DRIFT — A NUMERICAL SIMULATION SOLUTION FOR COOLING TOWER DRIFT ELIMINATOR PERFORMANCE

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ABSTRACT

A method for the analysis of the performance of standard industrial evaporative cooling tower drift eliminators using numerical simulation methods is reported. The simulation methods make use of the computer code SOLASUR as a subroutine of the computer code DRIFT to calculate the two dimensional laminar flow velocity field and pressure loss in a drift eliminator geometry. This information is then used in the main program to obtain the eliminator collection efficiency by performing trajectory calculations for droplets of a given size by a fourth order Runge-Kutta numerical method.

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NOMENCLATURE

C_d = drag coefficient

$\bar{g}$ = gravity acceleration (m/s^2)

h = time step size (s)

m_d = droplet mass (kg)

p = pressure (N)

R = droplet radius (m)

Re = Reynolds number

t = time (s)

u = horizontal velocity component (m/s)

v = vertical velocity component (m/s)

$\bar{V}_a$ = air velocity (m/s)

$\bar{V}_d$ = droplet velocity (m/s)

V_t = terminal velocity (m/s)

x = horizontal position coordinate

y = vertical position coordinate

ρ_a = air density (kg/m^3)

ρ_w = water density (kg/m^3)

μ_a = air viscosity (kg/s-m)

ν = kinematic viscosity

CHAPTER 1

INTRODUCTION

In order to evaluate cooling tower drift eliminators, a computer program, DRIFT, is written to simulate eliminator performance.(1,2) The main program of the code calculates the droplet trajectory such that the capture efficiency of the eliminator can be determined. The air velocity distribution within the eliminator is calculated by the subroutine SOLASUR,(3) which is then input into the main program for droplet trajectory calculation. SOLASUR also calculates the pressure drop across the eliminator when no-slip condition is used at the rigid boundaries of the eliminator. The standard eliminator geometries that have been included in this code for evaluation are the single-layer louvre eliminator, the double-layer louvre eliminator, the sinus-shaped eliminator, zig-zag eliminator, Hi-V eliminator, and the asbestos-cement eliminator. Other geometries can also be evaluated if the user will provide the boundary information in appropriate subroutines.

This program is written in FORTRAN IV computer language, and is run on IBM 370/168 system. The plotting is done by CALCOMP machine.

This report describes the details of the structure of the code, the input parameters and some numerical stability considerations. A listing of the program and a sample problem are also given.

CHAPTER 2

THEORY

Some theoretical basis of the DRIFT code are described in this chapter. The main program of the code solves the equation of motion of droplets by using the fourth order Runge-Kutta technique. The equation to be solved is

$$\frac{d\overline{V}_d}{dt} = \frac{9}{2} \frac{\mu_a}{\rho_w R^2} \frac{C_d Re}{24} (\overline{V}_a - \overline{V}_d) + \overline{g} \; , \qquad (2.1)$$

where

$$\frac{C_d Re}{24} = 1 + 0.197 Re^{0.63} + 2.6 \times 10^{-4} Re^{1.38} , \qquad (2.2)$$

and

$$Re = \frac{2|\overline{V}_a - \overline{V}_d| R \rho_a}{\mu_a} \; . \qquad (2.3)$$

In two dimensional coordinates, Eq. (2.1) can be written as

$$f_x \equiv \frac{dV_{d,x}}{dt} = \frac{9\mu_a}{2\rho_w R^2} \frac{C_d Re}{24} (V_{a,x} - V_{d,x}) + g_x \; , \qquad (2.4)$$

and

$$f_y \equiv \frac{dV_{d,y}}{dt} = \frac{9\mu_a}{2\rho_w R^2} \frac{C_d Re}{24} (V_{a,y} - V_{d,y}) + g_y \qquad (2.5)$$

These two equations are coupled by the Reynold's number determination. The position of the droplet at any instant can be determined from the velocities as

$$\frac{dx}{dt} = V_{d,x} \; , \qquad (2.6)$$

and

$$\frac{dy}{dt} = V_{d,y} \ . \tag{2.7}$$

Knowing the initial conditions of the four parameters at the beginning of the time step, these four coupled nonlinear differential equations can then be solved by standard fourth order Runge-Kutta technique.(4)

The initial conditions of the droplets at the entrance of the eliminator is determined from the local air velocities and the droplet terminal velocity. This terminal velocity is determined by solving the steady-state form of Eq. (2.1) which is

$$V_t = V_a - V_d = -\frac{2}{9}\frac{\rho_w g R^2}{\mu_a \frac{C_d Re}{24}} \ . \tag{2.8}$$

This nonlinear algebraic equation is solved by Newton's method of tangent(4) with a calculational accuracy of 0.1%.

A variable time-step size is used in the trajectory calculation. The step size is determined from consideration of the propagation of error(4). The propagation error in this numerical method will tend to diminish if at any time step i,

$$1 + h \left.\frac{\partial f}{\partial V_d}\right|_{t_i,\alpha} < 1 \ , \tag{2.9}$$

where α is a velocity value within the interval $V_d(t_i)$ and $V_d(t_{i+1})$. Therefore at the beginning of each time step $\partial f/\partial V_d$ is determined (which is always less than zero in the present cases) from which a time-step size can be determined such that the propagation error will diminish.

Subroutine SOLASUR calculates the air velocity distribution within eliminators by solving the Navier-Stokes equations

$$\begin{aligned} \frac{\partial u}{\partial t} + \frac{\partial u^2}{\partial x} + \frac{\partial uv}{\partial y} &= -\frac{\partial p}{\partial x} + g_x + \nu\left[\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right] \\ \frac{\partial v}{\partial t} + \frac{\partial uv}{\partial x} + \frac{\partial v^2}{\partial y} &= -\frac{\partial p}{\partial y} + g_y + \nu\left[\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right] \end{aligned} \tag{2.10}$$

together with the mass continuity equation

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \tag{2.11}$$

An implicit finite difference technique is used. First the guesses for the new velocities for the entire mesh are computed from the difference forms of Eq. (2.10), which involve only the previous time values for the contributing pressures and velocities in the various flux contributions. These velocities are then adjusted iteratively to satisfy the continuity equation (2.11) by making appropriate changes in the cell pressures. In the iteration, each cell is considered successively and is given a pressure change that drives its instantaneous velocity divergence to zero. Finally, when convergence has been achieved, the velocity and pressure fields are at the advanced time level and may be used as starting values for the next cycle.

CHAPTER 3

PROGRAM DESCRIPTION

The DRIFT code is written in FORTRAN IV for IBM 370/168 system. The main program calculates the droplet trajectory within eliminators and the collection efficiency for specified droplet sizes. A flow chart of the main program is shown in Fig. 3.1. It starts by reading some appropriate input parameters for the case to be studied. The air velocity distribution can either be calculated by the SOLASUR subroutine or supplied by the user. Then calculation starts for droplet trajectory of different droplet sizes. The initial conditions of the droplet are first determined and trajectory calculation is done step by step, advances in time. At each time step, the time-step size is determined from the conditions at the beginning of the step, then the final conditions in that time step are calculated by Runge-Kutta method. The calculation stops when the location of the droplet is either outside the eliminator walls (captured) or is out of the top of the eliminator (escape). For each droplet size this calculation starts at the left wall of the eliminator entrance. (Convention in wall definition is shown in Fig. 3.3.) When the droplet is captured by or escapes from the eliminator, another calculation is done by placing the droplet at a certain distance to the right of the previous location at the eliminator entrance. The procedure is repeated until the starting

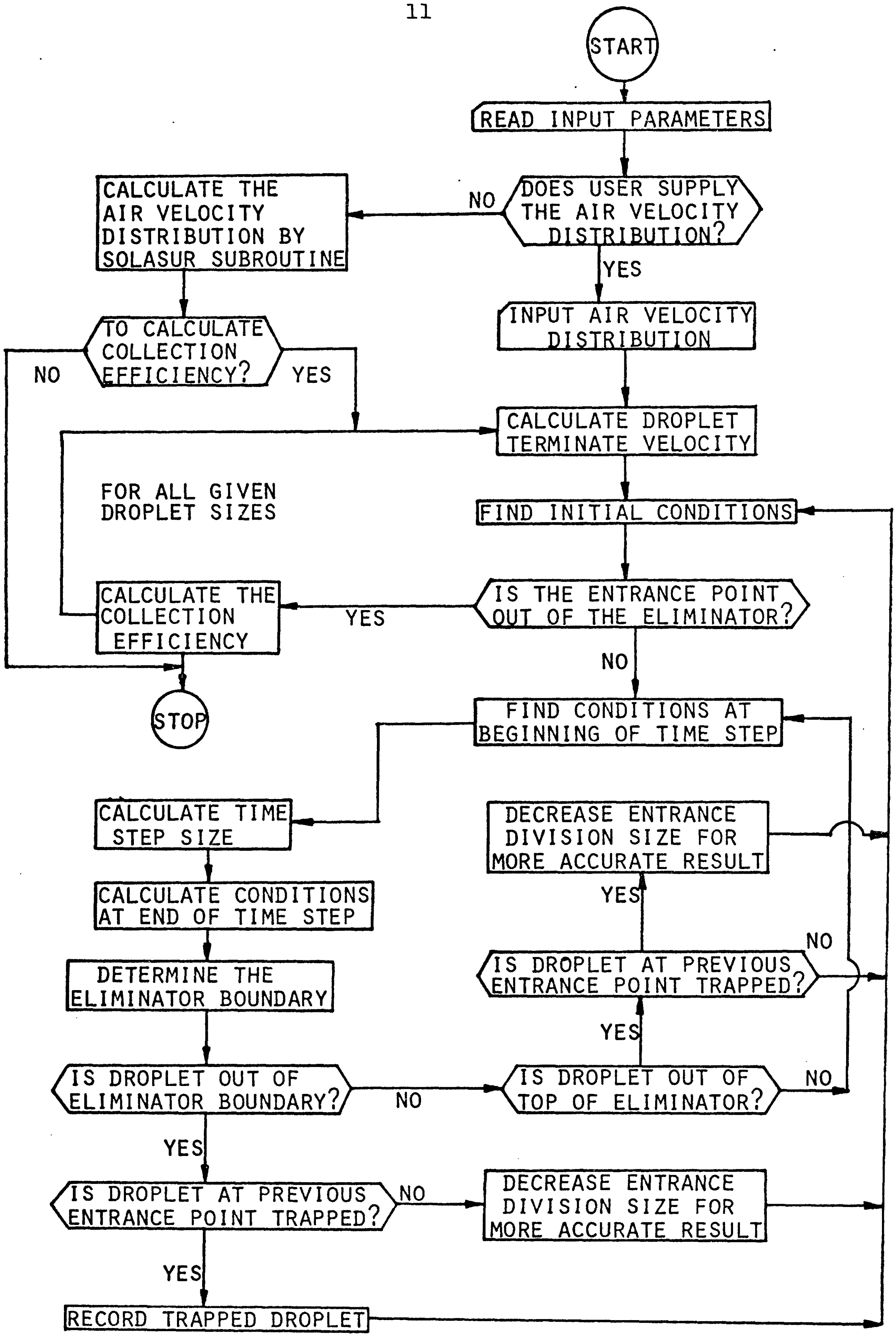
START
READ INPUT PARAMETERS
DOES USER SUPPLY THE AIR VELOCITY DISTRIBUTION?
NO
CALCULATE THE AIR VELOCITY DISTRIBUTION BY SOLASUR SUBROUTINE
YES
INPUT AIR VELOCITY DISTRIBUTION
TO CALCULATE COLLECTION EFFICIENCY?
NO
YES
CALCULATE DROPLET TERMINATE VELOCITY
FOR ALL GIVEN DROPLET SIZES
FIND INITIAL CONDITIONS
IS THE ENTRANCE POINT OUT OF THE ELIMINATOR?
YES
CALCULATE THE COLLECTION EFFICIENCY
NO
STOP
FIND CONDITIONS AT BEGINNING OF TIME STEP
CALCULATE TIME STEP SIZE
DECREASE ENTRANCE DIVISION SIZE FOR MORE ACCURATE RESULT
YES
CALCULATE CONDITIONS AT END OF TIME STEP
NO
DETERMINE THE ELIMINATOR BOUNDARY
IS DROPLET AT PREVIOUS ENTRANCE POINT TRAPPED?
YES
IS DROPLET OUT OF ELIMINATOR BOUNDARY?
NO
IS DROPLET OUT OF TOP OF ELIMINATOR?
NO
YES
IS DROPLET AT PREVIOUS ENTRANCE POINT TRAPPED?
NO
DECREASE ENTRANCE DIVISION SIZE FOR MORE ACCURATE RESULT
YES
RECORD TRAPPED DROPLET

Fig. 3.1 Flow Chart of the DRIFT Code

point coincides with the right wall of the eliminator. During these calculations, if a droplet starting at a certain location at the eliminator entrance is found to be captured while the previous droplet starting at the adjacent location has been found to escape, or vice versa, then a more detailed calculation will be performed between these two locations for more accurate results. This is done by dividing this distance into smaller intervals for trajectory calculation. The fraction of this distance starting from which the droplet will be trapped is determined. This information, together with the recorded information from "coarse" calculation, can then be used to determine the collection efficiency for that droplet size.

The procedure for air velocity calculation in the SOLASUR subroutine is shown in the flow chart of the code in Fig. 3.2. A more detailed description of this subroutine is given in Ref. (3).

The boundaries for many standard eliminator geometries are defined in the code. Boundaries for arbitrary geometries should be supplied by the user through several subroutines. A simple description of the main program and the subroutines of the code are listed below.

Main program: calculates droplet trajectory and collection efficiency.

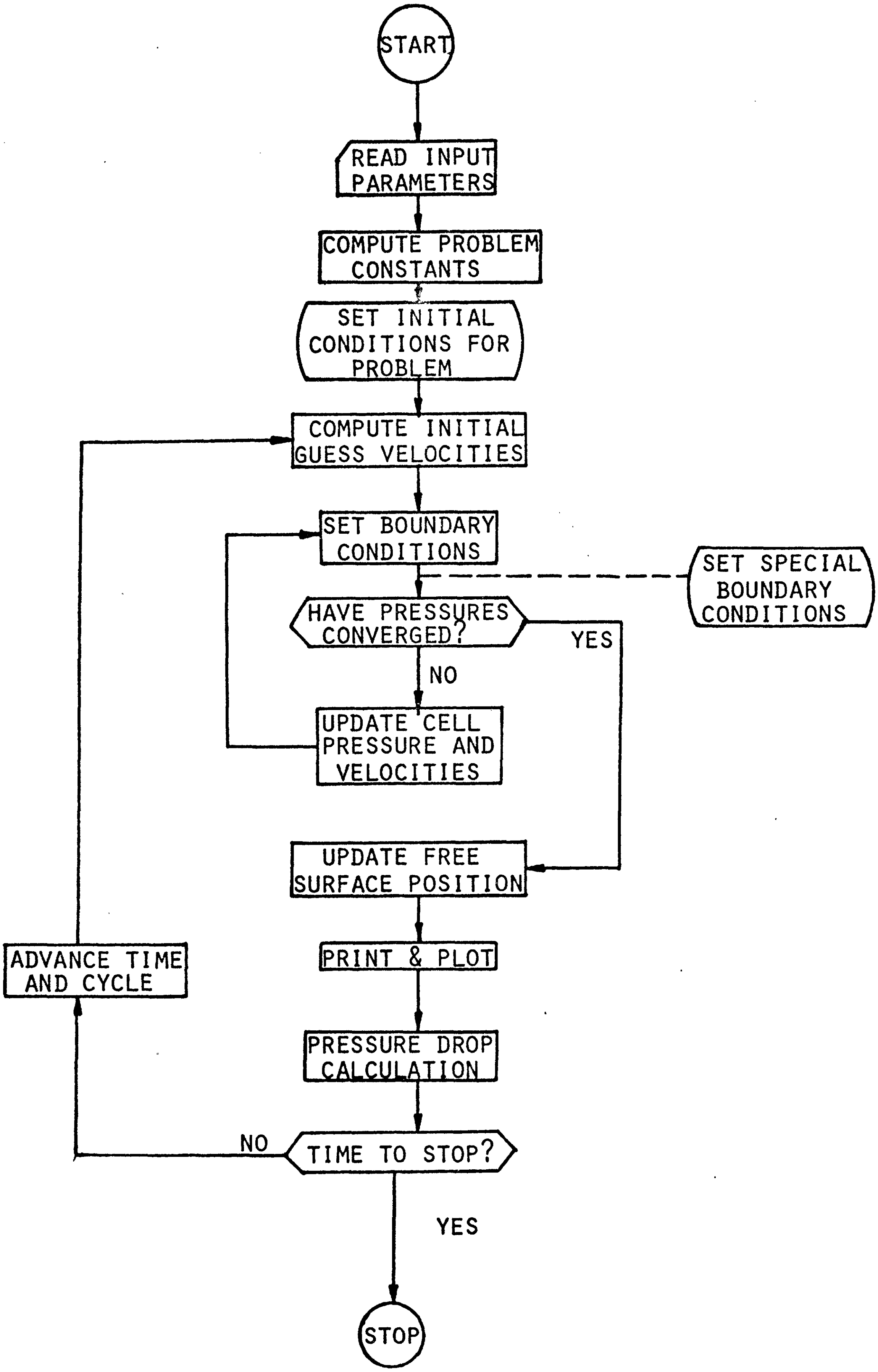
START
READ INPUT PARAMETERS
COMPUTE PROBLEM CONSTANTS
SET INITIAL CONDITIONS FOR PROBLEM
COMPUTE INITIAL GUESS VELOCITIES
SET BOUNDARY CONDITIONS
SET SPECIAL BOUNDARY CONDITIONS
HAVE PRESSURES CONVERGED?
YES
NO
UPDATE CELL PRESSURE AND VELOCITIES
UPDATE FREE SURFACE POSITION
PRINT & PLOT
ADVANCE TIME AND CYCLE
PRESSURE DROP CALCULATION
NO
TIME TO STOP?
YES
STOP

Fig. 3.2 Flow Chart of the SOLASUR Code

Subroutines

SOLASUR: calculates air velocity distribution and pressure drop.

HIVBT: defines the bottom boundary of the Hi-V eliminator.

HIBTB: defines the top boundary of the Hi-V eliminator

ASBCEM: defines the bottom boundary of the asbestos-cement eliminator.

BOUNPL: plots the boundaries of arbitrary eliminator geometry as defined by user.

BOUNTS: defines the boundaries of arbitrary eliminator geometry for testing whether droplets are captured. This information is supplied by user if needed.

BTBOUN: defines the boundaries of arbitrary eliminator geometry for air velocity calculation. This information is supplied by user if needed.

It should be noted that the convention in defining boundaries is different between the main program and the SOLASUR subroutine. Fig. 3.3 shows the convention of defining boundaries in the main program for either boundary plotting or for testing of the capturing possibility of droplets. The reference point and the coordinate system are shown in the figure. The left boundary is the top boundary as defined in SOLASUR (see Fig. 3.4) while the right boundary is the bottom boundary in SOLASUR. Convention for defining the boundary in the SOLASUR subroutine to be used for air velocity calculation is shown in Fig. 3.4. Therefore, in defining boundaries for

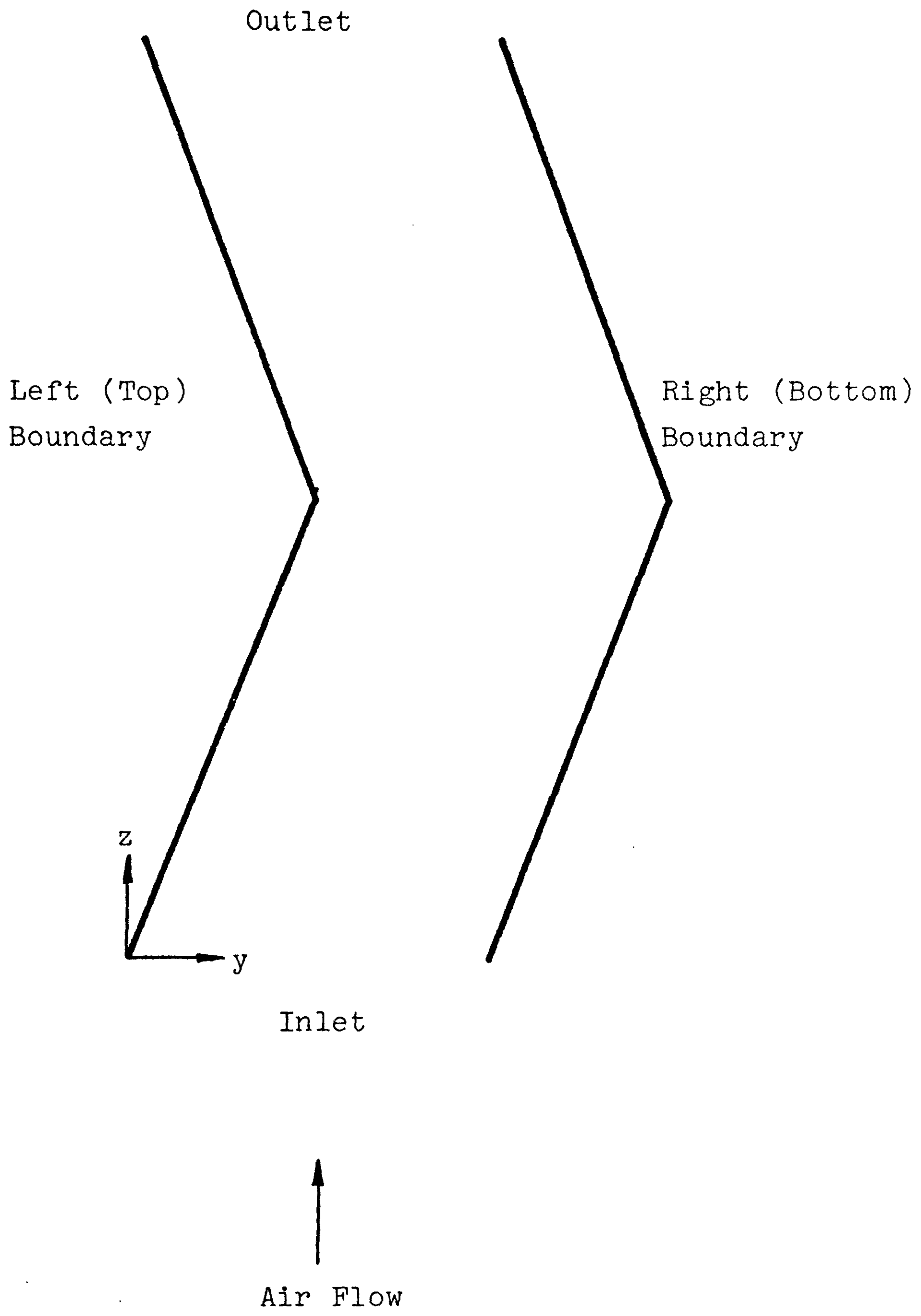
Outlet
Left (Top) Boundary
Right (Bottom) Boundary
z
y
Inlet
Air Flow

Fig. 3.3 Convention of Wall Definition for the Main Program

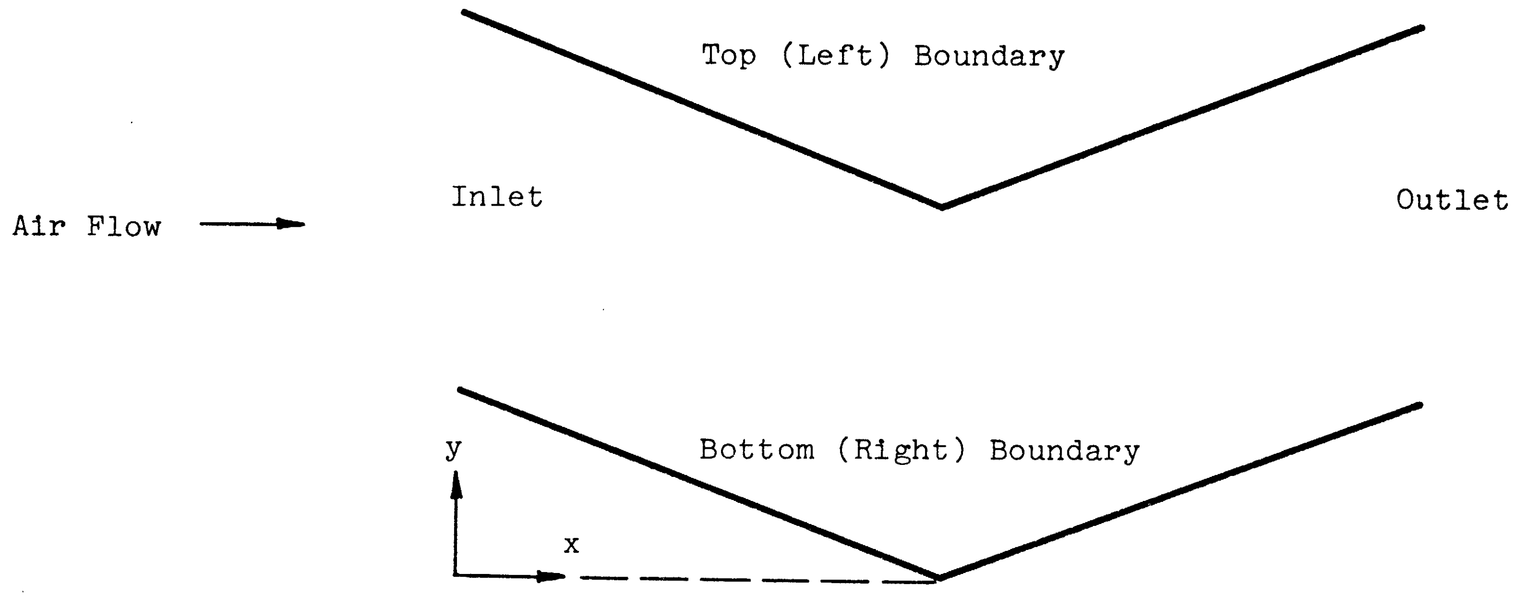
Air Flow
Inlet
Top (Left) Boundary
Outlet
Bottom (Right) Boundary
y
x

Fig. 3.4 Convention of Wall Definition for the SOLASUR Subroutine

arbitrary eliminator geometries in subroutines BOUNPL and BOUNTS, convention as shown in Fig. 3.3 should be used, while in subroutine BTBOUN the convention as shown in Fig. 3.4 should be adopted.

CHAPTER 4

INPUT DESCRIPTION

The input parameters of the DRIFT program are described below. MKS units are used throughout the program. Recommended values are given in brackets after the concerned parameters.

Card No. 1 Case identification

(AA(I),I=1,20)

FORMAT (20A4)

Any information can be put on this card from column one to eighty. The purpose of this input is to identify the case to be executed.

Card No. 2 Option definitions

NCAL, NTYPE, NTJ, NDATA

FORMAT(5I3)

(a) NCAL defines calculation mode.

<0 for air velocity distribution calculation only.

=0 for collection efficiency calculation with air velocity distribution being calculated by subroutine SOLASUR.

>0 for collection efficiency calculation with air velocity distribution being input by user.

(b) NTYPE defines types of eliminator.

=1 for single-layer louvre eliminator.

=2 for double-layer louvre eliminator.

=3 for sinus-shaped eliminator.

=4 for zig-zag eliminator.

=5 for Hi-V eliminator.

=6 for asbestos-cement eliminator.

=7 for other arbitrary geometry defined by user.

(c) NTJ defines droplet trajectory plot option.

≠0 for droplet trajectory plot.

=0 for omitting droplet trajectory plot.

(d) NDATA is used to number the data sets.

=1 for the first set of input data.

>1 for the other cases to be executed if there are any. (Note that either all cases use the same plotting options or that the cases with plotting option should be placed first.)

(A) If NCAL>0

Card No. 3A (If NCAL>0)

IMAX, XL, TTY, A, DELX, DELY

FORMAT(I10,5F10.3)

(a) IMAX is the maximum number of nodes in x-direction for the input velocity distribution.

(b) XL is the length of the eliminator.

(c) TTY is the pitch of the eliminator.

(d) A is the eliminator inclinded angle for single-, double-layer louvre and zig-zag eliminators, or the amplitude for other eliminators.

(e) DELX is the mesh size in x-direction used for the input velocity distribution determination.

(f) DELY is the mesh size in y-direction used for the input velocity distribution determination.

Card No. 4A to Card No. (IMAX+4)A (If NCAL>0)

```
(JB(I),JT(I),I=1,IMAX)
FORMAT(2I3)
```

(a) JB(I)=node number in y-direction for the bottom boundary of the eliminator used in input air velocity distribution determination.

