .OXINFXD2/XIXIP(JP1,IM2)
5351. P073XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)+XIYIP(J,I)*OXINFXD2/
5352. .XIXIP(J,I)
5353. P074XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)+XIYIP(J,IM1)*
5354. .OXINFXD2/XIXIP(J,IM1)
5355. P075XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)+XIYIP(J,IM2)*
5356. .OXINFXD2/XIXIP(J,IM2)
5357. T0=G2-1
5358. T1=(G1*(P017+P062+P02=P047+P032**2)+1)**T0
5359. T2=P017*P062XD2+P017XD2=P062*P02=P047XD2+P02XD2=P047+2*P032=
5360. P032XD2
5361. R1PX2+SG(I,J,K)=(G1=G2=T1=T2=S+G1=G2=(G1*(P016+P061+P01=P046+P031
5362. **2)+1)**T0=[P016*P061XD2+P016XD2=P061*P01=P046XD2+P01XD2=P046+2*
5363. P031=P031XD2)]+G1=G2=T1=T2
5364. T0=G2-1
5365. T1=(G1*(P018+P063+P03=P048+P033**2)+1)**T0
5366. T2=P018*P063XD2+P018XD2=P063*P03=P048XD2+P03XD2=P048+2*P033=
5367. P033XD2
5368. R1MX2+SG(IM1,J,K)=(G1=G2=T1=T2=S+G1=G2=(G1*(P017+P062+P02=P047+
5369. P032**2)+1)**T0=[P017*P062XD2+P017XD2=P062*P02=P047XD2+P02XD2=
5370. P047+2*P032=P032XD2)]+G1=G2=T1=T2
5371. T0=G2-1
5372. T1=(G1*(P017+P062+P02=P047+P032**2)+1)**T0
5373. T2=P017*P062XD2+P017XD2=P062*P02=P047XD2+P02XD2=P047+2*P032=
5374. P032XD2
5375. T3=G1=G2=T1=T2
5376. T4=(G1*(P018+P063+P03=P048+P033**2)+1)**T0
5377. T5=P018*P063XD2+P018XD2=P063*P03=P048XD2+P03XD2=P048+2*P033=
5378. P033XD2
5379. T6=(G1*(P020+P065+P05=P050+P035**2)+1)**T0
5380. T7=P020*P065XD2+P020XD2=P065*P05=P050XD2+P05=P050XD2+2*P035=
5381. P035XD2
5382. T8=G1=G2=T6=T7
5383. T9=(G1*(P021+P066+P051=P06+P036**2)+1)**T0
5384. T10=P051*P066XD2+P051=P066XD2+P021XD2=P066*P051XD2=P06+2*P036=
5385. P036XD2
5386. R1XD2+(SG(IM1,JM1,K)=(G1=G2=T9=T10=S+T8)+SG(I,JM1,K)=(G1=G2=T6=T7=
5387. S+G1=G2=(G1*(P019+P064+P04=P048+P034**2)+1)**T0=[P019*P064XD2+
5388. P019XD2=P064+P048=P048XD2+P04=P048XD2+2*P034=P034XD2)]+SG(IM1,J,K)
5389. =(G1=G2=T4=T5=S+T3)+SG(I,J,K)=(G1=G2=T1=T2=S+G1=G2=(G1*(P016+P061
5390. +P01=P046+P031**2)+1)**T0=[P016*P061XD2+P016XD2=P061*P01=P046XD2+
5391. P01XD2=P046+2*P031=P031XD2)]+G1=G2=T9=T10+T8+G1=G2=T4=T5+T3)/4.0
5392. T0=G2-1
5393. T1=(G1*(P017+P062+P02=P047+P032**2)+1)**T0
5394. T2=P017*P062XD2+P017XD2=P062*P02=P047XD2+P02XD2=P047+2*P032=
5395. P032XD2
5396. T3=G1=G2=T1=T2
5397. T4=(G1*(P018+P063+P03=P048+P033**2)+1)**T0
5398. T5=P018*P063XD2+P018XD2=P063*P03=P048XD2+P03XD2=P048+2*P033=
5399. P033XD2
5400. T6=(G1*(P053+P08+P023=P068+P038**2)+1)**T0
5401. T7=P053*P08XD2+P053XD2=P08+P023=P068XD2+P023XD2=P068+2*P038=
5402. P038XD2
5403. T8=G1=G2=T6=T7
5404. T9=(G1*(P054+P09+P024=P069+P039**2)+1)**T0
5405. T10=P054*P09XD2+P054XD2=P09+P024=P069XD2+P024XD2=P069+2*P039=
5406. P039XD2
5407. R1KXD2+(SG(IM1,J,KM1)=(G1=G2=T8=T10=S+T8)+SG(I,J,KM1)=(G1=G2=T6=T7=
5408. S+G1=G2=(G1*(P052+P07+P022=P067+P037**2)+1)**T0=[P052*P07XD2+
5409. P052XD2=P07+P022=P067XD2+P067+2*P037=P037XD2)]+SG(IM1,J,K)
5410. =(G1=G2=T4=T5=S+T3)+SG(I,J,K)=(G1=G2=T1=T2+S+G1=G2=(G1*(P016+
5411. P061+P01=P046+P031**2)+1)**T0=[P016*P061XD2+P016XD2=P061*P01=

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5412 . P046XD2+P01XD2+P046+2+P031+P031XD2))+G1+G2+T9+T10+T8+G1+G2+T4+T5+
5413 . T3)/4.0
5414 . TO+G2-1
5415 . T1=[G1+{P017+P062+P02+P047+P032+2+1}]==TO
5416 . T2+P017+P062XD2+P017XD2+P062+P02+P047XD2+P02XD2+P047+2+P032+
5417 . P032XD2
5418 . T3+G1+G2+T1+T2
5419 . T4=[G1+{P018+P063+P03+P048+P033+2+1}]==TO
5420 . T5+P018+P063XD2+P018XD2+P063+P03+P048XD2+P03XD2+P048+2+P033+
5421 . P033XD2
5422 . T6=[G1+{P028+P071+P011+P058+P041+2+1}]==TO
5423 . T7+P028+P071XD2+P028XD2+P071+P011+P058XD2+P011XD2+P058+2+P041+
5424 . P041XD2
5425 . T8+G1+G2+T8+T7
5426 . T9=[G1+{P027+P072+P012+P057+P042+2+1}]==TO
5427 . T10+P027+P072XD2+P027XD2+P072+P012+P057XD2+P012XD2+P057+2+P042+
5428 . P042XD2
5429 . RJPXD2+{SG[IM1,JP1,K]}=(G1+G2+T9+T10+S+T8)+SG[I,JP1,K]}=(G1+G2+T8+T7
5430 . +S+G1+G2+{G1+{P025+P070+P010+P055+P040+2+1}]==TO+{P025+P070XD2+
5431 . P025XD2+P070+P010+P055XD2+P010XD2+P055+2+P040+P040XD2}))+SG[IM1,J,
5432 . K]}=[G1+G2+T4+T8+S+T3]+SG[I,J,K]}=[G1+G2+T1+T2+S+G1+G2+{G1+{P016+
5433 . P061+P01+P048+P031+2+1}]==TO+{P016+P061XD2+P016XD2+P061+P01+
5434 . P048XD2+P01XD2+P048+2+P031+P031XD2}))+G1+G2+T8+T10+T8+G1+G2+T4+T5+
5435 . T3)/4.0
5436 . TO+G2-1
5437 . T1=[G1+{P017+P062+P02+P047+P032+2+1}]==TO
5438 . T2+P017+P062XD2+P017XD2+P062+P02+P047XD2+P02XD2+P047+2+P032+
5439 . P032XD2
5440 . T3+G1+G2+T1+T2
5441 . T4=[G1+{P018+P063+P03+P048+P033+2+1}]==TO
5442 . T5+P018+P063XD2+P018XD2+P063+P03+P048XD2+P03XD2+P048+2+P033+
5443 . P033XD2
5444 . T6=[G1+{P029+P074+P014+P059+P044+2+1}]==TO
5445 . T7+P029+P074XD2+P029XD2+P074+P014+P059XD2+P014XD2+P059+2+P044+
5446 . P044XD2
5447 . T8+G1+G2+T8+T7
5448 . T9=[G1+{P030+P075+P015+P060+P045+2+1}]==TO
5449 . T10+P030+P075XD2+P030XD2+P075+P015+P060XD2+P015XD2+P060+2+P045+
5450 . P045XD2
5451 . RKPXD2+{SG[IM1,J,KP1]}=[G1+G2+T8+T10+S+T8)+SG[I,J,KP1]}=[G1+G2+T8+T7
5452 . +S+G1+G2+{G1+{P028+P073+P013+P056+P043+2+1}]==TO+{P028+P073XD2+
5453 . P028XD2+P073+P013+P056XD2+P013XD2+P056+2+P043+P043XD2}))+SG[IM1,J,
5454 . K]}=[G1+G2+T4+T8+S+T3]+SG[I,J,K]}=[G1+G2+T1+T2+S+G1+G2+{G1+{P016+
5455 . P061+P01+P048+P031+2+1}]==TO+{P016+P061XD2+P016XD2+P061+P01+
5456 . P048XD2+P01XD2+P048+2+P031+P031XD2}))+G1+G2+T8+T10+T8+G1+G2+T4+T5+
5457 . T3)/4.0
5458 . TO+1/DXIC(I)
5459 . T1+P88
5460 . T2+P87
5461 . T3+P83
5462 . T4+P82
5463 . T5+XIXI(J,I)
5464 . T6+1/DZETAC(K)
5465 . RESXD2+{P88-P83}=RXXD2+TA33M+2+T5+T6+QZINF+RXXD2+2+T5+T6+QZINFXD2
5466 . +RXX+V2+{([T1+P113]=RKPXD2+TA33P+2+T5+T6+QZINF+RKPXD2+2+T5+T6+
5467 . QZINFXD2+RKP)}+V1+S+{RIMXD2+TA12M+{P83+P82+T1+T2}=TAJ2+{P88+P87+
5468 . T3+T4}=TAJ1)+{P88+T2}=RIMXD2+TA11M+2+TO+QXINF+RIMXD2+2+TO+
5469 . QXINFXD2+RIM)+RJPXD2+TA12P+{P84+P83+T1}=TAJ2+{P88+P88-P84-T3
5470 . }+TAJ1)+S+{RUXD2+TA21M+{P89+T1+P84+T3}=TA12+{P88+T2+P83+T4}=TA11
5471 . }+{P88+T3}=RUXD2+TA22M)+RJPXD2+TA21P+{P84+P83+P88+T1}=TA12+{P83
5472 . +P88+T2}=TA11)+{P83+T1}=RJPXD2+TA22P+{P89+T1}=RIPXD2+TA11P+2+
5473 . TO+QXINF+RIPXD2+2+TO+QXINFXD2+RIP
5474 .
5475 . IF [K.EQ.KUP.AND.I.GE.ILE.AND.J.LE.ITE.AND.J.LE.JTPM1] THEN
5476 .
5477 . P
5478 .
5479 .
5480 . P81 = P(JM1,K,IM2)
5481 . P82 = P(JM1,K,IM1)
5482 . P83 = P(JM1,K,I)
5483 . P84 = P(JM1,K,IP1)
5484 . P85 = P(J,K,IM2)
5485 . P86 = P(J,K,IM1)
5486 . P87 = P(J,K,I)
5487 . P88 = P(J,K,IP1)
5488 . P89 = P(J,K,IP1)
5489 . P90 = P(JP1,K,IM2)
5490 . P91 = P(JP1,K,IM1)
5491 . P92 = P(JP1,K,I)
5492 . P93 = P(JP1,K,IP1)
5493 . P94 = P(JP1,K,IP1)
5494 . P105 = P(JM1,KP1,IM2)
5495 . P106 = P(JM1,KP1,IM1)
5496 . P107 = P(JM1,KP1,I)
5497 . P108 = P(JM1,KP1,I)
5498 . P109 = P(JM1,KP1,IP1)
5499 . P110 = P(J,K,IM2)
5500 . P111 = P(J,K,IM1)
5501 . P112 = P(J,K,I)
5502 . P113 = P(J,K,IP1)
5503 . P114 = P(J,K,IP1)
5504 . P115 = P(JP1,KP1,IM2)
5505 . P116 = P(JP1,KP1,IM1)
5506 . P117 = P(JP1,KP1,I)
5507 . P118 = P(JP1,KP1,I)
5508 . P119 = P(JP1,KP1,IP1)
5509 . P120 = P(JM1,KP2,I)
5510 . P121 = P(J,KP2,IM2)
5511 . P122 = P(J,KP2,IM1)
5512 . P123 = P(J,KP2,I)
5513 . P124 = P(J,KP2,IP1)
5514 . P125 = P(JP1,KP2,I)
5515 . P126 = P(J,K+3,IM2)
5516 . P127 = P(J,K+3,IM1)
5517 . P128 = P(J,K+3,I)
5518 . P129 = P(J,K+3,IP1)
5519 .
5520 . PA
5521 .
5522 . PA1 = DXII(I)+{P88+S+P83}+QXINF/XIXIP(J,I)
5523 . PA2 = DXII(IM1)+{P87+S+P88}+QXINF/XIXIP(J,IM1)
5524 . PA3 = DXII(IM2)+{P88+S+P87}+QXINF/XIXIP(J,IM2)
5525 . PA13 = DXII(I)+{P113+S+P114}+QXINF/XIXIP(J,I)
5526 . PA14 = DXII(IM1)+{P112+S+P113}+QXINF/XIXIP(J,IM1)
5527 . PA15 = DXII(IM2)+{P111+S+P112}+QXINF/XIXIP(J,IM2)
5528 . PA16 = XIYIP(J,I)+QXINF+S/XIXIP(J,I)+{AJ2(J)}={P84+P83+P88-P88}+AJ1
5529 . (J)+{P89+P88-P84-P83}/2.0
5530 . PA17 = XIYIP(J,IM1)+QXINF+S/XIXIP(J,IM1)+{AJ2(J)}={P83+P82-P88-P87}
5531 . +AJ1(J)+{P88+P87-P83-P82}/2.0
5532 . PA18 = XIYIP(J,IM2)+QXINF+S/XIXIP(J,IM2)+{AJ2(J)}={P82+P81-P87-P86}
5533 . +AJ1(J)+{P87+P86-P82-P81}/2.0
5534 . PA28 = XIYIP(J,I)+QXINF+S/XIXIP(J,I)+{AJ2(J)}={P119+P118-P114-P113}
5535 . +AJ1(J)+{P114+P113-P108-P108}/2.0
5536 . PA29 = XIYIP(J,IM1)+QXINF+S/XIXIP(J,IM1)+{AJ2(J)}={P118+P117-P113-
5537 . P112}+AJ1(J)+{P113+P112-P108-P107}/2.0
5538 . PA30 = XIYIP(J,IM2)+QXINF+S/XIXIP(J,IM2)+{AJ2(J)}={P117+P116-P112-
5539 . P111}+AJ1(J)+{P112+P111-P107-P106}/2.0
5540 . PA31 = OZINF+{DC1+P88+DC1+P88+DC3+P138+DC3+P138+DC2+P114+DC2+P113}
5541 . /2.0
5542 . PA32 = OZINF+{DC1+P88+DC1+P87+DC3+P138+DC3+P137+DC2+P113+DC2+P112}
5543 . /2.0
5544 . PA33 = OZINF+{DC1+P87+DC1+P88+DC3+P137+DC3+P138+DC2+P112+DC2+P111}
5545 . /2.0
5546 . PA43 = OZINF+{DC3+P184+DC3+P163+DC2+P139+DC2+P138+DC1+P114+DC1+
5547 . P113}/2.0
5548 . PA44 = OZINF+{DC3+P183+DC3+P182+DC2+P138+DC2+P137+DC1+P113+DC1+
5549 . P112}/2.0