(b) JT(I)=node number in y-direction for the top boundary of the eliminator used in input air velocity distribution determination.

Card No. (IMAX+5)A and onward (If NCAL>0)

```
I,J, U(I,J), V(I,J)
FORMAT(I3,5X,I3,2(6X,E12.5))
```

(a) I is the nodal point number in x-direction.

(b) J is the nodal point number in y-direction.

(c) U(I,J) is the velocity component in x-direction at (I,J).

(d) V(I,J) is the velocity component in y-direction at (I,J).

(The velocities are read in at each I from JB(I)-1 to JT(I)+1.)

(B) If NCAL=0 or NCAL<0

Card No. 3B (If NCAL≤0)

NUM

FORMAT(6X,I2)

NUM is the number of input parameters necessary for air velocity distribution calculation in subroutine SOLASUR. (NUM=33 for present study)

Card No. 4B to Card No. 12B (If NCAL≤0)

(XPUT(I) ,I=1,NUM)

FORMAT(4(6X,E12.5))

4B

XPUT(1)=IBAR=number of cells in the x-direction, excluding boundary cells.

XPUT(2)=JBAR=number of cells in the y-direction, excluding boundary cells.

XPUT(3)=XL=length of the eliminator.

XPUT(4)=TTY=pitch of the eliminator.

5B

XPUT(5)=DELT=time increment.

XPUT(6)=NU=ν=coefficient of kinematic viscosity.

XPUT(7)=CYL=ξ=geometry indicator (1.0 for cylindrical coordinates, 0.0 for plane coordinates).

XPUT(8)=EPSI=ε=pressure iteration convergence criterion (0.005 to 0.01).

6B

XPUT(9)=DZRO=D_o=scaling factor for convergence test. (1.0)

XPUT(10)=GX=g_x=body acceleration in positive x-direction.

XPUT(11)=GY=g_y=body acceleration in positive y-direction

XPUT(12)=UI=x-direction velocity used for initializing mesh and/or setting special boundary conditions.

7B

XPUT(13)=VI=y-direction velocity for initializing mesh and/or setting special boundary conditions.

XPUT(14)=VELMX=maximum velocity expected in problem, used to scale velocity vector plot.

XPUT(15)=TWFIN-problem time when calculation is to be terminated.

XPUT(16)=CWPRT=number of cycles between long prints output on paper.

8B

XPUT(17)=CWPLT=number of cycles between velocity vector plots.

XPUT(18)=OMG=ω=over-relaxation factor used in pressure iteration. (1.95)

XPUT(19)=ALPHA=α=controls amount of donor cell fluxing : 1.0 for full donor cell differencing and 0.0 for centered differencing.

XPUT(20)=GAMMA=γ=controls the amount of donor cell fluxing in kinematic equations for free surface position. (Not concerned with the present study)

9B

XPUT(21)=WL=indicator for boundary condition to be used along the left side of the mesh:1.0=rigid free-slip wall, 2.0=rigid no-slip wall, 3.0=continuative boundary, 4.0=periodic boundary. (3.0)

XPUT(22)=WR=indicator for boundary condition along right side of mesh. (3.0)

XPUT(23)=WT=indicator for boundary condition along top of mesh. (Not concerned with the present study)

XPUT(24)=WB=indicator for boundary condition along bottom of mesh. (Not concerned with the present study)

10B

XPUT(25)=TB=top boundary definition:0.0 for top boundary coincident with the top mesh boundary, 1.0 for free surface, 2.0 for rigid top boundary. (2.0)

XPUT(26)=BB=bottom boundary definition: 0.0 for bottom boundary coincident with the bottom mesh boundary, 1.0 for free surface, 2.0 for rigid bottom boundary. (2.0)

XPUT(27)=A=eliminator inclined angle for single-, double-layer louvre or zig-zag eliminators, or the amplitude for other eliminators.

XPUT(28)=IPUNCH=>0.0 for punch output of final velocities, ≤0.0 for no punch output.

11B

XPUT(29)=VANG=angle between the air flow and the normal to the eliminator inlet transverse cross section.

XPUT(30)=INVEL=≠0.0 for initial velocity distribution supplied by user,

=0.0 assume constant initial velocity distribution of UI and VI.

XPUT(31)=NSLIP=>0.0 for free-slip condition at the rigid boundaries.

≤0.0 for no-slip condition at the rigid boundaries.

XPUT(32)=LIER=limiting number of iteration per cycle. (1500)

12B

XPUT(33)=LC=maximum cycle number beyond which velocity calculation will stop if iteration is greater than LIER. (60)

If INVEL ≠ 0.0

Card No. 13B and onward (If NCAL ≤ 0 and INVEL ≠ 0.0)

I,J, U(I,J), V(I,J)

FORMAT(I3,5X,I3,2(6X,E12.5))

(a) I is the nodal point number in x-direction.

(b) J is the nodal point number in y-direction.

(c) U(I,J) is the velocity component in x-direction at (I,J).

(d) V(I,J) is the velocity component in y-direction at (I,J).

(C) If NCAL ≥ 0

Card No. 3 Trajectory calculation information (If NCAL ≥ 0)

NY,DN,ERR,EANG

FORMAT(I10,5F10.3)

(a) NY=the number of points at eliminator entrance where trajectory calculation will start. (20)

(b) DN=number of points within 1/NY of the entrance width of the eliminator which will be tested when change of trapping conditions is detected. (10)

(c) ERR=the control parameter for time step determination. (0.1)

(d) EANG=angle between the eliminator length and the vertical.

Card No. 4 (If NCAL ≥ 0)

ND

FORMAT(I3)

ND=number of droplet sizes for which trajectory calculation will be performed.

Card No. 5 (If NCAL ≥ 0)

(DD(I),I=1,ND)

FORMAT(8F10.6)

DD(I)=droplet diameter in μm for which trajectory calculation will be performed.

CHAPTER 5

NUMERICAL STABILITY CONSIDERATIONS

Numerical calculations frequently exhibit unstable behavior in which computed quantities develop large, high frequency oscillations in space, time, or both. When this type of behavior occurs it is usually referred to as a numerical instability, especially if the physical problem being studied is known not to possess such behavior. When the physical problem does have unstable solutions, if the calculated results exhibit significant variations over distances comparable to a cell width or times comparable to the time increment, the accuracy of the results cannot be relied on. To avoid this type of numerical instability or inaccuracy in the velocity calculation by the Subroutine SOLASUR, certain restrictions must be observed in defining the mesh increments δx and δy, the time increment δt, and the upstream differencing parameter α. The restrictions to these parameters are as follows:

(1) The curved rigid boundaries must be definable by single valued functions, e.g., $y=H(x)$ for the top boundary and $y=HB(x)$ for the bottom boundary.

(2) The slope of the rigid boundaries must not exceed the cell aspect ratio $\delta y/\delta x$.

(3) The mesh increments must be chosen small enough to resolve the expected spatial variations in all dependent variables.

(4) Fluid cannot move through more than one cell in one time step. Therefore the time increment must satisfy the inequality

$$\delta t < \min \left\{ \frac{\delta x}{|u|}, \frac{\delta y}{|v|} \right\} , \qquad (5.1)$$

where the minimum is with respect to every cell in the mesh. Typically, δt is chosen equal to 1/4 to 1/3 of the minimum cell transit time.

(5) When a non-zero value of kinematic viscosity is employed, momentum must not diffuse more than approximately one cell in one time step. This implies

$$\nu \delta t < \frac{1}{2} \frac{\delta x^2 \delta y^2}{\delta x^2 + \delta y^2} . \qquad (5.2)$$

(6) α and γ should satisfy the following inequality in order to insure numerical stability:

$$1 \geq \alpha > \max \left\{ \left|\frac{u\delta t}{\delta x}\right|, \left|\frac{v\delta t}{\delta y}\right| \right\} \qquad (5.3)$$

As a rule of thumb, $\alpha = \gamma$ approximately 1.2 to 1.5 times larger than the right hand member of the last inequality is a good choice.

REFERENCES

(1) Chan, J. and Golay, M.W., "Numerical Simulation of Cooling Tower Drift Eliminator Performance," Numerical/ Laboratory Computer Methods in Fluid Mechanics, presented at the ASME Annual Winter Meeting, edited by A.A. Pouring and U.L. Shah, ASME, New York, Dec., 1976, pp. 229.

(2) Chan, J., "Comparative Evaluation of Cooling Tower Drift Eliminator Performance," Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, June, 1977.

(3) Hirt, C.W., Nichols, B.D. and Romero, N.C., "SOLA-- A Numerical Solution Algorithm for Transient Fluid Flows," LA-5832, 1974, Los Alamos Scientific Lab.

(4) Carnahan, B., Luther, H.A. and Wilkes, J.O., Applied Numerical Method, John Wiley & Sons, Inc., 1969.

APPENDIX A

LISTING OF THE DRIFT PROGRAM

```
C                                                                               MAIN0001
C    DRIFT - COMPUTER PROGRAM TO CALCULATE COOLING TOWER DRIFT                  MAIN0002
C            ELIMINATOR EFFECTIVENESS USING FOURTH ORDER RUNGE-KUTTA            MAIN0003
C            NUMERICAL SOLUTION                                                 MAIN0004
C                                                                               MAIN0005
      DIMENSION U(60,60),V(60,60),JB(60),JT(60)                                 MAIN0006
      DIMENSION DD(20),AA(20)                                                   MAIN0007
      COMMON NTYPE,TTY,XL,A,DELX,DELY,JB,JT,IMAX,TTY1,CWPLT,NDATA               MAIN0008
      DOUBLE PRECISION UY,UZ,E,FZE,FY,FZ,VTI,VY,VZ,Y,Z                          MAIN0009
      DOUBLE PRECISION YS(4),YB(4),F(4),FA(4)                                   MAIN0010
      E(X,Y)=2.*DA*R/VC*DSQRT((UY-X)**2+(UZ-Y)**2)                              MAIN0011
      FZE(X,Y)=1.+0.197*E(X,Y)**0.63+(2.6E-4)*E(X,Y)**1.38                      MAIN0012
      FY(VY,VZ)=FZE(VY,VZ)/VTI*(UY-VY)+9.80665*SIN(EANG)                        MAIN0013
      FZ(VY,VZ)=FZE(VY,VZ)/VTI*(UZ-VZ)-9.80665*COS(EANG)                        MAIN0014
   99 READ (5,102,END=95)  (AA(I),I=1,20)                                       MAIN0015
  102 FORMAT(20A4)                                                              MAIN0016
      PRINT 103,(AA(I),I=1,20)                                                  MAIN0017
  103 FORMAT(1H1,///,10X,20A4)                                                  MAIN0018
      READ 100,NCAL,NTYPE,NTJ,NDATA                                             MAIN0019
C                                                                               MAIN0020
C    NCAL=NEGATIVE INTEGER FOR VELOCITY DISTRIBUTION CALCULATION ONLY           MAIN0021
C    NCAL=0 FOR EFFECTIVENESS CALCULATION WITH INTERNALLY CALCULATED            MAIN0022
C           VELOCITY DISTRIBUTION                                               MAIN0023
C    NCAL=POSITIVE INTEGER FOR EFFECTIVENESS CALCULATION WITH                   MAIN0024
C         VELOCITY DISTRIBUTION INPUT BY USER                                   MAIN0025
C                                                                               MAIN0026
C    NTYPE=1 FOR SINGLE LAYER ELIMINATOR                                        MAIN0027
C    NTYPE=2 FOR DOUBLE LAYER ELIMINATOR                                        MAIN0028
C    NTYPE=3 FOR SINUS SHAPE  ELIMINATOR                                        MAIN0029
C    NTYPE=4 FOR TRIBLE LAYER ELIMINATOR                                        MAIN0030
C    NTYPE=5 FOR HI-V TYPE ELIMINATOR                                           MAIN0031
C    NTYPE=6 FOR ASBESTOS CEMENT ELIMINATOR                                     MAIN0032
C    NTYPE=7 FOR OTHER ELIMINATOR GEOMETRIES                                    MAIN0033
C                                                                               MAIN0034
C    NTJ NOT EQUAL 0 FOR DROPLET TRAJECTORY PLOT                                MAIN0035
C    NTJ=0 NO DROPLET TRAJECTORY PLOT                                           MAIN0036
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C                                                                       MAIN0037
C     NDATA REPRESENTS THE NUMBERING OF THE DATA SET                    MAIN0038
C     NOTE THAT EITHER ALL DATA SETS HAVE THE SAME PLOTTING OPTIONS     MAIN0039
C        OR THAT DATA SET WITH PLOTTING OPTION SHOULD BE PLACED FIRST   MAIN0040
C                                                                       MAIN0041
  100 FORMAT(5I3)                                                       MAIN0042
      PRINT 105,NCAL,NTYPE,NTJ,NDATA                                    MAIN0043
  105 FORMAT(1H ,5X,'NCAL= ',I3,//,5X,'NTYPE=',I3,//,5X,'NTJ=  ',I3,//,5MAIN0044
     1X,'NDATA=',I3)                                                    MAIN0045
      IF(NCAL) 1,1,2                                                    MAIN0046
    1 CALL SOLASU(U,V)                                                  MAIN0047
      IF(NCAL.EQ.0) GO TO 10                                            MAIN0048
      GO TO 99                                                          MAIN0049
    2 READ 200,IMAX,XL,TTY,A,DELX,DELY                                  MAIN0050
C                                                                       MAIN0051
C     IMAX=MAXIMUM NUMBER OF NODES IN X-DIRECTION                       MAIN0052
C     XL=LENGTH OF ELIMINATOR IN METER                                  MAIN0053
C     TTY=ELIMINATOR PITCH IN METER                                     MAIN0054
C     A=ELIMINATOR INCLINE ANGLE IN RADIAN OR AMPLITUDE FOR SINUS SHAPE MAIN0055
C     DELX=MESH SIZE IN X-DIRECTION                                     MAIN0056
C     DELY=MESH SIZE IN Y-DIRECTION                                     MAIN0057
C                                                                       MAIN0058
  200 FORMAT(I10,5F10.3)                                                MAIN0059
      IF(NTYPE.EQ.1) TTY1=TTY+XL/TAN(A)                                 MAIN0060
      IF(NTYPE.EQ.2) TTY1=TTY+XL/(2.*TAN(A))                            MAIN0061
      IF(NTYPE.GE.3) TTY1=TTY+A                                         MAIN0062
      IF(NTYPE.EQ.4) TTY1=TTY+XL/(3.*TAN(A))                            MAIN0063
      READ 350,(JB(I),JT(I),I=1,IMAX)                                   MAIN0064
C                                                                       MAIN0065
C     JB(I)=NODE NUMBER FOR BOTTOM BOUNDARY                             MAIN0066
C     JT(I)=NODE NUMBER FOR TOP BOUNDARY                                MAIN0067
C                                                                       MAIN0068
  350 FORMAT(2I3)                                                       MAIN0069
      DO 3 I=1,IMAX                                                     MAIN0070
      JB1=JB(I)-1                                                       MAIN0071
      JT1=JT(I)+1                                                       MAIN0072
      DO 3 J=JB1,JT1                                                    MAIN0073
      READ 300,I,J,U(I,J),V(I,J)                                        MAIN0074
C                                                                       MAIN0075
C   U=AIR VELOCITY IN X-DIRECTION                                       MAIN0076
C   V=AIR VELOCITY IN Y-DIRECTION                                       MAIN0077
C                                                                       MAIN0078
  300 FORMAT(I3,5X,I3,2(6X,E12.5))                                      MAIN0079
      PRINT 300,I,J,U(I,J),V(I,J)                                       MAIN0080
    3 CONTINUE                                                          MAIN0081
C                                                                       MAIN0082
C   START ELIMINATOR EFFICIENCY CALCULATION                             MAIN0083
C                                                                       MAIN0084
   10 READ 200,NY,DN,ERR,EANG                                           MAIN0085
C                                                                       MAIN0086
C   NY IS THE NUMBER OF POINTS AT ENTRANCE TO BE TESTED                 MAIN0087
C   DN IS THE NUMBER OF POINTS AT ENTRANCE TO BE TESTED AFTER CHANGE OF MAIN0088
C      TRAPPING IS DETECTED                                             MAIN0089
C   ERR IS THE CONTROL PARAMETER FOR TIME STEP DETERMINATION            MAIN0090
C   EANG=ANGLE BETWEEN THE ELIMINATOR AND THE VERTICAL                  MAIN0091
C                                                                       MAIN0092
      PRINT 250,NTYPE,NY,DN,ERR,XL,TTY,TTY1,A,EANG                      MAIN0093
  250 FORMAT(1H1,///,5X,'NTYPE= ',I3,//,5X,'NY= ',I3,//,5X,'DN= ',F5.1, MAIN0094
     11//,5X,'ERR= ',F10.6,//5X,'LENGTH(XL)= ',F10.6,//,5X,'PITCH(TTY)= 'MAIN0095
     2,F10.6,//,5X,'TOTAL WIDTH(TTY1)= ',F10.6,//,5X,'A= ',F10.6,//,5X, MAIN0096
     3'EANG= ',F10.6)                                                   MAIN0097
      DO 11 I=1,IMAX                                                    MAIN0098
      JT1=JT(I)                                                         MAIN0099
      JB1=JB(I)                                                         MAIN0100
      DO 11 J=JB1,JT1                                                   MAIN0101
   11 V(I,J)=-V(I,J)                                                    MAIN0102
C                                                                       MAIN0103
C   DA=AIR DENSITY IN KG/CUBIC METER                                    MAIN0104
C   DL=WATER DENSITY IN KG/CUBIC METER                                  MAIN0105
C   VC=AIR VISCOSITY IN KG/SEC-M                                        MAIN0106
C                                                                       MAIN0107
      DA=1.205                                                          MAIN0108
      DL=1000.                                                          MAIN0109
      VC=1.8479E-5                                                      MAIN0110
      DY=TTY/NY                                                         MAIN0111
      PI=3.1415926/XL                                                   MAIN0112
      DMN=0.5                                                           MAIN0113
      CONV=5.0/TTY1                                                     MAIN0114
      IF((XL*CONV).GT.8.) CONV=8.0/XL                                   MAIN0115
      PRINT 255,CONV                                                    MAIN0116
  255 FORMAT(///,5X,'CONVERSION FACTOR FOR TRAJECTORY PLOTTING = ',E20.6MAIN0117
     1)                                                                 MAIN0118
      READ 101,ND,(DD(I),I=1,ND)                                        MAIN0119
  101 FORMAT(I3,/,(8F10.6))                                             MAIN0120
      IF(NDATA.GT.1) GO TO 12                                           MAIN0121
      IF(NTJ.EQ.0) GO TO 13                                             MAIN0122
      IF(NCAL.EQ.0.AND.CWPLT.GT.0.0) GO TO 12                           MAIN0123
      CALL PLOTS(ID,ID,09)                                              MAIN0124
      CALL PLOT(0.0,2.0,-3)                                             MAIN0125
   12 IF(NTJ.EQ.0) GO TO 13                                             MAIN0126
      Y1=TTY1*CONV                                                      MAIN0127
      CALL PLOT(0.0,Y1,-3)                                              MAIN0128
   13 DO 90 K=1,ND                                                      MAIN0129
      D=DD(K)                                                           MAIN0130
      R=D*0.0000005                                                     MAIN0131
      CFT=R/20.E-6                                                      MAIN0132
      VTI=2./9.*DL/VC*R**2                                              MAIN0133
      VS=(2.*DA/VC)**2                                                  MAIN0134
      VT=VTI*9.80665                                                    MAIN0135
C                                                                       MAIN0136
C  USING NEWTON METHOD OF TANGENT TO CALCULATE INITIAL TERMINATE VELOCITY MAIN0137
C                                                                       MAIN0138
      DO 21 I=1,50                                                      MAIN0139
      DRE=2.*DA*R/VC                                                    MAIN0140
      RE=DRE*ABS(VT)                                                    MAIN0141
      DF=0. 97*0.63*RE**(-0.37)*DRE+(2.6E-4)*1.38*RE**0.38*DRE          MAIN0142
      FRE=1.+0.197*RE**0.63+(2.6E-4)*RE**1.38                           MAIN0143
      FV=VT-VTI*9.80665/FRE                                             MAIN0144
      DFV=1.+VTI*9.80665/FRE**2*DF                                      MAIN0145
      VT1=VT-FV/DFV                                                     MAIN0146
      VTH=ABS(VT1-VT)/VT1                                               MAIN0147
      IF(VTH.LT.0.001) GO TO 22                                         MAIN0148
      VT=VT1                                                            MAIN0149
   21 CONTINUE                                                          MAIN0150
   22 PRINT 400,D,VT1                                                   MAIN0151
  400 FORMAT(1H1,///,5X,'DIA OF DROPLET = ',F10.2.' MICRON',///,5X,     MAIN0152
     1'TERMINAL VELOCITY = ',F20.6)                                     MAIN0153
C                                                                       MAIN0154
C   PLOT ELIMINATOR BOUNDARIES                                          MAIN0155
C                                                                       MAIN0156
      IF(NTJ.EQ.0) GO TO 29                                             MAIN0157
      CALL SYMBOL(1.0,DMN,0.21,'DROPLET DIA= ',0.0.13)                  MAIN0158
      CALL NUMBER(999.0,999.0,0.21,D,0.0,-1)                            MAIN0159
      CALL SYMBOL(999.0,999.0,0.21,' MICRON',0.0.7)                     MAIN0160
      CALL PLOT(0.0,0.0,3)                                              MAIN0161
      IF(NTYPE.GT.6) GO TO 1029                                         MAIN0162
      GO TO(23,24,25,28,1028,1027),NTYPE                                MAIN0163
C                                                                       MAIN0164
C   BOUNDARY PLOT FOR SINGLE LAYER ELIMINATOR                           MAIN0165
C                                                                       MAIN0166
   23 Y1=-XL/TAN(A)*CONV                                                MAIN0167
      Z1=XL*CONV                                                        MAIN0168
      CALL PLOT(Z1,Y1,2)                                                MAIN0169
      Y1=Y1-TTY*CONV                                                    MAIN0170
      CALL PLOT(Z1,Y1,3)                                                MAIN0171
      Y1=-TTY*CONV                                                      MAIN0172
      CALL PLOT(0.,Y1,2)                                                MAIN0173
      CALL PLOT(0.,0.,3)                                                MAIN0174
      GO TO 29                                                          MAIN0175
C                                                                       MAIN0176
C   BOUNDARY PLOT FOR DOUBLE LAYER ELIMINATOR                           MAIN0177
C                                                                       MAIN0178
   24 Z1=XL*CONV/2.                                                     MAIN0179
      Y1=-Z1/TAN(A)                                                     MAIN0180
      CALL PLOT(Z1,Y1,2)                                                MAIN0181
      Z1=XL*CONV                                                        MAIN0182
      Y1=0.                                                             MAIN0183
      CALL PLOT(Z1,Y1,2)                                                MAIN0184
      Y1=-TTY*CONV                                                      MAIN0185
      Z1=0.                                                             MAIN0186
      CALL PLOT(Z1,Y1,3)                                                MAIN0187
      Z1=XL*CONV/2.                                                     MAIN0188
      Y1=-Z1/TAN(A)-TTY*CONV                                            MAIN0189
      CALL PLOT(Z1,Y1,2)                                                MAIN0190
      Z1=XL*CONV                                                        MAIN0191
      Y1=-TTY*CONV                                                      MAIN0192
      CALL PLOT(Z1,Y1,2)                                                MAIN0193
      CALL PLOT(0.,0.,3)                                                MAIN0194
      GO TO 29                                                          MAIN0195
C                                                                       MAIN0196
C    BOUNDARY PLOT FOR SINUS SHAPE ELIMINATOR                           MAIN0197
C                                                                       MAIN0198
   25 DELZ=XL/100.                                                      MAIN0199
      X1=0.0                                                            MAIN0200
      DO 26 I=1,100                                                     MAIN0201
      X1=X1+DELZ                                                        MAIN0202
      Y1=-A*SIN(PI*X1)*CONV                                             MAIN0203
      Z1=X1*CONV                                                        MAIN0204
      CALL PLOT(Z1,Y1,2)                                                MAIN0205
   26 CONTINUE                                                          MAIN0206
      X1=0.0                                                            MAIN0207
      Y1=-TTY*CONV                                                      MAIN0208
      CALL PLOT(X1,Y1,3)                                                MAIN0209
      DO 27 I=1,100                                                     MAIN0210
      X1=X1+DELZ                                                        MAIN0211
      Y1=-A*SIN(PI*X1)*CONV-TTY*CONV                                    MAIN0212
      Z1=X1*CONV                                                        MAIN0213
      CALL PLOT(Z1,Y1,2)                                                MAIN0214
   27 CONTINUE                                                          MAIN0215
      CALL PLOT(0.,0.,3)                                                MAIN0216
      GO TO 29                                                          MAIN0217
C                                                                       MAIN0218
C   BOUNDARY PLOT FOR ASBESTOS CEMENT ELIMINATOR                        MAIN0219
C                                                                       MAIN0220
 1027 CONTINUE                                                          MAIN0221
      DO 1929 I=1,2                                                     MAIN0222
      Z1=CONV*0.005                                                     MAIN0223
      Y1=-CONV*0.0                                                      MAIN0224
      CALL PLOT(Z1,Y1,2)                                                MAIN0225
      Z1=CONV*0.01                                                      MAIN0226
      Y1=-CONV*0.0015                                                   MAIN0227
      CALL PLOT(Z1,Y1,2)                                                MAIN0228
      Z1=CONV*0.015                                                     MAIN0229
      Y1=-CONV*0.004                                                    MAIN0230
      CALL PLOT(Z1,Y1,2)                                                MAIN0231
      Z1=CONV*0.02                                                      MAIN0232
      Y1=-CONV*0.0075                                                   MAIN0233
      CALL PLOT(Z1,Y1,2)                                                MAIN0234
      Z1=CONV*0.055                                                     MAIN0235
      Y1=-CONV*0.0374145                                                MAIN0236
      CALL PLOT(Z1,Y1,2)                                                MAIN0237
      Z1=CONV*0.06                                                      MAIN0238
      Y1=-CONV*0.04                                                     MAIN0239
      CALL PLOT(Z1,Y1,2)                                                MAIN0240
      Z1=CONV*0.065                                                     MAIN0241
      Y1=-CONV*0.042                                                    MAIN0242
      CALL PLOT(Z1,Y1,2)                                                MAIN0243
      Z1=CONV*0.07                                                      MAIN0244
      Y1=-CONV*0.0435                                                   MAIN0245
      CALL PLOT(Z1,Y1,2)                                                MAIN0246
      Z1=CONV*0.08                                                      MAIN0247
      Y1=-CONV*0.0435                                                   MAIN0248
      CALL PLOT(Z1,Y1,2)                                                MAIN0249
      Z1=CONV*0.085                                                     MAIN0250
      Y1=-CONV*0.042                                                    MAIN0251
      CALL PLOT(Z1,Y1,2)                                                MAIN0252
      Z1=CONV*0.09                                                      MAIN0253
      Y1=-CONV*0.04                                                     MAIN0254
      CALL PLOT(Z1,Y1,2)                                                MAIN0255
      Z1=CONV*0.095                                                     MAIN0256
      Y1=-CONV*0.0374145                                                MAIN0257
      CALL PLOT(Z1,Y1,2)                                                MAIN0258
      Z1=CONV*0.13                                                      MAIN0259
      Y1=-CONV*0.0075                                                   MAIN0260
      CALL PLOT(Z1,Y1,2)                                                MAIN0261
      Z1=CONV*0.135                                                     MAIN0262
      Y1=-CONV*0.004                                                    MAIN0263
      CALL PLOT(Z1,Y1,2)                                                MAIN0264
      Z1=CONV*0.14                                                      MAIN0265
      Y1=-CONV*0.0015                                                   MAIN0266
      CALL PLOT(Z1,Y1,2)                                                MAIN0267
      Z1=CONV*0.145                                                     MAIN0268
      Y1=-CONV*0.0                                                      MAIN0269
      CALL PLOT(Z1,Y1,2)                                                MAIN0270
      Z1=CONV*0.15                                                      MAIN0271
      Y1=-CONV*0.0                                                      MAIN0272
      CALL PLOT(Z1,Y1,2)                                                MAIN0273
      IF(I.EQ.2) GO TO 1929                                             MAIN0274
      Z1=0.0                                                            MAIN0275
      Y1=-CONV*TTY                                                      MAIN0276
      CALL PLOT(Z1,Y1,-3)                                               MAIN0277
 1929 CONTINUE                                                          MAIN0278
      Z1=0.0                                                            MAIN0279
      Y1=CONV*TTY                                                       MAIN0280
      CALL PLOT(Z1,Y1,-3)                                               MAIN0281
      GO TO 29                                                          MAIN0282
C                                                                       MAIN0283
C    BOUNDARY PLOT FOR TRIBLE LAYER ELIMINATOR                          MAIN0284
C                                                                       MAIN0285
   28 CONTINUE                                                          MAIN0286
      Z1=XL*CONV/3.                                                     MAIN0287
      Y1=-Z1/TAN(A)                                                     MAIN0288
      CALL PLOT(Z1,Y1,2)                                                MAIN0289
      Z1=2.*Z1                                                          MAIN0290
      Y1=0.                                                             MAIN0291
      CALL PLOT(Z1,Y1,2)                                                MAIN0292
      Z1=XL*CONV                                                        MAIN0293
      Y1=-Z1/(3.*TAN(A))                                                MAIN0294
      CALL PLOT(Z1,Y1,2)                                                MAIN0295
      Y1=-TTY*CONV                                                      MAIN0296
      Z1=0.                                                             MAIN0297
      CALL PLOT(Z1,Y1,3)                                                MAIN0298
      Z1=XL*CONV/3.                                                     MAIN0299
      Y1=-Z1/TAN(A)-TTY*CONV                                            MAIN0300
      CALL PLOT(Z1,Y1,2)                                                MAIN0301
      Z1=2.*XL*CONV/3.                                                  MAIN0302
      Y1=-TTY*CONV                                                      MAIN0303
      CALL PLOT(Z1,Y1,2)                                                MAIN0304
      Z1=XL*CONV                                                        MAIN0305
      Y1=-Z1/(3.*TAN(A))-TTY*CONV                                       MAIN0306
      CALL PLOT(Z1,Y1,2)                                                MAIN0307
      CALL PLOT(0.,0.,3)                                                MAIN0308
      GO TO 29                                                          MAIN0309
C                                                                       MAIN0310
C   BOUNDARY PLOT FOR HI-V TYPE ELIMINATOR                              MAIN0311
C                                                                       MAIN0312
 1028 CONTINUE                                                          MAIN0313
      Z1=CONV*0.015                                                     MAIN0314
      Y1=-CONV*0.0                                                      MAIN0315
      CALL PLOT(Z1,Y1,2)                                                MAIN0316
      Z1=CONV*0.055                                                     MAIN0317
      Y1=-CONV*0.04                                                     MAIN0318
      CALL PLOT(Z1,Y1,2)                                                MAIN0319
      Z1=CONV*0.085                                                     MAIN0320
      CALL PLOT(Z1,Y1,2)                                                MAIN0321
      Z1=CONV*0.125                                                     MAIN0322
      Y1=-CONV*0.0                                                      MAIN0323
      CALL PLOT(Z1,Y1,2)                                                MAIN0324
      Z1=CONV*0.14                                                      MAIN0325
      CALL PLOT(Z1,Y1,2)                                                MAIN0326
      Z1=CONV*0.0                                                       MAIN0327
      Y1=-CONV*TTY                                                      MAIN0328
      CALL PLOT(Z1,Y1,3)                                                MAIN0329
      Z1=CONV*0.02                                                      MAIN0330
      CALL PLOT(Z1,Y1,2)                                                MAIN0331
      Z1=CONV*0.06                                                      MAIN0332
      Y1=-CONV*(TTY+0.04)                                               MAIN0333
      CALL PLOT(Z1,Y1,2)                                                MAIN0334
      Z1=CONV*0.08                                                      MAIN0335
      CALL PLOT(Z1,Y1,2)                                                MAIN0336
      Z1=CONV*0.12                                                      MAIN0337
      Y1=-CONV*TTY                                                      MAIN0338
      CALL PLOT(Z1,Y1,2)                                                MAIN0339
      Z1=CONV*0.14                                                      MAIN0340
      CALL PLOT(Z1,Y1,2)                                                MAIN0341
      CALL PLOT(0.,0.,3)                                                MAIN0342
      GO TO 29                                                          MAIN0343
C                                                                       MAIN0344
C   BOUNDARY PLOT FOR ARBITRARY GEOMETRY AS SUPPLIED BY USER            MAIN0345
C                                                                       MAIN0346
 1029 CONTINUE                                                          MAIN0347
      CALL BOUNPL(CONV,TTY,XL,A,TTY1,DELX,DMN)                          MAIN0348
C                                                                       MAIN0349
C   INITIAL CONDITIONS                                                  MAIN0350
C                                                                       MAIN0351
   29 TPF=0.0                                                           MAIN0352
      N1=2                                                              MAIN0353
      ITEST=0                                                           MAIN0354
      NTRAP=0                                                           MAIN0355
      YI=0.                                                             MAIN0356
   30 IF(YI-TTY-1.E-8) 31,80,80                                         MAIN0357
   31 Z=0.D0                                                            MAIN0358
      IF(NTJ.EQ.0) GO TO 35                                             MAIN0359
      Z1=0.                                                             MAIN0360
      Y1=-YI*CONV                                                       MAIN0361
      CALL PLOT(Z1,Y1,3)                                                MAIN0362
   35 Y=YI                                                              MAIN0363
      H=TTY1-Y                                                          MAIN0364
      J=INT(H/DELY+1.E-8)+2                                             MAIN0365
      DDY=H-FLOAT(J-2)*DELY                                             MAIN0366
      IF(J.LE.JT(1)) GO TO 33                                           MAIN0367
      V(1,J)=V(1,JT(1))                                                 MAIN0368
      U(1,J)=U(1,JT(1))                                                 MAIN0369
   33 IF(J.GE.JB(1)) GO TO 34                                           MAIN0370
      V(1,J)=V(1,JB(1))                                                 MAIN0371
      U(1,J)=U(1,JB(1))                                                 MAIN0372
   34 IF((J+1).GT.JT(1))  V(1,J+1)=V(1,JT(1))                           MAIN0373
      IF((J+1).LT.JB(1))  V(1,J+1)=V(1,JB(1))                           MAIN0374
      UY=V(1,J)*(1.-DDY/DELY)+V(1,J+1)*DDY/DELY                         MAIN0375
      UZ=U(1,J)                                                         MAIN0376
      VY=UY+VT1*SIN(EANG)                                               MAIN0377
      VZ=UZ-VT1*COS(EANG)                                               MAIN0378
      YS(1)=Y                                                           MAIN0379
      YS(2)=VY                                                          MAIN0380
      YS(3)=Z                                                           MAIN0381
      YS(4)=VZ                                                          MAIN0382
   32 IF(VZ.GT.0.)  GO TO 40                                            MAIN0383
      IF(N1.EQ.2)  N1=1                                                 MAIN0384
      IF(YI.GT.TTY)  GO TO 80                                           MAIN0385
      GO TO 73                                                          MAIN0386
   40 CONTINUE                                                          MAIN0387
C                                                                       MAIN0388
C  TO FIND AIR VELOCITIES AT THIS TIME STEP                             MAIN0389
C                                                                       MAIN0390
      H=Z                                                               MAIN0391
      I=INT(H/DELX+1.E-8)+2                                             MAIN0392
      H=TTY1-Y                                                          MAIN0393
      J=INT(H/DELY+1.E-8)+2                                             MAIN0394
      DDX=Z-FLOAT(I-2)*DELX                                             MAIN0395
      DDY=H-FLOAT(J-2)*DELY                                             MAIN0396
      IF((I+1).GE.IMAX) U(I+1,J)=U(IMAX-1,J)                            MAIN0397
      IF(I.LT.IMAX) GO TO 41                                            MAIN0398
      U(I,J)=U(IMAX-1,J)                                                MAIN0399
      U(I+1,J)=U(I,J)                                                   MAIN0400
      V(I,J)=V(IMAX-1,J)                                                MAIN0401
      V(I,J+1)=V(I,J)                                                   MAIN0402
   41 IF(J.LE.JT(I)) GO TO 42                                           MAIN0403
      U(I,J)=U(I,JT(I))                                                 MAIN0404
      V(I,J)=V(I,JT(I))                                                 MAIN0405
   42 IF(J.GE.JB(I)) GO TO 43                                           MAIN0406
      U(I,J)=U(I,JB(I))                                                 MAIN0407
      V(I,J)=V(I,JB(I))                                                 MAIN0408
   43 IF(J.GT.JT(I+1)) U(I+1,J)=U(I+1,JT(I+1))                          MAIN0409
      IF(J.LT.JB(I+1)) U(I+1,J)=U(I+1,JB(I+1))                          MAIN0410
      IF((J+1).GT.JT(I)) V(I,J+1)=V(I,JT(I))                            MAIN0411
      IF((J+1).LT.JB(I)) V(I,J+1)=V(I,JB(I))                            MAIN0412
      UY=V(I,J)*(1.-DDY/DELY)+V(I,J+1)*DDY/DELY                         MAIN0413
      UZ=U(I,J)*(1.-DDX/DELX)+U(I+1,J)*DDX/DELX                         MAIN0414
C                                                                       MAIN0415
C    TO FIND TIME STEP SIZE                                             MAIN0416
C                                                                       MAIN0417
      RE1=E(VY,VZ)                                                      MAIN0418
      RES=VS*R**2/RE1*(0.124/RE1**0.37+(3.59E-4)*RE1**0.38)             MAIN0419
      DFZ=(FZE(VY,VZ)+(UZ-VZ)**2*RES)/VTI*CFT                           MAIN0420
      DFY=(FZE(VY,VZ)+(UY-VY)**2*RES)/VTI*CFT                           MAIN0421
      T=ERR/AMAX1(DFZ,DFY)                                              MAIN0422
C                                                                       MAIN0423
C   FOURTH ORDER RUNGE-KUTTA APPROXIMATION                              MAIN0424
C                                                                       MAIN0425
      DO 50 I=1,4                                                       MAIN0426
      YB(I)=YS(I)                                                       MAIN0427
   50 FA(I)=0.0D0                                                       MAIN0428
      MN=0                                                              MAIN0429
   51 F(1)=YS(2)                                                        MAIN0430
      F(2)=FY(YS(2),YS(4))                                              MAIN0431
      F(3)=YS(4)                                                        MAIN0432
      F(4)=FZ(YS(2),YS(4))                                              MAIN0433
      XMN=1.                                                            MAIN0434
      YMN=2.                                                            MAIN0435
      IF(MN.EQ.3) GO TO 53                                              MAIN0436
      DO 52 I=1,4                                                       MAIN0437
      IF(MN.NE.0) XMN=2.                                                MAIN0438
      FA(I)=FA(I)+F(I)*XMN                                              MAIN0439
      IF(MN.EQ.2) YMN=1.                                                MAIN0440
   52 YS(I)=YB(I)+T*F(I)/YMN                                            MAIN0441
      MN=MN+1                                                           MAIN0442
      GO TO 51                                                          MAIN0443
   53 DO 54 I=1,4                                                       MAIN0444
      FA(I)=(FA(I)+F(I))/6.                                             MAIN0445
   54 YS(I)=YB(I)+T*FA(I)                                               MAIN0446
      Y=YS(1)                                                           MAIN0447
      VY=YS(2)                                                          MAIN0448
      Z=YS(3)                                                           MAIN0449
      VZ=YS(4)                                                          MAIN0450
C                                                                       MAIN0451
C    DROPLET POSITION PLOT                                              MAIN0452
C                                                                       MAIN0453
      IF(NTJ.EQ.0) GO TO 59                                             MAIN0454
      IF(ITEST.NE.0) GO TO 59                                           MAIN0455
      Z1=Z*CONV                                                         MAIN0456
      Y1=-Y*CONV                                                        MAIN0457
      CALL PLOT(Z1,Y1,2)                                                MAIN0458
C                                                                       MAIN0459
C    DEFINE ELIMINATOR BOUNDARIES                                       MAIN0460
C                                                                       MAIN0461
   59 CONTINUE                                                          MAIN0462
      IF(NTYPE.GT.6) GO TO 1069                                         MAIN0463
      GO TO (60,61,62,63,64,65),NTYPE                                   MAIN0464
C                                                                       MAIN0465
C    BOUNDARY FOR SINGLE LAYER ELIMINATOR                               MAIN0466
C                                                                       MAIN0467
   60 YB1=Z/TAN(A)                                                      MAIN0468
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      GO TO 68                                                          MAIN0469
C                                                                       MAIN0470
C   BOUNDARY FOR DOUBLE LAYER ELIMINATOR                                MAIN0471
C                                                                       MAIN0472
   61 IF((Z-XL/2.).LT.0.0) GO TO 60                                     MAIN0473
      YB1=(XL-Z)/TAN(A)                                                 MAIN0474
      GO TO 68                                                          MAIN0475
C                                                                       MAIN0476
C   BOUNDARY FOR SINUS SHAPE ELIMINATOR                                 MAIN0477
C                                                                       MAIN0478
   62 H=Z                                                               MAIN0479
      YB1=A*SIN(PI*H)                                                   MAIN0480
      GO TO 68                                                          MAIN0481
C                                                                       MAIN0482
C   BOUNDARY FOR TRIBLE LAYER ELIMINATOR                                MAIN0483
C                                                                       MAIN0484
   63 IF(Z.GT.(XL/3.))  GO TO 1061                                      MAIN0485
      YB1=Z/TAN(A)                                                      MAIN0486
      GO TO 68                                                          MAIN0487
 1061 IF(Z.GT.(XL*2./3.)) GO TO 1062                                    MAIN0488
      YB1=(XL*2./3.-Z)/TAN(A)                                           MAIN0489
      GO TO 68                                                          MAIN0490
 1062 YB1=(Z-XL*2./3.)/TAN(A)                                           MAIN0491
      GO TO 68                                                          MAIN0492
C                                                                       MAIN0493
C   BOUNDARY FOR HI-V TYPE ELIMINATOR                                   MAIN0494
C                                                                       MAIN0495
   64 IF(Z.LE.0.015.OR.Z.GE.0.125) YB1=0.0                              MAIN0496
      IF(Z.LE.0.02.OR.Z.GE.0.12) YB2=TTY                                MAIN0497
      IF(Z.LE.0.085.AND.Z.GE.0.055) YB1=0.04                            MAIN0498
      IF(Z.LE.0.08 .AND.Z.GE.0.06 ) YB2=0.04+TTY                        MAIN0499
      IF(Z.LT.0.055.AND.Z.GT.0.015) YB1=Z-0.015                         MAIN0500
      IF(Z.LT.0.125.AND.Z.GT.0.085) YB1=0.125-Z                         MAIN0501
      IF(Z.LT.0.06.AND.Z.GT.0.02) YB2=Z+TTY-0.02                        MAIN0502
      IF(Z.LT.0.12.AND.Z.GT.0.08) YB2=TTY+0.12-Z                        MAIN0503
      GO TO 69                                                          MAIN0504
```

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C                                                                         MAIN0505
C   BOUNDARY FOR ASBESTOS CEMENT ELIMINATOR                               MAIN0506
C                                                                         MAIN0507
   65 CALL ASBCEM(Z,YB1)                                                  MAIN0508
   68 YB2=YB1+TTY                                                         MAIN0509
      GO TO 69                                                            MAIN0510
C                                                                         MAIN0511
C   BOUNDARIES FOR ARBITRARY GEOMETRIES DEFINED BY USER                   MAIN0512
C                                                                         MAIN0513
 1069 CONTINUE                                                            MAIN0514
      CALL BOUNTS(Z,YB1,YB2,TTY,XL,A,DELX)                                MAIN0515
C   TEST IF THE DROPLET GOES OUT OF BOUNDARIES                            MAIN0516
C                                                                         MAIN0517
   69 IF(Y.LE.YB1) GO TO 70                                               MAIN0518
      IF(Y.GE.YB2) GO TO 70                                               MAIN0519
      IF(Z-XL)32,75,75                                                    MAIN0520
C                                                                         MAIN0521
C   THE DROPLET IS TRAPPED                                                MAIN0522
C                                                                         MAIN0523
   70 IF(N1.EQ.2) N1=1                                                    MAIN0524
      IF(ITEST.EQ.0) GO TO 73                                             MAIN0525
      IF(N1-1)72,71,71                                                    MAIN0526
   71 YI=YI+DYY                                                           MAIN0527
      GO TO 31                                                            MAIN0528
   72 TPF=TPF-(DY-(YII-YI))/TTY                                           MAIN0529
      PRINT 501,TPF                                                       MAIN0530
  501 FORMAT(//,10X,'TPF= ',F15.6)                                        MAIN0531
      YI=YII                                                              MAIN0532
      N1=1                                                                MAIN0533
      ITEST=0                                                             MAIN0534
      GO TO 79                                                            MAIN0535
   73 NTRAP=NTRAP+1                                                       MAIN0536
      PRINT 500,YI,VZ,Z,VY,Y,T                                            MAIN0537
  500 FORMAT(//,5X,'TRAP  INITIAL POSITION = ',F15.6,                     MAIN0538
     12X,'VZ= ',D15.6,2X,'Z= ',D15.6,2X,'VY= ',D15.6,2X,'Y= ',D15.6,      MAIN0539
     2/,45X,'TIME STEP SIZE= ',F15.6)                                     MAIN0540
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```
      IF(N1.EQ.1) GO TO 79                                              MAIN0541
   74 ITEST=1                                                           MAIN0542
      DYY=DY/DN                                                         MAIN0543
      YII=YI                                                            MAIN0544
      YI=YI-DY+DYY                                                      MAIN0545
      GO TO 31                                                          MAIN0546
C                                                                       MAIN0547
C    THE DROPLET IS NOT TRAPPED                                         MAIN0548
C                                                                       MAIN0549
   75 IF(N1.EQ.2) N1=0                                                  MAIN0550
      IF(ITEST.EQ.0) GO TO 78                                           MAIN0551
      IF(N1-0)76,76,77                                                  MAIN0552
   76 YI=YI+DYY                                                         MAIN0553
      GO TO 31                                                          MAIN0554
   77 TPF=TPF+(DY-(YII-YI))/TTY                                         MAIN0555
      PRINT 501,TPF                                                     MAIN0556
      YI=YII                                                            MAIN0557
      N1=0                                                              MAIN0558
      ITEST=0                                                           MAIN0559
      GO TO 79                                                          MAIN0560
   78 IF(N1-0)79,79,74                                                  MAIN0561
   79 YI=YI+DY                                                          MAIN0562
      GO TO 30                                                          MAIN0563
C                                                                       MAIN0564
C    EFFICIENCY DETERMINATION                                           MAIN0565
C                                                                       MAIN0566
   80 EFF=FLOAT(NTRAP-1)/FLOAT(NY)+TPF                                  MAIN0567
      PRINT 600,EFF                                                     MAIN0568
  600 FORMAT(///,10X,'COLLECTION EFFICIENCY = ',F15.6)                  MAIN0569
      IF(NTJ.EQ.0) GO TO 90                                             MAIN0570
      CALL PLOT(15.0,0.0,-3)                                            MAIN0571
   90 CONTINUE                                                          MAIN0572
      IF(NTJ.EQ.0) GO TO 99                                             MAIN0573
      Y1=-TTY1*CONV                                                     MAIN0574
      CALL PLOT(15.0,Y1,-3)                                             MAIN0575
      GO TO 99                                                          MAIN0576
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95 IF(NTJ.EQ.0.AND.CWPLT.LE.0.0) GO TO 96
   CALL ENDPLT(15.0,0.0,999)
96 CONTINUE
   END
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      SUBROUTINE SOLASU(U,V)                                            SOLA0001
C     PROGRAM SOLASUR                                                   SOLA0002
      DIMENSION U(60,60),V(60,60),UN(60,60),VN(60,60),P(60,60),         SOLA0003
     1XPUT(35),H(60),HN(60),JT(60),JB(60),HB(60),HBN(60)                SOLA0004
      COMMON NTYPE,TTY,XL,A,DELX,DELY,JB,JT,IMAX,TTY1,CWPLT,NDATA       SOLA0005
      REAL NU                                                           SOLA0006
      INTEGER CYCLE,WL,WR,WT,WB                                         SOLA0007
      PRINT 35                                                          SOLA0008
C                                                                       SOLA0009
C * * READ AND PRINT INITIAL INPUT DATA                                 SOLA0010
C                                                                       SOLA0011
      READ 25,NUM,(XPUT(I),I=1,NUM)                                     SOLA0012
C                                                                       SOLA0013
C   IF IPUNCH IS GREATER THAN 0 VELOCITY DISTRIBUTION WILL BE PUNCHED OUT SOLA0014
C   IF CWPLT IS LESS OR EQUAL TO 0 NO VELOCITY DISTRIBUTION WILL BE PLOTTED SOLA0015
C   VANG=ANGLE BETWEEN THE AIR FLOW AND THE NORMAL TO THE ELIMINATOR    SOLA0016
C      INLET                                                            SOLA0017
C   IF INVEL IS GREATER THAN ZERO, THE INITIAL VELOCITY                 SOLA0018
C     DISTRIBUTION IS SUPPLIED BY USER                                  SOLA0019
C   IF NSLIP IS GREATER THAN ZERO, IT IS FREE SLIP BOUNDARY,            SOLA0020
C     OTHERWISE IT IS NO SLIP BOUNDARY                                  SOLA0021
C   LIER IS THE LIMIT NUMBER OF ITERATION PER CYCLE                     SOLA0022
C   LC IS THE MAXIMUM CYCLE IF ITERATION DOES NOT CONVERGE              SOLA0023
C                                                                       SOLA0024
      IBAR=XPUT(1)                                                      SOLA0025
      JBAR=XPUT(2)                                                      SOLA0026
      XL=XPUT(3)                                                        SOLA0027
      TTY=XPUT(4)                                                       SOLA0028
      A=XPUT(27)                                                        SOLA0029
      DELX=XL/XPUT(1)                                                   SOLA0030
      IF(NTYPE.EQ.1) TTY1=TTY+XL/TAN(A)                                 SOLA0031
      IF(NTYPE.EQ.2) TTY1=TTY+XL/(2.*TAN(A))                            SOLA0032
      IF(NTYPE.GE.3) TTY1=TTY+A                                         SOLA0033
      IF(NTYPE.EQ.4) TTY1=TTY+XL/(3.*TAN(A))                            SOLA0034
      DELY=TTY1/XPUT(2)                                                 SOLA0035
      XPUT(3)=DELX                                                      SOLA0036
      XPUT(4)=DELY                                                      SOLA0037
      DELT=XPUT(5)                                                      SOLA0038
      NU=XPUT(6)                                                        SOLA0039
      CYL=XPUT(7)                                                       SOLA0040
      EPSI=XPUT(8)                                                      SOLA0041
      DZRO=XPUT(9)                                                      SOLA0042
      GX=XPUT(10)                                                       SOLA0043
      GY=XPUT(11)                                                       SOLA0044
      UI=XPUT(12)                                                       SOLA0045
      VI=XPUT(13)                                                       SOLA0046
      VELMX=XPUT(14)                                                    SOLA0047
      TWFIN=XPUT(15)                                                    SOLA0048
      CWPRT=XPUT(16)                                                    SOLA0049
      CWPLT=XPUT(17)                                                    SOLA0050
      OMG=XPUT(18)                                                      SOLA0051
      ALPHA=XPUT(19)                                                    SOLA0052
      GAMMA=XPUT(20)                                                    SOLA0053
      WL=XPUT(21)                                                       SOLA0054
      WR=XPUT(22)                                                       SOLA0055
      WT=XPUT(23)                                                       SOLA0056
      WB=XPUT(24)                                                       SOLA0057
      TB=XPUT(25)                                                       SOLA0058
      BB=XPUT(26)                                                       SOLA0059
      IPUNCH=XPUT(28)                                                   SOLA0060
      VANG=XPUT(29)                                                     SOLA0061
      INVEL=XPUT(30)                                                    SOLA0062
      NSLIP=XPUT(31)                                                    SOLA0063
      LIER=XPUT(32)                                                     SOLA0064
      LC=XPUT(33)                                                       SOLA0065
      PRINT 50,(XPUT(I),I=1,NUM)                                        SOLA0066
   25 FORMAT(6X,I2,/(4(6X,E12.5)))                                      SOLA0067
   35 FORMAT(1H1)                                                       SOLA0068
   47 FORMAT(6X,'I',7X,'J',12X,'U',17X,'V',18X,'P',18X,'H',11X,'SUR CELL SOLA0069
     1',9X,'BOT CELL')                                                  SOLA0070
   48 FORMAT(4X,I3,5X,I3,4(6X,1PE12.5),2(6X,I6))                        SOLA0071
   49 FORMAT(6X'ITER=',I5,10X'TIME=',1PE12.5,10X'CYCLE=',I4,5X'FVOL=',  SOLA0072
    1 E12.5)                                                                    SOLA0073
   50 FORMAT(1H ,5X'IBAR=',1PE12.5/6X'JBAR=',E12.5/6X'DELX=',E12.5/             SOLA0074
     16X'DELY=',E12.5/6X'DELT=',E12.5/8X'NU=',E12.5/7X'CYL=',E12.5/             SOLA0075
     26X'EPSI=',E12.5/6X'DZRO=',E12.5/8X'GX=',E12.5/8X'GY=',E12.5/              SOLA0076
     38X'UI=',E12.5/8X'VI=',E12.5/5X'VELMX=',E12.5/5X'TWFIN=',E12.5/            SOLA0077
     45X'CWPRT=',E12.5/5X'CWPLT=',E12.5/7X'OMG=',E12.5/5X'ALPHA=',E12.5/        SOLA0078
     55X'GAMMA=',E12.5/8X'WL=',E12.5/8X'WR=',E12.5/8X'WT=',E12.5/               SOLA0079
     68X'WB=',E12.5/8X'TB=',E12.5/8X'BB=',E12.5/9X'A=',E12.5,                   SOLA0080
     7/4X'IPUNCH=',E12.5,/6X'VANG=',E12.5,/,5X,'INVEL=',E12.5,                  SOLA0081
     8/,5X,'NSLIP=',E12.5,/,6X,'LIER=',E12.5,/,8X,'LC=',E12.5)                  SOLA0082
   53 FORMAT(I3,5X,I3,2(6X,1PE12.5))                                            SOLA0083
   55 FORMAT(2I3)                                                               SOLA0084
   57 FORMAT(///,5X,'CONVERSION FACTOR FOR VELOCITY PLOTTING=',E20.6)           SOLA0085
C                                                                               SOLA0086
C * * COMPUTE CONSTANT TERMS AND INITIALIZE NECESSARY VARIABLES                 SOLA0087
C                                                                               SOLA0088
      IMAX=IBAR+2                                                               SOLA0089
      JMAX=JBAR+2                                                               SOLA0090
      IM1=IMAX-1                                                                SOLA0091
      JM1=JMAX-1                                                                SOLA0092
      RDX=1.0/DELX                                                              SOLA0093
      RDY=1.0/DELY                                                              SOLA0094
      JM2=JMAX-2                                                                SOLA0095
      IM2=IMAX-2                                                                SOLA0096
      ITB= INT(TB+1.E-10)                                                       SOLA0097
      IBB= INT(BB+1.E-10)                                                       SOLA0098
      T=0.                                                                      SOLA0099
      ITER=0                                                                    SOLA0100
      CYCLE=0                                                                   SOLA0101
      TWPRT= CWPRT*DELT                                                         SOLA0102
      TWPLT= CWPLT*DELT                                                         SOLA0103
      IF(NTYPE.LE.5) GO TO 110                                                  SOLA0104
      TTY1=FLOAT(JBAR)*DELY                                                     SOLA0105
      XL=FLOAT(IBAR)*DELX                                                       SOLA0106
  110 CONV=5.0/TTY1                                                             SOLA0107
      IF((XL*CONV).GT.8.) CONV=8./XL                                            SOLA0108
      VELMX1=AMIN1(DELX,DELY)/VELMX*CONV                                SOLA0109
      PRINT 57,VELMX1                                                   SOLA0110
      IF(NDATA.GT.1) GO TO 111                                          SOLA0111
      IF(CWPLT.LE.0.0) GO TO 111                                        SOLA0112
      CALL PLOTS(ID,ID,09)                                              SOLA0113
      CALL PLOT(0.0,2.0,-3)                                             SOLA0114
  111 CONTINUE                                                          SOLA0115
      BETA= OMG/(2.*DELT*(RDX**2+RDY**2))                               SOLA0116
      DO 150 I=1,IMAX                                                   SOLA0117
      HN(I)=0.                                                          SOLA0118
      HBN(I)=0.                                                         SOLA0119
      DO 150 J=1,JMAX                                                   SOLA0120
      P(I,J)=0.                                                         SOLA0121
      V(I,J)=0.                                                         SOLA0122
  150 U(I,J)=0.                                                         SOLA0123
C                                                                       SOLA0124
C * * SPECIAL INPUT DATA                                                SOLA0125
C                                                                       SOLA0126
C                                                                       SOLA0127
C * * DETERMINE SLOPED BOUNDARY LOCATION                                SOLA0128
C                                                                       SOLA0129
      IF(NTYPE.GT.6) GO TO 240                                          SOLA0130
      GO TO (210,215,220,225,230,235),NTYPE                             SOLA0131
C                                                                       SOLA0132
C * * BOTTOM BOUNDARY LOCATION FOR SINGLE LAYER ELIMINATOR              SOLA0133
C                                                                       SOLA0134
  210 CONTINUE                                                          SOLA0135
      DO 211 I=2,IM1                                                    SOLA0136
      HB(I)=(XL-(FLOAT(I-2)+0.5)*DELX)/TAN(A)                           SOLA0137
  211 JB(I)= INT(HB(I)*RDY+1.E-8) + 2                                   SOLA0138
      GO TO 250                                                         SOLA0139
C                                                                       SOLA0140
C * * BOTTOM BOUNDARY LOCATION FOR DOUBLE LAYER ELIMINATOR              SOLA0141
C                                                                       SOLA0142
  215 CONTINUE                                                          SOLA0143
      DO 216 I=2,IM1                                                    SOLA0144
      XY=(FLOAT(I-2)+0.5)*DELX
      IF(XY.LE.XL/2.)  HB(I)=(XL/2.-XY)/TAN(A)
      IF(XY.GE.XL/2.)  HB(I)=(XY-XL/2.)/TAN(A)
  216 JB(I)= INT(HB(I)*RDY+1.E-8)  + 2
      GO TO 250
C
C * * BOTTOM BOUNDARY LOCATION FOR SINUS SHAPE ELIMINATOR
C
  220 CONTINUE
      DO 221 I=2,IM1
      HB(I)=A*(1.0-SIN((FLOAT(I-2)+0.5)*DELX*3.1415926/XL))
  221 JB(I)= INT(HB(I)*RDY+1.E-8)  + 2
      GO TO 250
C
C * * BOTTOM BOUNDARY LOCATION FOR TRIBLE LAYER ELIMINATOR
C
  225 CONTINUE
      IMH=(IMAX-2)/3+1
      DO 226 I=2,IMH
      HB(I)=(XL/3.-(FLOAT(I-2)+0.5)*DELX)/TAN(A)
  226 JB(I)=INT(HB(I)*RDY+1.E-8)+2
      HB(1)=HB(2)
      JB(1)=JB(2)
      IMHH=2*(IMAX-2)/3+1
      IMH=IMH+1
      DO 227 I=IMH,IMHH
      HB(I)=HB(IMHH-I+2)
  227 JB(I)=JB(IMHH-I+2)
      IMH=IMHH+1
      DO 228 I=IMH,IM1
      HB(I)=HB(I-IMH+2)
  228 JB(I)=JB(I-IMH+2)
      GO TO 250
C
C * * BOTTOM BOUNDARY LOCATION FOR HI-V TYPE ELIMINATOR
C
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  230 CONTINUE                                                          SOLA0181
      IMH=IMAX/2                                                        SOLA0182
      Z1=DELX/2.                                                        SOLA0183
      CALL HIVBT(Z1,Y1,TTY1)                                            SOLA0184
      HB(2)=Y1                                                          SOLA0185
      DO 232 I=3,IMH                                                    SOLA0186
      Z1=Z1+DELX                                                        SOLA0187
      CALL HIVBT(Z1,Y1,TTY1)                                            SOLA0188
      HB(I)=Y1                                                          SOLA0189
  232 CONTINUE                                                          SOLA0190
      IMH=IMH+1                                                         SOLA0191
      DO 233 I=IMH,IM1                                                  SOLA0192
      HB(I)=HB(IM1-I+2)                                                 SOLA0193
  233 CONTINUE                                                          SOLA0194
      DO 231 I=2,IM1                                                    SOLA0195
  231 JB(I)=INT(HB(I)*RDY+1.E-8)+2                                      SOLA0196
      GO TO 250                                                         SOLA0197
C                                                                       SOLA0198
C * * BOTTOM BOUNDARY LOCATION FOR ASBESTOS CEMENT ELIMINATOR           SOLA0199
C                                                                       SOLA0200
  235 CONTINUE                                                          SOLA0201
      IMH=IMAX/2                                                        SOLA0202
      Z1=DELX/2.                                                        SOLA0203
      CALL ASBCEM(Z1,Y1)                                                SOLA0204
      HB(2)=A-Y1                                                        SOLA0205
      DO 238 I=3,IMH                                                    SOLA0206
      Z1=Z1+DELX                                                        SOLA0207
      CALL ASBCEM(Z1,Y1)                                                SOLA0208
      HB(I)=A-Y1                                                        SOLA0209
  238 CONTINUE                                                          SOLA0210
      IMH=IMH+1                                                         SOLA0211
      DO 239 I=IMH,IM1                                                  SOLA0212
      HB(I)=HB(IM1-I+2)                                                 SOLA0213
  239 CONTINUE                                                          SOLA0214
      DO 236 I=2,IM1                                                    SOLA0215
  236 JB(I)=INT(HB(I)*RDY+1.E-8)+2                                      SOLA0216
  250 HB(1)= HB(2)                                                                  SOLA0217
      HB(IMAX)=HB(IM1)                                                              SOLA0218
      JB(1)= JB(2)                                                                  SOLA0219
      JB(IMAX)=JB(IM1)                                                              SOLA0220
C                                                                                   SOLA0221
C * * COMPUTE INITIAL TOP SURFACE CONFIGURATION                                     SOLA0222
C                                                                                   SOLA0223
      IF(NTYPE.NE.5) GO TO 251                                                      SOLA0224
      IMH=IMAX/2                                                                    SOLA0225
      Z1=DELX/2.                                                                    SOLA0226
      CALL HIVTB(Z1,Y1,TTY1)                                                        SOLA0227
      H(2)=Y1                                                                       SOLA0228
      DO 253 I=3,IMH                                                                SOLA0229
      Z1=Z1+DELX                                                                    SOLA0230
      CALL HIVTB(Z1,Y1,TTY1)                                                        SOLA0231
      H(I)=Y1                                                                       SOLA0232
  253 CONTINUE                                                                      SOLA0233
      IMH=IMH+1                                                                     SOLA0234
      DO 254 I=IMH,IM1                                                              SOLA0235
      H(I)=H(IM1-I+2)                                                               SOLA0236
  254 CONTINUE                                                                      SOLA0237
      H(1)=H(2)                                                                     SOLA0238
      H(IMAX)=H(IM1)                                                                SOLA0239
      DO 252 I=1,IMAX                                                               SOLA0240
      JT(I)=INT(H(I)*RDY+1.E-8)+2                                                   SOLA0241
  252 IF(JT(I).GT.JM1) JT(I)= JM1                                                   SOLA0242
      GO TO 270                                                                     SOLA0243
  251 DO 260 I=2,IM1                                                                SOLA0244
      H(I)= HB(I)+TTY                                                               SOLA0245
      JT(I)= INT(H(I)*RDY+1.E-8) + 2                                                SOLA0246
      IF(JT(I).GT.JM1) JT(I)= JM1                                                   SOLA0247
  260 CONTINUE                                                                      SOLA0248
      H(1)= H(2)                                                                    SOLA0249
      H(IMAX)= H(IM1)                                                               SOLA0250
      JT(1)= JT(2)                                                                  SOLA0251
      JT(IMAX)= JT(IM1)                                                             SOLA0252
      GO TO 270                                                         SOLA0253
C                                                                       SOLA0254
C * * BOTTOM AND TOP BOUNDARY LOCATIONS FOR ARBITRARY GEOMETRY           SOLA0255
C                                                                       SOLA0256
  240 CONTINUE                                                          SOLA0257
      CALL BTBOUN(HB,H,JB,JT,RDY,IMAX,A,TTY,XL,DELX)                    SOLA0258
C                                                                       SOLA0259
C * * CALCULATE HYDROSTATIC PRESSURE                                    SOLA0260
C                                                                       SOLA0261
  270 CONTINUE                                                          SOLA0262
      DO 290 I=2,IM1                                                    SOLA0263
      JT1=JT(I)                                                         SOLA0264
      JB1= JB(I)                                                        SOLA0265
      IF(IBB.EQ.1) GO TO 282                                            SOLA0266
      DO 280 J= JB1,JT1                                                 SOLA0267
      P(I,J)= -GY*(H(I)-(FLOAT(J)-1.5)*DELY)                            SOLA0268
  280 CONTINUE                                                          SOLA0269
      GO TO 290                                                         SOLA0270
  282 CONTINUE                                                          SOLA0271
      DO 285 J= JB1,JT1                                                 SOLA0272
      P(I,J)= GY*((FLOAT(J)-1.5)*DELY-HB(I))                            SOLA0273
  285 CONTINUE                                                          SOLA0274
  290 CONTINUE                                                          SOLA0275
C                                                                       SOLA0276
C * * SET INITIAL VELOCITY FIELD INTO U AND V ARRAYS                    SOLA0277
C                                                                       SOLA0278
      IF(INVEL.EQ.0) GO TO 555                                          SOLA0279
      DO 550 I=1,IMAX                                                   SOLA0280
      JB1=JB(I)-1                                                       SOLA0281
      JT1=JT(I)+1                                                       SOLA0282
      DO 550 J=JB1,JT1                                                  SOLA0283
  550 READ 53,I,J,U(I,J),V(I,J)                                         SOLA0284
      GO TO 570                                                         SOLA0285
  555 CONTINUE                                                          SOLA0286
      DO 560 I=2,IM1                                                    SOLA0287
      JB2=JB(I)-1                                                       SOLA0288
      JT2=JT(I)+1
      DO 560 J=JB2,JT2
      V(I,J)= VI
      U(I,J)= UI
  560 CONTINUE
  570 CONTINUE
      ASSIGN 4280 TO KRET
      GO TO 2000
C
C * * START CYCLE
C
 1000 CONTINUE
      ITER=0
      FLG=1.
      ASSIGN 3000 TO KRET
C
C * * COMPUTE TEMPORARY U AND V
C
      DO 1100 I=2,IM1
      JT1= JT(I)
      JB1= JB(I)
      DO 1100 J= JB1,JT1
      FUX=((UN(I,J)+UN(I+1,J))*(UN(I,J)+UN(I+1,J))+ALPHA*ABS(UN(I,J)+UN(
     1I+1,J))*(UN(I,J)-UN(I+1,J))-(UN(I-1,J)+UN(I,J))*(UN(I-1,J)+UN(I,J)
     2)-ALPHA*ABS(UN(I-1,J)+UN(I,J))*(UN(I-1,J)-UN(I,J)))/(4.*DELX)
      FUY=((VN(I,J)+VN(I+1,J))*(UN(I,J)+UN(I,J+1))
     1+ALPHA*ABS(VN(I,J)+VN(I+1,J))*(UN(I,J)-UN(I,J+1))
     2-(VN(I,J-1)+VN(I+1,J-1))*(UN(I,J-1)+UN(I,J))
     3-ALPHA*ABS(VN(I,J-1)+VN(I+1,J-1))*(UN(I,J-1)-UN(I,J)))/(4.*DELY)
      FUC=CYL*((UN(I,J)+UN(I+1,J))*(UN(I,J)+UN(I+1,J))+(UN(I-1,J)+UN(I,J
     1))*(UN(I-1,J)+UN(I,J))
     2+ALPHA*ABS(UN(I,J)+UN(I+1,J))*(UN(I,J)-UN(I+1,J))
     3+ALPHA*ABS(UN(I-1,J)+UN(I,J))*(UN(I-1,J)-UN(I,J)))
     4/(8.*DELX*FLOAT(I-1))
      FVX=((UN(I,J)+UN(I,J+1))*(VN(I,J)+VN(I+1,J))+ALPHA*ABS(UN(I,J)+UN(
     1I,J+1))*(VN(I,J)-VN(I+1,J))-(UN(I-1,J)+UN(I-1,J+1))*(VN(I-1,J)+VN(
     2I,J))-ALPHA*ABS(UN(I-1,J)+UN(I-1,J+1))*(VN(I-1,J)-VN(I,J)))/(4.*DE        SOLA0325
     3LX)                                                                       SOLA0326
      FVY=((VN(I,J)+VN(I,J+1))*(VN(I,J)+VN(I,J+1))+ALPHA*ABS(VN(I,J)+VN         SOLA0327
     1(I,J+1))*(VN(I,J)-VN(I,J+1))-(VN(I,J-1)+VN(I,J))*(VN(I,J-1)+VN(I,J        SOLA0328
     2))-ALPHA*ABS(VN(I,J-1)+VN(I,J))*(VN(I,J-1)-VN(I,J)))/(4.*DELY)            SOLA0329
      FVC=CYL*((UN(I,J)+UN(I,J+1))*(VN(I,J)+VN(I+1,J))+(UN(I-1,J)+UN(I-1        SOLA0330
     1,J+1))*(VN(I-1,J)+VN(I,J))+ALPHA*ABS(UN(I,J)+UN(I,J+1))*(VN(I,J)-V        SOLA0331
     2N(I+1,J))+ALPHA*ABS(UN(I-1,J)+UN(I-1,J+1))*(VN(I-1,J)-VN(I,J)))           SOLA0332
     3/(8.*DELX*(FLOAT(I-1)-0.5))                                               SOLA0333
      VISX= NU*((UN(I+1,J)-2.*UN(I,J)+UN(I-1,J))/DELX**2+                       SOLA0334
     1          (UN(I,J+1)-2.*UN(I,J)+UN(I,J-1))/DELY**2                        SOLA0335
     2   +CYL*((UN(I+1,J)-UN(I-1,J))/(2.*DELX*DELX*FLOAT(I-1))                  SOLA0336
     3   -UN(I,J)/(DELX*FLOAT(I-1))**2))                                        SOLA0337
      VISY= NU*((VN(I+1,J)-2.*VN(I,J)+VN(I-1,J))/DELX**2+                       SOLA0338
     1          (VN(I,J+1)-2.*VN(I,J)+VN(I,J-1))/DELY**2                        SOLA0339
     2    +CYL*(VN(I+1,J)-VN(I-1,J))/(2.*DELX*DELX*(FLOAT(I)-1.5)))             SOLA0340
      U(I,J)= UN(I,J)+DELT*((P(I,J)-P(I+1,J))*RDX + GX-FUX-FUY-FUC+VISX)        SOLA0341
      V(I,J)= VN(I,J)+DELT*((P(I,J)-P(I,J+1))*RDY + GY-FVX-FVY-FVC+VISY)        SOLA0342
 1100 CONTINUE                                                                  SOLA0343
C                                                                               SOLA0344
C * * SET BOUNDARY CONDITIONS                                                   SOLA0345
C                                                                               SOLA0346
 2000 CONTINUE                                                                  SOLA0347
      HN(1)= HN(2)                                                              SOLA0348
      HN(IMAX)= HN(IM1)                                                         SOLA0349
      JT(1)=JT(2)                                                               SOLA0350
      JT(IMAX)=JT(IM1)                                                          SOLA0351
      HBN(1)= HBN(2)                                                            SOLA0352
      HBN(IMAX)= HBN(IM1)                                                       SOLA0353
      JB(1)= JB(2)                                                              SOLA0354
      JB(IMAX)= JB(IM1)                                                         SOLA0355
      DO 2200 J=1,JMAX                                                          SOLA0356
      GO TO(2020,2040,2060,2080),WL                                             SOLA0357
 2020 U(1,J)=0.0                                                                SOLA0358
      V(1,J)=V(2,J)                                                             SOLA0359
      GO TO 2100                                                                SOLA0360
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2040 U(1,J)=0.0                                                      SOLA0361
     V(1,J)=-V(2,J)                                                  SOLA0362
     GO TO 2100                                                      SOLA0363
2060 IF(ITER.GT.0)GO TO 2100                                         SOLA0364
     U(1,J)=U(2,J)                                                   SOLA0365
     V(1,J)=V(2,J)                                                   SOLA0366
     GO TO 2100                                                      SOLA0367
2080 U(1,J)=U(IM2,J)                                                 SOLA0368
     V(1,J)=V(IM2,J)                                                 SOLA0369
     V(2,J)=V(IM1,J)                                                 SOLA0370
     P(2,J)=P(IM1,J)                                                 SOLA0371
     HN(1)= HN(IM2)                                                  SOLA0372
     JT(1)= JT(IM2)                                                  SOLA0373
     HBN(1)= HBN(IM2)                                                SOLA0374
     JB(1)= JB(IM2)                                                  SOLA0375
2100 GO TO (2120,2140,2160,2180),WR                                  SOLA0376
2120 U(IM1,J)=0.0                                                    SOLA0377
     V(IMAX,J)=V(IM1,J)                                              SOLA0378
     GO TO 2200                                                      SOLA0379
2140 U(IM1,J)=0.0                                                    SOLA0380
     V(IMAX,J)=-V(IM1,J)                                             SOLA0381
     GO TO 2200                                                      SOLA0382
2160 IF(ITFR.GT.0)  GOTO 2200                                        SOLA0383
     U(IM1,J)=U(IM2,J)*(IM2/IM1*CYL+(1.0-CYL))                       SOLA0384
     V(IMAX,J)=V(IM1,J)                                              SOLA0385
     GO TO 2200                                                      SOLA0386
2180 U(IM1,J)=U(2,J)                                                 SOLA0387
     V(IMAX,J)=V(3,J)                                                SOLA0388
     HN(IM1)= HN(2)                                                  SOLA0389
     JT(IM1)= JT(2)                                                  SOLA0390
     HN(IMAX)= HN(3)                                                 SOLA0391
     JT(IMAX)= JT(3)                                                 SOLA0392
     HBN(IM1)= HBN(2)                                                SOLA0393
     JB(IM1)= JB(2)                                                  SOLA0394
     HBN(IMAX)= HBN(3)                                               SOLA0395
     JB(IMAX)= JB(3)                                                 SOLA0396
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2200 CONTINUE                                                      SOLA0397
     IF(IBB.NE.0 .AND. ITB.NE.0)GO TO 2600                          SOLA0398
     DO 2500 I=1,IMAX                                              SOLA0399
     JT1= JT(I)                                                    SOLA0400
     JB1= JB(I)                                                    SOLA0401
     IF(ITB.NE.0) GO TO 2400                                       SOLA0402
     GOTO (2320,2340,2360,2380),WT                                 SOLA0403
2320 V(I,JM1)=0.0                                                  SOLA0404
     U(I,JMAX)=U(I,JM1)                                            SOLA0405
     GO TO 2400                                                    SOLA0406
2340 V(I,JM1)=0.0                                                  SOLA0407
     U(I,JMAX)=-U(I,JM1)                                           SOLA0408
     GO TO 2400                                                    SOLA0409
2360 IF(ITER.GT.0) GOTO 2400                                       SOLA0410
     V(I,JM1)=V(I,JM2)                                             SOLA0411
     U(I,JMAX)=U(I,JM1)                                            SOLA0412
     GO TO 2400                                                    SOLA0413
2380 V(I,JM1)=V(I,2)                                               SOLA0414
     U(I,JMAX)=U(I,3)                                              SOLA0415
     GO TO 2400                                                    SOLA0416
2400 IF(IBB.NE.0) GO TO 2500                                       SOLA0417
     GOTO (2420,2440,2460,2480),WB                                 SOLA0418
2420 V(I,1)=0.0                                                    SOLA0419
     U(I,1)=U(I,2)                                                 SOLA0420
     GO TO 2500                                                    SOLA0421
2440 V(I,1)=0.0                                                    SOLA0422
     U(I,1)=-U(I,2)                                                SOLA0423
     GO TO 2500                                                    SOLA0424
2460 IF(ITER.GT.0) GO TO 2500                                      SOLA0425
     V(I,1)=V(I,2)                                                 SOLA0426
     U(I,1)=U(I,2)                                                 SOLA0427
     GO TO 2500                                                    SOLA0428
2480 V(I,1)=V(I,JM2)                                               SOLA0429
     U(I,1)=U(I,JM2)                                               SOLA0430
     U(I,2)=U(I,JM1)                                               SOLA0431
     P(I,2)=P(I,JM1)                                               SOLA0432
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 2500 CONTINUE                                                          SOLA0433
C                                                                       SOLA0434
C * * FREE SURFACE AND SLOPED BOUNDARY CONDITIONS                        SOLA0435
C                                                                       SOLA0436
 2600 CONTINUE                                                          SOLA0437
      IF(ITB.EQ.0 .AND. IBB.EQ.0) GO TO 2650                            SOLA0438
      DO 2620 I= 2,IM1                                                  SOLA0439
      JT1= JT(I)                                                        SOLA0440
      JB1= JB(I)                                                        SOLA0441
      IF(ITB.EQ.0) GO TO 2610                                           SOLA0442
      IF(JT(I+1).LT.JT(I)) U(I,JT1)= U(I,JT1-1)                         SOLA0443
      V(I,JT1)= V(I,JT1-1)-DELY*RDX*(U(I,JT1)-U(I-1,JT1))               SOLA0444
     1 -CYL*DELY*0.5*(U(I,JT1)+U(I-1,JT1))/((FLOAT(I)-1.5)*DELX)        SOLA0445
      U(I,JT1+1)=-U(I,JT1)                                              SOLA0446
      IF(NSLIP.GT.0) U(I,JT1+1)=U(I,JT1)                                SOLA0447
 2610 CONTINUE                                                          SOLA0448
      IF(IBB.EQ.0) GO TO 2620                                           SOLA0449
      IF(JB(I+1).GT.JB(I)) U(I,JB1)= U(I,JB1+1)                         SOLA0450
      V(I,JB1-1)= V(I,JB1)+DELY*RDX*(U(I,JB1)-U(I-1,JB1))               SOLA0451
     1 +CYL*DELY*0.5*(U(I,JB1)+U(I-1,JB1))/((FLOAT(I)-1.5)*DELX)        SOLA0452
      U(I,JB1-1)=-U(I,JB1)                                              SOLA0453
      IF(NSLIP.GT.0) U(I,JB1-1)=U(I,JB1)                                SOLA0454
 2620 CONTINUE                                                          SOLA0455
 2650 CONTINUE                                                          SOLA0456
C                                                                       SOLA0457
C * * SPECIAL BOUNDARY CONDITIONS                                        SOLA0458
C                                                                       SOLA0459
      JBN=JB(1)-1                                                       SOLA0460
      JTN=JT(1)+1                                                       SOLA0461
      DO 2800 J=JBN,JTN                                                 SOLA0462
      V(1,J)=UI*SIN(VANG)                                               SOLA0463
 2800 U(1,J)=UI*COS(VANG)                                               SOLA0464
      GO TO KRET,(3000,4280)                                            SOLA0465
 3000 CONTINUE                                                          SOLA0466
C                                                                       SOLA0467
C * * HAS CONVERGENCE BEEN REACHED                                       SOLA0468
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C                                                                       SOLA0469
      IF(FLG.EQ.0.)GOTO 4000                                            SOLA0470
      ITER=ITER+1                                                       SOLA0471
      IF(ITER.LT.LIER)GOTO 3050                                         SOLA0472
      IF(CYCLE.LT.LC) GO TO 4000                                        SOLA0473
      T= 1.E+10                                                         SOLA0474
      GOTO 4000                                                         SOLA0475
 3050 FLG=0.0                                                           SOLA0476
C                                                                       SOLA0477
C * * COMPUTE UPDATED CELL PRESSURE AND VELOCITIES                      SOLA0478
C                                                                       SOLA0479
      DO 3500 I= 2,IM1                                                  SOLA0480
      JT1= JT(I)                                                        SOLA0481
      JB1= JB(I)                                                        SOLA0482
      DO 3500 J= JB1,JT1                                                SOLA0483
      IF(J.NE.JB1 .AND. J.NE.JT1)  GO TO 3200                           SOLA0484
      IF(J.EQ.JT1 .AND. ITB.EQ.1)  GO TO 3100                           SOLA0485
      IF(J.EQ.JB1 .AND. IBB.EQ.2)  GO TO 3060                           SOLA0486
      IF(J.EQ.JT1 .AND. ITB.EQ.2)  GO TO 3070                           SOLA0487
      IF(J.EQ.JB1 .AND. IBB.EQ.1)  GO TO 3150                           SOLA0488
      GO TO 3200                                                        SOLA0489
 3060 CONTINUE                                                          SOLA0490
      VTM= RDY*(HB(I)-(J-2)*DELY)                                       SOLA0491
      VBM= RDY*((J-1)*DELY-HB(I))                                       SOLA0492
      F=-0.25*RDX*(HB(I+1)-HB(I-1))*(U(I,J)+U(I-1,J))+V(I,J)*VTM        SOLA0493
     1+VBM*(V(I,J)+DELY*RDX*(U(I,J)-U(I-1,J)))                          SOLA0494
      DFDP= DELT*RDY*(VTM+VBM)  + 2.*DELY*RDX*RDX*DELT*VBM              SOLA0495
      DELP= -F/DFDP                                                     SOLA0496
      GO TO 3300                                                        SOLA0497
 3070 CONTINUE                                                          SOLA0498
      VTM= RDY*(H(I)-(J-2)*DELY)                                        SOLA0499
      F=  -0.25*RDX*(H(I+1)-H(I-1))*(U(I,J)+U(I-1,J))+V(I.J-1)          SOLA0500
     1 -VTM*DELY*RDX*(U(I,J)-U(I-1,J))                                  SOLA0501
      DFDP= -DELT*RDY*(1.0+2.0*VTM*DELY**2 * RDX**2)                    SOLA0502
      DELP= -F/DFDP                                                     SOLA0503
      GO TO 3300                                                        SOLA0504
 3100 CONTINUE                                                      SOLA0505
      PETA= DELY/(HN(I)-(FLOAT(JT1)-2.5)*DELY)                          SOLA0506
      DELP= (1.0-PETA)*P(I,JT1-1) - P(I,JT1)                            SOLA0507
      GO TO 3300                                                        SOLA0508
 3150 CONTINUE                                                          SOLA0509
      PETA= DELY/((FLOAT(JB1)-0.5)*DELY - HB(I))                        SOLA0510
      DELP= (1.0-PETA)*P(I,JB1+1)-P(I,JB1)                              SOLA0511
      GO TO 3300                                                        SOLA0512
 3200 CONTINUE                                                          SOLA0513
      D=RDX*(U(I,J)-U(I-1,J))+RDY*(V(I,J)-V(I,J-1))+CYL*(U(I.J)        SOLA0514
     1+U(I-1,J))/(2.*DELX*(FLOAT(I)-1.5))                               SOLA0515
      IF(ABS(D/DZRO).GE.EPSI)FLG=1.0                                    SOLA0516
      DELP= -BETA*D                                                     SOLA0517
 3300 P(I,J)=P(I,J)+DELP                                                SOLA0518
      U(I,J)=U(I,J)+DELT*RDX*DELP                                       SOLA0519
      U(I-1,J)=U(I-1,J)-DELT*RDX*DELP                                   SOLA0520
      V(I,J)=V(I,J)+DELT*RDY*DELP                                       SOLA0521
      V(I,J-1)=V(I,J-1)-DELT*RDY*DELP                                   SOLA0522
 3500 CONTINUE                                                          SOLA0523
      GO TO 2000                                                        SOLA0524
 4000 CONTINUE                                                          SOLA0525
C                                                                       SOLA0526
C * * COMPUTE NEW SURFACE POSITION                                      SOLA0527
C                                                                       SOLA0528
      IF(ITB.NE.1) GO TO 4200                                           SOLA0529
      DO 4100 I=2,IM1                                                   SOLA0530
      JT1= JT(I)                                                        SOLA0531
      HV= RDY*(HN(I)-FLOAT(JT1-2)*DELY)                                 SOLA0532
      UAV= 0.5*(U(I-1,JT1) + U(I.JT1))                                  SOLA0533
      H(I)= HN(I)+DELT*(HV*V(I,JT1)+(1.0-HV)*V(I,JT1-1)                 SOLA0534
     1     -0.5*RDX*(UAV*HN(I+1)+GAMMA*ABS(UAV)*(HN(I)-HN(I+1))         SOLA0535
     2     -UAV*HN(I-1)-GAMMA*ABS(UAV)*(HN(I-1)-HN(I))))                SOLA0536
 4100 CONTINUE                                                          SOLA0537
 4200 CONTINUE                                                          SOLA0538
C                                                                       SOLA0539
C * * COMPUTE NEW POSITION FOR BOTTOM SURFACE                           SOLA0540
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C                                                                       SOLA0541
      IF(IBB.NE.1) GO TO 4230                                           SOLA0542
      DO 4220 I= 2,IM1                                                  SOLA0543
      JB1= JB(I)                                                        SOLA0544
      HBV= RDY*(HBN(I)-FLOAT(JB1-2)*DELY)                               SOLA0545
      UAV= 0.5*(U(I-1,JB1)+U(I,JB1))                                    SOLA0546
      HB(I)= HBN(I)+DELT*(HBV*V(I,JB1)+(1.0-HBV)*V(I,JB1-1)             SOLA0547
     1      -0.5*RDX*(UAV*HBN(I+1)+GAMMA*ABS(UAV)*(HBN(I)-HBN(I+1))     SOLA0548
     2      -UAV*HBN(I-1)-GAMMA*ABS(UAV)*(HBN(I-1)-HBN(I))))            SOLA0549
 4220 CONTINUE                                                          SOLA0550
 4230 CONTINUE                                                          SOLA0551
C                                                                       SOLA0552
C * * CALCULATE CELL IN WHICH SURFACE IS LOCATED AND UPDATE ARRAY       SOLA0553
C                                                                       SOLA0554
      DO 4250 I=2,IM1                                                   SOLA0555
      JT(I)= INT(H(I)*RDY+1.0E-8)  + 2                                  SOLA0556
      IF(JT(I).GT.JM1) JT(I)= JM1                                       SOLA0557
      JB(I)= INT(HB(I)*RDY+1.0E-8)  + 2                                 SOLA0558
 4250 CONTINUE                                                          SOLA0559
      ASSIGN 4280 TO KRET                                               SOLA0560
      GO TO 2600                                                        SOLA0561
 4280 CONTINUE                                                          SOLA0562
C                                                                       SOLA0563
C * * CALCULATE TOTAL FLUID VOLUME                                      SOLA0564
C                                                                       SOLA0565
      FVOL=0.0                                                          SOLA0566
      DO 4300 I=2,IM1                                                   SOLA0567
      ADELX= (CYL*6.28318*(FLOAT(I)-1.5)*DELX + (1.0-CYL))*DELX         SOLA0568
      FVOL= FVOL + (H(I)-HB(I))*ADELX                                   SOLA0569
 4300 CONTINUE                                                          SOLA0570
      FLX=0.0                                                           SOLA0571
      IF(WL.LT.3)GO TO 4345                                             SOLA0572
      JTF= JT(2)-1                                                      SOLA0573
      JBF= JB(2)+1                                                      SOLA0574
      DO 4340 J=JBF,JTF                                                 SOLA0575
      FLX=FLX+U(1,J)*DELT*DELY                                          SOLA0576
 4340 CONTINUE                                                          SOLA0577
      HDIF= H(1)-FLOAT(JT(1)-2)*DELY + FLOAT(JB(1)-1)*DELY-HB(1)        SOLA0578
      FLX=FLX+HDIF*U(1,JT1)*DELT                                        SOLA0579
 4345 CONTINUE                                                          SOLA0580
      IF(WR.LT.3) GOTO 4355                                             SOLA0581
      JTF= JT(IM1)-1                                                    SOLA0582
      JBF= JB(IM1)+1                                                    SOLA0583
      DO 4350 J= JBF,JTF                                                SOLA0584
      FLX=FLX-U(IM1,J)*DELT*DELY                                        SOLA0585
 4350 CONTINUE                                                          SOLA0586
      HDIF= H(IM1)-FLOAT(JT(IM1)-2)*DELY + FLOAT(JB(IM1)-1)*DELY-HB(IM1)SOLA0587
      FLX=FLX-HDIF*U(IM1,JT1)*DELT                                      SOLA0588
 4355 CONTINUE                                                          SOLA0589
      IF(WT.LT.3) GO TO 4365                                            SOLA0590
      DO 4360 I=2,IM1                                                   SOLA0591
      ADELX= (CYL*6.28318*(FLOAT(I)-1.5)*DELX + (1.0-CYL))*DELX         SOLA0592
      FLX= FLX - U(I,JM1)*DELT*ADELX                                    SOLA0593
 4360 CONTINUE                                                          SOLA0594
 4365 CONTINUE                                                          SOLA0595
      IF(WB.LT.3)  GOTO 4375                                            SOLA0596
      DO 4370 I=2,IM1                                                   SOLA0597
      ADELX= (CYL*6.28318*(FLOAT(I)-1.5)*DELX + (1.0-CYL))*DELX         SOLA0598
      FLX= FLX + U(I,1)*DELT*ADELX                                      SOLA0599
 4370 CONTINUE                                                          SOLA0600
 4375 CONTINUE                                                          SOLA0601
      FVOL=FVOL+FLX                                                     SOLA0602
C                                                                       SOLA0603
C * * PRINT AND PLOT                                                    SOLA0604
C                                                                       SOLA0605
C                                                                       SOLA0606
C * * LIST VELOCITY, PRESSURE, AND SURFACE POSITION                     SOLA0607
C                                                                       SOLA0608
 5600 CONTINUE                                                          SOLA0609
      IF(CWPRT.LE.0.) GO TO 5901                                        SOLA0610
      IF(CYCLE.LE.0) GO TO 5800                                         SOLA0611
      IF(T+1.E-6.LT.TWPRT) GO TO 5901                                   SOLA0612
      TWPRT=TWPRT+CWPRT*DELT                                            SOLA0613
 5800 CONTINUE                                                          SOLA0614
      PRINT 35                                                          SOLA0615
      PRINT 49,ITER,T,CYCLE,FVOL                                        SOLA0616
      PRINT 47                                                          SOLA0617
      DO 5900 I= 1,IMAX                                                 SOLA0618
      JT1= JT(I)                                                        SOLA0619
      JB1= JB(I)                                                        SOLA0620
      JT2= JT(I)+1                                                      SOLA0621
      JB2= JB(I)-1                                                      SOLA0622
      DO 5900 J= JB2,JT2                                                SOLA0623
      PRINT 48, I,J,U(I,J),V(I,J),P(I,J),H(I),JT1,JB1                   SOLA0624
 5900 CONTINUE                                                          SOLA0625
C                                                                       SOLA0626
C * * PRESSURE LOSS CALCULATION                                         SOLA0627
C                                                                       SOLA0628
      SPV=0.0                                                           SOLA0629
      SV=0.0                                                            SOLA0630
      JT1=JT(2)                                                         SOLA0631
      JB1=JB(2)                                                         SOLA0632
      DO 7000 I=JB1,JT1                                                 SOLA0633
      SPV=SPV+P(2,I)*U(2,I)                                             SOLA0634
 7000 SV=U(2,I)+SV                                                      SOLA0635
      PRA=SPV/SV                                                        SOLA0636
      SPV=0.0                                                           SOLA0637
      SV=0.0                                                            SOLA0638
      JB1=JB(IM2)                                                       SOLA0639
      JT1=JT(IM2)                                                       SOLA0640
      DO 7010 I=JB1,JT1                                                 SOLA0641
      SPV=SPV+P(IM2,I)*U(IM2,I)                                         SOLA0642
 7010 SV=SV+U(IM2,I)                                                    SOLA0643
      PDROP=(PRA-SPV/SV)*0.0001746                                      SOLA0644
      PRINT 7021,PDROP                                                  SOLA0645
 7021 FORMAT(///,5X,'PRESSURE DROP=',E20.6,2X,'PSI')                    SOLA0646
C                                                                       SOLA0647
C * * VELOCITY VECTOR PLOT                                              SOLA0648
```