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5544. PA45 = QZINF+[DC3=P162+DC3=P161+DC2=P137+DC2=P136+DC1=P112+DC1=
5545. P111]/2.0
5546. PA46 = A11R(J,I)=[DXII(I)=[P86+S+P89]+OXINF/XIXIP(J,I)]+X1YIP(J,I)
5547. = [X1YIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P84+P93-P89-P86]+AJ1(J)
5548. =[P89+P86-P84-P83]]/2.0]
5549. PA47 = A11R(J,IM1)=[DXII(IM1)=[P87+S+P88]+OXINF/XIXIP(J,IM1)]+
5550. X1YIP(J,IM1)=[X1YIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P93+P92-
5551. P88-P87]+AJ1(J)=[P88+P87-P83-P82]]/2.0]
5552. PA48 = A11R(J,IM2)=[DXII(IM2)=[P86+S+P87]+OXINF/XIXIP(J,IM2)]+
5553. X1YIP(J,IM2)=[X1YIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P92+P91-
5554. P87-P86]+AJ1(J)=[P87+P86-P82-P81]]/2.0]
5555. PA58 = A11R(J,I)=[DXII(I)=[P113+S+P114]+OXINF/XIXIP(J,I)]+X1YIP(J,
5556. I)=[X1YIP(J,I)+OXINF+S/XIXIP(J,I)+[AJ2(J)=[P118+P118-P114-P113]+
5557. AJ1(J)=[P114+P113-P109-P108]]/2.0]
5558. PA59 = A11R(J,IM1)=[DXII(IM1)=[P112+S+P113]+OXINF/XIXIP(J,IM1)]+
5559. X1YIP(J,IM1)=[X1YIP(J,IM1)+OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P118+
5560. P117-P113-P112]+AJ1(J)=[P113+P112-P108-P107]]/2.0]
5561. PA60 = A11R(J,IM2)=[DXII(IM2)=[P111+S+P112]+OXINF/XIXIP(J,IM2)]+
5562. X1YIP(J,IM2)=[X1YIP(J,IM2)+OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P117+
5563. P116-P112-P111]+AJ1(J)=[P112+P111-P107-P106]]/2.0]
5564. PA61 = X1YIP(J,I)=[DXII(I)=[P86+S+P89]+OXINF/XIXIP(J,I)]+X1YIP(J,I
5565. )OXINF+S/XIXIP(J,I)+[AJ2(J)=[P94+P93-P89-P86]+AJ1(J)=[P89+P88-
5566. P84-P83]]/2.0]
5567. PA62 = X1YIP(J,IM1)=[DXII(IM1)=[P87+S+P88]+OXINF/XIXIP(J,IM1)]+
5568. X1YIP(J,IM1)OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P93+P92-P88-P87]+AJ1(J
5569. )=[P88+P87-P83-P82]]/2.0]
5570. PA63 = X1YIP(J,IM2)=[DXII(IM2)=[P86+S+P87]+OXINF/XIXIP(J,IM2)]+
5571. X1YIP(J,IM2)OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P92+P91-P87-P86]+AJ1(J
5572. )=[P87+P86-P82-P81]]/2.0]
5573. PA73 = X1YIP(J,I)=[DXII(I)=[P113+S+P114]+OXINF/XIXIP(J,I)]+X1YIP(J
5574. I)OXINF+S/XIXIP(J,I)+[AJ2(J)=[P118+P118-P114-P113]+AJ1(J)=[P114
5575. +P113-P109-P108]]/2.0]
5576. PA74 = X1YIP(J,IM1)=[DXII(IM1)=[P112+S+P113]+OXINF/XIXIP(J,IM1)]+
5577. X1YIP(J,IM1)OXINF+S/XIXIP(J,IM1)+[AJ2(J)=[P118+P117-P113-P112]+
5578. AJ1(J)=[P113+P112-P108-P107]]/2.0]
5579. PA75 = X1YIP(J,IM2)=[DXII(IM2)=[P111+S+P112]+OXINF/XIXIP(J,IM2)]+
5580. X1YIP(J,IM2)OXINF+S/XIXIP(J,IM2)+[AJ2(J)=[P117+P116-P112-P111]+
5581. AJ1(J)=[P112+P111-P107-P106]]/2.0]
5582. C
5583. R1K, DPU
5584. C
5585. TO=[G1=[PA17+PA62+PA2=PA47+PA32**2)+1]**G2
5586. T1=[G1=[PA18+PA63+PA3=PA48+PA33**2)+1]**G2
5587. T2=[G1=[PA28+PA74+PA14=PA59+PA44**2)+1]**G2
5588. T3=[G1=[PA30+PA75+PA15=PA60+PA45**2)+1]**G2
5589. R1K=[S*(SG(IM1,J,KP1)=[T3+S+T2)+T3]+S*(SG(I,J,KP1)=[T2+S+(G1=[PA28
5590. =PA73+PA13=PA58+PA43**2)+1]**G2)+T2)+3*(SG(IM1,J,K)=[T1+S+TO)+T1)
5591. +3*(SG(I,J,K)=[TO+S+(G1=[PA18+PA61+PA1=PA46+PA31**2)+1]**G2)+TO)]
5592. /4.0
5593. DDPU=DPU(J,I)
5594. C
5595. DANOF11
5596. C
5597. C XD1
5598. PA1XD1 = OXINFXD1/XIXIP(J,I)
5599. PA2XD1 = OXINFXD1/XIXIP(J,IM1)
5600. PA3XD1 = OXINFXD1/XIXIP(J,IM2)
5601. PA13XD1 = OXINFXD1/XIXIP(J,I)
5602. PA14XD1 = OXINFXD1/XIXIP(J,IM1)
5603. PA15XD1 = OXINFXD1/XIXIP(J,IM2)
5604. PA16XD1 = X1YIP(J,I)OXINFXD1+S/XIXIP(J,I)
5605. PA17XD1 = X1YIP(J,IM1)OXINFXD1+S/XIXIP(J,IM1)
5606. PA18XD1 = X1YIP(J,IM2)OXINFXD1+S/XIXIP(J,IM2)
5607. PA28XD1 = X1YIP(J,I)OXINFXD1+S/XIXIP(J,I)
5608. PA29XD1 = X1YIP(J,IM1)OXINFXD1+S/XIXIP(J,IM1)
5609. PA30XD1 = X1YIP(J,IM2)OXINFXD1+S/XIXIP(J,IM2)
5610. PA31XD1 = QZINFXD1
5611. PA32XD1 = QZINFXD1
5612. PA33XD1 = QZINFXD1
5613. PA43XD1 = QZINFXD1
5614. PA44XD1 = QZINFXD1
5615. PA45XD1 = QZINFXD1
5616. PA46XD1 = X1YIP(J,I)**2OXINFXD1+S/XIXIP(J,I)+A11R(J,I)OXINFXD1/
5617. XIXIP(J,I)
5618. PA47XD1 = X1YIP(J,IM1)**2OXINFXD1+S/XIXIP(J,IM1)+A11R(J,IM1)
5619. OXINFXD1/XIXIP(J,IM1)
5620. PA48XD1 = X1YIP(J,IM2)**2OXINFXD1+S/XIXIP(J,IM2)+A11R(J,IM2)
5621. OXINFXD1/XIXIP(J,IM2)
5622. PA58XD1 = X1YIP(J,I)**2OXINFXD1+S/XIXIP(J,I)+A11R(J,I)OXINFXD1/
5623. XIXIP(J,I)
5624. PA59XD1 = X1YIP(J,IM1)**2OXINFXD1+S/XIXIP(J,IM1)+A11R(J,IM1)
5625. OXINFXD1/XIXIP(J,IM1)
5626. PA60XD1 = X1YIP(J,IM2)**2OXINFXD1+S/XIXIP(J,IM2)+A11R(J,IM2)
5627. OXINFXD1/XIXIP(J,IM2)
5628. PA61XD1 = X1YIP(J,I)OXINFXD1+S/XIXIP(J,I)+X1YIP(J,I)OXINFXD1/
5629. XIXIP(J,I)
5630. PA62XD1 = X1YIP(J,IM1)OXINFXD1+S/XIXIP(J,IM1)+X1YIP(J,IM1)
5631. OXINFXD1/XIXIP(J,IM1)
5632. PA63XD1 = X1YIP(J,IM2)OXINFXD1+S/XIXIP(J,IM2)+X1YIP(J,IM2)
5633. OXINFXD1/XIXIP(J,IM2)
5634. PA73XD1 = X1YIP(J,I)OXINFXD1+S/XIXIP(J,I)+X1YIP(J,I)OXINFXD1/
5635. XIXIP(J,I)
5636. PA74XD1 = X1YIP(J,IM1)OXINFXD1+S/XIXIP(J,IM1)+X1YIP(J,IM1)
5637. OXINFXD1/XIXIP(J,IM1)
5638. PA75XD1 = X1YIP(J,IM2)OXINFXD1+S/XIXIP(J,IM2)+X1YIP(J,IM2)
5639. OXINFXD1/XIXIP(J,IM2)
5640. TO=G2-1
5641. T1=[G1=[PA17+PA62+PA2=PA47+PA32**2)+1]**TO
5642. T2=[PA17+PA62XD1+PA17XD1+PA62+PA2+PA47XD1+PA2XD1=PA47+2*PA32=
5643. PA32XD1]
5644. T3=[G1=G2-T1=T2
5645. T4=[G1=[PA18+PA63+PA3=PA48+PA33**2)+1]**TO
5646. T5=[PA18+PA63XD1+PA18XD1+PA63+PA3+PA48XD1+PA3XD1=PA48+2*PA33=
5647. PA33XD1]
5648. T6=[G1=[PA28+PA74+PA14=PA59+PA44**2)+1]**TO
5649. T7=[PA28+PA74XD1+PA28XD1+PA74+PA14+PA59XD1+PA14XD1=PA59+2*PA44=
5650. PA44XD1]
5651. T8=G1=G2-T6=T7
5652. T9=[G1=[PA30+PA75+PA15=PA60+PA45**2)+1]**TO
5653. T10=[PA30+PA75XD1+PA30XD1+PA75+PA15+PA60XD1+PA15XD1=PA60+2*PA45=
5654. PA45XD1]
5655. R1KXD1=[S*(SG(IM1,J,KP1)=[G1=G2-T9=T10+S+T8)+G1=G2-T9=T10)+S*(SG(I
5656. ,J,KP1)=[G1=G2-T8=T7+S+G1=G2=[G1=[PA28+PA73+PA13=PA58+PA43**2)+1]
5657. **TO=[PA28+PA73XD1+PA28XD1+PA73+PA13=PA58XD1+PA13XD1=PA58+2*PA43=
5658. PA43XD1)]+T8)+3*(SG(IM1,J,K)=[G1=G2-T4=T5+S+T3)+G1=G2-T4=T5)+3*(
5659. SG(I,J,K)=[G1=G2-T1=T2+S-G1=G2=[G1=[PA18+PA61+PA1=PA46+PA31**2)+1]
5660. **TO=[PA18+PA61XD1+PA18XD1+PA61+PA1=PA46XD1+PA1XD1=PA46+2*PA31=
5661. PA31XD1)]+T3)]/4.0
5662. DDPUXD1=DZETA(KLOW)=[-OXINFXD1+DDZUX=XIXX(J,I)OXINFXD1]
5663. TO=XIXXI(J,I)
5664. T1=1/DZETAC(K)
5665. AN1XD1=S*(DDPU=R1KXD1+TA33M+DDPUXD1=R1K+TA33M*2)+TO=T1OXINF*R1KXD1
5666. +2*TO=T1OXINFXD1=R1K]
5667. C XD2
5668. PA1XD2 = OXINFXD2/XIXIP(J,I)
5669. PA2XD2 = OXINFXD2/XIXIP(J,IM1)
5670. PA3XD2 = OXINFXD2/XIXIP(J,IM2)
5671. PA13XD2 = OXINFXD2/XIXIP(J,I)
5672. PA14XD2 = OXINFXD2/XIXIP(J,IM1)
5673. PA15XD2 = OXINFXD2/XIXIP(J,IM2)
5674. PA16XD2 = X1YIP(J,I)OXINFXD2+S/XIXIP(J,I)
5675. PA17XD2 = X1YIP(J,IM1)OXINFXD2+S/XIXIP(J,IM1)
5676. PA18XD2 = X1YIP(J,IM2)OXINFXD2+S/XIXIP(J,IM2)

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8678. PA28XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)
8679. PA29XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)
8680. PA30XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)
8681. PA31XD2 = OZINFXD2
8682. PA32XD2 = OZINFXD2
8683. PA33XD2 = OZINFXD2
8684. PA43XD2 = OZINFXD2
8685. PA44XD2 = OZINFXD2
8686. PA45XD2 = OZINFXD2
8687. PA48XD2 = XIYIP(J,I)**2*OXINFXD2+S/XIXIP(J,I)+A11R(J,I)*OXINFXD2/
8688. XIXIP(J,I)
8689. PA47XD2 = XIYIP(J,IM1)**2*OXINFXD2+S/XIXIP(J,IM1)+A11R(J,IM1)*
8690. OXINFXD2/XIXIP(J,IM1)
8691. PA48XD2 = XIYIP(J,IM2)**2*OXINFXD2+S/XIXIP(J,IM2)+A11R(J,IM2)*
8692. OXINFXD2/XIXIP(J,IM2)
8693. PA58XD2 = XIYIP(J,I)**2*OXINFXD2+S/XIXIP(J,I)+A11R(J,I)*OXINFXD2/
8694. XIXIP(J,I)
8695. PA59XD2 = XIYIP(J,IM1)**2*OXINFXD2+S/XIXIP(J,IM1)+A11R(J,IM1)*
8696. OXINFXD2/XIXIP(J,IM1)
8697. PA60XD2 = XIYIP(J,IM2)**2*OXINFXD2+S/XIXIP(J,IM2)+A11R(J,IM2)*
8698. OXINFXD2/XIXIP(J,IM2)
8699. PA61XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)+XIYIP(J,I)*OXINFXD2/
8700. XIXIP(J,I)
8701. PA62XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)+XIYIP(J,IM1)*
8702. OXINFXD2/XIXIP(J,IM1)
8703. PA63XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)+XIYIP(J,IM2)*
8704. OXINFXD2/XIXIP(J,IM2)
8705. PA73XD2 = XIYIP(J,I)*OXINFXD2+S/XIXIP(J,I)+XIYIP(J,I)*OXINFXD2/
8706. XIXIP(J,I)
8707. PA74XD2 = XIYIP(J,IM1)*OXINFXD2+S/XIXIP(J,IM1)+XIYIP(J,IM1)*
8708. OXINFXD2/XIXIP(J,IM1)
8709. PA75XD2 = XIYIP(J,IM2)*OXINFXD2+S/XIXIP(J,IM2)+XIYIP(J,IM2)*
8710. OXINFXD2/XIXIP(J,IM2)
8711. TO=C2-1
8712. T1=(G1*(PA17*PA62+PA2*PA47+PA32**2)+1)**TO
8713. T2=PA17*PA62XD2+PA17XD2*PA62+PA2*PA47XD2+PA2XD2*PA47**2+PA32*
8714. PA32XD2
8715. T3=G1+C2+T1+T2
8716. T4=(G1*(PA18*PA63+PA3*PA48+PA33**2)+1)**TO
8717. T5=PA18*PA63XD2+PA18XD2*PA63+PA3*PA48XD2+PA3XD2*PA48**2+PA33*
8718. PA33XD2
8719. T6=(G1*(PA29*PA74+PA14*PA59+PA44**2)+1)**TO
8720. T7=PA29*PA74XD2+PA29XD2*PA74+PA14*PA59XD2+PA14XD2*PA59**2+PA44*
8721. PA44XD2
8722. T8=G1+C2+T6+T7
8723. T9=(G1*(PA30*PA75+PA15*PA60+PA45**2)+1)**TO
8724. T10=PA30*PA75XD2+PA30XD2*PA75+PA15*PA60XD2+PA15XD2*PA60**2+PA45*
8725. PA45XD2
8726. R1KXD2=(S*(SG(IM1,J,KP1))+(G1+C2+T8+T10+S+T8)+G1+C2+T8+T10)+S*(SG(I
8727. J,KP1))+(G1+C2+T8+T7+S+G1+C2*(G1*(PA28*PA73+PA13*PA58+PA43**2)+1)
8728. **TO*(PA28*PA73XD2+PA28XD2*PA73+PA13*PA58XD2+PA13XD2*PA58**2+PA43*
8729. PA43XD2))+T8)+3*(SG(IM1,J,K))+(G1+C2+T4+T5+S+T3)+G1+C2+T4+T5)+3*(
8730. SG(I,J,K))+(G1+C2+T1+T2+S+G1+C2*(G1*(PA18*PA61+PA1*PA46+PA31**2)+1)
8731. **TO*(PA18*PA61XD2+PA18XD2*PA61+PA1*PA46XD2+PA1XD2*PA46**2+PA31*
8732. PA31XD2))+T3)/4.0
8733. DDPUXD2=DZETA(KLOW)=(-OZINFXD2+DDZXU=XIXX(J,I)*OXINFXD2)
8734. TO=XIXX(I,J,I)
8735. T1=1/DZETAC(K)
8736. AN1XD2=S*(DDPU=R1KXD2+TA33M+DDPUXD2=R1K+TA33M**2+TO+T1*OZINF=R1KXD2
8737. **2+TO+T1*OZINFXD2=R1K)
8738. C X D3
8739. TO=XIYX(J,I)
8740. T1=CC3*P138
8741. T2=CC1*P88
8742. T3=CC2*P113+S
8743. T4=S*(T3+T2+T1)
8744. T5=(T4+CC2*P114+S+CC1*P89+CC3*P139)+TA12+(S*(CC2*P112+S+CC1*P87+
8745. CC3*P137)+T3+T2+T1)+TA11
8746. T6=(S*(CC2*P108+S+CC1*P83+CC3*P133)+T3+T2+T1)+TAJ1
8747. T7=(T4+CC2*P118+S+CC1*P93+CC3*P143)+TAJ2
8748. T8=XIXX(J,I)
8749. DDPUXD3=DZETA(KLOW)=(DDZYXD3=(TO*(T7+T8)+(TO**2+T8**2)+T5+T6+
8750. OXINF)+DDZYXD3*(T7+T8+TO+T5))
8751. AN1XD3=DDPUXD3=R1K+S+TA33M
8752. C X D4
8753. TO=XIYX(J,I)
8754. T1=CC3*P138
8755. T2=CC1*P88
8756. T3=CC2*P113+S
8757. T4=S*(T3+T2+T1)
8758. T5=(T4+CC2*P114+S+CC1*P89+CC3*P139)+TA12+(S*(CC2*P112+S+CC1*P87+
8759. CC3*P137)+T3+T2+T1)+TA11
8760. T6=(S*(CC2*P108+S+CC1*P83+CC3*P133)+T3+T2+T1)+TAJ1
8761. T7=(T4+CC2*P118+S+CC1*P93+CC3*P143)+TAJ2
8762. T8=XIXX(J,I)
8763. DDPUXD4=DZETA(KLOW)=(DDZYXD4=(TO*(T7+T8)+(TO**2+T8**2)+T5+T6+
8764. OXINF)+DDZYXD4*(T7+T8+TO+T5))
8765. AN1XD4=DDPUXD4=R1K+S+TA33M
8766. C X D5
8767. TO=XIYX(J,I)
8768. T1=CC3*P138
8769. T2=CC1*P88
8770. T3=CC2*P113+S
8771. T4=S*(T3+T2+T1)
8772. T5=(T4+CC2*P114+S+CC1*P89+CC3*P139)+TA12+(S*(CC2*P112+S+CC1*P87+
8773. CC3*P137)+T3+T2+T1)+TA11
8774. T6=(S*(CC2*P108+S+CC1*P83+CC3*P133)+T3+T2+T1)+TAJ1
8775. T7=(T4+CC2*P118+S+CC1*P93+CC3*P143)+TAJ2
8776. T8=XIXX(J,I)
8777. DDPUXD5=DZETA(KLOW)=(DDZYXD5=(TO*(T7+T8)+(TO**2+T8**2)+T5+T6+
8778. OXINF)+DDZYXD5*(T7+T8+TO+T5))
8779. AN1XD5=DDPUXD5=R1K+S+TA33M
8780. C
8781. ENDP
8782. C
8783. IF (K.EQ.KLOW.AND.I.GE.ILE.AND.I.LE.ITE.AND.J.LE.JYPM1) THEN
8784. C
8785. P
8786. P11 = P(J,K-3,IM2)
8787. P12 = P(J,K-3,IM1)
8788. P13 = P(J,K-3,I)
8789. P14 = P(J,K-3,IP1)
8790. P33 = P(JM1,KM2,I)
8791. P38 = P(J,KM2,IM2)
8792. P37 = P(J,KM2,IM1)
8793. P36 = P(J,KM2,I)
8794. P39 = P(J,KM2,IP1)
8795. P43 = P(JM1,KM2,I)
8796. P88 = P(JM1,KM1,IM2)
8797. P87 = P(JM1,KM1,IM1)
8798. P86 = P(JM1,KM1,I)
8799. P89 = P(JM1,KM1,IP1)
8800. P61 = P(J,KM1,IM2)
8801. P62 = P(J,KM1,IM1)
8802. P63 = P(J,KM1,I)
8803. P64 = P(J,KM1,IP1)
8804. P66 = P(JP1,KM1,IM2)
8805. P67 = P(JP1,KM1,IM1)
8806. P68 = P(JP1,KM1,I)
8807. P69 = P(JP1,KM1,IP1)
8808. P61 = P(JM1,K,IM2)

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5808. P82 = P(JM1,K,IM1)
5809. P83 = P(JM1,K,1)
5810. P84 = P(JM1,K,IP1)
5811. P85 = P(J,K,IM2)
5812. P87 = P(J,K,IM1)
5813. P88 = P(J,K,1)
5814. P89 = P(J,K,IP1)
5815. P91 = P(JP1,K,IM2)
5816. P92 = P(JP1,K,IM1)
5817. P93 = P(JP1,K,1)
5818. P94 = P(JP1,K,IP1)
5819.
5820. C
5821. C
5822. C
5823. PB1 = DXII(I) = (P88+S+P89)+OXINF/XIXIP(J,I)
5824. PB2 = DXII(IM1) = (P87+S+P88)+OXINF/XIXIP(J,IM1)
5825. PB3 = DXII(IM2) = (P88+S+P87)+OXINF/XIXIP(J,IM2)
5826. PB7 = DXII(I) = (P83+S+P84)+OXINF/XIXIP(J,I)
5827. PB8 = DXII(IM1) = (P82+S+P83)+OXINF/XIXIP(J,IM1)
5828. PB9 = DXII(IM2) = (P81+S+P82)+OXINF/XIXIP(J,IM2)
5829. PB16 = XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1(J) = (P89+P88-P84-P83))/2.0
5830. PB17 = XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P93+P92-P86-P87)+AJ1(J) = (P86+P87-P83-P82))/2.0
5831. PB18 = XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P92+P91-P87-P86)+AJ1(J) = (P87+P86-P82-P81))/2.0
5832. PB22 = XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1(J) = (P84+P83-P59-P58))/2.0
5833. PB23 = XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P88+P87-P83-P82)+AJ1(J) = (P82+P82-P58-P57))/2.0
5834. PB24 = XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P87+P86-P82-P81)+AJ1(J) = (P82+P81-P57-P56))/2.0
5840. PB31 = OZINF*(DC4+P89+OC4+P88+DC5+P84+DC5+P83+DC6+P38+DC8+P36)/2.0
5841. PB32 = OZINF*(DC4+P88+DC4+P87+DC5+P83+DC5+P82+DC6+P38+DC8+P37)/2.0
5842. PB33 = OZINF*(DC4+P87+DC4+P86+DC5+P82+DC5+P81+DC6+P37+DC8+P36)/2.0
5843. PB37 = OZINF*(DC4+P84+DC4+P83+DC5+P39+DC5+P38+DC6+P14+DC6+P13)/2.0
5844. PB38 = OZINF*(DC4+P83+DC4+P82+DC5+P34+DC5+P37+DC6+P13+DC6+P12)/2.0
5845. PB39 = OZINF*(DC4+P82+DC4+P81+DC5+P37+DC5+P36+DC6+P12+DC6+P11)/2.0
5846. P848 = A11R(J,I) = (DXII(I) = (P88+S+P89)+OXINF/XIXIP(J,I) + XIXIP(J,I) = (XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1(J) = (P89+P88-P84-P83))/2.0)
5847. P847 = A11R(J,IM1) = (DXII(IM1) = (P87+S+P88)+OXINF/XIXIP(J,IM1) + XIXIP(J,IM1) = (XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P93+P92-P86-P87)+AJ1(J) = (P86+P87-P83-P82))/2.0)
5851. P848 = A11R(J,IM2) = (DXII(IM2) = (P88+S+P87)+OXINF/XIXIP(J,IM2) + XIXIP(J,IM2) = (XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P92+P91-P87-P86)+AJ1(J) = (P87+P86-P82-P81))/2.0)
5855. P852 = A11R(J,I) = (DXII(I) = (P83+S+P84)+OXINF/XIXIP(J,I) + XIXIP(J,I) = (XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1(J) = (P84+P83-P59-P58))/2.0)
5856. P853 = A11R(J,IM1) = (DXII(IM1) = (P82+S+P83)+OXINF/XIXIP(J,IM1) + XIXIP(J,IM1) = (XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P88+P87-P83-P82)+AJ1(J) = (P83+P82-P58-P57))/2.0)
5860. P854 = A11R(J,IM2) = (DXII(IM2) = (P81+S+P82)+OXINF/XIXIP(J,IM2) + XIXIP(J,IM2) = (XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P87+P86-P82-P81)+AJ1(J) = (P82+P81-P57-P56))/2.0)
5862. P861 = XIXIP(J,I) = (DXII(I) = (P88+S+P89)+OXINF/XIXIP(J,I) + XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P94+P93-P89-P88)+AJ1(J) = (P89+P88-P84-P83))/2.0)
5867. P862 = XIXIP(J,IM1) = (DXII(IM1) = (P87+S+P88)+OXINF/XIXIP(J,IM1) + XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P93+P92-P86-P87)+AJ1(J) = (P86+P87-P83-P82))/2.0)
5869. P863 = XIXIP(J,IM2) = (DXII(IM2) = (P88+S+P87)+OXINF/XIXIP(J,IM2) + XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P92+P91-P87-P86)+AJ1(J) = (P87+P86-P82-P81))/2.0)
5871. P867 = XIXIP(J,I) = (DXII(I) = (P83+S+P84)+OXINF/XIXIP(J,I) + XIXIP(J,I) = OXINF/S/XIXIP(J,I) + (AJ2(J) = (P89+P88-P84-P83)+AJ1(J) = (P84+P83-P59-P58))/2.0)
5872. P868 = XIXIP(J,IM1) = (DXII(IM1) = (P82+S+P83)+OXINF/XIXIP(J,IM1) + XIXIP(J,IM1) = OXINF/S/XIXIP(J,IM1) + (AJ2(J) = (P88+P87-P83-P82)+AJ1(J) = (P83+P82-P58-P57))/2.0)
5878. P869 = XIXIP(J,IM2) = (DXII(IM2) = (P81+S+P82)+OXINF/XIXIP(J,IM2) + XIXIP(J,IM2) = OXINF/S/XIXIP(J,IM2) + (AJ2(J) = (P87+P86-P82-P81)+AJ1(J) = (P82+P81-P57-P56))/2.0)
5881.
5882. C
5883. C
5884. C
5885. TO = (G1 = (PB17+PB62+PB2+PB47+PB32+2)+1) = G2
5886. T1 = (G1 = (PB18+PB63+PB3+PB48+PB33+2)+1) = G2
5887. T2 = (G1 = (PB53+PB8+PB23+PB88+PB38+2)+1) = G2
5888. T3 = (G1 = (PB54+PB9+PB24+PB89+PB39+2)+1) = G2
5889. RIKU(S = (SG(IM1,J,KM1) = (T3+S+T2)+T3)+S = (SG(I,J,KM1) = (T2+S+G1) = (PB52+PB7+PB22+PB67+PB37+2)+1) = G2)+T2)+3 = (SG(IM1,J,K) = (T1+S+TO) + T1)+3 = (SG(I,J,K) = (TO+S+(G1 = (PB16+PB61+PB1+PB46+PB31+2)+1) = G2) + TO))/4.0
5892. DDPL = DPLQ(J,I)
5893.
5894. C
5895. C
5896. C
5897. C
5898. C
5899. C
5900. C
5901. C
5902. C
5903. C
5904. C
5905. C
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5938. C
5939. C