```
C                                                                       SOLA0649
 5901 CONTINUE                                                          SOLA0650
      IF(CWPLT.LE.0.0) GO TO 6000                                       SOLA0651
      IF(T+1.E-6.LT.TWPLT) GO TO 6000                                   SOLA0652
      TWPLT=TWPLT+CWPLT*DELT                                            SOLA0653
      JB1=JB(1)                                                         SOLA0654
      JT1=JT(1)                                                         SOLA0655
      XC=0.5*DELX*CONV                                                  SOLA0656
      DO 5001 J=JB1,JT1                                                 SOLA0657
      YC=(FLOAT(J)-1.5)*DELY*CONV                                       SOLA0658
      CALL PLOT(XC,YC,3)                                                SOLA0659
      XVEL=U(1,J)*VELMX1+XC                                             SOLA0660
      YVEL=V(1,J)*VELMX1+YC                                             SOLA0661
      CALL PLOT(XVEL,YVEL,2)                                            SOLA0662
 5001 CONTINUE                                                          SOLA0663
      DO 5000 I=2,IM1                                                   SOLA0664
      JT1=JT(I)                                                         SOLA0665
      JB1=JB(I)                                                         SOLA0666
      DO 5000 J=JB1,JT1                                                 SOLA0667
      XC=(FLOAT(I)-0.5)*DELX*CONV                                       SOLA0668
      YC=(FLOAT(J)-1.5)*DELY*CONV                                       SOLA0669
      CALL PLOT(XC,YC,3)                                                SOLA0670
      XVEL=(U(I,J)+U(I-1,J))*0.5*VELMX1+XC                              SOLA0671
      YVEL=(V(I,J)+V(I,J-1))*0.5*VELMX1+YC                              SOLA0672
      CALL PLOT(XVEL,YVEL,2)                                            SOLA0673
 5000 CONTINUE                                                          SOLA0674
      CALL PLOT(15.0,0.0,-3)                                            SOLA0675
C                                                                       SOLA0676
C * * SET THE ADVANCE TIME VELOCITIES U AND V INTO THE UN AND VN ARRAYS SOLA0677
C * * AND THE ADVANCED TIME SURFACE HEIGHT H INTO THE HN ARRAY          SOLA0678
C                                                                       SOLA0679
 6000 CONTINUE                                                          SOLA0680
      DO 6100 J=1,JMAX                                                  SOLA0681
      DO 6100 I=1,IMAX                                                  SOLA0682
      UN(I,J)=U(I,J)                                                    SOLA0683
      VN(I,J)=V(I,J)                                                    SOLA0684
      HN(I)=H(I)                                                        SOLA0685
      HBN(I)= HB(I)                                                     SOLA0686
 6100 CONTINUE                                                          SOLA0687
C                                                                       SOLA0688
C * * ADVANCE TIME T= T+DELT                                             SOLA0689
C                                                                       SOLA0690
      T=T+DELT                                                          SOLA0691
      IF(T.GT.TWFIN)  GOTO 6500                                         SOLA0692
      CYCLE=CYCLE+1                                                     SOLA0693
      GOTO 1000                                                         SOLA0694
 6500 CONTINUE                                                          SOLA0695
C                                                                       SOLA0696
C * * DATA PUNCH                                                        SOLA0697
C                                                                       SOLA0698
      IF(IPUNCH.LE.0) GO TO 6600                                        SOLA0699
      PUNCH 55,(JB(I),JT(I),I=1,IMAX)                                   SOLA0700
      DO 6505 I=1,IMAX                                                  SOLA0701
      JB1=JB(I)-1                                                       SOLA0702
      JT1=JT(I)+1                                                       SOLA0703
      DO 6505 J=JB1,JT1                                                 SOLA0704
 6505 PUNCH 53,I,J,U(I,J),V(I,J)                                        SOLA0705
 6600 CONTINUE                                                          SOLA0706
      RETURN                                                            SOLA0707
      END                                                               SOLA0708
      SUBROUTINE HIVBT(Z,Y,TTY1)                                        HIVB0001
C                                                                       HIVB0002
C    THIS SUBROUTINE DEFINES THE BOTTOM BOUNDARY OF HI-V ELIMINATOR     HIVB0003
C                                                                       HIVB0004
      IF(Z.LE.0.02) Y=0.04                                              HIVB0005
      IF(Z.GE.0.06) Y=0.0                                               HIVB0006
      IF(Z.LT.0.06.AND.Z.GT.0.02) Y=0.06-Z                              HIVB0007
      RETURN                                                            HIVB0008
      END                                                               HIVB0009
      SUBROUTINE HIVTB(Z,Y,TTY1)                                        HIVT0001
C                                                                       HIVT0002
C    THIS SUBROUTINE DEFINES THE TOP BOUNDARY OF THE HI-V ELIMINATOR    HIVT0003
C                                                                       HIVT0004
      IF(Z.LE.0.015) Y=TTY1                                             HIVT0005
      IF(Z.GE.0.055) Y=TTY1-0.04                                        HIVT0006
      IF(Z.LT.0.055.AND.Z.GT.0.015) Y=TTY1-Z+0.015                      HIVT0007
      RETURN                                                            HIVT0008
      END                                                               HIVT0009
      SUBROUTINE ASBCEM(Z,YB1)                                          ASBM0001
C                                                                       ASBM0002
C   THIS SUBROUTINE DEFINES THE BOTTOM BOUNDARY OF ASBESTOS CEMENT ELIMINATOR   ASBM0003
C                                                                       ASBM0004
      IF(Z.GT.0.055.OR.Z.LT.0.02) GO TO 1063                            ASBM0005
      YB1=(Z-0.012980)/1.17                                             ASBM0006
      GO TO 68                                                          ASBM0007
 1063 IF(Z.GT.0.13.OR.Z.LT.0.095) GO TO 1064                            ASBM0008
      YB1=(0.137020-Z)/1.17                                             ASBM0009
      GO TO 68                                                          ASBM0010
 1064 IF(Z.GT.0.02) GO TO 1065                                          ASBM0011
      IF(Z.LE.0.005) YB1=0.0                                            ASBM0012
      IF(Z.LE.0.01.AND.Z.GE.0.005) YB1=(Z-0.005)*0.3                    ASBM0013
      IF(Z.LE.0.015.AND.Z.GE.0.01) YB1=0.4*Z-0.0025                     ASBM0014
      IF(Z.LE.0.02.AND.Z.GE.0.015) YB1=0.5*Z-0.0040                     ASBM0015
      GO TO 68                                                          ASBM0016
 1065 IF(Z.LT.0.13) GO TO 1066                                          ASBM0017
      IF(Z.GE.0.145) YB1=0.0                                            ASBM0018
      IF(Z.LE.0.145.AND.Z.GE.0.14) YB1=(0.145-Z)*0.3                    ASBM0019
      IF(Z.LE.0.14.AND.Z.GE.0.135) YB1=0.0575-0.4*Z                     ASBM0020
      IF(Z.LE.0.135.AND.Z.GE.0.13) YB1=0.0710-0.5*Z                     ASBM0021
      GO TO 68                                                          ASBM0022
 1066 IF(Z.LE.0.06 .AND.Z.GE.0.055) YB1=0.0359145+(Z-0.055)*0.5171      ASBM0023
      IF(Z.LE.0.065.AND.Z.GE.0.06 ) YB1=0.0385+(Z-0.06)*0.4             ASBM0024
      IF(Z.LE.0.07 .AND.Z.GE.0.065) YB1=0.0405+(Z-0.065)*0.3            ASBM0025
      IF(Z.LE.0.08 .AND.Z.GE.0.07 ) YB1=0.0420                          ASBM0026
      IF(Z.LE.0.085.AND.Z.GE.0.08 ) YB1=0.0405+(0.085-Z)*0.3            ASBM0027
      IF(Z.LE.0.09 .AND.Z.GE.0.085) YB1=0.0385+(0.09-Z)*0.3             ASBM0028
      IF(Z.LE.0.095.AND.Z.GE.0.09 ) YB1=0.0359145+(0.095-Z)*0.5171      ASBM0029
   68 CONTINUE                                                          ASBM0030
      RETURN                                                            ASBM0031
      END                                                               ASBM0032
      SUBROUTINE BOUNPL(CONV,TTY,XL,A,TTY1,DELX,DMN)                    BNPL0001
C                                                                       BNPL0002
C    THIS SUBROUTINE IS FOR PLOTTING BOUNDARIES OF ARBITRARY GEOMETRY   BNPL0003
C     AS SUPPLIED BY USER                                               BNPL0004
C                                                                       BNPL0005
      DEL=ABS(TTY1-TTY-0.0015)                                          BNPL0006
      IF(DEL.LT.0.01) GO TO 10                                          BNPL0007
      DMN=0.5+CONV*0.05025                                              BNPL0008
      Z1=0.0                                                            BNPL0009
      Y1=-CONV*0.05025                                                  BNPL0010
      CALL PLOT(Z1,Y1,-3)                                               BNPL0011
   10 Z=DELX/2.                                                         BNPL0012
      Y=0.0397404-0.606247*Z+5.72396*Z**2+45.2729*Z**3-1688.92*Z**4     BNPL0013
     1+30946.7*Z**5-12495.2*Z**6-1175970.*Z**7                          BNPL0014
      Z1=Z*CONV                                                         BNPL0015
      Y1=-CONV*(0.040583-Y)                                             BNPL0016
      CALL PLOT(Z1,Y1,2)                                                BNPL0017
      DO 1 I=1,36                                                       BNPL0018
      Z=Z+DELX                                                          BNPL0019
      Y=0.0397404-0.606247*Z+5.72396*Z**2+45.2729*Z**3-1688.92*Z**4     BNPL0020
     1+30946.7*Z**5-12495.2*Z**6-1175970.*Z**7                          BNPL0021
      Z1=Z*CONV                                                         BNPL0022
      Y1=-CONV*(0.040583-Y)                                             BNPL0023
    1 CALL PLOT(Z1,Y1,2)                                                BNPL0024
      Z1=0.0                                                            BNPL0025
      Y1=-TTY*CONV                                                      BNPL0026
      CALL PLOT(Z1,Y1,3)                                                BNPL0027
      Z=DELX/2.                                                         BNPL0028
      Y=0.00139581-0.166823*Z+8.46123*Z**2-247.643*Z**3+4301.62*Z**4    BNPL0029
     1-19361.9*Z**5                                                     BNPL0030
      Z1=Z*CONV                                                         BNPL0031
      Y1=-CONV*(0.040583-Y)                                             BNPL0032
      CALL PLOT(Z1,Y1,2)                                                BNPL0033
      DO 2 I=1,36                                                       BNPL0034
      Z=Z+DELX                                                          BNPL0035
      Y=0.00139581-0.166823*Z+8.46123*Z**2-247.643*Z**3+4301.62*Z**4    BNPL0036
     1-19361.9*Z**5                                                     BNPL0037
      Z1=Z*CONV                                                         BNPL0038
      Y1=-CONV*(0.040583-Y)                                             BNPL0039
    2 CALL PLOT(Z1,Y1,2)                                                BNPL0040
      CALL PLOT(0.0,0.0,3)                                              BNPL0041
      TTY1=TTY+0.0015                                                   BNPL0042
      RETURN                                                            BNPL0043
      END                                                               BNPL0044
      SUBROUTINE BOUNTS(Z,YB1,YB2,TTY,XL,A,DELX)                                  BUTS0001
C                                                                                 BUTS0002
C   THIS SUBROUTINE IS FOR DEFINING BOUNDARY OF ARBITRARY GEOMETRY FOR            BUTS0003
C     TESTING WHETHER THE DROPLET IS TRAPPED                                      BUTS0004
C                                                                                 BUTS0005
C   YB1 IS LEFT SIDE BOUNDARY Y VALUE, YB2 IS RIGHT SIDE VALUE, BOTH AT           BUTS0006
C     ELAVATION Z                                                                 BUTS0007
C                                                                                 BUTS0008
      Y=0.0397404-0.606247*Z+5.72396*Z**2+45.2729*Z**3-1688.92*Z**4               BUTS0009
     1+30946.7*Z**5-12495.2*Z**6-1175970.*Z**7                                    BUTS0010
      YB1=Y                                                                       BUTS0011
      Y=0.00139581-0.166823*Z+8.46123*Z**2-247.643*Z**3+4301.62*Z**4              BUTS0012
     1-19361.9*Z**5                                                               BUTS0013
      YB2= Y                                                                      BUTS0014
      YB1=0.040583-YB1                                                            BUTS0015
      YB2=0.040583-YB2                                                            BUTS0016
      RETURN                                                                      BUTS0017
      END                                                                         BUTS0018
      SUBROUTINE BTBOUN(HB,H,JB,JT,RDY,IMAX,A,TTY.XL.DELX)              BTBU0001
C                                                                       BTBU0002
C    THIS SUBROUTINE DEFINES THE BOTTOM AND TOP BOUNDARY                BTBU0003
C    HEIGHT FO ARBITRARY GEOMETRY AS SUPPLIED BY USER                   BTBU0004
C                                                                       BTBU0005
      DIMENSION HB(60),JB(60),H(60),JT(60)                              BTBU0006
      IM1=IMAX-1                                                        BTBU0007
      Z=DELX/2.                                                         BTBU0008
      Y=0.00139581-0.166823*Z+8.46123*Z**2-247.643*Z**3+4301.62*Z**4    BTBU0009
     1-19361.9*Z**5                                                     BTBU0010
      HB(2)= Y                                                          BTBU0011
      Y=0.0397404-0.606247*Z+5.72396*Z**2+45.2729*Z**3-1688.92*Z**4     BTBU0012
     1+30946.7*Z**5-12495.2*Z**6-1175970.*Z**7                          BTBU0013
      H(2)=  Y                                                          BTBU0014
      DO 1 I=3,IM1                                                      BTBU0015
      Z=Z+DELX                                                          BTBU0016
      Y=0.00139581-0.166823*Z+8.46123*Z**2-247.643*Z**3+4301.62*Z**4    BTBU0017
     1-19361.9*Z**5                                                     BTBU0018
      HB(I)= Y                                                          BTBU0019
      Y=0.0397404-0.606247*Z+5.72396*Z**2+45.2729*Z**3-1688.92*Z**4     BTBU0020
     1+30946.7*Z**5-12495.2*Z**6-1175970.*Z**7                          BTBU0021
    1 H(I)=  Y                                                          BTBU0022
      DO 2 I=2,IM1                                                      BTBU0023
      JB(I)=INT(HB(I)*RDY+1.E-8)+2                                      BTBU0024
    2 JT(I)=INT( H(I)*RDY+1.E-8)+2                                      BTBU0025
      HB(1)=HB(2)                                                       BTBU0026
      HB(IMAX)=HB(IM1)                                                  BTBU0027
      H(1)=H(2)                                                         BTBU0028
      H(IMAX)=H(IM1)                                                    BTBU0029
      JB(1)=JB(2)                                                       BTBU0030
      JB(IMAX)=JB(IM1)                                                  BTBU0031
      JT(1)=JT(2)                                                       BTBU0032
      JT(IMAX)=JT(IM1)                                                  BTBU0033
      RETURN                                                            BTBU0034
      END                                                               BTBU0035
```

APPENDIX B

SAMPLE PROBLEM

A sample problem is presented to demonstrate the use of the DRIFT code. In this case the performance of the Hi-V eliminator is studied. Section B.1 lists the input values for this particular case. Initial velocities at all the cells are input. The output of the code is shown in Section B.2. Figs. B.1 to B.3 are the velocity vector plots for this case and Figs. B.4 to B.7 are the droplet trajectory plots for this sample problem.

APPENDIX B.1

INPUT DATA FOR SAMPLE PROBLEM

```
     HI-V ELIMINATOR WITH AIR VELOCITY=1.5M/S    NO SLIP CONDITION
  C   5  1  1
       33
IBAR = 36.         JBAR =   21.        HEIGHT 0.14        PITCH= 0.0428
DELT = 0.C005      NU    = 0.000015    CYL    =  0.       EPSI =.01
DZRO =  1.         GX    = 0.          GY     = 0.        UI    = 1.5
VI    = 0.         VELMX=  4.5         TWFIN= 0.03        CWPRT=  5.0
CWPLT=  20.        OMG   = 1.95        ALPHA= 0.7         GAMMA=  0.7
WL    = 3.         WR    = 3.          WT     = 1.        WB    =  1.
TB    = 2.0        BB    = 2.0          A     = 0.04      IPUNCH    1.
VANG = 0.0         INVEL= 1.           NSLIP= 0.0         LIER =  1500.
LC    =  80.
  1       11       1.50000E+00       0.0
  1       12       1.50000E+00       0.0
  1       13       1.50000E+00       0.0
  1       14       1.50000E+00       0.0
  1       15       1.50000E+00       0.0
  1       16       1.50000E+00       0.0
  1       17       1.50000E+00       0.0
  1       18       1.50000E+00       0.0
  1       19       1.50000E+00       0.0
  1       20       1.50000E+00       0.0
  1       21       1.50000E+00       0.0
  1       22       1.50000E+00       0.0
  1       23       1.50000E+00       0.0
  2       11      -1.52637E+00       3.91550E-03
  2       12       1.52637E+00      -2.28176E-02
  2       13       1.53596E+00      -5.92633E-02
  2       14       1.52841E+00      -8.80505E-02
  2       15       1.52133E+00      -1.10170E-01
```

```
2     16      1.51599E+00     -1.26370E-01
2     17      1.51019E+00     -1.36688E-01
2     18      1.50332E+00     -1.40041E-01
2     19      1.49373E+00     -1.33668E-01
2     20      1.47912E+00     -1.12482E-01
2     21      1.45804E+00     -6.99212E-02
2     22      1.43106E+00     -2.92659E-05
2     23     -1.43106E+00      0.0
3     11     -1.58929E+00      9.27647E-03
3     12      1.58929E+00     -5.45210E-02
3     13      1.60714E+00     -1.26686E-01
3     14      1.58388E+00     -1.82927E-01
3     15      1.56421E+00     -2.25888E-01
3     16      1.54736E+00     -2.57687E-01
3     17      1.53089E+00     -2.78677E-01
3     18      1.51156E+00     -2.87029E-01
3     19      1.48449E+00     -2.77655E-01
3     20      1.44201E+00     -2.40024E-01
3     21      1.37383E+00     -1.54654E-01
3     22      1.27855E+00     -1.81794E-05
3     23     -1.27855E+00      0.0
4     11     -1.70313E+00      1.67571E-02
4     12      1.70313E+00     -9.86606E-02
4     13      1.71793E+00     -2.10989E-01
4     14      1.66337E+00     -2.91576E-01
4     15      1.62458E+00     -3.52793E-01
4     16      1.59285E+00     -3.98914E-01
4     17      1.56231E+00     -4.30766E-01
4     18      1.52711E+00     -4.46537E-01
4     19      1.47982E+00     -4.41807E-01
4     20      1.40749E+00     -4.06813E-01
4     21      1.27736E+00     -3.08994E-01
4     22      9.73800E-01     -1.98483E-05
4     23     -9.73800E-01      0.0
5     11     -1.94288E+00      3.52615E-02
5     12      1.94288E+00     -2.07812E-01
```

```
5       13        1.83937E+00        -3.30939E-01
5       14        1.75647E+00        -4.25341E-01
5       15        1.69839E+00        -5.00170E-01
5       16        1.65067E+00        -5.58799E-01
5       17        1.60503E+00        -6.02114E-01
5       18        1.55396E+00        -6.29332E-01
5       19        1.48865E+00        -6.38276E-01
5       20        1.39275E+00        -6.23330E-01
5       21        1.20822E+00        -5.53237E-01
5       22        6.92250E-01        -2.67781E-01
5       23       -6.92250E-01         0.0
6       11       -1.98302E+00        -3.44591E-01
6       12        1.98302E+00        -3.85287E-01
6       13        1.94492E+00        -4.92292E-01
6       14        1.85549E+00        -5.92679E-01
6       15        1.78017E+00        -6.75596E-01
6       16        1.71463E+00        -7.40446E-01
6       17        1.64819E+00        -7.84205E-01
6       18        1.56785E+00        -7.98282E-01
6       19        1.45662E+00        -7.65814E-01
6       20        1.29985E+00        -6.71625E-01
6       21        1.12353E+00        -5.85755E-01
6       22        1.12353E+00        -1.02302E+00
6       23       -1.12353E+00         0.0
7       10       -3.61649E-01         2.43449E+00
7       11        3.61649E-01         5.72944E-02
7       12        2.52699E+00        -4.94232E-01
7       13        2.12899E+00        -6.80765E-01
7       14        1.96785E+00        -7.94682E-01
7       15        1.86339E+00        -8.77048E-01
7       16        1.77713E+00        -9.42413E-01
7       17        1.69005E+00        -9.84953E-01
7       18        1.59281E+00        -1.01016E+00
7       19        1.49005E+00        -1.04405E+00
7       20        1.41085E+00        -1.15659E+00
7       21        1.41085E+00        -1.44790E+00
```