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5940. T1=(G1+(PB17+PB62+PB2+PB47+PB32**2)+1)**TO
5941. T2=PB17+PB62XD1+PB17XD1+PB62+PB2+PB47XD1+PB2XD1+PB47+2+PB32=
5942. PB32XD1
5943. T3=G1+G2+T1+T2
5944. T4=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**TO
5945. T5=PB18+PB63XD1+PB18XD1+PB63+PB3+PB48XD1+PB3XD1+PB48+2+PB33=
5946. PB33XD1
5947. T6=(G1+(PB53+PB8+PB23+PB68+PB38**2)+1)**TO
5948. T7=PB53+PB8XD1+PB53XD1+PB8+PB23+PB68XD1+PB23XD1+PB68+2+PB38=
5949. PB38XD1
5950. T8=G1+G2+T8+T7
5951. T9=(G1+(PB54+PB9+PB24+PB69+PB39**2)+1)**TO
5952. T10=PB54+PB9XD1+PB54XD1+PB9+PB24+PB69XD1+PB24XD1+PB69+2+PB39=
5953. PB39XD1
5954. R1KUXD1=(S+(SG(IM1,J,KM1))+(G1+G2+T9+T10+S+T8)+G1+G2+T9+T10)+S+(SG(
5955. I,J,KM1))+(G1+G2+T8+T7+S+G1+G2+(G1+(PB52+PB7+PB22+PB67+PB37**2)+1)
5956. **TO+(PB52+PB7XD1+PB52XD1+PB7+PB22+PB67XD1+PB22XD1+PB67+2+PB37=
5957. PB37XD1))+T8)+3*(SG(IM1,J,K)+(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+3*(
5958. SG(I,J,K)+(G1+G2+T1+T2+S+G1+G2+(G1+(PB16+PB61+PB1+PB46+PB31**2)+1)
5959. **TO+(PB16+PB61XD1+PB16XD1+PB61+PB1+PB46XD1+PB1XD1+PB46+2+PB31=
5960. PB31XD1))+T3))/4.0
5961. DDPLXD1=DZETA(KLOW)=(-OZINFXD1+DDZXL=XIXX(J,I)=OXINFXD1)
5962. TO=XIXX1(J,I)
5963. T1=1/DZETAC(K)
5964. AN2XD1=DDPL=R1KUXD1+TA33P+DDPLXD1=R1KU+TA33P+2*TO=T1+OZINF=R1KUXD1
5965. +2*TO=T1+OZINFXD1=R1KU
5966.
5967. C XD2
5968. PB1XD2 = OXINFXD2/XIXIP(J,I)
5969. PB2XD2 = OXINFXD2/XIXIP(J,IM1)
5970. PB3XD2 = OXINFXD2/XIXIP(J,IM2)
5971. PB7XD2 = OXINFXD2/XIXIP(J,I)
5972. PB8XD2 = OXINFXD2/XIXIP(J,IM1)
5973. PB9XD2 = OXINFXD2/XIXIP(J,IM2)
5974. PB16XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)
5975. PB17XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)
5976. PB18XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)
5977. PB22XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)
5978. PB23XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)
5979. PB24XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)
5980. PB31XD2 = OZINFXD2
5981. PB32XD2 = OZINFXD2
5982. PB33XD2 = OZINFXD2
5983. PB37XD2 = OZINFXD2
5984. PB38XD2 = OZINFXD2
5985. PB39XD2 = OZINFXD2
5986. PB48XD2 = XIYIP(J,I)**2+OXINFXD2*S/XIXIP(J,I)+A11R(J,I)=OXINFXD2/
5987. XIXIP(J,I)
5988. PB47XD2 = XIYIP(J,IM1)**2+OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)=
5989. OXINFXD2/XIXIP(J,IM1)
5990. PB48XD2 = XIYIP(J,IM2)**2+OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)=
5991. OXINFXD2/XIXIP(J,IM2)
5992. PB52XD2 = XIYIP(J,I)**2+OXINFXD2*S/XIXIP(J,I)+A11R(J,I)=OXINFXD2/
5993. XIXIP(J,I)
5994. PB53XD2 = XIYIP(J,IM1)**2+OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)=
5995. OXINFXD2/XIXIP(J,IM1)
5996. PB54XD2 = XIYIP(J,IM2)**2+OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)=
5997. OXINFXD2/XIXIP(J,IM2)
5998. PB61XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD2/
5999. XIXIP(J,I)
6000. PB62XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
6001. OXINFXD2/XIXIP(J,IM1)
6002. PB63XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
6003. OXINFXD2/XIXIP(J,IM2)
6004. PB67XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD2/
6005. XIXIP(J,I)
6006. PB68XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
6007. OXINFXD2/XIXIP(J,IM1)
6008. PB69XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
6009. OXINFXD2/XIXIP(J,IM2)
6010. TO=G2-1
6011. T1=(G1+(PB17+PB62+PB2+PB47+PB32**2)+1)**TO
6012. T2=PB17+PB62XD2+PB17XD2+PB62+PB2+PB47XD2+PB2XD2+PB47+2+PB32=
6013. PB32XD2
6014. T3=G1+G2+T1+T2
6015. T4=(G1+(PB18+PB63+PB3+PB48+PB33**2)+1)**TO
6016. T5=PB18+PB63XD2+PB18XD2+PB63+PB3+PB48XD2+PB3XD2+PB48+2+PB33=
6017. PB33XD2
6018. T6=(G1+(PB53+PB8+PB23+PB68+PB38**2)+1)**TO
6019. T7=PB53+PB8XD2+PB53XD2+PB8+PB23+PB68XD2+PB23XD2+PB68+2+PB38=
6020. PB38XD2
6021. T8=G1+G2+T8+T7
6022. T9=(G1+(PB54+PB9+PB24+PB69+PB39**2)+1)**TO
6023. T10=PB54+PB9XD2+PB54XD2+PB9+PB24+PB69XD2+PB24XD2+PB69+2+PB39=
6024. PB39XD2
6025. R1KUXD2=(S+(SG(IM1,J,KM1))+(G1+G2+T9+T10+S+T8)+G1+G2+T9+T10)+S+(SG(
6026. I,J,KM1))+(G1+G2+T8+T7+S+G1+G2+(G1+(PB52+PB7+PB22+PB67+PB37**2)+1)
6027. **TO+(PB52+PB7XD2+PB52XD2+PB7+PB22+PB67XD2+PB22XD2+PB67+2+PB37=
6028. PB37XD2))+T8)+3*(SG(IM1,J,K)+(G1+G2+T4+T5+S+T3)+G1+G2+T4+T5)+3*(
6029. SG(I,J,K)+(G1+G2+T1+T2+S+G1+G2+(G1+(PB16+PB61+PB1+PB46+PB31**2)+1)
6030. **TO+(PB16+PB61XD2+PB16XD2+PB61+PB1+PB46XD2+PB1XD2+PB46+2+PB31=
6031. PB31XD2))+T3))/4.0
6032. DDPLXD2=DZETA(KLOW)=(-OZINFXD2+DDZXL=XIXX(J,I)=OXINFXD2)
6033. TO=XIXX1(J,I)
6034. T1=1/DZETAC(K)
6035. AN2XD2=DDPL=R1KUXD2+TA33P+DDPLXD2=R1KU+TA33P+2*TO=T1+OZINF=R1KUXD2
6036. +2*TO=T1+OZINFXD2=R1KU
6037.
6038. C XD3
6039. TO=XIYX(J,I)
6040. T1=CC8+P38
6041. T2=CC4+P88
6042. T3=CC5+P83+S
6043. T4=S+(T3+T2+T1)
6044. T5=(T4+CC5+P64+S+CC4+P89+CC8+P39)=TA12+(S+(CC5+P62+S+CC4+P87+CC6+
6045. P37)+T3+T2+T1)=TA11
6046. T6=(S+(CC5+P58+S+CC4+P83+CC8+P33)+T3+T2+T1)=TAJ1
6047. T7=(T4+CC5+P88+S+CC4+P83+CC8+P43)=TAJ2
6048. T8=XIXX1(J,I)
6049. DDPLXD3=DZETA(KLOW)=(DDZXLXD3=(TO+(T7+T6)+(TO**2+T8**2)+T5+T8=
6050. OXINF)+DDZYLXD3=(T7+T6+TO+T5))
6051. AN2XD3=DDPLXD3=R1KU+TA33P
6052.
6053. C XD4
6054. TO=XIYX(J,I)
6055. T1=CC8+P38
6056. T2=CC4+P88
6057. T3=CC5+P83+S
6058. T4=S+(T3+T2+T1)
6059. T5=(T4+CC5+P64+S+CC4+P89+CC8+P39)=TA12+(S+(CC5+P62+S+CC4+P87+CC6+
6060. P37)+T3+T2+T1)=TA11
6061. T6=(S+(CC5+P58+S+CC4+P83+CC8+P33)+T3+T2+T1)=TAJ1
6062. T7=(T4+CC5+P88+S+CC4+P83+CC8+P43)=TAJ2
6063. T8=XIXX1(J,I)
6064. DDPLXD4=DZETA(KLOW)=(DDZXLXD4=(TO+(T7+T6)+(TO**2+T8**2)+T5+T8=
6065. OXINF)+DDZYLXD4=(T7+T6+TO+T5))
6066. AN2XD4=DDPLXD4=R1KU+TA33P
6067.
6068. C XD5
6069. TO=XIYX(J,I)
6070. T1=CC8+P38
6071. T2=CC4+P88
6072. T3=CC5+P83+S
6073. T4=S+(T3+T2+T1)
6074. T5=(T4+CC5+P64+S+CC4+P89+CC8+P39)=TA12+(S+(CC5+P62+S+CC4+P87+CC6+
6075. P37)+T3+T2+T1)=TA11

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8072. T6:=(S+(CC5+P58+S+CC4+P83+CC8+P33)+T3+T2+T1)+TAJ1
8073. T7:=(T4+CC5+P68+S+CC4+P93+CC8+P43)+TAJ2
8074. T8:=XIXX(J,I)
8075. DOPLKDS+DZETA(KLOW)=(DDZLXDS+(TO*(T7+T8)+(TO**2+T8**2))+T5+T8*
8076. QXINF)+DDZYLXDS*(T7+T8+TO+T5))
8077. AN2XDS+DDPLXDS=R1KU+TAJ3P
8078.
8079. C
8080. ENDIF
8081. C
8082. IF (K.EQ.KUP.AND.I.GT.ITE.AND.J.LE.JTPM1) THEN
8083. C
8084. C
8085. C
8086. C
8087. P
8088. P36 = P(J,KM2,IM2)
8089. P37 = P(J,KM2,IM1)
8090. P38 = P(J,KM2,I)
8091. P39 = P(J,KM2,IP1)
8092. P56 = P(JM1,KM1,IM2)
8093. P57 = P(JM1,KM1,IM1)
8094. P58 = P(JM1,KM1,I)
8095. P59 = P(JM1,KM1,IP1)
8096. P61 = P(J,KM1,IM2)
8097. P62 = P(J,KM1,IM1)
8098. P63 = P(J,KM1,I)
8099. P64 = P(J,KM1,IP1)
8100. P66 = P(JP1,KM1,IM2)
8101. P67 = P(JP1,KM1,IM1)
8102. P68 = P(JP1,KM1,I)
8103. P69 = P(JP1,KM1,IP1)
8104. P81 = P(JM1,K,IM2)
8105. P82 = P(JM1,K,IM1)
8106. P83 = P(JM1,K,I)
8107. P84 = P(JM1,K,IP1)
8108. P86 = P(J,K,IM2)
8109. P87 = P(J,K,IM1)
8110. P88 = P(J,K,I)
8111. P89 = P(JP1,K,IP1)
8112. P91 = P(JP1,K,IM2)
8113. P92 = P(JP1,K,IM1)
8114. P93 = P(JP1,K,I)
8115. P94 = P(JP1,K,IP1)
8116. P111 = P(J,KP1,IM2)
8117. P112 = P(J,KP1,IM1)
8118. P113 = P(J,KP1,I)
8119. P114 = P(J,KP1,IP1)
8120. P182 = P(J,KLOW-2,ITE)
8121. P183 = P(J,KLOW-1,ITE)
8122. P184 = P(J,KLOW,ITE)
8123. P185 = P(J,KUP,ITE)
8124. P186 = P(J,KUP+1,ITE)
8125. P187 = P(J,KUP+2,ITE)
8126. C
8127. C
8128. C
8129. PC
8130. PC1 = DXII(I)=(P88+S+P89)+OXINF/XIXIP(J,I)
8131. PC2 = DXII(IM1)=(P87+S+P88)+OXINF/XIXIP(J,IM1)
8132. PC3 = DXII(IM2)=(P86+S+P87)+OXINF/XIXIP(J,IM2)
8133. PC7 = DXII(I)=(P83+S+P84)+OXINF/XIXIP(J,I)
8134. PC8 = DXII(IM1)=(P82+S+P83)+OXINF/XIXIP(J,IM1)
8135. PC9 = DXII(IM2)=(P81+S+P82)+OXINF/XIXIP(J,IM2)
8136. PC16 = XIXIP(J,I)=OXINF*S/XIXIP(J,I)+(AJ2(J)=(P84+P93-P88-P86)+AJ1
8137. (J)=(P88+P89-P84-P83))/2.0
8138. PC17 = XIXIP(J,IM1)=OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P93+P92-P88-P87)
8139. +AJ1(J)=(P89+P87-P83-P82))/2.0
8140. PC18 = XIXIP(J,IM2)=OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P92+P91-P87-P86)
8141. +AJ1(J)=(P87+P86-P82-P81))/2.0
8142. PC22 = XIXIP(J,I)=OXINF*S/XIXIP(J,I)+(AJ2(J)=(P89+P88-P84-P83)+AJ1
8143. (J)=(P84+P83-P89-P88))/2.0
8144. PC23 = XIXIP(J,IM1)=OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P88+P87-P83-P82)
8145. +AJ1(J)=(P83+P82-P88-P87))/2.0
8146. PC24 = XIXIP(J,IM2)=OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P87+P86-P82-P81)
8147. +AJ1(J)=(P82+P81-P87-P86))/2.0
8148. PC31 = -(A1K(K)=(CC2+P186+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
8149. P185+CC5+P183))+OZINF+(A1K(K)=(P89+P88-P84-P83)+A2K(K)=(-P89-P88+
8150. P114+P113))/2.0
8151. PC32 = -(A1K(K)=(CC2+P186+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
8152. P185+CC5+P183))+OZINF+(A1K(K)=(P87+P86-P82-P81)+A2K(K)=(-P87-P86+
8153. P112+P111))/2.0
8154. PC33 = -(A1K(KM1)=(CC2+P186+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
8155. P185+CC5+P183))+OZINF+(A2K(KM1)=(P89+P88-P84-P83)+A1K(KM1)=(P84+
8156. P83-P38-P39))/2.0
8157. PC34 = -(A1K(KM1)=(CC2+P186+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
8158. P185+CC5+P183))+OZINF+(A2K(KM1)=(P88+P87-P83-P82)+A1K(KM1)=(P83+
8159. P82-P38-P37))/2.0
8160. PC38 = -(A1K(KM1)=(CC2+P186+S+CC4+P184+S+CC8+P182+S+CC3+P187+CC1+
8161. P185+CC5+P183))+OZINF+(A2K(KM1)=(P87+P86-P82-P81)+A1K(KM1)=(P82+
8162. P81-P37-P36))/2.0
8163. PC46 = A1R(J,I)=(DXII(I)=(P88+S+P89)+OXINF/XIXIP(J,I))+XIXIP(J,I)
8164. =(XIXIP(J,I)+OXINF*S/XIXIP(J,I)+(AJ2(J)=(P94+P93-P89-P86)+AJ1(J)=
8165. (P89+P88-P84-P83))/2.0)
8166. PC47 = A1R(J,IM1)=(DXII(IM1)=(P87+S+P88)+OXINF/XIXIP(J,IM1))+
8167. XIXIP(J,IM1)=(XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P93+P92-
8168. P88-P87)+AJ1(J)=(P88+P87-P83-P82))/2.0)
8169. PC48 = A1R(J,IM2)=(DXII(IM2)=(P86+S+P87)+OXINF/XIXIP(J,IM2))+
8170. XIXIP(J,IM2)=(XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P92+P91-
8171. P87-P86)+AJ1(J)=(P87+P86-P82-P81))/2.0)
8172. PC52 = A1R(J,I)=(DXII(I)=(P83+S+P84)+OXINF/XIXIP(J,I))+XIXIP(J,I)
8173. =(XIXIP(J,I)+OXINF*S/XIXIP(J,I)+(AJ2(J)=(P89+P88-P84-P83)+AJ1(J)=
8174. (P84+P83-P59-P58))/2.0)
8175. PC53 = A1R(J,IM1)=(DXII(IM1)=(P82+S+P83)+OXINF/XIXIP(J,IM1))+
8176. XIXIP(J,IM1)=(XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P88+P87-
8177. P83-P82)+AJ1(J)=(P83+P82-P58-P57))/2.0)
8178. PC54 = A1R(J,IM2)=(DXII(IM2)=(P81+S+P82)+OXINF/XIXIP(J,IM2))+
8179. XIXIP(J,IM2)=(XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P87+P86-
8180. P82-P81)+AJ1(J)=(P82+P81-P57-P56))/2.0)
8181. PC61 = XIXIP(J,I)=(DXII(I)=(P88+S+P89)+OXINF/XIXIP(J,I))+XIXIP(J,I)
8182. +OXINF*S/XIXIP(J,I)+(AJ2(J)=(P94+P93-P89-P86)+AJ1(J)=(P89+P88-
8183. P84-P83))/2.0
8184. PC62 = XIXIP(J,IM1)=(DXII(IM1)=(P87+S+P88)+OXINF/XIXIP(J,IM1))+
8185. XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P93+P92-P88-P87)+AJ1(J)
8186. =(P88+P87-P83-P82))/2.0
8187. PC63 = XIXIP(J,IM2)=(DXII(IM2)=(P86+S+P87)+OXINF/XIXIP(J,IM2))+
8188. XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P92+P91-P87-P86)+AJ1(J)
8189. =(P87+P86-P82-P81))/2.0
8190. PC67 = XIXIP(J,I)=(DXII(I)=(P83+S+P84)+OXINF/XIXIP(J,I))+XIXIP(J,I)
8191. +OXINF*S/XIXIP(J,I)+(AJ2(J)=(P89+P88-P84-P83)+AJ1(J)=(P84+P83-
8192. P59-P58))/2.0
8193. PC68 = XIXIP(J,IM1)=(DXII(IM1)=(P82+S+P83)+OXINF/XIXIP(J,IM1))+
8194. XIXIP(J,IM1)+OXINF*S/XIXIP(J,IM1)+(AJ2(J)=(P88+P87-P83-P82)+AJ1(J)
8195. =(P83+P82-P58-P57))/2.0
8196. PC69 = XIXIP(J,IM2)=(DXII(IM2)=(P81+S+P82)+OXINF/XIXIP(J,IM2))+
8197. XIXIP(J,IM2)+OXINF*S/XIXIP(J,IM2)+(AJ2(J)=(P87+P86-P82-P81)+AJ1(J)
8198. =(P82+P81-P57-P56))/2.0
8199. C
8200. C
8201. R2KW,CIR
8202. T0:(G1=(PC17+PC2+PC2+PC47+PC32**2)+1)**G2
8203. T1:(G1=(PC18+PC3+PC3+PC48+PC33**2)+1)**G2
8204. T2:(G1=(PC53+PC8+PC23+PC88+PC38**2)+1)**G2

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8204. T3=[G1=(PC54+PC9+PC24+PC88+PC38**2)+1]**G2
8205. R2KW1=[SG(IM1,J,KM1)=[T3*S+T2]+SG(I,J,KM1)=[T2*S+(G1=(PC52+PC7+PC22
8206. **PC67+PC37**2)+1)**G2]+SG(IM1,J,K)=[T1*S+T0]+SG(I,J,K)=[T0*S+(G1=
8207. (PC18+PC61+PC1+PC48+PC31**2)+1)**G2]+T3+T2+T1+T0]/4.0
8208. CIR=CIRC(J)
8209.
8210. C
8211. C
8212. DANOF13
8213. C XD1
8214. PC1XD1 = OXINFXD1/XIXIP(J,I)
8215. PC2XD1 = OXINFXD1/XIXIP(J,IM1)
8216. PC3XD1 = OXINFXD1/XIXIP(J,IM2)
8217. PC7XD1 = OXINFXD1/XIXIP(J,I)
8218. PC8XD1 = OXINFXD1/XIXIP(J,IM1)
8219. PC9XD1 = OXINFXD1/XIXIP(J,IM2)
8220. PC18XD1 = XIYIP(J,I)=OXINFXD1*S/XIXIP(J,I)
8221. PC17XD1 = XIYIP(J,IM1)=OXINFXD1*S/XIXIP(J,IM1)
8222. PC18XD1 = XIYIP(J,IM2)=OXINFXD1*S/XIXIP(J,IM2)
8223. PC22XD1 = XIYIP(J,I)=OXINFXD1*S/XIXIP(J,I)
8224. PC23XD1 = XIYIP(J,IM1)=OXINFXD1*S/XIXIP(J,IM1)
8225. PC24XD1 = XIYIP(J,IM2)=OXINFXD1*S/XIXIP(J,IM2)
8226. PC31XD1 = OZINFXD1
8227. PC32XD1 = OZINFXD1
8228. PC33XD1 = OZINFXD1
8229. PC37XD1 = OZINFXD1
8230. PC38XD1 = OZINFXD1
8231. PC39XD1 = OZINFXD1
8232. PC48XD1 = XIYIP(J,I)**2=OXINFXD1*S/XIXIP(J,I)+A11R(J,I)+OXINFXD1/
8233. XIXIP(J,I)
8234. PC47XD1 = XIYIP(J,IM1)**2=OXINFXD1*S/XIXIP(J,IM1)+A11R(J,IM1)+
8235. OXINFXD1/XIXIP(J,IM1)
8236. PC48XD1 = XIYIP(J,IM2)**2=OXINFXD1*S/XIXIP(J,IM2)+A11R(J,IM2)+
8237. OXINFXD1/XIXIP(J,IM2)
8238. PC52XD1 = XIYIP(J,I)**2=OXINFXD1*S/XIXIP(J,I)+A11R(J,I)+OXINFXD1/
8239. XIXIP(J,I)
8240. PC53XD1 = XIYIP(J,IM1)**2=OXINFXD1*S/XIXIP(J,IM1)+A11R(J,IM1)+
8241. OXINFXD1/XIXIP(J,IM1)
8242. PC54XD1 = XIYIP(J,IM2)**2=OXINFXD1*S/XIXIP(J,IM2)+A11R(J,IM2)+
8243. OXINFXD1/XIXIP(J,IM2)
8244. PC81XD1 = XIYIP(J,I)+OXINFXD1*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD1/
8245. XIXIP(J,I)
8246. PC82XD1 = XIYIP(J,IM1)+OXINFXD1*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8247. OXINFXD1/XIXIP(J,IM1)
8248. PC83XD1 = XIYIP(J,IM2)+OXINFXD1*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8249. OXINFXD1/XIXIP(J,IM2)
8250. PC67XD1 = XIYIP(J,I)+OXINFXD1*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD1/
8251. XIXIP(J,I)
8252. PC68XD1 = XIYIP(J,IM1)+OXINFXD1*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8253. OXINFXD1/XIXIP(J,IM1)
8254. PC69XD1 = XIYIP(J,IM2)+OXINFXD1*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8255. OXINFXD1/XIXIP(J,IM2)
8256. TO=G2-1
8257. T1=[G1=(PC17+PC82+PC2+PC47+PC32**2)+1]**TO
8258. T2=PC17+PC82XD1+PC17XD1+PC82+PC2+PC47XD1+PC2XD1+PC47+2+PC32+
8259. PC32XD1
8260. T3=G1+G2+T1+T2
8261. T4=[G1=(PC18+PC83+PC3+PC48+PC33**2)+1]**TO
8262. T5=PC18+PC83XD1+PC18XD1+PC83+PC3+PC48XD1+PC3XD1+PC48+2+PC33+
8263. PC33XD1
8264. T6=[G1=(PC53+PC8+PC23+PC68+PC38**2)+1]**TO
8265. T7=PC53+PC8XD1+PC53XD1+PC8+PC23+PC68XD1+PC23XD1+PC68+2+PC38+
8266. PC38XD1
8267. T8=G1+G2+T6+T7
8268. T9=[G1=(PC54+PC9+PC24+PC89+PC39**2)+1]**TO
8269. T10=PC54+PC9XD1+PC54XD1+PC9+PC24+PC89XD1+PC24XD1+PC89+2+PC39+
8270. PC39XD1
8271. R2KW2=[SG(IM1,J,KM1)=[G1+G2+T8+T10+S+T8]+SG(I,J,KM1)=[G1+G2+T8+
8272. T7+S+G1+G2+(G1=(PC52+PC7+PC22+PC67+PC37**2)+1)**TO+(PC52+PC7XD1+
8273. PC52XD1+PC7+PC22+PC67XD1+PC22XD1+PC67+2+PC37+PC37XD1)]+SG(IM1,J,K
8274. )=[G1+G2+T4+T5+S+T3]+SG(I,J,K)=[G1+G2+T1+T2+S+G1+G2+(G1=(PC18+
8275. PC61+PC1+PC48+PC31**2)+1)**TO+(PC18+PC61XD1+PC18XD1+PC61+PC1+
8276. PC48XD1+PC1XD1+PC48+2+PC31+PC31XD1)]+G1+G2+T8+T10+T8+G1+G2+T4+T5+
8277. T3]/4.0
8278. AN3XD1=CIR+R2KW21+TA33M
8279. C XD2
8280. PC1XD2 = OXINFXD2/XIXIP(J,I)
8281. PC2XD2 = OXINFXD2/XIXIP(J,IM1)
8282. PC3XD2 = OXINFXD2/XIXIP(J,IM2)
8283. PC7XD2 = OXINFXD2/XIXIP(J,I)
8284. PC8XD2 = OXINFXD2/XIXIP(J,IM1)
8285. PC9XD2 = OXINFXD2/XIXIP(J,IM2)
8286. PC18XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)
8287. PC17XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)
8288. PC18XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)
8289. PC22XD2 = XIYIP(J,I)=OXINFXD2*S/XIXIP(J,I)
8290. PC23XD2 = XIYIP(J,IM1)=OXINFXD2*S/XIXIP(J,IM1)
8291. PC24XD2 = XIYIP(J,IM2)=OXINFXD2*S/XIXIP(J,IM2)
8292. PC31XD2 = OZINFXD2
8293. PC32XD2 = OZINFXD2
8294. PC33XD2 = OZINFXD2
8295. PC37XD2 = OZINFXD2
8296. PC38XD2 = OZINFXD2
8297. PC39XD2 = OZINFXD2
8298. PC48XD2 = XIYIP(J,I)**2=OXINFXD2*S/XIXIP(J,I)+A11R(J,I)+OXINFXD2/
8299. XIXIP(J,I)
8300. PC47XD2 = XIYIP(J,IM1)**2=OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)+
8301. OXINFXD2/XIXIP(J,IM1)
8302. PC48XD2 = XIYIP(J,IM2)**2=OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)+
8303. OXINFXD2/XIXIP(J,IM2)
8304. PC52XD2 = XIYIP(J,I)**2=OXINFXD2*S/XIXIP(J,I)+A11R(J,I)+OXINFXD2/
8305. XIXIP(J,I)
8306. PC53XD2 = XIYIP(J,IM1)**2=OXINFXD2*S/XIXIP(J,IM1)+A11R(J,IM1)+
8307. OXINFXD2/XIXIP(J,IM1)
8308. PC54XD2 = XIYIP(J,IM2)**2=OXINFXD2*S/XIXIP(J,IM2)+A11R(J,IM2)+
8309. OXINFXD2/XIXIP(J,IM2)
8310. PC81XD2 = XIYIP(J,I)+OXINFXD2*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD2/
8311. XIXIP(J,I)
8312. PC82XD2 = XIYIP(J,IM1)+OXINFXD2*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8313. OXINFXD2/XIXIP(J,IM1)
8314. PC83XD2 = XIYIP(J,IM2)+OXINFXD2*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8315. OXINFXD2/XIXIP(J,IM2)
8316. PC67XD2 = XIYIP(J,I)+OXINFXD2*S/XIXIP(J,I)+XIYIP(J,I)=OXINFXD2/
8317. XIXIP(J,I)
8318. PC68XD2 = XIYIP(J,IM1)+OXINFXD2*S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8319. OXINFXD2/XIXIP(J,IM1)
8320. PC69XD2 = XIYIP(J,IM2)+OXINFXD2*S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8321. OXINFXD2/XIXIP(J,IM2)
8322. TO=G2-1
8323. T1=[G1=(PC17+PC82+PC2+PC47+PC32**2)+1]**TO
8324. T2=PC17+PC82XD2+PC17XD2+PC82+PC2+PC47XD2+PC2XD2+PC47+2+PC32+
8325. PC32XD2
8326. T3=G1+G2+T1+T2
8327. T4=[G1=(PC18+PC83+PC3+PC48+PC33**2)+1]**TO
8328. T5=PC18+PC83XD2+PC18XD2+PC83+PC3+PC48XD2+PC3XD2+PC48+2+PC33+
8329. PC33XD2
8330. T6=[G1=(PC53+PC8+PC23+PC68+PC38**2)+1]**TO
8331. T7=PC53+PC8XD2+PC53XD2+PC8+PC23+PC68XD2+PC23XD2+PC68+2+PC38+
8332. PC38XD2
8333. T8=G1+G2+T6+T7
8334. T9=[G1=(PC54+PC9+PC24+PC89+PC39**2)+1]**TO
8335. T10=PC54+PC9XD2+PC54XD2+PC9+PC24+PC89XD2+PC24XD2+PC89+2+PC39+
8336. PC39XD2
8337. R2KW2=[SG(IM1,J,KM1)=[G1+G2+T9+T10+S+T8]+SG(I,J,KM1)=[G1+G2+T8+

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6335. T7=S+G1*G2*(G1={PC52=PC7+PC22+PC67+PC37=*2+1})==TO={PC52=PC7XD2+
6337. PC52XD2+PC7+PC22+PC67XD2+PC22XD2+PC67*2+PC37=PC37XD2}+SG{IM1,J,K
6338. }=(G1=G2+T4+T5+S+T3)+SG{I,J,K}={G1=G2+T1+T2+S-G1+G2=(G1={PC16=
6339. PC81+PC1=PC46+PC31=*2+1})==TO={PC16=PC81XD2+PC16XD2=PC81+PC1=
6340. PC46XD2+PC1XD2=PC46*2=PC31+PC31XD2}}+G1*G2+T8+T10+T8+G1*G2+T4+T5+
6341. T3)/4.0
6342. AN3XD2=C1R=R2KWXD2=TA33M
6343.
C
6344. ENDF
6345.
C
6346. IF (K.EQ.KLOW.AND.I.GT.ITE.AND.J.LE.JTPI1) THEN
6347.
C
6348. P
6349.
C
6350. P61 = P(J,KM1,IM2)
6351. P62 = P(J,KM1,IM1)
6352. P63 = P(J,KM1,I)
6353. P64 = P(J,KM1,IP1)
6354. P65 = P(JM1,K,IM2)
6355. P66 = P(JM1,K,IM1)
6356. P67 = P(JM1,K,I)
6357. P68 = P(JM1,K,IP1)
6358. P69 = P(J,K,IM2)
6359. P70 = P(J,K,IM1)
6360. P71 = P(J,K,I)
6361. P72 = P(J,K,IP1)
6362. P73 = P(JP1,K,IM2)
6363. P74 = P(JP1,K,IM1)
6364. P75 = P(JP1,K,I)
6365. P76 = P(JP1,K,IP1)
6366. P77 = P(JM1,KP1,IM2)
6367. P78 = P(JM1,KP1,IM1)
6368. P79 = P(JM1,KP1,I)
6369. P80 = P(JM1,KP1,IP1)
6370. P81 = P(J,KP1,IM2)
6371. P82 = P(J,KP1,IM1)
6372. P83 = P(J,KP1,I)
6373. P84 = P(J,KP1,IP1)
6374. P85 = P(JP1,KP1,IM2)
6375. P86 = P(JP1,KP1,IM1)
6376. P87 = P(JP1,KP1,I)
6377. P88 = P(JP1,KP1,IP1)
6378. P89 = P(J,KP2,IM2)
6379. P90 = P(J,KP2,IM1)
6380. P91 = P(J,KP2,I)
6381. P92 = P(J,KP2,IP1)
6382. P93 = P(J,KLOW-2,ITE)
6383. P94 = P(J,KLOW-1,ITE)
6384. P95 = P(J,KLOW,ITE)
6385. P96 = P(J,KUP,ITE)
6386. P97 = P(J,KUP+1,ITE)
6387. P98 = P(J,KUP+2,ITE)
6388.
C
6389. PD
6390.
C
6391. PD1 = DXII(I)={P88+S+P89}+OXINF/XIXIP(J,I)
6392. PD2 = DXII(IM1)={P87+S+P88}+OXINF/XIXIP(J,IM1)
6393. PD3 = DXII(IM2)={P86+S+P87}+OXINF/XIXIP(J,IM2)
6394. PD13 = DXII(I)={P113+S+P114}+OXINF/XIXIP(J,I)
6395. PD14 = DXII(IM1)={P112+S+P113}+OXINF/XIXIP(J,IM1)
6396. PD15 = DXII(IM2)={P111+S+P112}+OXINF/XIXIP(J,IM2)
6397. PD16 = XIXIP(J,I)+OXINF/S/XIXIP(J,I)+{AJ2(J)={P84+P83-P89-P88}+AJ1
6398. (J)={P89+P88-P84-P83}}/2.0
6399. PD17 = XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P83+P82-P88-P87}
6400. +AJ1(J)={P88+P87-P83-P82}}/2.0
6401. PD18 = XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P82+P81-P87-P86}
6402. +AJ1(J)={P87+P86-P82-P81}}/2.0
6403. PD28 = XIXIP(J,I)+OXINF/S/XIXIP(J,I)+{AJ2(J)={P119+P118-P114-P113}
6404. +AJ1(J)={P114+P113-P108-P107}}/2.0
6405. PD29 = XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P118+P117-P113-
6406. P112}+AJ1(J)={P113+P112-P108-P107}}/2.0
6407. PD30 = XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P117+P116-P112-
6408. P111}+AJ1(J)={P112+P111-P107-P106}}/2.0
6409. PD31 = -{AZK(K)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6410. P185+CC3+P183}}+OXINF+{A1K(K)={P88+P87-P83-P82}+A2K(K)={-P88-P87+
6411. P114+P113}}/2.0
6412. PD32 = -{AZK(K)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6413. P185+CC3+P183}}+OXINF+{A1K(K)={P88+P87-P83-P82}+A2K(K)={-P88-P87+
6414. P113+P112}}/2.0
6415. PD33 = -{AZK(K)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6416. P185+CC3+P183}}+OXINF+{A1K(K)={P87+P86-P82-P81}+A2K(K)={-P87-P86+
6417. P112+P111}}/2.0
6418. PD43 = -{AZK(KP1)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6419. P185+CC3+P183}}+OXINF+{A1K(KP1)={-P89-P88+P114+P113}+A2K(KP1)={
6420. P139+P138-P114-P113}}/2.0
6421. PD44 = -{AZK(KP1)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6422. P185+CC3+P183}}+OXINF+{A1K(KP1)={-P88-P87+P113+P112}+A2K(KP1)={
6423. P138+P137-P113-P112}}/2.0
6424. PD45 = -{AZK(KP1)={CC2+P186+S+CC4+P184+S+CC5+P182+S+CC3+P187+CC1+
6425. P185+CC3+P183}}+OXINF+{A1K(KP1)={-P87-P86+P112+P111}+A2K(KP1)={
6426. P137+P136-P112-P111}}/2.0
6427. PD46 = A1R(J,I)={DXII(I)={P88+S+P89}+OXINF/XIXIP(J,I)+XIXIP(J,I)
6428. }+XIXIP(J,I)+OXINF/S/XIXIP(J,I)+{AJ2(J)={P84+P83-P89-P88}+AJ1(J)={
6429. P88+P86-P83}}/2.0
6430. PD47 = A1R(J,IM1)={DXII(IM1)={P87+S+P88}+OXINF/XIXIP(J,IM1)+
6431. XIXIP(J,IM1)={XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P83+P82-
6432. P88-P87}+AJ1(J)={P88+P87-P83-P82}}/2.0
6433. PD48 = A1R(J,IM2)={DXII(IM2)={P86+S+P87}+OXINF/XIXIP(J,IM2)+
6434. XIXIP(J,IM2)={XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P82+P81-
6435. P87-P86}+AJ1(J)={P87+P86-P82-P81}}/2.0
6436. PD56 = A1R(J,I)={DXII(I)={P113+S+P114}+OXINF/XIXIP(J,I)+XIXIP(J,
6437. I)={XIXIP(J,I)+OXINF/S/XIXIP(J,I)+{AJ2(J)={P119+P118-P114-P113}+
6438. AJ1(J)={P114+P113-P108-P107}}/2.0
6439. PD59 = A1R(J,IM1)={DXII(IM1)={P112+S+P113}+OXINF/XIXIP(J,IM1)+
6440. XIXIP(J,IM1)={XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P118+
6441. P117-P113-P112}+AJ1(J)={P113+P112-P108-P107}}/2.0
6442. PD60 = A1R(J,IM2)={DXII(IM2)={P111+S+P112}+OXINF/XIXIP(J,IM2)+
6443. XIXIP(J,IM2)={XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P117+
6444. P116-P112-P111}+AJ1(J)={P112+P111-P107-P106}}/2.0
6445. PD61 = XIXIP(J,I)={DXII(I)={P88+S+P89}+OXINF/XIXIP(J,I)+XIXIP(J,I)
6446. }+OXINF/S/XIXIP(J,I)+{AJ2(J)={P84+P83-P89-P88}+AJ1(J)={P88+P86-
6447. P84-P83}}/2.0
6448. PD62 = XIXIP(J,IM1)={DXII(IM1)={P87+S+P88}+OXINF/XIXIP(J,IM1)+
6449. XIXIP(J,IM1)={XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P83+P82-P88-P87}+AJ1(J)
6450. }={P88+P87-P83-P82}}/2.0
6451. PD63 = XIXIP(J,IM2)={DXII(IM2)={P86+S+P87}+OXINF/XIXIP(J,IM2)+
6452. XIXIP(J,IM2)={XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P82+P81-P87-P86}+AJ1(J)
6453. }={P87+P86-P82-P81}}/2.0
6454. PD73 = XIXIP(J,I)={DXII(I)={P113+S+P114}+OXINF/XIXIP(J,I)+XIXIP(J,
6455. I)={XIXIP(J,I)+OXINF/S/XIXIP(J,I)+{AJ2(J)={P119+P118-P114-P113}+AJ1(J)={P114
6456. +P113-P108-P107}}/2.0
6457. PD74 = XIXIP(J,IM1)={DXII(IM1)={P112+S+P113}+OXINF/XIXIP(J,IM1)+
6458. XIXIP(J,IM1)={XIXIP(J,IM1)+OXINF/S/XIXIP(J,IM1)+{AJ2(J)={P118+P117-P113-P112}+
6459. AJ1(J)={P113+P112-P108-P107}}/2.0
6460. PD75 = XIXIP(J,IM2)={DXII(IM2)={P111+S+P112}+OXINF/XIXIP(J,IM2)+
6461. XIXIP(J,IM2)={XIXIP(J,IM2)+OXINF/S/XIXIP(J,IM2)+{AJ2(J)={P117+P116-P112-P111}+
6462. AJ1(J)={P112+P111-P107-P106}}/2.0
6463.
C
6464. R2KP,CIR
6465.
C
6466. TO={G1={PD17+PD62+PD2+PD47+PD32=*2+1}}==G2
6467. T1={G1={PD16+PD63+PD3+PD46+PD33=*2+1}}==G2