```
  7     22      -1.41085E+00       0.0
  8      9      -1.53012E-01       5.25109E-01
  8     10       1.53012E-01       3.30633E-03
  8     11       1.26329E+00      -9.10850E-01
  8     12       2.52304E+00      -9.06838E-01
  8     13       2.17888E+00      -9.57521E-01
  8     14       2.04221E+00      -1.03292E+00
  8     15       1.93300E+00      -1.10350E+00
  8     16       1.83751E+00      -1.16471E+00
  8     17       1.74774E+00      -1.22320E+00
  8     18       1.66905E+00      -1.30050E+00
  8     19       1.61974E+00      -1.43199E+00
  8     20       1.61974E+00      -1.64377E+00
  8     21      -1.61974E+00       0.0
  9      8      -1.29098E-01       2.46539E-01
  9      9       1.29098E-01      -3.94857E-02
  9     10       9.14160E-01      -8.11195E-01
  9     11       1.72974E+00      -1.28411E+00
  9     12       2.45202E+00      -1.21210E+00
  9     13       2.19015E+00      -1.22352E+00
  9     14       2.09537E+00      -1.27711E+00
  9     15       1.99545E+00      -1.34042E+00
  9     16       1.90784E+00      -1.41172E+00
  9     17       1.83838E+00      -1.50362E+00
  9     18       1.79902E+00      -1.63539E+00
  9     19       1.79902E+00      -1.81716E+00
  9     20      -1.79902E+00       0.0
 10      7      -1.32473E-01       2.19446E-01
 10      8       1.32473E-01      -4.57543E-02
 10      9       7.74454E-01      -7.00065E-01
 10     10       1.40207E+00      -1.19475E+00
 10     11       2.01080E+00      -1.47972E+00
 10     12       2.40260E+00      -1.42962E+00
 10     13       2.21501E+00      -1.45482E+00
 10     14       2.15125E+00      -1.51178E+00
 10     15       2.06851E+00      -1.58585E+00
```

```
10      16      2.00270E+00     -1.68203E+00
10      17      1.96585E+00     -1.81127E+00
10      18      1.96585E+00     -1.98042E+00
10      19     -1.96585E+00      0.0
11       6     -9.00604E-02      2.12430E-01
11       7      9.00604E-02     -1.31916E-02
11       8      6.92196E-01     -5.80682E-01
11       9      1.22945E+00     -1.04199E+00
11      10      1.76056E+00     -1.40546E+00
11      11      2.19915E+00     -1.59641E+00
11      12      2.40176E+00     -1.59556E+00
11      13      2.27734E+00     -1.65876E+00
11      14      2.23383E+00     -1.74248E+00
11      15      2.17013E+00     -1.84551E+00
11      16      2.13110E+00     -1.97569E+00
11      17      2.13110E+00     -2.14323E+00
11      18     -2.13110E+00      0.0
12       5      1.02360E-02      1.19864E-01
12       6     -1.02360E-02      3.89324E-02
12       7      5.93751E-01     -4.71747E-01
12       8      1.09333E+00     -8.78447E-01
12       9      1.58688E+00     -1.24083E+00
12      10      2.03463E+00     -1.51870E+00
12      11      2.35322E+00     -1.67491E+00
12      12      2.46400E+00     -1.73801E+00
12      13      2.39358E+00     -1.85586E+00
12      14      2.36341E+00     -1.98724E+00
12      15      2.32055E+00     -2.13976E+00
12      16      2.32055E+00     -2.33184E+00
12      17     -2.32055E+00      0.0
13       4      1.69168E-01     -7.96328E-02
13       5     -1.69168E-01      1.02260E-01
13       6      4.63831E-01     -3.78385E-01
13       7      9.37372E-01     -7.26773E-01
13       8      1.41208E+00     -1.04995E+00
13       9      1.86946E+00     -1.33645E+00
```

```
13    10     2.25618E+00    -1.56108E+00
13    11     2.50920E+00    -1.71922E+00
13    12     2.60462E+00    -1.86179E+00
13    13     2.60527E+00    -2.07642E+00
13    14     2.61339E+00    -2.32987E+00
13    15     2.61339E+00    -2.62677E+00
13    16    -2.61339E+00     0.0
14     3     3.99339E-01    -3.97017E-01
14     4    -3.99339E-01     1.79378E-01
14     5     3.16611E-01    -3.13141E-01
14     6     7.44821E-01    -5.98030E-01
14     7     1.20159E+00    -8.65916E-01
14     8     1.66137E+00    -1.11866E+00
14     9     2.09708E+00    -1.34944E+00
14    10     2.46526E+00    -1.56142E+00
14    11     2.74164E+00    -1.79709E+00
14    12     2.94427E+00    -2.14145E+00
14    13     3.07901E+00    -2.62175E+00
14    14     3.07901E+00    -3.09382E+00
14    15    -3.07901E+00     0.0
15     2     6.12134E-01    -8.18776E-01
15     3    -6.12134E-01     2.06731E-01
15     4     1.14307E-01    -3.14043E-01
15     5     5.11412E-01    -5.11544E-01
15     6     9.54942E-01    -7.24581E-01
15     7     1.40666E+00    -9.32492E-01
15     8     1.86621E+00    -1.14017E+00
15     9     2.31412E+00    -1.36021E+00
15    10     2.72857E+00    -1.62728E+00
15    11     3.10964E+00    -2.00039E+00
15    12     3.43585E+00    -2.49879E+00
15    13     3.43585E+00    -2.86058E+00
15    14    -3.43585E+00     0.0
16     1     7.94071E-01    -1.21803E+00
16     2    -7.94071E-01     2.07686E-01
16     3    -1.13508E-01    -2.97860E-01
```

```
16     4      2.60510E-01      -4.46090E-01
16     5      6.75441E-01      -6.12396E-01
16     6      1.11125E+00      -7.70876E-01
16     7      1.55893E+00      -9.25262E-01
16     8      2.01696E+00      -1.07810E+00
16     9      2.46694E+00      -1.23305E+00
16    10      2.87222E+00      -1.37859E+00
16    11      3.16313E+00      -1.43283E+00
16    12      2.97080E+00      -9.61330E-01
16    13     -2.97080E+00       0.0
17     1      2.99484E-01       2.53902E-01
17     2     -2.99484E-01      -2.47547E-01
17     3      1.10907E-02      -3.73873E-01
17     4      3.91428E-01      -5.06606E-01
17     5      7.99159E-01      -6.32042E-01
17     6      1.22217E+00      -7.44499E-01
17     7      1.65770E+00      -8.44639E-01
17     8      2.09936E+00      -9.28189E-01
17     9      2.51686E+00      -9.78802E-01
17    10      2.83376E+00      -9.39811E-01
17    11      2.89006E+00      -6.62950E-01
17    12      2.20611E+00       1.12348E-01
17    13     -2.20611E+00       0.0
18     1      9.41921E-02       3.58224E-05
18     2     -9.41921E-02      -2.08105E-01
18     3      1.72464E-01      -3.71718E-01
18     4      5.08502E-01      -4.90415E-01
18     5      8.91174E-01      -5.83709E-01
18     6      1.29435E+00      -6.56887E-01
18     7      1.70940E+00      -7.09303E-01
18     8      2.12368E+00      -7.33957E-01
18     9      2.49839E+00      -7.15230E-01
18    10      2.73392E+00      -6.13896E-01
18    11      2.64110E+00      -3.61483E-01
18    12      1.78916E+00       6.12524E-02
18    13     -1.78916E+00       0.0
```

```
19     1    -8.66959E-02     3.49283E-05
19     2     8.66959E-02    -1.83363E-01
19     3     3.06215E-01    -3.18971E-01
19     4     6.03898E-01    -4.15688E-01
19     5     9.55277E-01    -4.80682E-01
19     6     1.33452E+00    -5.21406E-01
19     7     1.72454E+00    -5.36758E-01
19     8     2.10839E+00    -5.21260E-01
19     9     2.44626E+00    -4.68402E-01
19    10     2.63372E+00    -3.66917E-01
19    11     2.47424E+00    -1.97744E-01
19    12     1.56108E+00     3.35017E-02
19    13    -1.56108E+00     0.0
20     1    -2.04748E-01     3.46303E-05
20     2     2.04748E-01    -1.19656E-01
20     3     4.06422E-01    -2.21255E-01
20     4     6.75339E-01    -2.93687E-01
20     5     9.95196E-01    -3.34158E-01
20     6     1.34900E+00    -3.48840E-01
20     7     1.71301E+00    -3.37153E-01
20     8     2.06863E+00    -2.96833E-01
20     9     2.38016E+00    -2.29819E-01
20    10     2.55373E+00    -1.48721E-01
20    11     2.39459E+00    -6.79580E-02
20    12     1.48271E+00     1.15034E-02
20    13    -1.48271E+00     0.0
21     1    -2.18699E-01     3.38219E-05
21     2     2.18699E-01    -1.41099E-02
21     3     4.73113E-01    -8.17267E-02
21     4     7.25126E-01    -1.32205E-01
21     5     1.01645E+00    -1.53758E-01
21     6     1.34340E+00    -1.48083E-01
21     7     1.68255E+00    -1.17205E-01
21     8     2.01447E+00    -6.23024E-02
21     9     2.30731E+00     1.15586E-02
21    10     2.48778E+00     7.84242E-02
```

```
21      11      2.38874E+00       8.43468E-02
21      12      1.58002E+00      -1.43096E-02
21      13     -1.58002E+00       0.0
22       1     -1.93547E-01       9.57298E-02
22       2      1.93547E-01       1.21231E-01
22       3      4.93566E-01       1.00494E-01
22       4      7.59922E-01       6.52150E-02
22       5      1.02760E+00       5.39135E-02
22       6      1.32584E+00       7.17158E-02
22       7      1.63903E+00       1.15842E-01
22       8      1.94733E+00       1.83923E-01
22       9      2.22466E+00       2.67723E-01
22      10      2.41492E+00       3.41595E-01
22      11      2.39631E+00       3.33923E-01
22      12      1.96520E+00      -5.66095E-02
22      13     -1.96520E+00       0.0
23       1     -5.94975E-01       7.52946E-01
23       2      5.94975E-01       3.45948E-01
23       3      5.94975E-01       2.43136E-01
23       4      7.52177E-01       2.50986E-01
23       5      1.00685E+00       2.72025E-01
23       6      1.29405E+00       3.04255E-01
23       7      1.58675E+00       3.57265E-01
23       8      1.87214E+00       4.33490E-01
23       9      2.13101E+00       5.28439E-01
23      10      2.31741E+00       6.27298E-01
23      11      2.32048E+00       7.04181E-01
23      12      2.03576E+00       6.32640E-01
23      13     -2.03576E+00       0.0
24       2     -9.18931E-01       1.05328E+00
24       3      9.18931E-01       7.24833E-01
24       4      9.18931E-01       5.55766E-01
24       5      1.04238E+00       5.19233E-01
24       6      1.26961E+00       5.44014E-01
24       7      1.53403E+00       5.97460E-01
24       8      1.79688E+00       6.73763E-01
```

```
24    9    2.03650E+00    7.69583E-01
24   10    2.21972E+00    8.68629E-01
24   11    2.26471E+00    9.25170E-01
24   12    2.22620E+00    7.32089E-01
24   13    6.16156E-01   -1.95663E+00
24   14   -6.16156E-01    0.0
25    3   -1.21131E+00    1.32851E+00
25    4    1.21131E+00    1.03207E+00
25    5    1.21131E+00    8.61308E-01
25    6    1.31790E+00    8.12348E-01
25    7    1.50994E+00    8.36778E-01
25    8    1.73530E+00    8.99517E-01
25    9    1.95121E+00    9.85990E-01
25   10    2.12530E+00    1.08172E+00
25   11    2.18211E+00    1.16546E+00
25   12    2.20043E+00    1.19159E+00
25   13    1.22993E+00    5.69303E-01
25   14    5.90983E-01   -6.54585E-01
25   15   -5.90983E-01    0.0
26    4   -1.47429E+00    1.57606E+00
26    5    1.47429E+00    1.30943E+00
26    6    1.47429E+00    1.15086E+00
26    7    1.56184E+00    1.09823E+00
26    8    1.71648E+00    1.11701E+00
26    9    1.89413E+00    1.17488E+00
26   10    2.05249E+00    1.24870E+00
26   11    2.11571E+00    1.31602E+00
26   12    2.16852E+00    1.34837E+00
26   13    1.61341E+00    9.59569E-01
26   14    1.04173E+00    5.02564E-01
26   15    5.38524E-01   -6.42615E-01
26   16   -5.38524E-01    0.0
27    5   -1.70119E+00    1.78584E+00
27    6    1.70119E+00    1.55580E+00
27    7    1.70119E+00    1.41451E+00
27    8    1.77278E+00    1.35743E+00
```

```
27     9     1.89371E+00     1.35785E+00
27    10     2.02504E+00     1.38568E+00
27    11     2.08971E+00     1.41205E+00
27    12     2.15859E+00     1.42211E+00
27    13     1.85466E+00     1.17751E+00
27    14     1.40742E+00     8.06742E-01
27    15     9.45231E-01     3.94390E-01
27    16     4.39080E-01    -5.96779E-01
27    17    -4.39080E-01     0.0
28     6    -1.90141E+00     1.97334E+00
28     7     1.90141E+00     1.77033E+00
28     8     1.90141E+00     1.63992E+00
28     9     1.96727E+00     1.56534E+00
28    10     2.06663E+00     1.52317E+00
28    11     2.12470E+00     1.48769E+00
28    12     2.18776E+00     1.45812E+00
28    13     2.02589E+00     1.28451E+00
28    14     1.69209E+00     9.95899E-01
28    15     1.27974E+00     6.56749E-01
28    16     8.30736E-01     2.59656E-01
28    17     3.03934E-01    -4.93667E-01
28    18    -3.03934E-01     0.0
29     7    -2.13102E+00     2.21031E+00
29     8     2.13102E+00     1.97752E+00
29     9     2.13102E+00     1.81149E+00
29    10     2.19303E+00     1.68334E+00
29    11     2.23693E+00     1.56955E+00
29    12     2.27521E+00     1.48089E+00
29    13     2.17737E+00     1.32731E+00
29    14     1.92149E+00     1.09472E+00
29    15     1.55754E+00     8.13064E-01
29    16     1.13769E+00     5.01851E-01
29    17     6.81719E-01     1.18822E-01
29    18     1.52348E-01    -3.43791E-01
29    19    -1.52348E-01     0.0
30     8    -2.53889E+00     2.67407E+00
```

```
30     9     2.53889E+00     2.26055E+00
30    10     2.53889E+00     1.90989E+00
30    11     2.50492E+00     1.63817E+00
30    12     2.45028E+00     1.46066E+00
30    13     2.33499E+00     1.30085E+00
30    14     2.11167E+00     1.10802E+00
30    15     1.78295E+00     8.79484E-01
30    16     1.38750E+00     6.26208E-01
30    17     9.61183E-01     3.42866E-01
30    18     5.10299E-01    -2.00522E-02
30    19    -7.38862E-03    -1.67023E-01
30    20     7.38862E-03     0.0
31     9    -3.14930E+00     3.34314E+00
31    10     3.14930E+00     2.72426E+00
31    11     3.14930E+00     2.07094E+00
31    12     2.92161E+00     1.59307E+00
31    13     2.62825E+00     1.29575E+00
31    14     2.32417E+00     1.08030E+00
31    15     1.97973E+00     8.80785E-01
31    16     1.59070E+00     6.74759E-01
31    17     1.17998E+00     4.52923E-01
31    18     7.62961E-01     1.96754E-01
31    19     3.31153E-01    -1.46485E-01
31    20    -1.63812E-01     2.70915E-02
31    21     1.63812E-01     0.0
32    10    -3.42380E+00     2.45077E+00
32    11     3.42380E+00     2.17246E+00
32    12     3.42380E+00     1.66330E+00
32    13     2.99614E+00     1.29030E+00
32    14     2.57324E+00     1.03777E+00
32    15     2.16891E+00     8.45959E-01
32    16     1.76018E+00     6.74127E-01
32    17     1.35144E+00     5.00288E-01
32    18     9.52772E-01     3.07840E-01
32    19     5.55691E-01     8.01843E-02
32    20     1.50053E-01    -2.38038E-01
```

```
32        21        -2.90303E-01        2.22379E-01
32        22         2.90303E-01        0.0
33        11        -2.93490E+00        4.95903E-01
33        12         2.93490E+00        9.91586E-01
33        13         3.00371E+00        9.83913E-01
33        14         2.68525E+00        8.70344E-01
33        15         2.29365E+00        7.43874E-01
33        16         1.88151E+00        6.20856E-01
33        17         1.47559E+00        4.94977E-01
33        18         1.08721E+00        3.58676E-01
33        19         7.08947E-01        2.03293E-01
33        20         3.43175E-01        7.49074E-03
33        21         1.19145E-03       -2.88049E-01
33        22        -3.83215E-01        3.94814E-01
33        23         3.83215E-01        0.0
34        11        -2.41918E+00       -7.57770E-02
34        12         2.41918E+00        4.47094E-01
34        13         2.82461E+00        6.28681E-01
34        14         2.67498E+00        6.39095E-01
34        15         2.34363E+00        5.88422E-01
34        16         1.94944E+00        5.19552E-01
34        17         1.55355E+00        4.40515E-01
34        18         1.17375E+00        3.52766E-01
34        19         8.04025E-01        2.56367E-01
34        20         4.42528E-01        1.55635E-01
34        21         1.00452E-01        5.49961E-02
34        22        -2.31524E-01       -9.87993E-02
34        23         2.31524E-01        0.0
35        11        -2.16055E+00       -3.80001E-02
35        12         2.16055E+00        2.24221E-01
35        13         2.68034E+00        3.70484E-01
35        14         2.63232E+00        4.13741E-01
35        15         2.35022E+00        4.07059E-01
35        16         1.97741E+00        3.78698E-01
35        17         1.59460E+00        3.37072E-01
35        18         1.22185E+00        2.88309E-01
```

```
35    19     8.55924E-01     2.35691E-01
35    20     4.99011E-01     1.78423E-01
35    21     1.68010E-01     1.09928E-01
35    22    -1.23101E-01     2.98023E-07
35    23     1.23101E-01     0.0
36    11    -2.04134E+00    -1.75159E-02
36    12     2.04134E+00     1.03355E-01
36    13     2.60475E+00     1.79996E-01
36    14     2.60046E+00     2.12297E-01
36    15     2.34226E+00     2.20366E-01
36    16     1.98434E+00     2.13341E-01
36    17     1.61142E+00     1.96292E-01
36    18     1.24139E+00     1.76472E-01
36    19     8.75533E-01     1.56591E-01
36    20     5.23280E-01     1.31984E-01
36    21     2.09670E-01     8.97453E-02
36    22    -3.45852E-02     1.01328E-06
36    23     3.45852E-02     0.0
37    11    -2.05317E+00     1.74128E-03
37    12     2.05317E+00    -1.02542E-02
37    13     2.61599E+00    -2.16489E-02
37    14     2.61010E+00    -3.14281E-02
37    15     2.34917E+00    -3.84420E-02
37    16     1.98780E+00    -4.19609E-02
37    17     1.61143E+00    -4.19719E-02
37    18     1.23809E+00    -3.86270E-02
37    19     8.68933E-01    -3.19364E-02
37    20     5.14237E-01    -2.27686E-02
37    21     1.98910E-01    -1.18584E-02
37    22    -4.62812E-02    -1.45286E-07
37    23     4.62812E-02     0.0
38    11     0.0             1.89250E-03
38    12     0.0            -1.07204E-02
38    13     0.0            -2.28795E-02
38    14     0.0            -3.35075E-02
38    15     0.0            -4.11317E-02
```

```
38      16       0.0              -4.47792E-02
38      17       0.0              -4.47270E-02
38      18       0.0              -4.12135E-02
38      19       0.0              -3.39399E-02
38      20       0.0              -2.41531E-02
38      21       0.0              -1.25641E-02
38      22       0.0               1.05045E-01
38      23       0.0               0.0
       20  10.      0.1       0.0
 4
  30.       40.      50.        60.       70.      80.       90.        100.
```

APPENDIX B.2

OUTPUT OF THE SAMPLE PROBLEM

```
         HI-V ELIMINATOR WITH AIR VELOCITY=1.5M/S   NO SLIP CONDITION
 NCAL=    0

NTYPE=   5

NTJ=     1

NDATA=   1
```

```
  IBAR= 3.60000E+01
  JBAR= 2.10000E+01
  DELX= 3.88889E-03
  DELY= 3.94285E-03
  DELT= 5.00000E-04
    NU= 1.50000E-05
   CYL= 0.0
  EPSI= 1.00000E-02
  DZRO= 1.00000E+00
    GX= 0.0
    GY= 0.0
    UI= 1.50000E+00
    VI= 0.0
 VELMX= 4.50000E+00
 TWFIN= 3.00000E-02
 CWPRT= 5.00000E+00
 CWPLT= 2.00000E+01
   OMG= 1.95000E+00
 ALPHA= 7.00000E-01
 GAMMA= 7.00000E-01
    WL= 3.00000E+00
    WR= 3.00000E+00
    WT= 1.00000E+00
    WB= 1.00000E+00
    TB= 2.00000E+00
    BB= 2.00000E+00
     A= 4.00000E-02
IPUNCH= 1.00000E+00
  VANG= 0.0
 INVEL= 1.00000E+00
 NSLIP= 0.0
  LIER= 1.50000E+03
    LC= 8.00000E+01


 CONVERSION FACTOR FOR VELOCITY PLOTTING=        0.493827E-01
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ITER=    0         TIME= 0.0                    CYCLE=    0    FVOL= 5.59907E-03
I        J          U              V                  P                  H              SUR CELL        BOT CELL
1       11      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       12      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       13      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       14      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       15      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       16      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       17      1.500C0E+00    0.0                0.0              8.28000E-02           22              12
1       18      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       19      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       20      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       21      1.500C0E+00    0.0                0.0              8.28000E-02           22              12
1       22      1.50000E+00    0.0                0.0              8.28000E-02           22              12
1       23      1.50000E+00    0.0                0.0              8.28000E-02           22              12
2       11     -1.52637E+00   -2.28176E-02        0.0              8.28000E-02           22              12
2       12      1.52637E+00   -2.28176E-02        0.0              8.28000E-02           22              12
2       13      1.53596E+00   -5.92633E-02        0.0              8.28000E-02           22              12
2       14      1.52841E+00   -8.80505E-02        0.0              8.28000E-02           22              12
2       15      1.52183E+00   -1.10170E-01        0.0              8.28000E-02           22              12
2       16      1.51599E+00   -1.26370E-01        0.0              8.28000E-02           22              12
2       17      1.51019E+00   -1.36688E-01        0.0              8.28000E-02           22              12
2       18      1.50332E+00   -1.40041E-01        0.0              8.28000E-02           22              12
2       19      1.49373E+00   -1.33668E-01        0.0              8.28000E-02           22              12
2       20      1.47912E+00   -1.12482E-01        0.0              8.28000E-02           22              12
2       21      1.45804E+00   -6.99212E-02        0.0              8.28000E-02           22              12
2       22      1.43106E+00   -6.99212E-02        0.0              8.28000E-02           22              12
2       23     -1.43106E+00    0.0                0.0              8.28000E-02           22              12
3       11     -1.58929E+00    9.27165E-03        0.0              8.28000E-02           22              12
3       12      1.58929E+00   -5.45210E-02        0.0              8.28000E-02           22              12
3       13      1.60714E+00   -1.26686E-01        0.0              8.28000E-02           22              12
3       14      1.58388E+00   -1.82927E-01        0.0              8.28000E-02           22              12
3       15      1.56471E+00   -2.25888E-01        0.0              8.28000E-02           22              12
3       16      1.54736E+00   -2.57687E-01        0.0              8.28000E-02           22              12
3       17      1.53087E+00   -2.78677E-01        0.0              8.28000E-02           22              12
3       18      1.51156E+00   -2.87028E-01        0.0              8.28000E-02           22              12
3       19      1.48449E+00   -2.77655E-01        0.0              8.28000E-02           22              12
3       20      1.44201E+00   -2.40024E-01        0.0              8.28000E-02           22              12
3       21      1.37383E+00   -1.54654E-01        0.0              8.28000E-02           22              12
3       22      1.27855E+00   -2.81334E-05        0.0              8.28000E-02           22              12
3       23     -1.27855E+00    0.0                0.0              6.28000E-02           22              12
4       11     -1.70313E+00    1.67591E-02        0.0              8.28000E-02           22              12
4       12      1.70313E+00   -9.86606E-02        0.0              8.28000E-02           22              12
4       13      1.71793E+00   -2.10989E-01        0.0              8.28000E-02           22              12
4       14      1.66337E+00   -2.91576E-01        0.0              8.28000E-02           22              12
4       15      1.62458E+00   -3.52793E-01        0.0              8.28000E-02           22              12
4       16      1.59285E+00   -3.98914E-01        0.0              8.28000E-02           22              12
4       17      1.56231E+00   -4.30766E-01        0.0              8.28000E-02           22              12
4       18      1.52711E+00   -4.46537E-01        0.0              8.28000E-02           22              12
4       19      1.47782E+00   -4.41807E-01        0.0              8.28000E-02           22              12
4       20      1.40749E+00   -4.06813E-01        0.0              8.28000E-02           22              12
4       21      1.27736E+00   -3.08994E-01        0.0              8.28000E-02           22              12
4       22      9.73800E-01   -1.51992E-05        0.0              8.28000E-02           22              12
4       23     -9.73800E-01    0.0                0.0              8.28000E-02           22              12
5       11     -1.94288E+00    3.52646E-02        0.0              8.28000E-02           22              12
5       12      1.94288E+00   -2.07812E-01        0.0              8.28000E-02           22              12
5       13      1.83937E+00   -3.30939E-01        0.0              8.28000E-02           22              12
5       14      1.75647E+00   -4.25341E-01        0.0              8.28000E-02           22              12
5       15      1.69839E+00   -5.00170E-01        0.0              8.28000E-02           22              12
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5   16    1.65067E+00   -5.58799E-01   0.0     8.28000E-02   22   12
5   17    1.60503E+00   -6.02114E-01   0.0     8.28000E-02   22   12
5   18    1.55396E+00   -6.29332E-01   0.0     8.28000E-02   22   12
5   19    1.48865E+00   -6.38276E-01   0.0     8.28000E-02   22   12
5   20    1.39275E+00   -6.23330E-01   0.0     8.28000E-02   22   12
5   21    1.20822F+00   -5.53237E-01   0.0     8.28000E-02   22   12
5   22    6.92250E-01   -2.67780E-01   0.0     8.28000E-02   22   12
5   23   -6.92250E-01    0.0           0.0     8.28000E-02   22   12
6   11   -1.98302E+00   -3.44590E-01   0.0     8.02999E-02   22   12
6   12    1.98302E+00   -3.85287E-01   0.0     8.02999E-02   22   12
6   13    1.94492E+00   -4.92292E-01   0.0     8.02999E-02   22   12
6   14    1.85549E+00   -5.92679E-01   0.0     8.02999E-02   22   12
6   15    1.78017E+00   -6.75596E-01   0.0     8.02999E-02   22   12
6   16    1.71463E+00   -7.40446E-01   0.0     8.02999E-02   22   12
6   17    1.64819E+00   -7.84205E-01   0.0     8.02999E-02   22   12
6   18    1.56785E+00   -7.98282E-01   0.0     8.02999E-02   22   12
6   19    1.45662E+00   -7.65814E-01   0.0     8.02999E-02   22   12
6   20    1.29985E+00   -6.71625E-01   0.0     8.02999E-02   22   12
6   21    1.12353E+00   -5.85755E-01   0.0     8.02999E-02   22   12
6   22    1.12353E+00   -1.02302E+00   0.0     8.02999E-02   22   12
6   23   -1.12353E+00    0.0           0.0     8.02999E-02   22   12
7   10   -3.61649E-01    2.43450E+00   0.0     7.64111E-02   21   11
7   11    3.61649E-01    5.72944E-02   0.0     7.64111E-02   21   11
7   12    2.52699E+00   -4.94232E-01   0.0     7.64111E-02   21   11
7   13    2.12889F+00   -6.80765E-01   0.0     7.64111E-02   21   11
7   14    1.96785E+00   -7.94682E-01   0.0     7.64111E-02   21   11
7   15    1.86339E+00   -8.79048E-01   0.0     7.64111E-02   21   11
7   16    1.77713E+00   -9.42413F-01   0.0     7.64111E-02   21   11
7   17    1.69005E+00   -9.84853E-01   0.0     7.64111E-02   21   11
7   18    1.59281E+00   -1.01016E+00   0.0     7.64111E-02   21   11
7   19    1.49005E+00   -1.04405E+00   0.0     7.64111E-02   21   11
7   20    1.41085E+00   -1.15659E+00   0.0     7.64111E-02   21   11
7   21    1.41085E+00   -1.44790E+00   0.0     7.64111E-02   21   11
7   22   -1.41085E+00    0.0           0.0     7.64111E-02   21   11
8    9   -1.53012E-01    5.25109E-01   0.0     7.25222E-02   20   10
8   10    1.53012E-01    3.30633E-03   0.0     7.25222E-02   20   10
8   11    1.26329E+00   -9.10850E-01   0.0     7.25222E-02   20   10
8   12    2.52304E+00   -9.06838E-01   0.0     7.25222E-02   20   10
8   13    2.17888E+00   -9.57521E-01   0.0     7.25222E-02   20   10
8   14    2.04221E+00   -1.03292E+00   0.0     7.25222E-02   20   10
8   15    1.93300E+00   -1.10350E+00   0.0     7.25222E-02   20   10
8   16    1.83751E+00   -1.16471E+00   0.0     7.25222E-02   20   10
8   17    1.74774E+00   -1.22320E+00   0.0     7.25222E-02   20   10
8   18    1.66905E+00   -1.30050E+00   0.0     7.25222E-02   20   10
8   19    1.61974E+00   -1.43199E+00   0.0     7.25222E-02   20   10
8   20    1.61974E+00   -1.64378E+00   0.0     7.25222E-02   20   10
8   21   -1.61974E+00    0.0           0.0     7.25222E-02   20   10
9    8   -1.29098E-01    2.46539E-01   0.0     6.86333E-02   19    9
9    9    1.29098E-01   -3.94857E-02   0.0     6.86333E-02   19    9
9   10    9.14160E-01   -8.11195E-01   0.0     6.86333E-02   19    9
9   11    1.72974E+00   -1.28411E+00   0.0     6.86333E-02   19    9
9   12    2.45202E+00   -1.21210E+00   0.0     6.86333E-02   19    9
9   13    2.19015E+00   -1.22352E+00   0.0     6.86333E-02   19    9
9   14    2.09507E+00   -1.27711E+00   0.0     6.86333E-02   19    9
9   15    1.99545E+00   -1.34042E+00   0.0     6.86333E-02   19    9
9   16    1.90784E+00   -1.41172E+00   0.0     6.86333E-02   19    9
9   17    1.83838E+00   -1.50362E+00   0.0     6.86333E-02   19    9
9   18    1.79902E+00   -1.63539E+00   0.0     6.86333E-02   19    9
9   19    1.79902E+00   -1.81716E+00   0.0     6.86333E-02   19    9
9   20   -1.79902E+00    0.0           0.0     6.86333E-02   19    9
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10    7   -1.32473E-01    2.19446E-01   0.0    6.47444E-02   18   8
10    8    1.32473E-01   -4.57543E-02   0.0    6.47444E-02   18   8
10    9    7.74454E-01   -7.00065E-01   0.0    6.47444E-02   18   8
10   10    1.40207E+00   -1.19475E+00   0.0    6.47444E-02   18   8
10   11    2.01080E+00   -1.47972E+00   0.0    6.47444E-02   18   8
10   12    2.40260E+00   -1.42962E+00   0.0    6.47444E-02   18   8
10   13    2.21501E+00   -1.45482E+00   0.0    6.47444E-02   18   8
10   14    2.15125E+00   -1.51178E+00   0.0    6.47444E-02   18   8
10   15    2.06851E+00   -1.58585E+00   0.0    6.47444E-02   18   8
10   16    2.00270E+00   -1.68203E+00   0.0    6.47444E-02   18   8
10   17    1.96585E+00   -1.81127E+00   0.0    6.47444E-02   18   8
10   18    1.96585E+00   -1.98041E+00   0.0    6.47444E-02   18   8
10   19   -1.96585E+00    0.0           0.0    6.47444E-02   18   8
11    6   -9.00604E-02    2.12430E-01   0.0    6.08555E-02   17   7
11    7    9.00604E-02   -1.31916E-02   0.0    6.08555E-02   17   7
11    8    6.92176E-01   -5.80682E-01   0.0    6.08555E-02   17   7
11    9    1.22945E+00   -1.04199E+00   0.0    6.08555E-02   17   7
11   10    1.76056E+00   -1.40546E+00   0.0    6.08555E-02   17   7
11   11    2.19915E+00   -1.59641E+00   0.0    6.08555E-02   17   7
11   12    2.40176E+00   -1.59556E+00   0.0    6.08555E-02   17   7
11   13    2.27734E+00   -1.65876E+00   0.0    6.08555E-02   17   7
11   14    2.23383E+00   -1.74248E+00   0.0    6.08555E-02   17   7
11   15    2.17013E+00   -1.84551E+00   0.0    6.08555E-02   17   7
11   16    2.13110E+00   -1.97569E+00   0.0    6.08555E-02   17   7
11   17    2.13110E+00   -2.14323E+00   0.0    6.08555E-02   17   7
11   18   -2.13110E+00    0.0           0.0    6.08555E-02   17   7
12    5    1.02360E-02    1.19864E-01   0.0    5.69667E-02   16   6
12    6   -1.02360E-02    3.89324E-02   0.0    5.69667E-02   16   6
12    7    5.93751E-01   -4.71747E-01   0.0    5.69667E-02   16   6
12    8    1.09333E+00   -8.78447E-01   0.0    5.69667E-02   16   6
12    9    1.58688E+00   -1.24083E+00   0.0    5.69667E-02   16   6
12   10    2.03463E+00   -1.51870E+00   0.0    5.69667E-02   16   6
12   11    2.35322E+00   -1.67491E+00   0.0    5.69667E-02   16   6
12   12    2.46400E+00   -1.73801E+00   0.0    5.69667E-02   16   6
12   13    2.39358E+00   -1.85586E+00   0.0    5.69667E-02   16   6
12   14    2.36341E+00   -1.98724E+00   0.0    5.69667E-02   16   6
12   15    2.32055E+00   -2.13976E+00   0.0    5.69667E-02   16   6
12   16    2.32055E+00   -2.33184E+00   0.0    5.69667E-02   16   6
12   17   -2.32055E+00    0.0           0.0    5.69667E-02   16   6
13    4    1.69168E-01   -7.96334E-02   0.0    5.30778E-02   15   5
13    5   -1.69168E-01    1.02260E-01   0.0    5.30778E-02   15   5
13    6    4.63831E-01   -3.78385E-01   0.0    5.30778E-02   15   5
13    7    9.37372E-01   -7.26773E-01   0.0    5.30778E-02   15   5
13    8    1.41208E+00   -1.04995E+00   0.0    5.30778E-02   15   5
13    9    1.86946E+00   -1.33645E+00   0.0    5.30778E-02   15   5
13   10    2.25618E+00   -1.56108E+00   0.0    5.30778E-02   15   5
13   11    2.50920E+00   -1.71922E+00   0.0    5.30778E-02   15   5
13   12    2.60462E+00   -1.86179E+00   0.0    5.30778E-02   15   5
13   13    2.60527E+00   -2.07642E+00   0.0    5.30778E-02   15   5
13   14    2.61339E+00   -2.32987E+00   0.0    5.30778E-02   15   5
13   15    2.61339E+00   -2.62677E+00   0.0    5.30778E-02   15   5
13   16   -2.61339E+00    0.0           0.0    5.30778E-02   15   5
14    3    3.99339E-01   -3.97018E-01   0.0    4.91889E-02   14   4
14    4   -3.99339E-01    1.79378E-01   0.0    4.91889E-02   14   4
14    5    3.16611E-01   -3.13141E-01   0.0    4.91889E-02   14   4
14    6    7.44821E-01   -5.98030E-01   0.0    4.91889E-02   14   4
14    7    1.20159E+00   -8.65916E-01   0.0    4.91889E-02   14   4
14    8    1.66137E+00   -1.11866E+00   0.0    4.91889E-02   14   4
14    9    2.09708E+00   -1.34944E+00   0.0    4.91889E-02   14   4
14   10    2.46526E+00   -1.56142E+00   0.0    4.91889E-02   14   4
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14   11    2.74164E+00   -1.79709E+00   0.0      4.91889E-02   14   4
14   12    2.94427E+00   -2.14145E+00   0.0      4.91889E-02   14   4
14   13    3.07901E+00   -2.62175E+00   0.0      4.91889E-02   14   4
14   14    3.07901E+00   -3.09383E+00   0.0      4.91889E-02   14   4
14   15   -3.07901E+00    0.0           0.0      4.91889E-02   14   4
15    2    6.12134E-01   -8.18776E-01   0.0      4.53000E-02   13   3
15    3   -6.12134E-01    2.06731E-01   0.0      4.53000E-02   13   3
15    4    1.14307E-01   -3.14043E-01   0.0      4.53000E-02   13   3
15    5    5.11412E-01   -5.11544E-01   0.0      4.53000E-02   13   3
15    6    9.54742E-01   -7.24581E-01   0.0      4.53000E-02   13   3
15    7    1.40666E+00   -9.32492E-01   0.0      4.53000E-02   13   3
15    8    1.86621E+00   -1.14017E+00   0.0      4.53000E-02   13   3
15    9    2.31412E+00   -1.36021E+00   0.0      4.53000E-02   13   3
15   10    2.72867E+00   -1.62728E+00   0.0      4.53000E-02   13   3
15   11    3.10964E+00   -2.00039E+00   0.0      4.53000E-02   13   3
15   12    3.43585E+00   -2.49879E+00   0.0      4.53000E-02   13   3
15   13    3.43585E+00   -2.86058E+00   0.0      4.53000E-02   13   3
15   14   -3.43585E+00    0.0           0.0      4.53000E-02   13   3
16    1    7.94071E-01   -1.21803E+00   0.0      4.28000E-02   12   2
16    2   -7.94071E-01    2.07686E-01   0.0      4.28000E-02   12   2
16    3   -1.13508E-01   -2.97860E-01   0.0      4.28000E-02   12   2
16    4    2.60510E-01   -4.46090E-01   0.0      4.28000E-02   12   2
16    5    6.75441E-01   -6.12396E-01   0.0      4.28000E-02   12   2
16    6    1.11125E+00   -7.70876E-01   0.0      4.28000E-02   12   2
16    7    1.55893E+00   -9.25262E-01   0.0      4.28000E-02   12   2
16    8    2.01696E+00   -1.07810E+00   0.0      4.28000E-02   12   2
16    9    2.46694E+00   -1.23305E+00   0.0      4.28000E-02   12   2
16   10    2.87222E+00   -1.37859E+00   0.0      4.28000E-02   12   2
16   11    3.16313E+00   -1.43283E+00   0.0      4.28000E-02   12   2
16   12    2.97080E+00   -9.61327E-01   0.0      4.28000E-02   12   2
16   13   -2.97080E+00    0.0           0.0      4.28000E-02   12   2
17    1    2.99484E-01    2.53903E-01   0.0      4.28000E-02   12   2
17    2   -2.99484E-01   -2.47547E-01   0.0      4.28000E-02   12   2
17    3    1.10907E-02   -3.73873E-01   0.0      4.28000E-02   12   2
17    4    3.91428E-01   -5.06606E-01   0.0      4.28000E-02   12   2
17    5    7.99159E-01   -6.32042E-01   0.0      4.28000E-02   12   2
17    6    1.22217E+00   -7.44499E-01   0.0      4.28000E-02   12   2
17    7    1.65770E+00   -8.44639E-01   0.0      4.28000E-02   12   2
17    8    2.09936E+00   -9.28189E-01   0.0      4.28000E-02   12   2
17    9    2.51686E+00   -9.78802E-01   0.0      4.28000E-02   12   2
17   10    2.83376E+00   -9.39811E-01   0.0      4.28000E-02   12   2
17   11    2.89006E+00   -6.62950E-01   0.0      4.28000E-02   12   2
17   12    2.20611E+00    1.12351E-01   0.0      4.28000E-02   12   2
17   13   -2.20611E+00    0.0           0.0      4.28000E-02   12   2
18    1    9.41921E-02    3.54648E-05   0.0      4.28000E-02   12   2
18    2   -9.41921E-02   -2.08105E-01   0.0      4.28000E-02   12   2
18    3    1.72464E-01   -3.71718E-01   0.0      4.28000E-02   12   2
18    4    5.08502E-01   -4.90415E-01   0.0      4.28000E-02   12   2
18    5    8.91174E-01   -5.83707E-01   0.0      4.28000E-02   12   2
18    6    1.29435E+00   -6.56887E-01   0.0      4.28000E-02   12   2
18    7    1.70940E+00   -7.09303E-01   0.0      4.28000E-02   12   2
18    8    2.12368E+00   -7.33957E-01   0.0      4.28000E-02   12   2
18    9    2.49839E+00   -7.15230E-01   0.0      4.28000E-02   12   2
18   10    2.73382E+00   -6.13896E-01   0.0      4.28000E-02   12   2
18   11    2.64110E+00   -3.61483E-01   0.0      4.28000E-02   12   2
18   12    1.78916E+00    6.12528E-02   0.0      4.28000E-02   12   2
18   13   -1.78916E+00    0.0           0.0      4.28000E-02   12   2
19    1   -8.66959E-02    3.49283E-05   0.0      4.28000E-02   12   2
19    2    8.66959E-02   -1.83363E-01   0.0      4.28000E-02   12   2
19    3    3.06215E-01   -3.18971E-01   0.0      4.28000E-02   12   2
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19    4     6.03898E-01   -4.15688E-01   0.0        4.28000E-02      12       2
19    5     9.55277E-01   -4.80682E-01   0.0        4.28000E-02      12       2
19    6     1.33452E+00   -5.21406E-01   0.0        4.28000E-02      12       2
19    7     1.72454E+00   -5.36758E-01   0.0        4.28000E-02      12       2
19    8     2.10839E+00   -5.21260E-01   0.0        4.28000E-02      12       2
19    9     2.44626E+00   -4.68402E-01   0.0        4.28000E-02      12       2
19   10     2.63372E+00   -3.66917E-01   0.0        4.28000E-02      12       2
19   11     2.47424E+00   -1.97744E-01   0.0        4.28000E-02      12       2
19   12     1.56108E+00    3.35006E-02   0.0        4.28000E-02      12       2
19   13    -1.56108E+00    0.0           0.0        4.28000E-02      12       2
20    1    -2.04748E-01    3.40939E-05   0.0        4.28000E-02      12       2
20    2     2.04748E-01   -1.19656E-01   0.0        4.28000E-02      12       2
20    3     4.06422E-01   -2.21255E-01   0.0        4.28000E-02      12       2
20    4     6.75339E-01   -2.93687E-01   0.0        4.28000E-02      12       2
20    5     9.95196E-01   -3.34158E-01   0.0        4.28000E-02      12       2
20    6     1.34900E+00   -3.48840E-01   0.0        4.28000E-02      12       2
20    7     1.71301E+00   -3.37153E-01   0.0        4.28000E-02      12       2
20    8     2.06863E+00   -2.96833E-01   0.0        4.28000E-02      12       2
20    9     2.38016E+00   -2.29819E-01   0.0        4.28000E-02      12       2
20   10     2.55373E+00   -1.48721E-01   0.0        4.28000E-02      12       2
20   11     2.39459E+00   -6.79580E-02   0.0        4.28000E-02      12       2
20   12     1.48271E+00    1.14995E-02   0.0        4.28000E-02      12       2
20   13    -1.48271E+00    0.0           0.0        4.28000E-02      12       2
21    1    -2.18699E-01    3.46862E-05   0.0        4.28000E-02      12       2
21    2     2.18699E-01   -1.41099E-02   0.0        4.28000E-02      12       2
21    3     4.73113E-01   -8.17267E-02   0.0        4.28000E-02      12       2
21    4     7.25126E-01   -1.32205E-01   0.0        4.28000E-02      12       2
21    5     1.01645E+00   -1.53758E-01   0.0        4.28000E-02      12       2
21    6     1.34340E+00   -1.48083E-01   0.0        4.28000E-02      12       2
21    7     1.68255E+00   -1.17205E-01   0.0        4.28000E-02      12       2
21    8     2.01447E+00   -6.23024E-02   0.0        4.28000E-02      12       2
21    9     2.30731E+00    1.15586E-02   0.0        4.28000E-02      12       2
21   10     2.48779E+00    7.84242E-02   0.0        4.28000E-02      12       2
21   11     2.38874E+00    8.43468E-02   0.0        4.28000E-02      12       2
21   12     1.58002E+00   -1.43135E-02   0.0        4.28000E-02      12       2
21   13    -1.58002E+00    0.0           0.0        4.28000E-02      12       2
22    1    -1.93547E-01    9.57300E-02   0.0        4.28000E-02      12       2
22    2     1.93547E-01    1.21231E-01   0.0        4.28000E-02      12       2
22    3     4.93566E-01    1.00494E-01   0.0        4.28000E-02      12       2
22    4     7.59922E-01    6.52150E-02   0.0        4.28000E-02      12       2
22    5     1.02750E+00    5.39135E-02   0.0        4.28000E-02      12       2
22    6     1.32584E+00    7.17158E-02   0.0        4.28000E-02      12       2
22    7     1.63903E+00    1.15842E-01   0.0        4.28000E-02      12       2
22    8     1.94713E+00    1.83923E-01   0.0        4.28000E-02      12       2
22    9     2.22466E+00    2.67723E-01   0.0        4.28000E-02      12       2
22   10     2.41492E+00    3.41595E-01   0.0        4.28000E-02      12       2
22   11     2.39631E+00    3.33923E-01   0.0        4.28000E-02      12       2
22   12     1.96520E+00   -5.66022E-02   0.0        4.28000E-02      12       2
22   13    -1.96520E+00    0.0           0.0        4.28000E-02      12       2
23    1    -5.94975E-01    7.52946E-01   0.0        4.28000E-02      12       2
23    2     5.94975E-01    3.45948E-01   0.0        4.28000E-02      12       2
23    3     5.94975E-01    2.43136E-01   0.0        4.28000E-02      12       2
23    4     7.52177E-01    2.50986E-01   0.0        4.28000E-02      12       2
23    5     1.00685E+00    2.72025E-01   0.0        4.28000E-02      12       2
23    6     1.29405E+00    3.04255E-01   0.0        4.28000E-02      12       2
23    7     1.58675E+00    3.57265E-01   0.0        4.28000E-02      12       2
23    8     1.87214E+00    4.33490E-01   0.0        4.28000E-02      12       2
23    9     2.13101E+00    5.28439E-01   0.0        4.28000E-02      12       2
23   10     2.31741E+00    6.27298E-01   0.0        4.28000E-02      12       2
23   11     2.32048E+00    7.04181E-01   0.0        4.28000E-02      12       2
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23    12     2.03576E+00     6.32642E-01     0.0          4.28000E-02      12        2
23    13    -2.03576E+00     0.0             0.0          4.28000E-02      12        2
24     2    -9.18931E-01     1.05328E+00     0.0          4.53000E-02      13        3
24     3     9.18931E-01     7.24833E-01     0.0          4.53000E-02      13        3
24     4     9.18931E-01     5.55766E-01     0.0          4.53000E-02      13        3
24     5     1.04288E+00     5.19233E-01     0.0          4.53000E-02      13        3
24     6     1.26961E+00     5.44014E-01     0.0          4.53000E-02      13        3
24     7     1.53403E+00     5.97460E-01     0.0          4.53000E-02      13        3
24     8     1.79688E+00     6.73763E-01     0.0          4.53000E-02      13        3
24     9     2.03650E+00     7.69583E-01     0.0          4.53000E-02      13        3
24    10     2.21972E+00     8.68629E-01     0.0          4.53000E-02      13        3
24    11     2.26471E+00     9.25170E-01     0.0          4.53000E-02      13        3
24    12     2.22620E+00     7.32089E-01     0.0          4.53000E-02      13        3
24    13     6.16156E-01    -1.95662E+00     0.0          4.53000E-02      13        3
24    14    -6.16156E-01     0.0             0.0          4.53000E-02      13        3
25     3    -1.21131E+00     1.32851E+00     0.0          4.91889E-02      14        4
25     4     1.21131E+00     1.03207E+00     0.0          4.91889E-02      14        4
25     5     1.21131E+00     8.61308E-01     0.0          4.91889E-02      14        4
25     6     1.31790E+00     8.12348E-01     0.0          4.91889E-02      14        4
25     7     1.50994E+00     8.36778E-01     0.0          4.91889E-02      14        4
25     8     1.73500E+00     8.99517E-01     0.0          4.91889E-02      14        4
25     9     1.95121E+00     9.85990E-01     0.0          4.91889E-02      14        4
25    10     2.12530E+00     1.08172E+00     0.0          4.91889E-02      14        4
25    11     2.18211E+00     1.16546E+00     0.0          4.91889E-02      14        4
25    12     2.20043E+00     1.19159E+00     0.0          4.91889E-02      14        4
25    13     1.22993E+00     5.69303E-01     0.0          4.91889E-02      14        4
25    14     5.90983E-01    -6.54584E-01     0.0          4.91889E-02      14        4
25    15    -5.90983E-01     0.0             0.0          4.91889E-02      14        4
26     4    -1.47429E+00     1.57606E+00     0.0          5.30778E-02      15        5
26     5     1.47429E+00     1.30943E+00     0.0          5.30778E-02      15        5
26     6     1.47429E+00     1.15086E+00     0.0          5.30778E-02      15        5
26     7     1.56184E+00     1.09823E+00     0.0          5.30778E-02      15        5
26     8     1.71648E+00     1.11701E+00     0.0          5.30778E-02      15        5
26     9     1.89413E+00     1.17488E+00     0.0          5.30778E-02      15        5
26    10     2.05249E+00     1.24870E+00     0.0          5.30778E-02      15        5
26    11     2.11571E+00     1.31602E+00     0.0          5.30778E-02      15        5
26    12     2.16852E+00     1.34837E+00     0.0          5.30778E-02      15        5
26    13     1.61341E+00     9.59569E-01     0.0          5.30778E-02      15        5
26    14     1.04173E+00     5.02564E-01     0.0          5.30778E-02      15        5
26    15     5.38524E-01    -6.42615E-01     0.0          5.30778E-02      15        5
26    16    -5.38524E-01     0.0             0.0          5.30778E-02      15        5
27     5    -1.70119E+00     1.78585E+00     0.0          5.69667E-02      16        6
27     6     1.70119E+00     1.55580E+00     0.0          5.69667E-02      16        6
27     7     1.70119E+00     1.41451E+00     0.0          5.69667E-02      16        6
27     8     1.77278E+00     1.35743E+00     0.0          5.69667E-02      16        6
27     9     1.89371E+00     1.35785E+00     0.0          5.69667E-02      16        6
27    10     2.02504E+00     1.38568E+00     0.0          5.69667E-02      16        6
27    11     2.08971E+00     1.41205E+00     0.0          5.69667E-02      16        6
27    12     2.15859E+00     1.42211E+00     0.0          5.69667E-02      16        6
27    13     1.85466E+00     1.17751E+00     0.0          5.69667E-02      16        6
27    14     1.40742E+00     8.06742E-01     0.0          5.69667E-02      16        6
27    15     9.45231E-01     3.94390E-01     0.0          5.69667E-02      16        6
27    16     4.39080E-01    -5.96779E-01     0.0          5.69667E-02      16        6
27    17    -4.39080E-01     0.0             0.0          5.69667E-02      16        6
28     6    -1.90141E+00     1.97333E+00     0.0          6.08555E-02      17        7
28     7     1.90141E+00     1.77033E+00     0.0          6.08555E-02      17        7
28     8     1.90141E+00     1.63992E+00     0.0          6.08555E-02      17        7
28     9     1.96727E+00     1.56534E+00     0.0          6.08555E-02      17        7
28    10     2.06663E+00     1.52317E+00     0.0          6.08555E-02      17        7
28    11     2.12470E+00     1.48769E+00     0.0          6.08555E-02      17        7
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28   12    2.18776E+00    1.45812E+00   0.0     6.08555E-02   17    7
28   13    2.02589E+00    1.28451E+00   0.0     6.08555E-02   17    7
28   14    1.69209E+00    9.95899E-01   0.0     6.08555E-02   17    7
28   15    1.27974E+00    6.56749E-01   0.0     6.08555E-02   17    7
28   16    8.30736E-01    2.59656E-01   0.0     6.08555E-02   17    7
28   17    3.03934E-01   -4.93668E-01   0.0     6.08555E-02   17    7
28   18   -3.03934E-01    0.0           0.0     6.08555E-02   17    7
29    7   -2.13102E+00    2.21031E+00   0.0     6.47444E-02   18    8
29    8    2.13102E+00    1.97752E+00   0.0     6.47444E-02   18    8
29    9    2.13102E+00    1.81149E+00   0.0     6.47444E-02   18    8
29   10    2.19303E+00    1.68334E+00   0.0     6.47444E-02   18    8
29   11    2.23693E+00    1.56955E+00   0.0     6.47444E-02   18    8
29   12    2.27521E+00    1.48088E+00   0.0     6.47444E-02   18    8
29   13    2.17737E+00    1.32731E+00   0.0     6.47444E-02   18    8
29   14    1.92149E+00    1.09472E+00   0.0     6.47444E-02   18    8
29   15    1.55754E+00    8.13064E-01   0.0     6.47444E-02   18    8
29   16    1.13769E+00    5.01851E-01   0.0     6.47444E-02   18    8
29   17    6.81719E-01    1.18822E-01   0.0     6.47444E-02   18    8
29   18    1.52348E-01   -3.43791E-01   0.0     6.47444E-02   18    8
29   19   -1.52348E-01    0.0           0.0     6.47444E-02   18    8
30    8   -2.53889E+00    2.67408E+00   0.0     6.86333E-02   19    9
30    9    2.53889E+00    2.26055E+00   0.0     6.86333E-02   19    9
30   10    2.53889E+00    1.90989E+00   0.0     6.86333E-02   19    9
30   11    2.50497E+00    1.63817E+00   0.0     6.86333E-02   19    9
30   12    2.45028E+00    1.46066E+00   0.0     6.86333E-02   19    9
30   13    2.33499E+00    1.30085E+00   0.0     6.86333E-02   19    9
30   14    2.11167E+00    1.10802E+00   0.0     6.86333E-02   19    9
30   15    1.78295E+00    8.79484E-01   0.0     6.86333E-02   19    9
30   16    1.38750E+00    6.26208E-01   0.0     6.86333E-02   19    9
30   17    9.61183E-01    3.42866E-01   0.0     6.86333E-02   19    9
30   18    5.10299E-01   -2.00522E-02   0.0     6.86333E-02   19    9
30   19   -7.38862E-03   -1.67023E-01   0.0     6.86333E-02   19    9
30   20    7.38862E-03    0.0           0.0     6.86333E-02   19    9
31    9   -3.14930E+00    3.34314E+00   0.0     7.25222E-02   20   10
31   10    3.14930E+00    2.72426E+00   0.0     7.25222E-02   20   10
31   11    3.14930E+00    2.07094E+00   0.0     7.25222E-02   20   10
31   12    2.92161E+00    1.59307E+00   0.0     7.25222E-02   20   10
31   13    2.62825E+00    1.29575E+00   0.0     7.25222E-02   20   10
31   14    2.32417E+00    1.08030E+00   0.0     7.25222E-02   20   10
31   15    1.97973E+00    8.80785E-01   0.0     7.25222E-02   20   10
31   16    1.59070E+00    6.74759E-01   0.0     7.25222E-02   20   10
31   17    1.17998E+00    4.52923E-01   0.0     7.25222E-02   20   10
31   18    7.62961E-01    1.96754E-01   0.0     7.25222E-02   20   10
31   19    3.31153E-01   -1.46485E-01   0.0     7.25222E-02   20   10
31   20   -1.63812E-01    2.70911E-02   0.0     7.25222E-02   20   10
31   21    1.63812E-01    0.0           0.0     7.25222E-02   20   10
32   10   -3.42390E+00    2.45077E+00   0.0     7.64111E-02   21   11
32   11    3.42390E+00    2.17246E+00   0.0     7.64111E-02   21   11
32   12    3.42390E+00    1.66330E+00   0.0     7.64111E-02   21   11
32   13    2.99614E+00    1.29030E+00   0.0     7.64111E-02   21   11
32   14    2.57324E+00    1.03777E+00   0.0     7.64111E-02   21   11
32   15    2.16891E+00    8.45959E-01   0.0     7.64111E-02   21   11
32   16    1.76018E+00    6.74127E-01   0.0     7.64111E-02   21   11
32   17    1.35144E+00    5.00288E-01   0.0     7.64111E-02   21   11
32   18    9.52772E-01    3.07840E-01   0.0     7.64111E-02   21   11
32   19    5.55691E-01    8.01843E-02   0.0     7.64111E-02   21   11
32   20    1.50053E-01   -2.38038E-01   0.0     7.64111E-02   21   11
32   21   -2.90303E-01    2.22378E-01   0.0     7.64111E-02   21   11
32   22    2.90303E-01    0.0           0.0     7.64111E-02   21   11
33   11   -2.93490E+00    4.95902E-01   0.0     8.02999E-02   22   12
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33     12     2.93490E+00     9.91586E-01    0.0     8.02999E-02    22     12
33     13     3.00371E+00     9.83913E-01    0.0     8.02999E-02    22     12
33     14     2.68525E+00     8.70344E-01    0.0     8.02999E-02    22     12
33     15     2.29365E+00     7.43874E-01    0.0     8.02999E-02    22     12
33     16     1.88151E+00     6.20856E-01    0.0     8.02999E-02    22     12
33     17     1.47559E+00     4.94977E-01    0.0     8.02999E-02    22     12
33     18     1.08721E+00     3.58676E-01    0.0     8.02999E-02    22     12
33     19     7.08947E-01     2.03293E-01    0.0     8.02999E-02    22     12
33     20     3.43175E-01     7.49074E-03    0.0     8.02999E-02    22     12
33     21     1.19145E-03    -2.88049E-01    0.0     8.02999E-02    22     12
33     22    -3.83215E-01     3.94815E-01    0.0     8.02999E-02    22     12
33     23     3.83215E-01     0.0            0.0     8.02999E-02    22     12
34     11    -2.41918E+00    -7.57824E-02    0.0     8.28000E-02    22     12
34     12     2.41918E+00     4.47094E-01    0.0     8.28000E-02    22     12
34     13     2.82461E+00     6.28681E-01    0.0     8.28000E-02    22     12
34     14     2.67498E+00     6.39095E-01    0.0     8.28000E-02    22     12
34     15     2.34363E+00     5.88422E-01    0.0     8.28000E-02    22     12
34     16     1.94944E+00     5.19552E-01    0.0     8.28000E-02    22     12
34     17     1.55355E+00     4.40515E-01    0.0     8.28000E-02    22     12
34     18     1.17375E+00     3.52766E-01    0.0     8.28000E-02    22     12
34     19     8.04075E-01     2.56367E-01    0.0     8.28000E-02    22     12
34     20     4.42528E-01     1.55635E-01    0.0     8.28000E-02    22     12
34     21     1.00452E-01     5.49961E-02    0.0     8.28000E-02    22     12
34     22    -2.31524E-01    -9.87997E-02    0.0     8.28000E-02    22     12
34     23     2.31524E-01     0.0            0.0     8.28000E-02    22     12
35     11    -2.16055E+00    -3.79975E-02    0.0     8.28000E-02    22     12
35     12     2.16055E+00     2.24221E-01    0.0     8.28000E-02    22     12
35     13     2.68034E+00     3.70484E-01    0.0     8.28000E-02    22     12
35     14     2.63232E+00     4.13741E-01    0.0     8.28000E-02    22     12
35     15     2.35022E+00     4.07059E-01    0.0     8.28000E-02    22     12
35     16     1.97741E+00     3.78698E-01    0.0     8.28000E-02    22     12
35     17     1.59460E+00     3.37072E-01    0.0     8.28000E-02    22     12
35     18     1.22185E+00     2.88309E-01    0.0     8.28000E-02    22     12
35     19     8.55924E-01     2.35691E-01    0.0     8.28000E-02    22     12
35     20     4.99011E-01     1.78423E-01    0.0     8.28000E-02    22     12
35     21     1.68010E-01     1.09928E-01    0.0     8.28000E-02    22     12
35     22    -1.23101E-01     5.96046E-07    0.0     8.28000E-02    22     12
35     23     1.23101E-01     0.0            0.0     8.28000E-02    22     12
36     11    -2.04134E+00    -1.75094E-02    0.0     8.28000E-02    22     12
36     12     2.04134E+00     1.03355E-01    0.0     8.28000E-02    22     12
36     13     2.60475E+00     1.79996E-01    0.0     8.28000E-02    22     12
36     14     2.60046E+00     2.12297E-01    0.0     8.28000E-02    22     12
36     15     2.34226E+00     2.20366E-01    0.0     8.28000E-02    22     12
36     16     1.98434E+00     2.13341E-01    0.0     8.28000E-02    22     12
36     17     1.61142E+00     1.96292E-01    0.0     8.28000E-02    22     12
36     18     1.24137E+00     1.76472E-01    0.0     8.28000E-02    22     12
36     19     8.75533E-01     1.56591E-01    0.0     8.28000E-02    22     12
36     20     5.23280E-01     1.31984E-01    0.0     8.28000E-02    22     12
36     21     2.09670E-01     8.97453E-02    0.0     8.28000E-02    22     12
36     22    -3.45852E-02     1.31130E-06    0.0     8.28000E-02    22     12
36     23     3.45852E-02     0.0            0.0     8.28000E-02    22     12
37     11    -2.04134E+00    -1.02542E-02    0.0     8.28000E-02    22     12
37     12     2.04134E+00    -1.02542E-02    0.0     8.28000E-02    22     12
37     13     2.60475E+00    -2.16489E-02    0.0     8.28000E-02    22     12
37     14     2.60046E+00    -3.14281E-02    0.0     8.28000E-02    22     12
37     15     2.34226E+00    -3.84420E-02    0.0     8.28000E-02    22     12
37     16     1.98434E+00    -4.19609E-02    0.0     8.28000E-02    22     12
37     17     1.61142E+00    -4.19719E-02    0.0     8.28000E-02    22     12
37     18     1.24139E+00    -3.86270E-02    0.0     8.28000E-02    22     12
37     19     8.75533E-01    -3.19364E-02    0.0     8.28000E-02    22     12
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 37    20      5.23280E-01    -2.27686E-02    0.0          8.28000E-02    22    12
 37    21      2.09670E-01    -1.18584E-02    0.0          8.28000E-02    22    12
 37    22     -3.45852E-02    -1.18584E-02    0.0          8.28000E-02    22    12
 37    23      3.45852E-02     0.0            0.0          8.28000E-02    22    12
 38    11      0.0             1.74128E-03    0.0          8.28000E-02    22    12
 38    12      0.0            -1.02542E-02    0.0          8.28000E-02    22    12
 38    13      0.0            -2.16489E-02    0.0          8.28000E-02    22    12
 38    14      0.0            -3.14281E-02    0.0          8.28000E-02    22    12
 38    15      0.0            -3.84420E-02    0.0          8.28000E-02    22    12
 38    16      0.0            -4.19609E-02    0.0          8.28000E-02    22    12
 38    17      0.0            -4.19719E-02    0.0          8.28000E-02    22    12
 38    18      0.0            -3.86270E-02    0.0          8.28000E-02    22    12
 38    19      0.0            -3.19364E-02    0.0          8.28000E-02    22    12
 38    20      0.0            -2.27686E-02    0.0          8.28000E-02    22    12
 38    21      0.0            -1.18584E-02    0.0          8.28000E-02    22    12
 38    22      0.0            -1.45286E-07    0.0          8.28000E-02    22    12
 38    23      0.0             0.0            0.0          8.28000E-02    22    12