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8488. T2: (G1={PD29+PD74+PD14+PD59+PD44==2})+1==G2
8489. T3: (G1={PD30+PD75+PD15+PD60+PD45==2})+1==G2
8470. R2KP1={SG(IM1,J,KP1)}={T3+S+T2+SG(I,J,KP1)}={T2+S+(G1={PD28+PD73+
8471. PD13+PD58+PD43==2})+1}+G2)-SG(IM1,J,K)}={T1+S+T0)+SG(I,J,K)}={T0+S+
8472. (G1={PD18+PD61+PD1+PD48+PD31==2})+1}+G2)+T3+T2+T1+T0)/4.0
8473. CIR=CIRC(J)
8474.
C
8475. DANOF14
8476.
C X01
8477. PD1XD1 = QXINFXD1/XIXIP(J,I)
8478. PD2XD1 = QXINFXD1/XIXIP(J,IM1)
8479. PD3XD1 = QXINFXD1/XIXIP(J,IM2)
8480. PD13XD1 = QXINFXD1/XIXIP(J,I)
8481. PD14XD1 = QXINFXD1/XIXIP(J,IM1)
8482. PD15XD1 = QXINFXD1/XIXIP(J,IM2)
8483. PD16XD1 = XIYIP(J,I)=QXINFXD1=S/XIXIP(J,I)
8484. PD17XD1 = XIYIP(J,IM1)=QXINFXD1=S/XIXIP(J,IM1)
8485. PD18XD1 = XIYIP(J,IM2)=QXINFXD1=S/XIXIP(J,IM2)
8486. PD28XD1 = XIYIP(J,I)=QXINFXD1=S/XIXIP(J,I)
8487. PD29XD1 = XIYIP(J,IM1)=QXINFXD1=S/XIXIP(J,IM1)
8488. PD30XD1 = XIYIP(J,IM2)=QXINFXD1=S/XIXIP(J,IM2)
8489. PD31XD1 = QZINFXD1
8490. PD32XD1 = QZINFXD1
8491. PD33XD1 = QZINFXD1
8492. PD43XD1 = QZINFXD1
8493. PD44XD1 = QZINFXD1
8494. PD45XD1 = QZINFXD1
8495. PD46XD1 = XIYIP(J,I)==2*QXINFXD1=S/XIXIP(J,I)+A11R(J,I)=QXINFXD1/
8496. XIXIP(J,I)
8497. PD47XD1 = XIYIP(J,IM1)==2*QXINFXD1=S/XIXIP(J,IM1)+A11R(J,IM1)=
8498. QXINFXD1/XIXIP(J,IM1)
8499. PD48XD1 = XIYIP(J,IM2)==2*QXINFXD1=S/XIXIP(J,IM2)+A11R(J,IM2)=
8500. QXINFXD1/XIXIP(J,IM2)
8501. PD58XD1 = XIYIP(J,I)==2*QXINFXD1=S/XIXIP(J,I)+A11R(J,I)=QXINFXD1/
8502. XIXIP(J,I)
8503. PD59XD1 = XIYIP(J,IM1)==2*QXINFXD1=S/XIXIP(J,IM1)+A11R(J,IM1)=
8504. QXINFXD1/XIXIP(J,IM1)
8505. PD60XD1 = XIYIP(J,IM2)==2*QXINFXD1=S/XIXIP(J,IM2)+A11R(J,IM2)=
8506. QXINFXD1/XIXIP(J,IM2)
8507. PD61XD1 = XIYIP(J,I)=QXINFXD1=S/XIXIP(J,I)+XIYIP(J,I)=QXINFXD1/
8508. XIXIP(J,I)
8509. PD62XD1 = XIYIP(J,IM1)=QXINFXD1=S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8510. QXINFXD1/XIXIP(J,IM1)
8511. PD63XD1 = XIYIP(J,IM2)=QXINFXD1=S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8512. QXINFXD1/XIXIP(J,IM2)
8513. PD73XD1 = XIYIP(J,I)=QXINFXD1=S/XIXIP(J,I)+XIYIP(J,I)=QXINFXD1/
8514. XIXIP(J,I)
8515. PD74XD1 = XIYIP(J,IM1)=QXINFXD1=S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8516. QXINFXD1/XIXIP(J,IM1)
8517. PD75XD1 = XIYIP(J,IM2)=QXINFXD1=S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8518. QXINFXD1/XIXIP(J,IM2)
8519. T0=G2-1
8520. T1: (G1={PD17+PD62+PD2+PD47+PD32==2})+1==T0
8521. T2+PD17+PD62XD1+PD17XD1+PD62+PD2+PD47XD1+PD2XD1=PD47+2+PD32=
8522. PD32XD1
8523. T3+G1+G2=T1+T2
8524. T4: (G1={PD18+PD63+PD3+PD48+PD33==2})+1==T0
8525. T5+PD18+PD63XD1+PD18XD1+PD63+PD3+PD48XD1+PD3XD1=PD48+2+PD33=
8526. PD33XD1
8527. T6: (G1={PD29+PD74+PD14+PD59+PD44==2})+1==T0
8528. T7+PD29+PD74XD1+PD29XD1+PD74+PD14+PD59XD1+PD14XD1=PD59+2+PD44=
8529. PD44XD1
8530. T8+G1+G2=T6+T7
8531. T9: (G1={PD30+PD75+PD15+PD60+PD45==2})+1==T0
8532. T10+PD30+PD75XD1+PD30XD1+PD75+PD15+PD60XD1+PD15XD1=PD60+2+PD45=
8533. PD45XD1
8534. R2KPD1={SG(IM1,J,KP1)}={G1+G2+T9+T10+S+T8)+SG(I,J,KP1)}={G1+G2+T8+
8535. T7+S+G1+G2+G1={PD28+PD73+PD13+PD58+PD43==2})+1}+T0={PD28+PD73XD1+
8536. PD28XD1+PD73+PD13+PD58XD1+PD13XD1+PD58+2+PD43+PD43XD1)}-SG(IM1,J
8537. ,K)}={G1+G2+T4+T5+S+T3)+SG(I,J,K)}={G1+G2+T1+T2+S+G1+G2+G1={PD18+
8538. PD61+PD1+PD48+PD31==2})+1}+T0={PD18+PD61XD1+PD18XD1+PD61+PD1=
8539. PD48XD1+PD1XD1+PD48+2+PD31+PD31XD1)}+G1+G2+T9+T10+T8+G1+G2+T4+T5+
8540. T3)/4.0
8541. AN4XD1=CIR=R2KPD1=S+TA33P
8542.
C X02
8543. PD1XD2 = QXINFXD2/XIXIP(J,I)
8544. PD2XD2 = QXINFXD2/XIXIP(J,IM1)
8545. PD3XD2 = QXINFXD2/XIXIP(J,IM2)
8546. PD13XD2 = QXINFXD2/XIXIP(J,I)
8547. PD14XD2 = QXINFXD2/XIXIP(J,IM1)
8548. PD15XD2 = QXINFXD2/XIXIP(J,IM2)
8549. PD16XD2 = XIYIP(J,I)=QXINFXD2=S/XIXIP(J,I)
8550. PD17XD2 = XIYIP(J,IM1)=QXINFXD2=S/XIXIP(J,IM1)
8551. PD18XD2 = XIYIP(J,IM2)=QXINFXD2=S/XIXIP(J,IM2)
8552. PD28XD2 = XIYIP(J,I)=QXINFXD2=S/XIXIP(J,I)
8553. PD29XD2 = XIYIP(J,IM1)=QXINFXD2=S/XIXIP(J,IM1)
8554. PD30XD2 = XIYIP(J,IM2)=QXINFXD2=S/XIXIP(J,IM2)
8555. PD31XD2 = QZINFXD2
8556. PD32XD2 = QZINFXD2
8557. PD33XD2 = QZINFXD2
8558. PD43XD2 = QZINFXD2
8559. PD44XD2 = QZINFXD2
8560. PD45XD2 = QZINFXD2
8561. PD46XD2 = XIYIP(J,I)==2*QXINFXD2=S/XIXIP(J,I)+A11R(J,I)=QXINFXD2/
8562. XIXIP(J,I)
8563. PD47XD2 = XIYIP(J,IM1)==2*QXINFXD2=S/XIXIP(J,IM1)+A11R(J,IM1)=
8564. QXINFXD2/XIXIP(J,IM1)
8565. PD48XD2 = XIYIP(J,IM2)==2*QXINFXD2=S/XIXIP(J,IM2)+A11R(J,IM2)=
8566. QXINFXD2/XIXIP(J,IM2)
8567. PD58XD2 = XIYIP(J,I)==2*QXINFXD2=S/XIXIP(J,I)+A11R(J,I)=QXINFXD2/
8568. XIXIP(J,I)
8569. PD59XD2 = XIYIP(J,IM1)==2*QXINFXD2=S/XIXIP(J,IM1)+A11R(J,IM1)=
8570. QXINFXD2/XIXIP(J,IM1)
8571. PD60XD2 = XIYIP(J,IM2)==2*QXINFXD2=S/XIXIP(J,IM2)+A11R(J,IM2)=
8572. QXINFXD2/XIXIP(J,IM2)
8573. PD61XD2 = XIYIP(J,I)=QXINFXD2=S/XIXIP(J,I)+XIYIP(J,I)=QXINFXD2/
8574. XIXIP(J,I)
8575. PD62XD2 = XIYIP(J,IM1)=QXINFXD2=S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8576. QXINFXD2/XIXIP(J,IM1)
8577. PD63XD2 = XIYIP(J,IM2)=QXINFXD2=S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8578. QXINFXD2/XIXIP(J,IM2)
8579. PD73XD2 = XIYIP(J,I)=QXINFXD2=S/XIXIP(J,I)+XIYIP(J,I)=QXINFXD2/
8580. XIXIP(J,I)
8581. PD74XD2 = XIYIP(J,IM1)=QXINFXD2=S/XIXIP(J,IM1)+XIYIP(J,IM1)=
8582. QXINFXD2/XIXIP(J,IM1)
8583. PD75XD2 = XIYIP(J,IM2)=QXINFXD2=S/XIXIP(J,IM2)+XIYIP(J,IM2)=
8584. QXINFXD2/XIXIP(J,IM2)
8585. T0=G2-1
8586. T1: (G1={PD17+PD62+PD2+PD47+PD32==2})+1==T0
8587. T2+PD17+PD62XD2+PD17XD2+PD62+PD2+PD47XD2+PD2XD2=PD47+2+PD32=
8588. PD32XD2
8589. T3+G1+G2=T1+T2
8590. T4: (G1={PD18+PD63+PD3+PD48+PD33==2})+1==T0
8591. T5+PD18+PD63XD2+PD18XD2+PD63+PD3+PD48XD2+PD3XD2=PD48+2+PD33=
8592. PD33XD2
8593. T6: (G1={PD29+PD74+PD14+PD59+PD44==2})+1==T0
8594. T7+PD29+PD74XD2+PD29XD2+PD74+PD14+PD59XD2+PD14XD2=PD59+2+PD44=
8595. PD44XD2
8596. T8+G1+G2=T6+T7
8597. T9: (G1={PD30+PD75+PD15+PD60+PD45==2})+1==T0
8598. T10+PD30+PD75XD2+PD30XD2+PD75+PD15+PD60XD2+PD15XD2=PD60+2+PD45=
8599. PD45XD2

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8600. R2KPX02*(SG(IM1,J,KP1))*(G1*G2*T8+T10+S-T4)+SG(I,J,KP1)*(G1*G2*T6*
8601. T7+S*G1*G2*(G1*(PD28+PD73+PD13+PD58+PD43**2)+1)**+TO*(PD28+PD73XD2
8602. +PD28XD2*PD73+PD13+PD58XD2+PD13XD2+PD58+2*PD43+PD43XD2))+SG(IM1,J
8603. ,K)*(G1*G2*T4+T5+S+T3)+SG(I,J,K)*(G1*G2*T1+T2+S*G1*G2*(G1*(PD16*
8604. PD61+PD1*PD46+PD31**2)+1)**+TO*(PD16+PD61XD2+PD16XD2+PD61+PD1*
8605. PD46XD2+PD1XD2+PD46+2*PD31+PD31XD2))+G1*G2*T8+T10+T8+G1*G2*T4+T5*
8606. T3)/4.0
8607. AN4XD2+CIR=R2KPX02*S*TA33P
8608.
8609. ENDIF
8610.
8611. C
8612. RNSM = RESXD1 + AN1XD1 + AN2XD1 + AN3XD1 + AN4XD1
8613. RNSA = RESXD2 + AN1XD2 + AN2XD2 + AN3XD2 + AN4XD2
8614. RNSM = AN1XD3 + AN2XD3
8615. RNSC = AN1XD4 + AN2XD4
8616. RNSL = AN1XD5 + AN2XD5
8617.
8618. C
8619. RETURN
8620. END
8621. SUBROUTINE RE(J,I,K,JJ,II,KK,M)
8622. RE.POR
8623.
8624. C
8625. INCLUDE (INTROM)
8626.
8627. C P36
8628. IF (CND(II,JJ,KK,IM2,J,KM2)) THEN
8629. M = 1
8630.
8631. C P37
8632. ELSEIF (CND(II,JJ,KK,IM1,J,KM2)) THEN
8633. M = 1
8634.
8635. C P38
8636. ELSEIF (CND(II,JJ,KK,I,J,KM2)) THEN
8637. M = 1
8638.
8639. C P39
8640. ELSEIF (CND(II,JJ,KK,IP1,J,KM2)) THEN
8641. M = 1
8642.
8643. C P56
8644. ELSEIF (CND(II,JJ,KK,IM2,JM1,KM1)) THEN
8645. M = 1
8646.
8647. C P57
8648. ELSEIF (CND(II,JJ,KK,IM1,JM1,KM1)) THEN
8649. M = 1
8650.
8651. C P58
8652. ELSEIF (CND(II,JJ,KK,I,JM1,KM1)) THEN
8653. M = 1
8654.
8655. C P59
8656. ELSEIF (CND(II,JJ,KK,IP1,JM1,KM1)) THEN
8657. M = 1
8658.
8659. C P61
8660. ELSEIF (CND(II,JJ,KK,IM2,J,KM1)) THEN
8661. M = 1
8662.
8663. C P62
8664. ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
8665. M = 1
8666.
8667. C P63
8668. ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
8669. M = 1
8670.
8671. C P64
8672. ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
8673. M = 1
8674.
8675. C P66
8676. ELSEIF (CND(II,JJ,KK,IM2,JP1,KM1)) THEN
8677. M = 1
8678.
8679. C P67
8680. ELSEIF (CND(II,JJ,KK,IM1,JP1,KM1)) THEN
8681. M = 1
8682.
8683. C P68
8684. ELSEIF (CND(II,JJ,KK,I,JP1,KM1)) THEN
8685. M = 1
8686.
8687. C P69
8688. ELSEIF (CND(II,JJ,KK,IP1,JP1,KM1)) THEN
8689. M = 1
8690.
8691. C P76
8692. ELSEIF (CND(II,JJ,KK,IM2,JM2,K)) THEN
8693. M = 1
8694.
8695. C P77
8696. ELSEIF (CND(II,JJ,KK,IM1,JM2,K)) THEN
8697. M = 1
8698.
8699. C P78
8700. ELSEIF (CND(II,JJ,KK,I,JM2,K)) THEN
8701. M = 1
8702.
8703. C P79
8704. ELSEIF (CND(II,JJ,KK,IP1,JM2,K)) THEN
8705. M = 1
8706.
8707. C P81
8708. ELSEIF (CND(II,JJ,KK,IM2,JM1,K)) THEN
8709. M = 1
8710.
8711. C P82
8712. ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
8713. M = 1
8714.
8715. C P83
8716. ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
8717. M = 1
8718.
8719. C P84
8720. ELSEIF (CND(II,JJ,KK,IP1,JM1,K)) THEN
8721. M = 1
8722.
8723. C P86
8724. ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
8725. M = 1
8726.
8727. C P87
8728. ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
8729. M = 1
8730.
8731. C P88
8732. ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
8733. M = 1
8734.
8735. C P89
8736. ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
8737. M = 1
8738.
8739. C P91
8740. ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
8741. M = 1
8742.
8743. C P92
8744. ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
8745. M = 1
8746.
8747. C P93
8748. ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
8749. M = 1
8750.
8751. C P94
8752. ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
8753. M = 1
8754.
8755. C P96
8756. ELSEIF (CND(II,JJ,KK,IM2,JP2,K)) THEN
8757. M = 1
8758.
8759. C P97
8760. ELSEIF (CND(II,JJ,KK,IM1,JP2,K)) THEN
8761. M = 1
8762.
8763. C P98
8764. ELSEIF (CND(II,JJ,KK,I,JP2,K)) THEN
8765. M = 1
8766.
8767. C P99
8768. ELSEIF (CND(II,JJ,KK,IP1,JP2,K)) THEN
8769. M = 1
8770.
8771. C P100

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8732. ELSEIF (CND(II,JJ,KK,IM2,JM1,KP1)) THEN
8733. M = 1
8734. C P107
8735. ELSEIF (CND(II,JJ,KK,IM1,JM1,KP1)) THEN
8736. M = 1
8737. C P108
8738. ELSEIF (CND(II,JJ,KK,I,JM1,KP1)) THEN
8739. M = 1
8740. C P109
8741. ELSEIF (CND(II,JJ,KK,IP1,JM1,KP1)) THEN
8742. M = 1
8743. C P111
8744. ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN
8745. M = 1
8746. C P112
8747. ELSEIF (CND(II,JJ,KK,IM1,J,KP1)) THEN
8748. M = 1
8749. C P113
8750. ELSEIF (CND(II,JJ,KK,I,J,KP1)) THEN
8751. M = 1
8752. C P114
8753. ELSEIF (CND(II,JJ,KK,IP1,J,KP1)) THEN
8754. M = 1
8755. C P116
8756. ELSEIF (CND(II,JJ,KK,IM2,JP1,KP1)) THEN
8757. M = 1
8758. C P117
8759. ELSEIF (CND(II,JJ,KK,IM1,JP1,KP1)) THEN
8760. M = 1
8761. C P118
8762. ELSEIF (CND(II,JJ,KK,I,JP1,KP1)) THEN
8763. M = 1
8764. C P119
8765. ELSEIF (CND(II,JJ,KK,IP1,JP1,KP1)) THEN
8766. M = 1
8767. C P136
8768. ELSEIF (CND(II,JJ,KK,IM2,J,KP2)) THEN
8769. M = 1
8770. C P137
8771. ELSEIF (CND(II,JJ,KK,IM1,J,KP2)) THEN
8772. M = 1
8773. C P138
8774. ELSEIF (CND(II,JJ,KK,I,J,KP2)) THEN
8775. M = 1
8776. C P139
8777. ELSEIF (CND(II,JJ,KK,IP1,J,KP2)) THEN
8778. M = 1
8779. ENDIF
8780. C
8781. RETURN
8782. END
8783. SUBROUTINE RIE(J,I,K,JJ,II,KK,MM)
8784. C
8785. RIE.FOR
8786. C
8787. INCLUDE (INTRM)
8788. C P81
8789. IF (CND(II,JJ,KK,IM2,JM1,K)) THEN
8790. MM = 1
8791. C P82
8792. ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
8793. MM = 1
8794. C P83
8795. ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
8796. MM = 1
8797. C P84
8798. ELSEIF (CND(II,JJ,KK,IP1,JM1,K)) THEN
8799. MM = 1
8800. C P86
8801. ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
8802. MM = 1
8803. C P87
8804. ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
8805. MM = 1
8806. C P88
8807. ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
8808. MM = 1
8809. C P89
8810. ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
8811. MM = 1
8812. C P91
8813. ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
8814. MM = 1
8815. C P92
8816. ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
8817. MM = 1
8818. C P93
8819. ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
8820. MM = 1
8821. C P94
8822. ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
8823. MM = 1
8824. C P108
8825. ELSEIF (CND(II,JJ,KK,IM2,JM1,KP1)) THEN
8826. MM = 1
8827. C P107
8828. ELSEIF (CND(II,JJ,KK,IM1,JM1,KP1)) THEN
8829. MM = 1
8830. C P108
8831. ELSEIF (CND(II,JJ,KK,I,JM1,KP1)) THEN
8832. MM = 1
8833. C P109
8834. ELSEIF (CND(II,JJ,KK,IP1,JM1,KP1)) THEN
8835. MM = 1
8836. C P111
8837. ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN
8838. MM = 1
8839. C P112
8840. ELSEIF (CND(II,JJ,KK,IM1,J,KP1)) THEN
8841. MM = 1
8842. C P113
8843. ELSEIF (CND(II,JJ,KK,I,J,KP1)) THEN
8844. MM = 1
8845. C P114
8846. ELSEIF (CND(II,JJ,KK,IP1,J,KP1)) THEN
8847. MM = 1
8848. C P116
8849. ELSEIF (CND(II,JJ,KK,IM2,JP1,KP1)) THEN
8850. MM = 1
8851. C P117
8852. ELSEIF (CND(II,JJ,KK,IM1,JP1,KP1)) THEN
8853. MM = 1
8854. C P118
8855. ELSEIF (CND(II,JJ,KK,I,JP1,KP1)) THEN
8856. MM = 1
8857. C P119
8858. ELSEIF (CND(II,JJ,KK,IP1,JP1,KP1)) THEN
8859. MM = 1
8860. C P133
8861. ELSEIF (CND(II,JJ,KK,I,JM1,KP2)) THEN
8862. MM = 1
8863. C P136
8864. ELSEIF (CND(II,JJ,KK,IM2,J,KP2)) THEN

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0054. MM = 1
0055. C P137
0056. ELSEIF (CND(II,JJ,KK,IM1,J,KP2)) THEN
0057. MM = 1
0058. C P138
0059. ELSEIF (CND(II,JJ,KK,I,J,KP2)) THEN
0060. MM = 1
0061. C P139
0062. ELSEIF (CND(II,JJ,KK,IP1,J,KP2)) THEN
0063. MM = 1
0064. C P143
0065. ELSEIF (CND(II,JJ,KK,I,JP1,KP2)) THEN
0066. MM = 1
0067. C P161
0068. ELSEIF (CND(II,JJ,KK,IM2,J,K+3)) THEN
0069. MM = 1
0070. C P162
0071. ELSEIF (CND(II,JJ,KK,IM1,J,K+3)) THEN
0072. MM = 1
0073. C P163
0074. ELSEIF (CND(II,JJ,KK,I,J,K+3)) THEN
0075. MM = 1
0076. C P164
0077. ELSEIF (CND(II,JJ,KK,IP1,J,K+3)) THEN
0078. MM = 1
0079. ENDIF
0080. C
0081. RETURN
0082. END
0083. SUBROUTINE R2E(J,I,K,JJ,II,KK,MM)
0084. R2E.FOR
0085. C
0086. INCLUDE (INTROM)
0087. C P11
0088. IF (CND(II,JJ,KK,IM2,J,K-3)) THEN
0089. MM = 1
0090. C P12
0091. ELSEIF (CND(II,JJ,KK,IM1,J,K-3)) THEN
0092. MM = 1
0093. C P13
0094. ELSEIF (CND(II,JJ,KK,I,J,K-3)) THEN
0095. MM = 1
0096. C P14
0097. ELSEIF (CND(II,JJ,KK,IP1,J,K-3)) THEN
0098. MM = 1
0099. C P33
0100. ELSEIF (CND(II,JJ,KK,I,JM1,KM2)) THEN
0101. MM = 1
0102. C P36
0103. ELSEIF (CND(II,JJ,KK,IM2,J,KM2)) THEN
0104. MM = 1
0105. C P37
0106. ELSEIF (CND(II,JJ,KK,IM1,J,KM2)) THEN
0107. MM = 1
0108. C P38
0109. ELSEIF (CND(II,JJ,KK,I,J,KM2)) THEN
0110. MM = 1
0111. C P39
0112. ELSEIF (CND(II,JJ,KK,IP1,J,KM2)) THEN
0113. MM = 1
0114. C P43
0115. ELSEIF (CND(II,JJ,KK,I,JP1,KM2)) THEN
0116. MM = 1
0117. C P58
0118. ELSEIF (CND(II,JJ,KK,IM2,JM1,KM1)) THEN
0119. MM = 1
0120. C P57
0121. ELSEIF (CND(II,JJ,KK,IM1,JM1,KM1)) THEN
0122. MM = 1
0123. C P56
0124. ELSEIF (CND(II,JJ,KK,I,JM1,KM1)) THEN
0125. MM = 1
0126. C P59
0127. ELSEIF (CND(II,JJ,KK,IP1,JM1,KM1)) THEN
0128. MM = 1
0129. C P61
0130. ELSEIF (CND(II,JJ,KK,IM2,J,KM1)) THEN
0131. MM = 1
0132. C P62
0133. ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
0134. MM = 1
0135. C P63
0136. ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
0137. MM = 1
0138. C P64
0139. ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
0140. MM = 1
0141. C P68
0142. ELSEIF (CND(II,JJ,KK,IM2,JP1,KM1)) THEN
0143. MM = 1
0144. C P67
0145. ELSEIF (CND(II,JJ,KK,IM1,JP1,KM1)) THEN
0146. MM = 1
0147. C P66
0148. ELSEIF (CND(II,JJ,KK,I,JP1,KM1)) THEN
0149. MM = 1
0150. C P69
0151. ELSEIF (CND(II,JJ,KK,IP1,JP1,KM1)) THEN
0152. MM = 1
0153. C P81
0154. ELSEIF (CND(II,JJ,KK,IM2,JM1,K)) THEN
0155. MM = 1
0156. C P82
0157. ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
0158. MM = 1
0159. C P83
0160. ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
0161. MM = 1
0162. C P84
0163. ELSEIF (CND(II,JJ,KK,IP1,JM1,K)) THEN
0164. MM = 1
0165. C P86
0166. ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
0167. MM = 1
0168. C P87
0169. ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
0170. MM = 1
0171. C P88
0172. ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
0173. MM = 1
0174. C P88
0175. ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
0176. MM = 1
0177. C P91
0178. ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
0179. MM = 1
0180. C P92
0181. ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
0182. MM = 1
0183. C P93
0184. ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
0185. MM = 1

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8996. C P94
8997.     ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
8998.     MM = 1
8999.     ENDIF
9000. C
9001.     RETURN
9002.     END
9003.     SUBROUTINE R3E(J,I,K,JJ,II,KK,MM)
9004.     R3E.FOR
9005. C
9006.     INCLUDE (INTRM)
9007. C P36
9008.     IF (CND(II,JJ,KK,IM2,J,KM2)) THEN
9009.     MM = 1
9010. C P37
9011.     ELSEIF (CND(II,JJ,KK,IM1,J,KM2)) THEN
9012.     MM = 1
9013. C P38
9014.     ELSEIF (CND(II,JJ,KK,I,J,KM2)) THEN
9015.     MM = 1
9016. C P39
9017.     ELSEIF (CND(II,JJ,KK,IP1,J,KM2)) THEN
9018.     MM = 1
9019. C P56
9020.     ELSEIF (CND(II,JJ,KK,IM2,JM1,KM1)) THEN
9021.     MM = 1
9022. C P57
9023.     ELSEIF (CND(II,JJ,KK,IM1,JM1,KM1)) THEN
9024.     MM = 1
9025. C P58
9026.     ELSEIF (CND(II,JJ,KK,I,JM1,KM1)) THEN
9027.     MM = 1
9028. C P59
9029.     ELSEIF (CND(II,JJ,KK,IP1,JM1,KM1)) THEN
9030.     MM = 1
9031. C P61
9032.     ELSEIF (CND(II,JJ,KK,IM2,J,KM1)) THEN
9033.     MM = 1
9034. C P62
9035.     ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
9036.     MM = 1
9037. C P63
9038.     ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
9039.     MM = 1
9040. C P64
9041.     ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
9042.     MM = 1
9043. C P66
9044.     ELSEIF (CND(II,JJ,KK,IM2,JP1,KM1)) THEN
9045.     MM = 1
9046. C P67
9047.     ELSEIF (CND(II,JJ,KK,IM1,JP1,KM1)) THEN
9048.     MM = 1
9049. C P68
9050.     ELSEIF (CND(II,JJ,KK,I,JP1,KM1)) THEN
9051.     MM = 1
9052. C P69
9053.     ELSEIF (CND(II,JJ,KK,IP1,JP1,KM1)) THEN
9054.     MM = 1
9055. C P81
9056.     ELSEIF (CND(II,JJ,KK,IM2,JM1,K)) THEN
9057.     MM = 1
9058. C P82
9059.     ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
9060.     MM = 1
9061. C P83
9062.     ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
9063.     MM = 1
9064. C P84
9065.     ELSEIF (CND(II,JJ,KK,IP1,JM1,K)) THEN
9066.     MM = 1
9067. C P86
9068.     ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
9069.     MM = 1
9070. C P87
9071.     ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
9072.     MM = 1
9073. C P88
9074.     ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
9075.     MM = 1
9076. C P89
9077.     ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
9078.     MM = 1
9079. C P91
9080.     ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
9081.     MM = 1
9082. C P92
9083.     ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
9084.     MM = 1
9085. C P93
9086.     ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
9087.     MM = 1
9088. C P94
9089.     ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
9090.     MM = 1
9091. C P111
9092.     ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN
9093.     MM = 1
9094. C P112
9095.     ELSEIF (CND(II,JJ,KK,IM1,J,KP1)) THEN
9096.     MM = 1
9097. C P113
9098.     ELSEIF (CND(II,JJ,KK,I,J,KP1)) THEN
9099.     MM = 1
9100. C P114
9101.     ELSEIF (CND(II,JJ,KK,IP1,J,KP1)) THEN
9102.     MM = 1
9103. C P162
9104.     ELSEIF (CND(II,JJ,KK,ITE,J,KLOW-2)) THEN
9105.     MM = 1
9106. C P163
9107.     ELSEIF (CND(II,JJ,KK,ITE,J,KLOW-1)) THEN
9108.     MM = 1
9109. C P164
9110.     ELSEIF (CND(II,JJ,KK,ITE,J,KLDW)) THEN
9111.     MM = 1
9112. C P165
9113.     ELSEIF (CND(II,JJ,KK,ITE,J,KUP)) THEN
9114.     MM = 1
9115. C P166
9116.     ELSEIF (CND(II,JJ,KK,ITE,J,KUP+1)) THEN
9117.     MM = 1
9118. C P167
9119.     ELSEIF (CND(II,JJ,KK,ITE,J,KUP+2)) THEN
9120.     MM = 1
9121.     ENDIF
9122. C
9123.     RETURN
9124.     END
9125.     SUBROUTINE R4E(J,I,K,JJ,II,KK,MM)
9126.     R4E.FOR
9127. C

```

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7128.      INCLUDE (INTROM)
7129.      C P61      IF (CND(II,JJ,KK,IM2,J,KM1)) THEN
7130.              MM = 1
7131.      C P62      ELSEIF (CND(II,JJ,KK,IM1,J,KM1)) THEN
7132.              MM = 1
7133.      C P63      ELSEIF (CND(II,JJ,KK,I,J,KM1)) THEN
7134.              MM = 1
7135.      C P64      ELSEIF (CND(II,JJ,KK,IP1,J,KM1)) THEN
7136.              MM = 1
7137.      C P65      ELSEIF (CND(II,JJ,KK,IM2,JM1,K)) THEN
7138.              MM = 1
7139.      C P66      ELSEIF (CND(II,JJ,KK,IM1,JM1,K)) THEN
7140.              MM = 1
7141.      C P67      ELSEIF (CND(II,JJ,KK,I,JM1,K)) THEN
7142.              MM = 1
7143.      C P68      ELSEIF (CND(II,JJ,KK,IP1,JM1,K)) THEN
7144.              MM = 1
7145.      C P69      ELSEIF (CND(II,JJ,KK,IM2,J,K)) THEN
7146.              MM = 1
7147.      C P70      ELSEIF (CND(II,JJ,KK,IM1,J,K)) THEN
7148.              MM = 1
7149.      C P71      ELSEIF (CND(II,JJ,KK,I,J,K)) THEN
7150.              MM = 1
7151.      C P72      ELSEIF (CND(II,JJ,KK,IP1,J,K)) THEN
7152.              MM = 1
7153.      C P73      ELSEIF (CND(II,JJ,KK,IM2,JP1,K)) THEN
7154.              MM = 1
7155.      C P74      ELSEIF (CND(II,JJ,KK,IM1,JP1,K)) THEN
7156.              MM = 1
7157.      C P75      ELSEIF (CND(II,JJ,KK,I,JP1,K)) THEN
7158.              MM = 1
7159.      C P76      ELSEIF (CND(II,JJ,KK,IP1,JP1,K)) THEN
7160.              MM = 1
7161.      C P77      ELSEIF (CND(II,JJ,KK,IM2,JM1,KP1)) THEN
7162.              MM = 1
7163.      C P78      ELSEIF (CND(II,JJ,KK,IM1,JM1,KP1)) THEN
7164.              MM = 1
7165.      C P79      ELSEIF (CND(II,JJ,KK,I,JM1,KP1)) THEN
7166.              MM = 1
7167.      C P80      ELSEIF (CND(II,JJ,KK,IP1,JM1,KP1)) THEN
7168.              MM = 1
7169.      C P81      ELSEIF (CND(II,JJ,KK,IM2,J,KP1)) THEN
7170.              MM = 1
7171.      C P82      ELSEIF (CND(II,JJ,KK,IM1,J,KP1)) THEN
7172.              MM = 1
7173.      C P83      ELSEIF (CND(II,JJ,KK,I,J,KP1)) THEN
7174.              MM = 1
7175.      C P84      ELSEIF (CND(II,JJ,KK,IP1,J,KP1)) THEN
7176.              MM = 1
7177.      C P85      ELSEIF (CND(II,JJ,KK,IM2,JP1,KP1)) THEN
7178.              MM = 1
7179.      C P86      ELSEIF (CND(II,JJ,KK,IM1,JP1,KP1)) THEN
7180.              MM = 1
7181.      C P87      ELSEIF (CND(II,JJ,KK,I,JP1,KP1)) THEN
7182.              MM = 1
7183.      C P88      ELSEIF (CND(II,JJ,KK,IP1,JP1,KP1)) THEN
7184.              MM = 1
7185.      C P89      ELSEIF (CND(II,JJ,KK,IM2,J,KP2)) THEN
7186.              MM = 1
7187.      C P90      ELSEIF (CND(II,JJ,KK,IM1,J,KP2)) THEN
7188.              MM = 1
7189.      C P91      ELSEIF (CND(II,JJ,KK,I,J,KP2)) THEN
7190.              MM = 1
7191.      C P92      ELSEIF (CND(II,JJ,KK,IP1,J,KP2)) THEN
7192.              MM = 1
7193.      C P93      ELSEIF (CND(II,JJ,KK,IM2,JP1,KP2)) THEN
7194.              MM = 1
7195.      C P94      ELSEIF (CND(II,JJ,KK,IM1,JP1,KP2)) THEN
7196.              MM = 1
7197.      C P95      ELSEIF (CND(II,JJ,KK,I,JP1,KP2)) THEN
7198.              MM = 1
7199.      C P96      ELSEIF (CND(II,JJ,KK,IP1,JP1,KP2)) THEN
7200.              MM = 1
7201.      C P97      ELSEIF (CND(II,JJ,KK,ITE,J,KLOW-2)) THEN
7202.              MM = 1
7203.      C P98      ELSEIF (CND(II,JJ,KK,ITE,J,KLOW-1)) THEN
7204.              MM = 1
7205.      C P99      ELSEIF (CND(II,JJ,KK,ITE,J,KLOW)) THEN
7206.              MM = 1
7207.      C P100     ELSEIF (CND(II,JJ,KK,ITE,J,KUP)) THEN
7208.              MM = 1
7209.      C P101     ELSEIF (CND(II,JJ,KK,ITE,J,KUP+1)) THEN
7210.              MM = 1
7211.      C P102     ELSEIF (CND(II,JJ,KK,ITE,J,KUP+2)) THEN
7212.              MM = 1
7213.      C          ENDIF
7214.      C          RETURN
7215.      C          END
7216.
7244.
7245.
7246.

```

# APPENDIX D

MACSYMA CODE TO FIND THE SENSITIVITY  
OF THE PRESSURE COEFFICIENT WITH RESPECT TO  
THE DESIGN VARIABLES



```

/*-----*/
/* RC.MAC : SENSITIVITY OF CP W.R.T. XD'S */
/* DESIGN VARIABLES : [XD1, XD2, XD3, XD4, XD5] = [MACH, AOAR, T, C, L] */
/*-----*/
( SHOWTIME : TRUE, ROINF : (1+G1*QINF#2) * G2 )$

FU (I,J) := CC1*P(J,K,I) + S*CC2*P(J,K+1,I) + CC3*P(J,K+2,I)$
FXU() := TAI1*(FU(I,J)+S*FU(I-1,J)) + TAI2*(FU(I+1,J)+S*FU(I,J))
        + QXINF*XIXXI(J,I)$
FYU() := TAJ1*(FU(I,J)+S*FU(I,J-1)) + TAJ2*(FU(I,J+1)+S*FU(I,J))
        - QXINF*XIXXI(J,I)*XIYX(J,I)$
UU () := (XIXX(J,I)#2+XIYX(J,I)#2)*FXU() + XIYX(J,I)*FYU()$
VU () := XIYX(J,I)*FXU() + FYU()$
DPU() := UU()*DDZXU + VU()*DDZYU$

FL (I,J) := CC4*P(J,K,I) + S*CC5*P(J,K-1,I) + CC6*P(J,K-2,I)$
FXL() := TAI1*(FL(I,J)+S*FL(I-1,J)) + TAI2*(FL(I+1,J)+S*FL(I,J))
        + QXINF*XIXXI(J,I)$
FYL() := TAJ1*(FL(I,J)+S*FL(I,J-1)) + TAJ2*(FL(I,J+1)+S*FL(I,J))
        - QXINF*XIXXI(J,I)*XIYX(J,I)$
UL () := (XIXX(J,I)#2+XIYX(J,I)#2)*FXL() + XIYX(J,I)*FYL()$
VL () := XIYX(J,I)*FXL() + FYL()$
DPLO():= UL()*DDZXL + VL()*DDZYL$

RHOU():= (1+G1*(UU()*FXU()+VU()*FYU()+DPU()*#2)) * G2$
RHOL():= (1+G1*(UL()*FXL()+VL()*FYL()+DPLO()*#2)) * G2$

CPU ():= G7 * (RHOU()*#G8-ROINF#G8) / (ROINF*QINF#2)$
CPL ():= G7 * (RHOL()*#G8-ROINF#G8) / (ROINF*QINF#2)$
/*-----*/
RTTU:
[P(J-1,K ,I)=P83 ,P(J ,K ,I-1)=P87 ,P(J ,K ,I )=P88 ,P(J ,K ,I+1)=P89 ,
 P(J+1,K ,I)=P93 ,P(J-1,K+1,I )=P108,P(J ,K+1,I-1)=P112,P(J ,K+1,I )=P113,
 P(J,K+1,I+1)=P114,P(J+1,K+1,I )=P118,P(J-1,K+2,I )=P133,P(J ,K+2,I-1)=P137,
 P(J,K+2,I )=P138,P(J ,K+2,I+1)=P139,P(J+1,K+2,I )=P143]$
RTTL:
[P(J-1,K-2,I)=P33 ,P(J ,K-2,I-1)=P37 ,P(J ,K-2,I )=P38 ,P(J ,K-2,I+1)=P39 ,
 P(J+1,K-2,I)=P43 ,P(J-1,K-1,I )=P58 ,P(J ,K-1,I-1)=P62 ,P(J ,K-1,I )=P63 ,
 P(J,K-1,I+1)=P64 ,P(J+1,K-1,I )=P68 ,P(J-1,K ,I )=P83 ,P(J ,K ,I-1)=P87 ,
 P(J,K ,I )=P88 ,P(J ,K ,I+1)=P89 ,P(J+1,K ,I )=P93]$

SDPU : [P83,P87,P88,P89,P93,P108,P112,P113,P114,P118,P133,P137,P138,P139,P143]$
SDPLO: [P33,P37,P38,P39,P43,P58,P62,P63,P64,P68,P83,P87,P88,P89,P93]$
LJKI : [J-2=JM2, J-1=JM1, J+1=JP1, J+2=JP2, I-2=IM2, I-1=IM1, I+1=IP1, I+2=IP2]$
/*-----*/
(CPU : SUBST(RTTU,CPU()), CPL : SUBST(RTTL,CPL()))$

( MATCHDECLARE([DIFF,A,B],TRUE), TELLSIMP('DIFF(A,B),CONCAT(A,B)) )$
( SDES:[XD1,XD2,XD3,XD4,XD5], SDES1:[XD1,XD2], SDES2:[XD3,XD4,XD5] )$
DEPENDS([QXINF,QZINF],SDES1,[DOZXU,DDZYU,DCZXL,DDZYL],SDES2,QINF,XD1)$

DEPENDS(SDPU,SDES1,SDPLO,SDES1)$
FOR M:1 THRU LENGTH(SDES1) DO ( DCPU[M]: DIFF(CPU,SDES1[M]),
                               DCPL[M]: DIFF(CPL,SDES1[M]) )$
(REMOVE(SDPU,DEPENDENCY), REMOVE(SDPLO,DEPENDENCY), KILL(RULES))$

FOR L:1 THRU LENGTH(RTTU) DO ( RTTU[L]: SUBST(LJKI,RTTU[L]) )$
FOR L:1 THRU LENGTH(RTTL) DO ( RTTL[L]: SUBST(LJKI,RTTL[L]) )$
/*-----*/
TITLET(ST1,ST2,ST3) := ( GENTRAN(LITERAL(TAB,EVAL(ST1),CR)),
  GENTRAN(LITERAL("C",TAB,EVAL(ST2),CR,"C",CR,TAB,EVAL(ST3),CR)) )$
TITLEB() := GENTRAN(LITERAL("C",CR,TAB,"RETURN",CR,TAB,"END",CR))$
TITLE1(LNR,RTT) := ( GENTRAN(LITERAL("C",CR,"C",TAB,"P,PXD",CR,"C",CR)),
  FOR L:1 THRU LNR DO
  GENTRAN(LITERAL(TAB,EVAL(RHS(RTT[L])), " = ", EVAL(LHS(RTT[L])), CR)) )$
TITLE4(ST1,RTTT,DRD) := GENTRAN(LRSETQ(EVAL(CONCAT(ST1,RTTT)),DRD))$
SUBRCX(ST1,ST2,ST3,M) := ( TITLET(ST1,ST2,ST3),
  GENTRAN(LITERAL(TAB,"K = KUP",CR)), TITLE1(LENGTH(RTTU),RTTU),
  FOR L:1 THRU LENGTH(RTTU) DO ( PNN: RHS(RTTU[L]), RTT: LHS(RTTU[L]),
  GENTRAN(LITERAL(TAB,EVAL(PNN),EVAL(SDES[M]), " = P", EVAL(RTT),CR)) ),
  GENTRAN(LITERAL("C",CR,"C",TAB,"DCPU",CR)), TITLE4("CPU",SDES[M],DCPU[M]),
  GENTRAN(LITERAL(TAB,"K = KLOW",CR)), TITLE1(LENGTH(RTTL),RTTL),
  FOR L:1 THRU LENGTH(RTTL) DO ( PNN: RHS(RTTL[L]), RTT: LHS(RTTL[L]),
  GENTRAN(LITERAL(TAB,EVAL(PNN),EVAL(SDES[M]), " = P", EVAL(RTT),CR)) ),
  GENTRAN(LITERAL("C",CR,"C",TAB,"DCPL",CR)), TITLE4("CPL",SDES[M],DCPL[M]),
  /*-----*/ TITLEB() )$
(GENTRANOUT("RC.FOR"), GENTRANOPT: TRUE)$
SUBRCX("SUBROUTINE RCXD1(J,I,CPUXD1,CPLXD1)","RCXD1.FOR","INCLUDE (INTROX)",1)$
SUBRCX("SUBROUTINE RCXD2(J,I,CPUXD2,CPLXD2)","RCXD2.FOR","INCLUDE (INTROX)",2)$
/*-----*/

```

```

1 SUBROUTINE RCXD1(J,I,CPUXD1,CPLXD1)
2 RCXD1 FOR
3
4 INCLUDE (INTROX)
5 K = KUP
6
7 C C C
8 P, PXD
9
10 P83 = P(JM1,K,I)
11 P87 = P(J,K,IM1)
12 P88 = P(J,K,I)
13 P89 = P(J,K,IP1)
14 P93 = P(JP1,K,I)
15 P108 = P(JM1,K+1,I)
16 P112 = P(J,K+1,IM1)
17 P113 = P(J,K+1,I)
18 P114 = P(J,K+1,IP1)
19 P118 = P(JP1,K+1,I)
20 P133 = P(JM1,K+2,I)
21 P137 = P(J,K+2,IM1)
22 P138 = P(J,K+2,I)
23 P139 = P(J,K+2,IP1)
24 P143 = P(JP1,K+2,I)
25 P83XD1 = PP(JM1,K,I)
26 P87XD1 = PP(J,K,IM1)
27 P88XD1 = PP(J,K,I)
28 P89XD1 = PP(J,K,IP1)
29 P93XD1 = PP(JP1,K,I)
30 P108XD1 = PP(JM1,K+1,I)
31 P112XD1 = PP(J,K+1,IM1)
32 P113XD1 = PP(J,K+1,I)
33 P114XD1 = PP(J,K+1,IP1)
34 P118XD1 = PP(JP1,K+1,I)
35 P133XD1 = PP(JM1,K+2,I)
36 P137XD1 = PP(J,K+2,IM1)
37 P138XD1 = PP(J,K+2,I)
38 P139XD1 = PP(J,K+2,IP1)
39 P143XD1 = PP(JP1,K+2,I)
40
41 C C
42 DCPU
43 T0=QINF**2
44 T1=G1+T0+1
45 T2=T1**G2
46 T3=T2**G8
47 T4=XIXX(J,I)
48 T5=XIYX(J,I)
49 T8=(T4+T5+QXINF)
50 T7=CC3+P138
51 T8=CC1+P88
52 T9=CC2+P113+S
53 T10=(S*(CC2+P108+S+CC1+P83+CC3+P133))+T9+T8+T7)+TAJ1
54 T11=S*(T9+T8+T7)
55 T12=(T11+CC2+P118+S+CC1+P89+CC3+P143)+TAJ2
56 T13=T12+T10+T8
57 T14=(T11+CC2+P114+S+CC1+P89+CC3+P139)+TAI2+(S*(CC2+P112+S+CC1+P87+
58 CC3+P137))+T9+T8+T7)+TAI1+T4+QXINF
59 T15=T12+T10+T5+T14+T8
60 T18=T5**2+XIXX(J,I)**2
61 T17=T5+T13+T18+T14
62 T18=DDZXU+T17+DDZYU+T15
63 T19=G1*(T18**2+T14+T17+T13+T15)+1
64 T20=T19**G2**G8
65 T21=T20-T3
66 T22=1/T2
67 T23=(T4+T5+QXINFXD1)
68 T24=CC3+P138XD1
69 T25=CC1+P88XD1
70 T26=CC2+P113XD1+S
71 T27=(S*(CC3+P108XD1+S+CC1+P83XD1+CC3+P133XD1))+T26+T25+T24)+TAJ1
72 T28=S*(T26+T25+T24)
73 T29=(T28+CC2+P118XD1+S+CC1+P89XD1+CC3+P143XD1)+TAJ2
74 T30=T29-T27+T23
75 T31=(T28+CC2+P114XD1+S+CC1+P89XD1+CC3+P139XD1)+TAI2+(S*(CC2+
76 P112XD1+S+CC1+P87XD1+CC3+P137XD1))+T26+T25+T24)+TAI1+T4+QXINFXD1
77 T32=T28+T27+T5+T31+T23
78 T33=T5+T30+T18+T31
79 CPUXD1=G7+T22*(G1+G2+G8*(2-T18+(DDZXU+T33+DDZYU+T32)+T14+T33+T31+
80 T17+T13+T32+T15+T30)+T20/T19-(2*G1+G2+G8+QINF+T3+QINFXD1/T11)/T0-
81 (2*G7+T22*QINFXD1+T21/QINF**3)-(2*G1+G2+G7+T11**(-G2-1)*QINFXD1+
82 T21/QINF)
83 K = KLOW
84
85 C C C
86 P, PXD
87
88 P33 = P(JM1,K-2,I)
89 P37 = P(J,K-2,IM1)
90 P38 = P(J,K-2,I)
91 P39 = P(J,K-2,IP1)
92 P43 = P(JP1,K-2,I)
93 P58 = P(JM1,K-1,I)
94 P62 = P(J,K-1,IM1)
95 P63 = P(J,K-1,I)
96 P64 = P(J,K-1,IP1)
97 P68 = P(JP1,K-1,I)
98 P83 = P(JM1,K,I)
99 P87 = P(J,K,IM1)
100 P88 = P(J,K,I)
101 P89 = P(J,K,IP1)
102 P93 = P(JP1,K,I)
103 P33XD1 = PP(JM1,K-2,I)
104 P37XD1 = PP(J,K-2,IM1)
105 P38XD1 = PP(J,K-2,I)
106 P39XD1 = PP(J,K-2,IP1)
107 P43XD1 = PP(JP1,K-2,I)
108 P58XD1 = PP(JM1,K-1,I)
109 P62XD1 = PP(J,K-1,IM1)
110 P63XD1 = PP(J,K-1,I)
111 P64XD1 = PP(J,K-1,IP1)
112 P68XD1 = PP(JP1,K-1,I)
113 P83XD1 = PP(JM1,K,I)
114 P87XD1 = PP(J,K,IM1)
115 P88XD1 = PP(J,K,I)
116 P89XD1 = PP(J,K,IP1)
117 P93XD1 = PP(JP1,K,I)
118
119 C C
120 DCPL
121 T0=QINF**2
122 T1=G1+T0+1
123 T2=T1**G2
124 T3=T2**G8
125 T4=XIXX(J,I)
126 T5=XIYX(J,I)
127 T8=(T4+T5+QXINF)
128 T7=CC6+P38
129 T8=CC4+P88
130 T9=CC5+P63+S
131 T10=(S*(CC5+P58+S+CC4+P83+CC6+P33))+T9+T8+T7)+TAJ1
132 T11=S*(T9+T8+T7)
133 T12=(T11+CC5+P68+S+CC4+P93+CC6+P43)+TAJ2
134 T13=T12+T10+T8
135 T14=(T11+CC5+P64+S+CC4+P89+CC6+P39)+TAI2+(S*(CC5+P62+S+CC4+P87+CC6

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33 *P37+T3+T8+T7+TA1+T4*OXINF
34 T15+T12+T10+T5+T14+T6
35 T16+T5+2+K1XX(J,I)**2
36 T17+T5+T13+T16+T14
37 T18+DDZXL+T17+DDZYL+T15
38 T19+G1*(T18+2+T14+T17+T13+T15)+1
39 T20+T19+G2+G8
40 T21+T20+T3
41 T22+1/T2
42 T23+-(T4+T5+OXINFXD1)
43 T24+CC6+P33XD1
44 T25+CC4+P88XD1
45 T26+CC5+P83XD1+S
46 T27+(S+(CC5+P58XD1+S+CC4+P83XD1+CC6+P33XD1)+T26+T25+T24)=TAJ1
47 T28+S=(T26+T25+T24)
48 T29+(T26+CC5+P58XD1+S+CC4+P83XD1+CC6+P43XD1)=TAJ2
49 T30+T29+T27+T23
50 T31+(T26+CC5+P58XD1+S+CC4+P88XD1+CC6+P33XD1)=TAI2+(S+(CC5+P82XD1+S
51 +CC4+P87XD1+CC6+P37XD1)+T26+T25+T24)=TAI1+T4*OXINFXD1
52 T32+T29+T27+T5+T31+T23
53 T33+T5+T30+T16+T31
54 CPLXD1+G7+T22*(G1+G2+G8*(2+T18*(DDZXL+T33+DDZYL+T32)+T14+T33+T31+
55 T17+T13+T32+T15+T30)+T20/T19*(2+G1+G2+G8*OXINF=T3*OXINFXD1/T1))/TO-
56 (2+G7+T22*OXINFXD1+T21/OINF**3)-(2+G1+G2+G7+T1)*(-C2-1)*OXINFXD1=
57 T21/OINF)

```

```

58 RETURN
59 END
60 SUBROUTINE RCXD2(J,I,CPUXD2,CPLXD2)
61 RCXD2.FOR

```

```

62 INCLUDE [INTROX]
63 K = KUP

```

```

64 P,PXD

```

```

65 P83 = P(JM1,K,I)
66 P87 = P(J,K,IM1)
67 P88 = P(J,K,I)
68 P89 = P(J,K,IP1)
69 P93 = P(JP1,K,I)
70 P108 = P(JM1,K+1,I)
71 P112 = P(J,K+1,IM1)
72 P113 = P(J,K+1,I)
73 P114 = P(J,K+1,IP1)
74 P118 = P(JP1,K+1,I)
75 P133 = P(JM1,K+2,I)
76 P137 = P(J,K+2,IM1)
77 P138 = P(J,K+2,I)
78 P139 = P(J,K+2,IP1)
79 P143 = P(JP1,K+2,I)
80 P83XD2 = PP(JM1,K,I)
81 P87XD2 = PP(J,K,IM1)
82 P88XD2 = PP(J,K,I)
83 P89XD2 = PP(J,K,IP1)
84 P93XD2 = PP(JP1,K,I)
85 P108XD2 = PP(JM1,K+1,I)
86 P112XD2 = PP(J,K+1,IM1)
87 P113XD2 = PP(J,K+1,I)
88 P114XD2 = PP(J,K+1,IP1)
89 P118XD2 = PP(JP1,K+1,I)
90 P133XD2 = PP(JM1,K+2,I)
91 P137XD2 = PP(J,K+2,IM1)
92 P138XD2 = PP(J,K+2,I)
93 P139XD2 = PP(J,K+2,IP1)
94 P143XD2 = PP(JP1,K+2,I)

```

```

95 OCPU

```

```

96 TO+OXINF**2
97 T1+X1XX(J,I)
98 T2+K1YX(J,I)
99 T3+-(T1+T2*OXINF)
100 T4+CC3+P138
101 T5+CC1+P88
102 T6+CC2+P113+S
103 T7+S=(T6+T5+T4)
104 T8+(T7+CC2+P114+S+CC1+P89+CC3+P139)+TAI2+(S+(CC2+P112+S+CC1+P87+
105 CC3+P137)+T6+T5+T4)=TAI1+T1*OXINF
106 T9+(S+(CC2+P108+S+CC1+P83+CC3+P133)+T6+T5+T4)=TAJ1
107 T10+(T7+CC2+P118+S+CC1+P93+CC3+P143)=TAJ2
108 T11+T10+T9+T2+T8+T3
109 T12+-(T1+T2*OXINFXD2)
110 T13+CC3+P138XD2
111 T14+CC1+P88XD2
112 T15+CC2+P113XD2+S
113 T16+(S+(CC2+P108XD2+S+CC1+P83XD2+CC3+P133XD2)+T15+T14+T13)=TAJ1
114 T17+S=(T15+T14+T13)
115 T18+(T17+CC2+P118XD2+S+CC1+P93XD2+CC3+P143XD2)=TAJ2
116 T19+T18+T16+T12
117 T20+T10+T9+T3
118 T21+(T17+CC2+P114XD2+S+CC1+P89XD2+CC3+P139XD2)=TAI2+(S+(CC2+
119 P112XD2+S+CC1+P87XD2+CC3+P137XD2)+T15+T14+T13)=TAI1+T1*OXINFXD2
120 T22+T18+T16+T2+T21+T12
121 T23+T2**2+X1XX(J,I)**2
122 T24+T2+T20+T23+T8
123 T25+T2+T19+T23+T21
124 T26+DDZXU+T24+DDZYU+T11
125 T27+G1*(T26**2+T8+T24+T20+T11)+1
126 CPUXD2+G1+G2+G7+G8*(2+T26*(DDZXU+T25+DDZYU+T22)+T8+T25+T21+T24+T20
127 +T22+T11+T19)=T27**G2**G8/TO/(G1+TO+1)**G2/T27
128 K = KLOW

```

```

129 P,PXD

```

```

130 P33 = P(JM1,K-2,I)
131 P37 = P(J,K-2,IM1)
132 P38 = P(J,K-2,I)
133 P39 = P(J,K-2,IP1)
134 P43 = P(JP1,K-2,I)
135 P58 = P(JM1,K-1,I)
136 P62 = P(J,K-1,IM1)
137 P63 = P(J,K-1,I)
138 P64 = P(J,K-1,IP1)
139 P68 = P(JP1,K-1,I)
140 P83 = P(JM1,K,I)
141 P87 = P(J,K,IM1)
142 P88 = P(J,K,I)
143 P89 = P(J,K,IP1)
144 P93 = P(JP1,K,I)
145 P33XD2 = PP(JM1,K-2,I)
146 P37XD2 = PP(J,K-2,IM1)
147 P38XD2 = PP(J,K-2,I)
148 P39XD2 = PP(J,K-2,IP1)
149 P43XD2 = PP(JP1,K-2,I)
150 P58XD2 = PP(JM1,K-1,I)
151 P62XD2 = PP(J,K-1,IM1)
152 P63XD2 = PP(J,K-1,I)
153 P64XD2 = PP(J,K-1,IP1)
154 P68XD2 = PP(JP1,K-1,I)
155 P83XD2 = PP(JM1,K,I)
156 P87XD2 = PP(J,K,IM1)
157 P88XD2 = PP(J,K,I)

```

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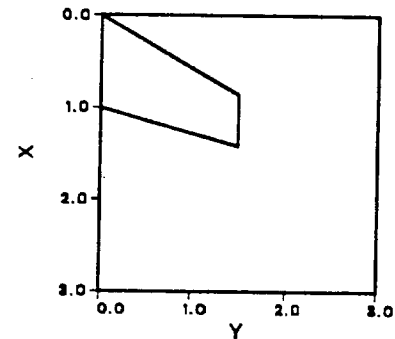
264. P89X02 = PP(J,K,[P])
265. P93X02 = PP(JP,K,I)
266.
267. C
268. C
269. OCPL
270. TO=O(NF**2
271. T1=XIXX(J,I)
272. T2=XIYX(J,I)
273. T3=-(T1+T2*OXINF)
274. T4=CC6+P38
275. T5=CC4+P88
276. T6=CC5+P83+S
277. T7=S*(T6-T5+T4)
278. T8=(T7+CC5+P84+S+CC4+P89+CC6+P39)*TAI2+(S*(CC5+P62+S+CC4+P87+CC6+
279. P37)-T8-T5+T4)*TAI1+T1*OXINF
280. T9=(S*(CC5+P58+S+CC4+P83+CC6+P33)-T8-T5+T4)*TAJ1
281. T10=(T7+CC5+P88+S+CC4+P83+CC6+P43)*TAJ2
282. T11=T10+T9+T2+T8+T3
283. T12=-(T1+T2*OXINF*X02)
284. T13=CC6+P38X02
285. T14=CC4+P88X02
286. T15=CC5+P83X02+S
287. T16=(S*(CC5+P58X02+S+CC4+P83X02+CC6+P33X02)+T15+T14+T13)*TAJ1
288. T17=S*(T15+T14+T13)
289. T18=(T17+CC5+P88X02+S+CC4+P83X02+CC6+P43X02)*TAJ2
290. T19=T18+T16+T12
291. T20=T10+T9+T3
292. T21=(T17+CC5+P84X02+S+CC4+P89X02+CC6+P39X02)*TAI2+(S*(CC5+P62X02+S
293. +CC4+P87X02+CC6+P37X02)+T15+T14+T13)*TAI1+T1*OXINF*X02
294. T22=T18+T16+T2+T21+T12
295. T23=T2**2+XIXX(J,I)**2
296. T24=T2=T20+T23+T8
297. T25=T2=T19+T23+T21
298. T26=DDZXL=T24+DDZYL=T11
299. T27=G1=(T28**2+T8+T24+T20+T11)*I
300. CPLX02=G1*G2+G7+G8=(2*T28*(DDZXL+T25+DDZYL+T22)+T8+T25+T21+T24+T20
301. +T22+T11+T19)*T27**G2**G8/TO/(G1*TO+1)**G2/T27
302. C
303. RETURN
304. END

```

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## WING PLANFORM :

### ONERA M6



ROOT CHORD	1.00	ASPECT RATIO	3.80
TIP CHORD	0.56	TAPER RATIO	0.56
MEAN CHORD	0.80	SEMI SPAN	1.48
AREA	1.16	L.E. SWEEP	30.00
REF. AREA	1.16	T.E. SWEEP	15.76
REF. CHORD	0.80	ROOT TWIST	0.00
REF. MOMENT	0.25	TIP TWIST	0.00

MEDIUM GRID      45 30 16

PARABOLIC-ARC SECTION

MACH NUMBER	0.80
ANGLE OF ATTACK	0.00
AIRFOIL MAX THICKNESS	0.06
AIRFOIL MAX CAMBER	0.00
LOCATION OF MAX CAMBER	0.40

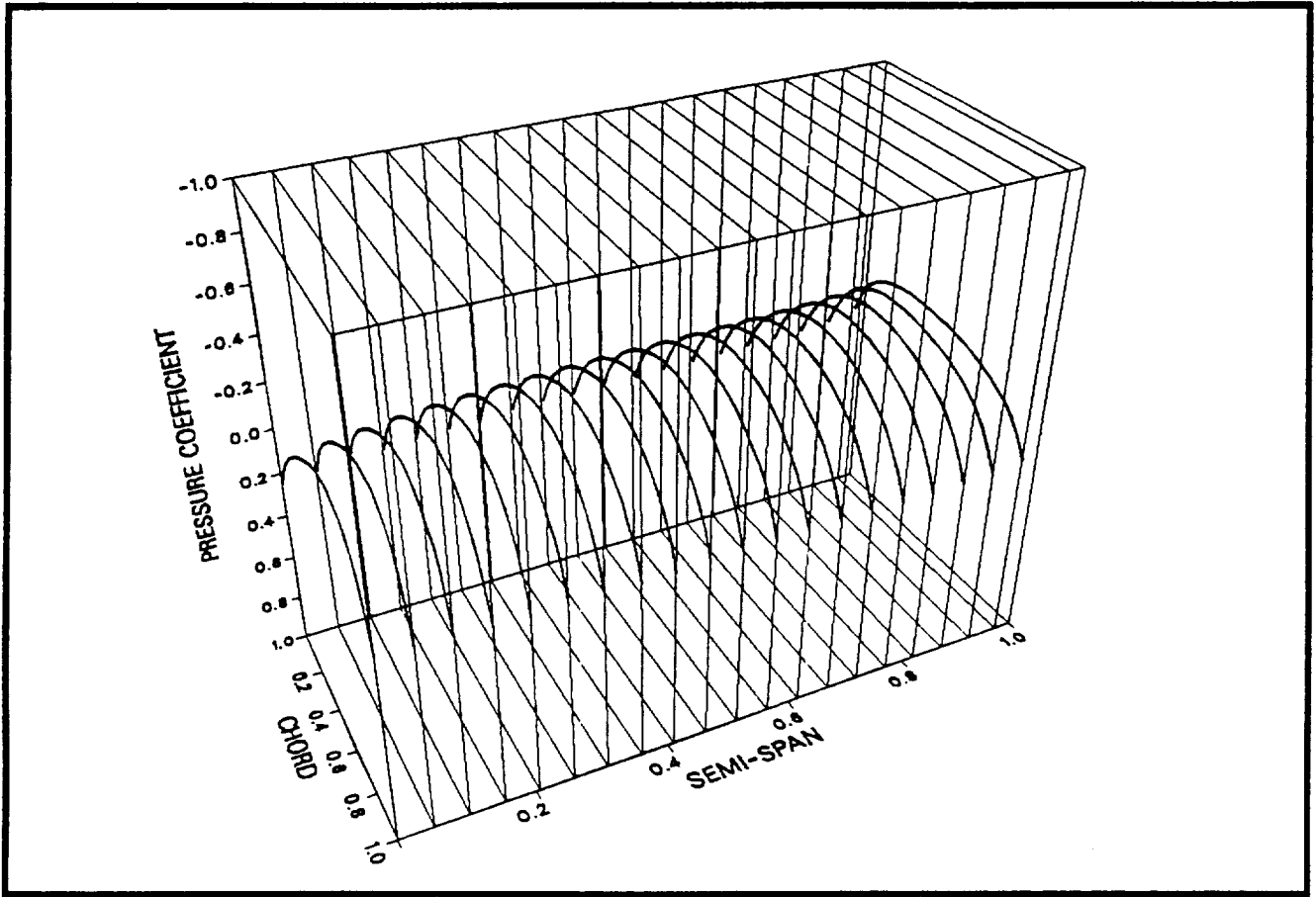
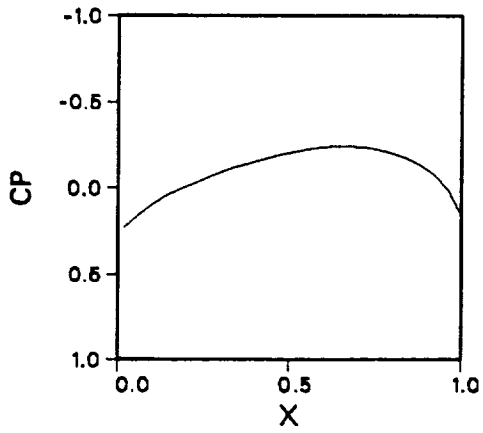
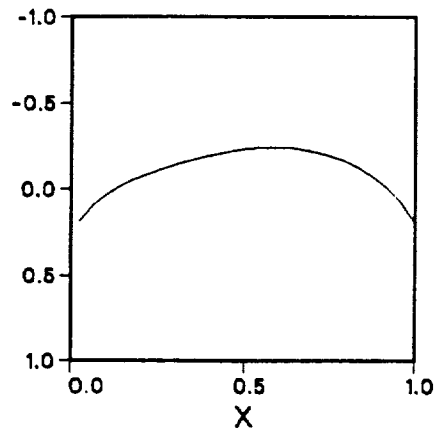


Figure (1)

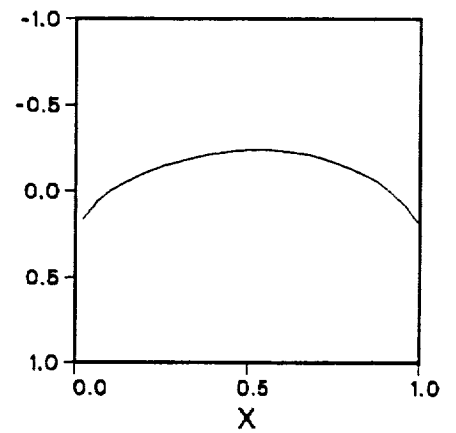
ETA(1) = 0.000



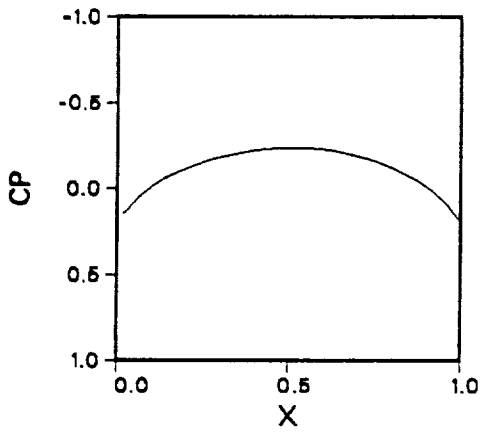
ETA(4) = 0.154



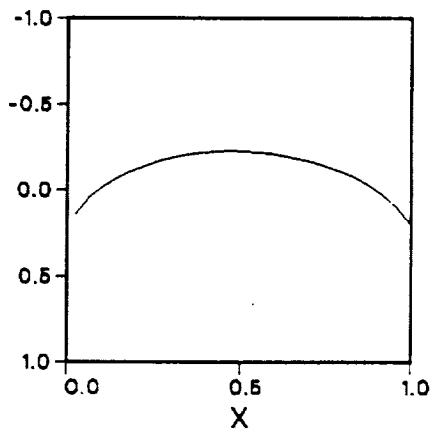
ETA(8) = 0.359



ETA(12) = 0.564



ETA(16) = 0.769



ETA(20) = 0.974

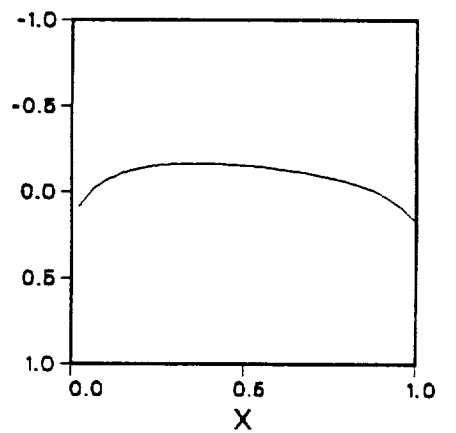
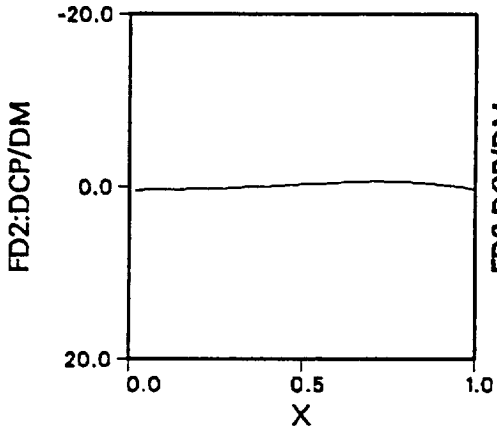


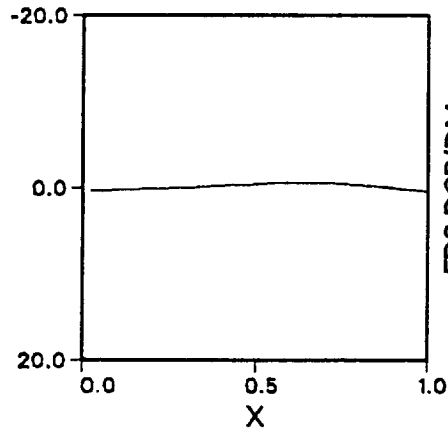
Figure (2)



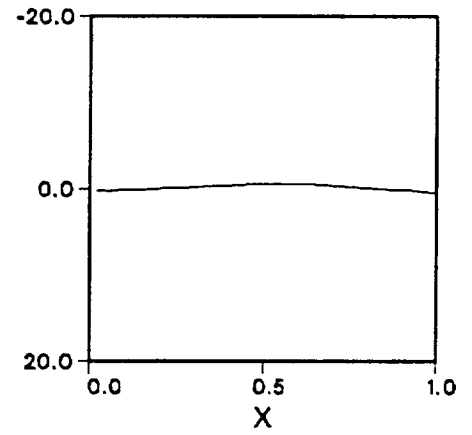
ETA(1) = 0.000



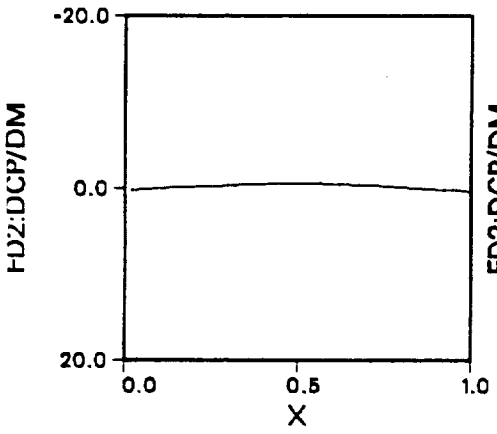
ETA(4) = 0.154



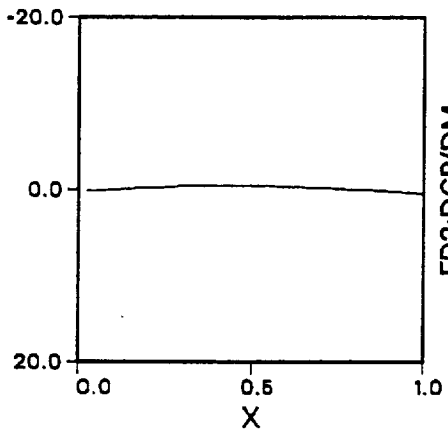
ETA(8) = 0.359



ETA(12) = 0.564



ETA(16) = 0.769



ETA(20) = 0.974

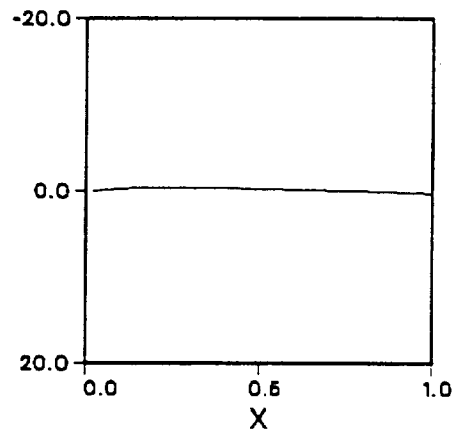
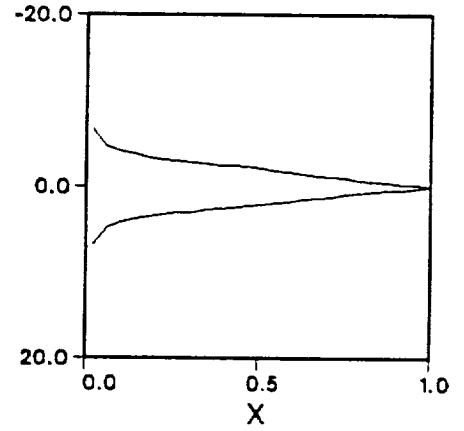
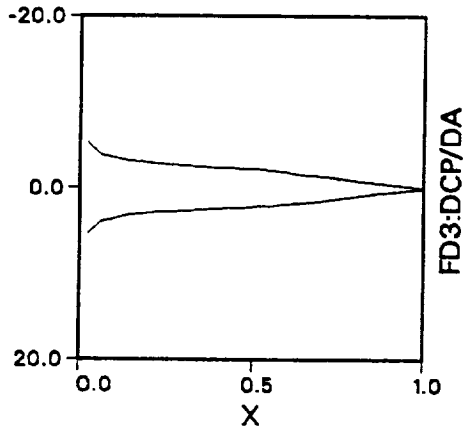
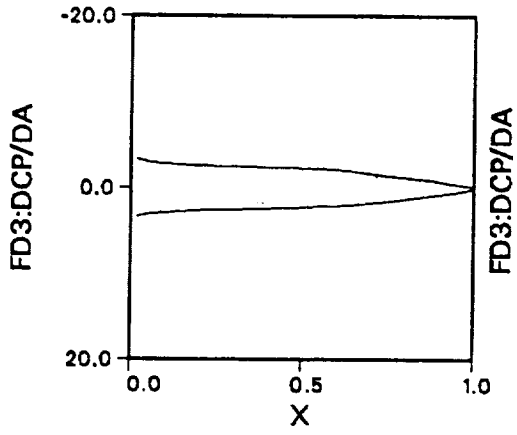


Figure (3)

ETA(1) = 0.000

ETA(4) = 0.154

ETA(8) = 0.359



ETA(12) = 0.564

ETA(16) = 0.769

ETA(20) = 0.974

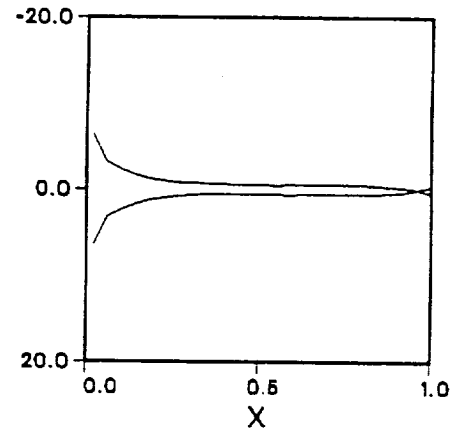
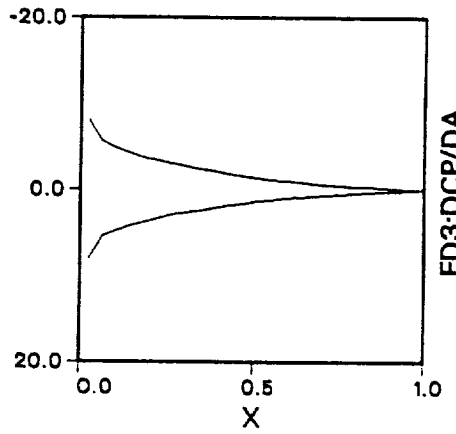
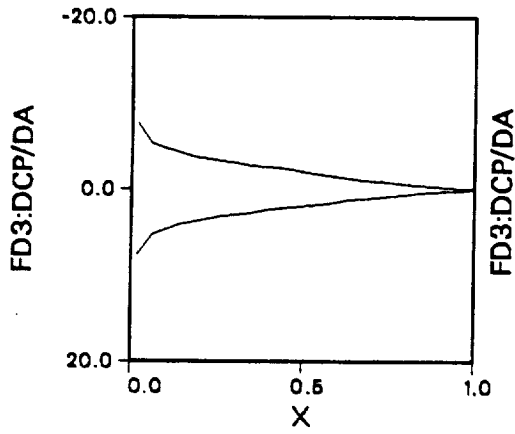
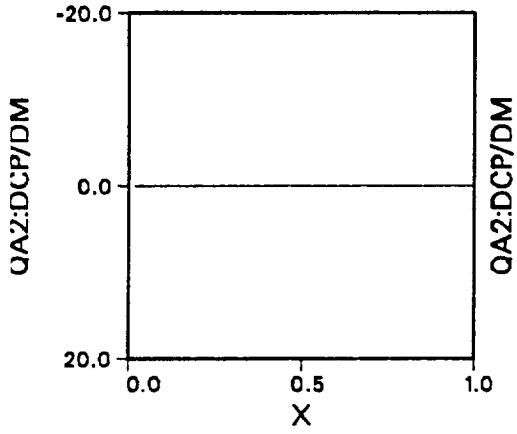
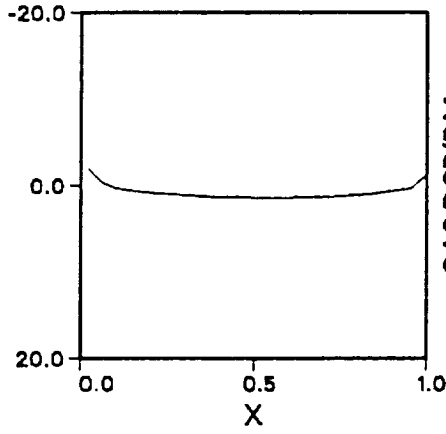


Figure (4)

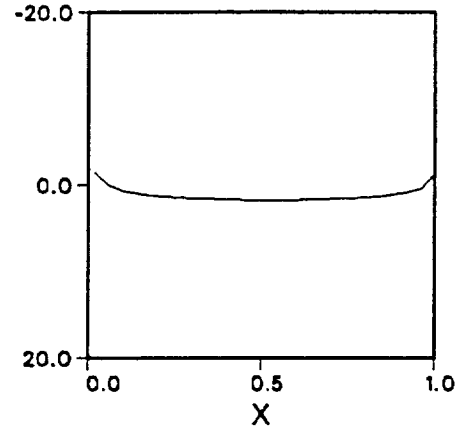
ETA(1) = 0.000



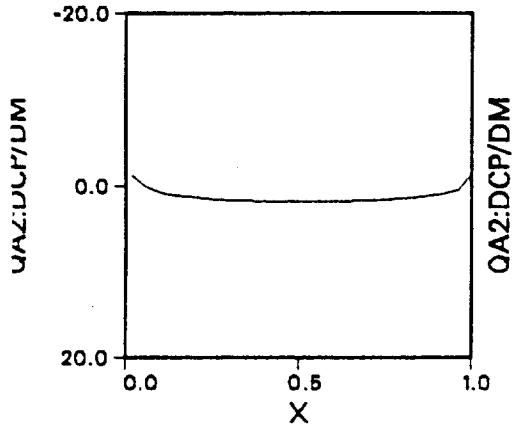
ETA(4) = 0.154



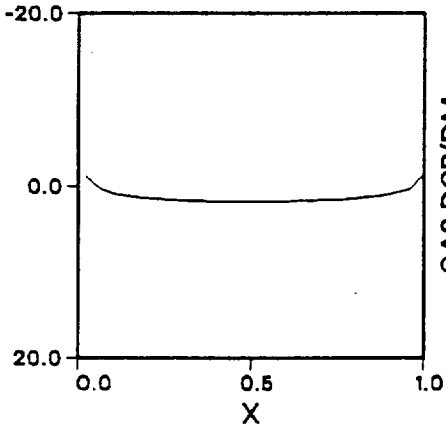
ETA(8) = 0.359



ETA(12) = 0.564



ETA(16) = 0.769



ETA(20) = 0.974

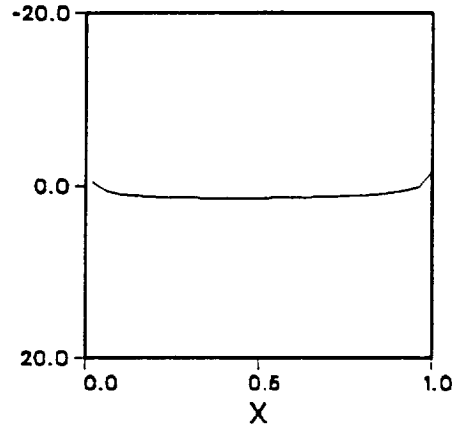


Figure (5)

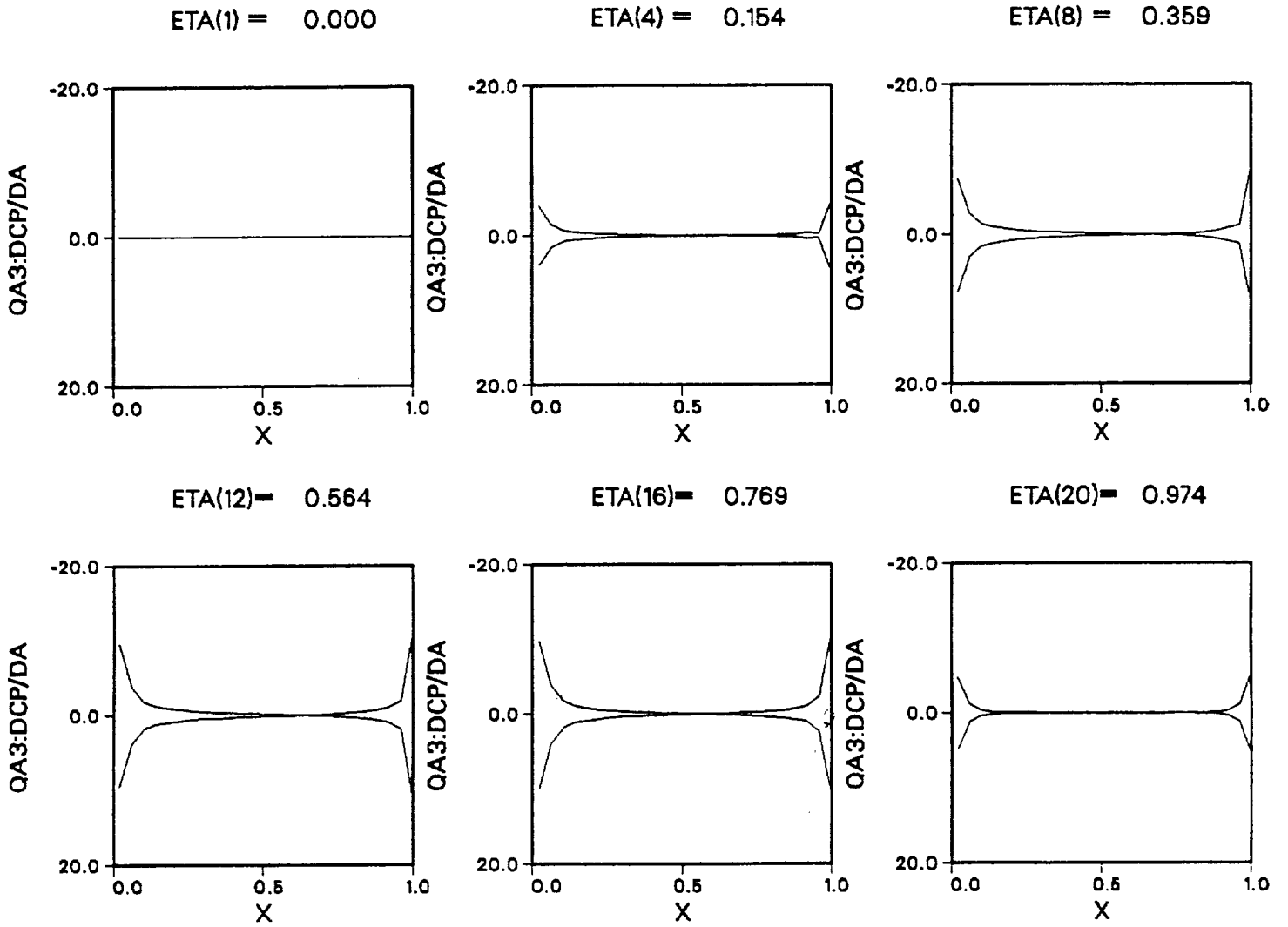


Figure (6)