PRESSURE DROP=       0.0          PSI
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ITER=   112         TIME= 9.99997E-03          CYCLE=  20    FVOL= 5.60163E-03
I        J          U               V                P                 H                SUR CELL     BOT CELL
1        11         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        12         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        13         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        14         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        15         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        16         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        17         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        18         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        19         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        20         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        21         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        22         1.50000E+00     0.0              0.0               8.28000E-02        22           12
1        23         1.50000E+00     0.0              0.0               8.28000E-02        22           12
2        11        -1.52594E+00     3.85277E-03      0.0               8.28000E-02        22           12
2        12         1.52594E+00    -2.24490E-02      1.25877E+00       8.28000E-02        22           12
2        13         1.53581E+00    -5.87374E-02      1.29362E+00       8.28000E-02        22           12
2        14         1.52839E+00    -8.75080E-02      1.38312E+00       8.28000E-02        22           12
2        15         1.52186E+00    -1.09656E-01      1.51606E+00       8.28000E-02        22           12
2        16         1.51605E+00    -1.25913E-01      1.68259E+00       8.28000E-02        22           12
2        17         1.51025E+00    -1.36292E-01      1.87411E+00       8.28000E-02        22           12
2        18         1.50338E+00    -1.39702E-01      2.08219E+00       8.28000E-02        22           12
2        19         1.49379E+00    -1.33390E-01      2.29692E+00       8.28000E-02        22           12
2        20         1.47921E+00    -1.12295E-01      2.50424E+00       8.28000E-02        22           12
2        21         1.45815E+00    -6.98531E-02      2.68160E+00       8.28000E-02        22           12
2        22         1.43113E+00    -2.98023E-05      2.79326E+00       8.28000E-02        22           12
2        23        -1.43113E+00     0.0              0.0               8.28000E-02        22           12
3        11        -1.58853E+00     9.22716E-03      0.0               8.28000E-02        22           12
3        12         1.58853E+00    -5.42261E-02      1.18251E+00       8.28000E-02        22           12
3        13         1.60780E+00    -1.27217E-01      1.22937E+00       8.28000E-02        22           12
3        14         1.58447E+00    -1.84069E-01      1.33206E+00       8.28000E-02        22           12
3        15         1.56460E+00    -2.27398E-01      1.47644E+00       8.28000E-02        22           12
3        16         1.54745E+00    -2.59237E-01      1.65295E+00       8.28000E-02        22           12
3        17         1.53077E+00    -2.80040E-01      1.85415E+00       8.28000E-02        22           12
3        18         1.51131E+00    -2.80082E-01      2.07330E+00       8.28000E-02        22           12
3        19         1.48425E+00    -2.78412E-01      2.30322E+00       8.28000E-02        22           12
3        20         1.44186E+00    -2.40545E-01      2.53420E+00       8.28000E-02        22           12
3        21         1.37377E+00    -1.54990E-01      2.74801E+00       8.28000E-02        22           12
3        22         1.27828E+00    -1.74642E-05      2.89781E+00       8.28000E-02        22           12
3        23        -1.27828E+00     0.0              0.0               8.28000E-02        22           12
4        11        -1.70426E+00     1.70363E-02      0.0               8.28000E-02        22           12
4        12         1.70426E+00    -1.00307E-01      1.02547E+00       8.28000E-02        22           12
4        13         1.72135F+00    -2.15436E-01      1.10132E+00       8.28000E-02        22           12
4        14         1.66559E+00    -2.97683E-01      1.23308E+00       8.28000E-02        22           12
4        15         1.62546E+00    -3.59390E-01      1.40033E+00       8.28000E-02        22           12
4        16         1.59245E+00    -4.05014E-01      1.59532E+00       8.28000E-02        22           12
4        17         1.56106E+00    -4.35724E-01      1.81304E+00       8.28000E-02        22           12
4        18         1.52550E+00    -4.50113E-01      2.04947E+00       8.28000E-02        22           12
4        19         1.47832E+00    -4.44098E-01      2.30113E+00       8.28000E-02        22           12
4        20         1.40636E+00    -4.08103E-01      2.56617E+00       8.28000E-02        22           12
4        21         1.27665E+00    -3.09636E-01      2.84586E+00       8.28000E-02        22           12
4        22         9.72902E-01    -1.99676E-05      3.11119E+00       8.28000E-02        22           12
4        23        -9.72902E-01     0.0              0.0               8.28000E-02        22           12
5        11        -1.94984E+00     3.61178E-02      0.0               8.28000E-02        22           12
5        12         1.94984E+00    -2.12868E-01      7.10612E-01       8.28000E-02        22           12
5        13         1.84643E+00    -3.39681E-01      8.94419E-01       8.28000E-02        22           12
5        14         1.76052E+00    -4.35934E-01      1.08177E+00       8.28000E-02        22           12
5        15         1.69909E+00    -5.10587E-01      1.28466E+00       8.28000E-02        22           12
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5   16    1.64872E+00   -5.67635E-01    1.50582E+00    8.28000E-02    22    12
5   17    1.60159E+00   -6.08720E-01    1.74479E+00    8.28000E-02    22    12
5   18    1.55018E+00   -6.33739E-01    2.00008E+00    8.28000E-02    22    12
5   19    1.48543E+00   -6.40948E-01    2.26919E+00    8.28000E-02    22    12
5   20    1.39033E+00   -6.24692E-01    2.54903E+00    8.28000E-02    22    12
5   21    1.20635E+00   -5.53416E-01    2.84634E+00    8.28000E-02    22    12
5   22    6.90805E-01   -2.67404E-01    3.19502E+00    8.28000E-02    22    12
5   23   -6.90805E-01    0.0            0.0            8.28000E-02    22    12
6   11   -1.99329E+00   -3.45645E-01    0.0            8.02999E-02    22    12
6   12    1.99329E+00   -3.89697E-01    3.64762E-01    8.02999E-02    22    12
6   13    1.95455E+00   -4.99310E-01    6.39320E-01    8.02999E-02    22    12
6   14    1.86013E+00   -6.00295E-01    8.84284E-01    8.02999E-02    22    12
6   15    1.77965E+00   -6.81973E-01    1.12907E+00    8.02999E-02    22    12
6   16    1.71058E+00   -7.44695E-01    1.38142E+00    8.02999E-02    22    12
6   17    1.64265E+00   -7.86327E-01    1.64454E+00    8.02999E-02    22    12
6   18    1.56229E+00   -7.98606E-01    1.91954E+00    8.02999E-02    22    12
6   19    1.45197E+00   -7.64686E-01    2.20299E+00    8.02999E-02    22    12
6   20    1.29677E+00   -6.69835E-01    2.47495E+00    8.02999E-02    22    12
6   21    1.12226E+00   -5.84575E-01    2.66855E+00    8.02999E-02    22    12
6   22    1.12226E+00   -1.02202E+00    2.54550E+00    8.02999E-02    22    12
6   23   -1.12226E+00    0.0            0.0            8.02999E-02    22    12
7   10   -3.43733E-01    2.43791E+00    0.0            7.64111E-02    21    11
7   11    3.43733E-01    6.84634E-02   -2.47445E+00    7.64111E-02    21    11
7   12    2.54136E+00   -4.87206E-01    1.61025E-01    7.64111E-02    21    11
7   13    2.14020E+00   -6.75436E-01    3.58530E-01    7.64111E-02    21    11
7   14    1.97197E+00   -7.88828E-01    6.43418E-01    7.64111E-02    21    11
7   15    1.86192E+00   -8.72231E-01    9.33574E-01    7.64111E-02    21    11
7   16    1.77247E+00   -9.34978E-01    1.22028E+00    7.64111E-02    21    11
7   17    1.68446E+00   -9.77369E-01    1.50865E+00    7.64111E-02    21    11
7   18    1.58825E+00   -1.00368E+00    1.80276E+00    7.64111E-02    21    11
7   19    1.48750E+00   -1.03970E+00    2.10348E+00    7.64111E-02    21    11
7   20    1.41097E+00   -1.15548E+00    2.40332E+00    7.64111E-02    21    11
7   21    1.41097E+00   -1.44820E+00    2.67349E+00    7.64111E-02    21    11
7   22   -1.41097E+00    0.0            0.0            7.64111E-02    21    11
8    9   -1.16933E-01    4.90046E-01    0.0            7.25222E-02    20    10
8   10    1.16933E-01    2.29872E-02   -2.09338E+00    7.25222E-02    20    10
8   11    1.24178E+00   -8.87520E-01   -2.24362E+00    7.25222E-02    20    10
8   12    2.53831E+00   -8.84426E-01   -1.00394E+00    7.25222E-02    20    10
8   13    2.18857E+00   -9.33472E-01   -1.35379E-01    7.25222E-02    20    10
8   14    2.04625E+00   -1.00878E+00    3.35600E-01    7.25222E-02    20    10
8   15    1.93333E+00   -1.08119E+00    6.97648E-01    7.25222E-02    20    10
8   16    1.83642E+00   -1.14603E+00    1.02131E+00    7.25222E-02    20    10
8   17    1.74719E+00   -1.20963E+00    1.33085E+00    7.25222E-02    20    10
8   18    1.67101E+00   -1.29354E+00    1.63409E+00    7.25222E-02    20    10
8   19    1.62466E+00   -1.43259E+00    1.92989E+00    7.25222E-02    20    10
8   20    1.62466E+00   -1.64924E+00    2.20835E+00    7.25222E-02    20    10
8   21   -1.62466E+00    0.0            0.0            7.25222E-02    20    10
9    8   -7.02049E-02    1.78983E-01    0.0            6.86333E-02    19     9
9    9    7.02049E-02   -1.07522E-02   -1.61115E+00    6.86333E-02    19     9
9   10    8.73728E-01   -7.78048E-01   -1.81953E+00    6.86333E-02    19     9
9   11    1.70511E+00   -1.24781E+00   -1.72921E+00    6.86333E-02    19     9
9   12    2.46442E+00   -1.17289E+00   -1.07574E+00    6.86333E-02    19     9
9   13    2.19805E+00   -1.18251E+00   -4.09056E-01    6.86333E-02    19     9
9   14    2.10251E+00   -1.23954E+00    6.13177E-02    6.86333E-02    19     9
9   15    2.00343E+00   -1.31061E+00    4.46053E-01    6.86333E-02    19     9
9   16    1.91721E+00   -1.39252E+00    7.88987E-01    6.86333E-02    19     9
9   17    1.85006E+00   -1.49682E+00    1.10849E+00    6.86333E-02    19     9
9   18    1.81335E+00   -1.64113E+00    1.40921E+00    6.86333E-02    19     9
9   19    1.81335E+00   -1.83244E+00    1.68918E+00    6.86333E-02    19     9
9   20   -1.81335E+00    0.0            0.0            6.86333E-02    19     9
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10    7   -5.45790E-02    1.13319E-01    0.0            6.47444E-02    18    8
10    8    5.45790E-02   -1.31961E-02   -1.24298E+00    6.47444E-02    18    8
10    9    7.12834E-01   -6.64744E-01   -1.40940E+00    6.47444E-02    18    8
10   10    1.35081E+00   -1.14844E+00   -1.50287E+00    6.47444E-02    18    8
10   11    1.98494E+00   -1.43215E+00   -1.41982E+00    6.47444E-02    18    8
10   12    2.41218E+00   -1.37919E+00   -1.04283E+00    6.47444E-02    18    8
10   13    2.22713E+00   -1.40866E+00   -5.92916E-01    6.47444E-02    18    8
10   14    2.16968E+00   -1.47676E+00   -1.91529E-01    6.47444E-02    18    8
10   15    2.09181E+00   -1.56637E+00    1.78589E-01    6.47444E-02    18    8
10   16    2.02931E+00   -1.68003E+00    5.23046E-01    6.47444E-02    18    8
10   17    1.99469E+00   -1.82666E+00    8.43278E-01    6.47444E-02    18    8
10   18    1.99469E+00   -2.01053E+00    1.13685E+00    6.47444E-02    18    8
10   19   -1.99469E+00    0.0            0.0            6.47444E-02    18    8
11    6    4.03845E-04    7.40612E-02    0.0            6.08555E-02    17    7
11    7   -4.03845E-04    1.91344E-02   -9.75799E-01    6.08555E-02    17    7
11    8    6.08570E-01   -5.42543E-01   -1.09398E+00    6.08555E-02    17    7
11    9    1.15642E+00   -9.92289E-01   -1.20427E+00    6.08555E-02    17    7
11   10    1.70557E+00   -1.35198E+00   -1.29093E+00    6.08555E-02    17    7
11   11    2.17666E+00   -1.54636E+00   -1.27400E+00    6.08555E-02    17    7
11   12    2.41515E+00   -1.54938E+00   -1.07763E+00    6.08555E-02    17    7
11   13    2.30384E+00   -1.62715E+00   -7.89077E-01    6.08555E-02    17    7
11   14    2.27166E+00   -1.73055E+00   -4.65904E-01    6.08555E-02    17    7
11   15    2.21447E+00   -1.85491E+00   -1.22548E-01    6.08555E-02    17    7
11   16    2.17795E+00   -2.00560E+00    2.18940E-01    6.08555E-02    17    7
11   17    2.17795E+00   -2.19140E+00    5.39579E-01    6.08555E-02    17    7
11   18   -2.17795E+00    0.0            0.0            6.08555E-02    17    7
12    5    1.23233E-01   -4.65055E-02    0.0            5.69667E-02    16    6
12    6   -1.23233E-01    7.88474E-02   -7.68206E-01    5.69667E-02    16    6
12    7    4.95883E-01   -4.24326E-01   -8.53896E-01    5.69667E-02    16    6
12    8    1.00170E+00   -8.22904E-01   -9.45472E-01    5.69667E-02    16    6
12    9    1.51289E+00   -1.18432E+00   -1.05987E+00    5.69667E-02    16    6
12   10    1.98542E+00   -1.46825E+00   -1.18374E+00    5.69667E-02    16    6
12   11    2.34272E+00   -1.63661E+00   -1.26060E+00    5.69667E-02    16    6
12   12    2.49273E+00   -1.71527E+00   -1.21715E+00    5.69667E-02    16    6
12   13    2.44358E+00   -1.85705E+00   -1.06315E+00    5.69667E-02    16    6
12   14    2.42530E+00   -2.01282E+00   -8.12783E-01    5.69667E-02    16    6
12   15    2.38675E+00   -2.18749E+00   -4.85631E-01    5.69667E-02    16    6
12   16    2.38675E+00   -2.39918E+00   -1.30815E-01    5.69667E-02    16    6
12   17   -2.38675E+00    0.0            0.0            5.69667E-02    16    6
13    4    3.46942E-01   -3.05144E-01    0.0            5.30778E-02    15    5
13    5   -3.46942E-01    1.71556E-01   -5.91013E-01    5.30778E-02    15    5
13    6    3.64983E-01   -3.23437E-01   -6.51404E-01    5.30778E-02    15    5
13    7    8.29009E-01   -6.61184E-01   -7.23996E-01    5.30778E-02    15    5
13    8    1.32392E+00   -9.87884E-01   -8.19596E-01    5.30778E-02    15    5
13    9    1.80427E+00   -1.28330E+00   -9.67828E-01    5.30778E-02    15    5
13   10    2.22326E+00   -1.52424E+00   -1.16483E+00    5.30778E-02    15    5
13   11    2.52119E+00   -1.70518E+00   -1.36473E+00    5.30778E-02    15    5
13   12    2.65960E+00   -1.87437E+00   -1.48971E+00    5.30778E-02    15    5
13   13    2.68400E+00   -2.11801E+00   -1.48642E+00    5.30778E-02    15    5
13   14    2.70019E+00   -2.39672E+00   -1.30671E+00    5.30778E-02    15    5
13   15    2.70019E+00   -2.71451E+00   -9.59273E-01    5.30778E-02    15    5
13   16   -2.70019E+00    0.0            0.0            5.30778E-02    15    5
14    3    6.04447E-01   -7.28262E-01    0.0            4.91889E-02    14    4
14    4   -6.04447E-01    2.36329E-01   -3.63765E-01    4.91889E-02    14    4
14    5    1.64919E-01   -2.82634E-01   -4.54070E-01    4.91889E-02    14    4
14    6    6.01673E-01   -5.22609E-01   -5.22598E-01    4.91889E-02    14    4
14    7    1.09330E+00   -7.90568E-01   -5.86325E-01    4.91889E-02    14    4
14    8    1.58572E+00   -1.05600E+00   -7.06500E-01    4.91889E-02    14    4
14    9    2.05127E+00   -1.30642E+00   -9.12302E-01    4.91889E-02    14    4
14   10    2.45970E+00   -1.54615E+00   -1.21252E+00    4.91889E-02    14    4
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14   11    2.78789E+00   -1.81656E+00   -1.57952E+00   4.91889E-02   14   4
14   12    3.03489E+00   -2.19705E+00   -1.94966E+00   4.91889E-02   14   4
14   13    3.18889E+00   -2.70896E+00   -2.20200E+00   4.91889E-02   14   4
14   14    3.18889E+00   -3.20444E+00   -2.12600E+00   4.91889E-02   14   4
14   15   -3.18889E+00    0.0            0.0           4.91889E-02   14   4
15    2    8.20814E-01   -1.19548E+00    0.0           4.53000E-02   13   3
15    3   -8.20814E-01    2.49553E-01   -6.84263E-02   4.53000E-02   13   3
15    4   -1.05138E-01   -2.56683E-01   -1.89346E-01   4.53000E-02   13   3
15    5    3.31389E-01   -4.25462E-01   -2.70178E-01   4.53000E-02   13   3
15    6    8.07946E-01   -6.34600E-01   -3.36699E-01   4.53000E-02   13   3
15    7    1.31113E+00   -8.55449E-01   -4.25370E-01   4.53000E-02   13   3
15    8    1.81364E+00   -1.08653E+00   -5.86459E-01   4.53000E-02   13   3
15    9    2.29866E+00   -1.33736E+00   -8.62829E-01   4.53000E-02   13   3
15   10    2.76010E+00   -1.64193E+00   -1.28906E+00   4.53000E-02   13   3
15   11    3.19527E+00   -2.05496E+00   -1.90205E+00   4.53000E-02   13   3
15   12    3.56044E+00   -2.58780E+00   -2.75735E+00   4.53000E-02   13   3
15   13    3.56044E+00   -2.96450E+00   -3.61596E+00   4.53000E-02   13   3
15   14   -3.56044E+00    0.0            0.0           4.53000E-02   13   3
16    1    9.63817E-01   -1.58820E+00    0.0           4.28000E-02   12   2
16    2   -9.63817E-01    2.21191E-01    1.78183E-01   4.28000E-02   12   2
16    3   -3.70716E-01   -2.35151E-01    1.03711E-01   4.28000E-02   12   2
16    4    2.05921E-02   -3.62625E-01    1.81757E-02   4.28000E-02   12   2
16    5    4.77818E-01   -5.11087E-01   -5.24585E-02   4.28000E-02   12   2
16    6    9.71320E-01   -6.76728E-01   -1.26348E-01   4.28000E-02   12   2
16    7    1.48342E+00   -8.51409E-01   -2.42461E-01   4.28000E-02   12   2
16    8    1.99334E+00   -1.03360E+00   -4.51775E-01   4.28000E-02   12   2
16    9    2.48385E+00   -1.22137E+00   -8.11889E-01   4.28000E-02   12   2
16   10    2.93485E+00   -1.39854E+00   -1.40231E+00   4.28000E-02   12   2
16   11    3.27162E+00   -1.47595E+00   -2.36328E+00   4.28000E-02   12   2
16   12    3.09105E+00   -1.00004E+00   -3.93544E+00   4.28000E-02   12   2
16   13   -3.09105E+00    0.0            0.0           4.28000E-02   12   2
17    1    4.47192E-01    3.27596E-01    0.0           4.28000E-02   12   2
17    2   -4.47192E-01   -1.96198E-01    3.53217E-01   4.28000E-02   12   2
17    3   -2.82901E-01   -2.85231E-01    3.29993E-01   4.28000E-02   12   2
17    4    1.44280E-01   -4.10637E-01    2.58801E-01   4.28000E-02   12   2
17    5    5.97562E-01   -5.32038E-01    1.87175E-01   4.28000E-02   12   2
17    6    1.09160E+00   -6.53992E-01    9.89854E-02   4.28000E-02   12   2
17    7    1.60376E+00   -7.76203E-01   -4.71428E-02   4.28000E-02   12   2
17    8    2.10483E+00   -8.89236E-01   -3.04406E-01   4.28000E-02   12   2
17    9    2.56225E+00   -9.68725E-01   -7.36351E-01   4.28000E-02   12   2
17   10    2.91640E+00   -9.50021E-01   -1.43420E+00   4.28000E-02   12   2
17   11    3.00320E+00   -6.77872E-01   -2.58769E+00   4.28000E-02   12   2
17   12    2.30914E+00    1.14879E-01   -4.66919E+00   4.28000E-02   12   2
17   13   -2.30914E+00    0.0            0.0           4.28000E-02   12   2
18    1    3.44011E-01    3.26633E-05    0.0           4.28000E-02   12   2
18    2   -3.44011E-01   -1.04580E-01    6.33958E-01   4.28000E-02   12   2
18    3   -9.74488E-02   -2.92605E-01    5.63115E-01   4.28000E-02   12   2
18    4    2.57351E-01   -4.07246E-01    4.95614E-01   4.28000E-02   12   2
18    5    6.89425E-01   -5.00384E-01    4.23193E-01   4.28000E-02   12   2
18    6    1.17071E+00   -5.80583E-01    3.21311E-01   4.28000E-02   12   2
18    7    1.67332E+00   -6.50909E-01    1.48297E-01   4.28000E-02   12   2
18    8    2.15522E+00   -7.02003E-01   -1.46339E-01   4.28000E-02   12   2
18    9    2.56879E+00   -7.08629E-01   -6.11386E-01   4.28000E-02   12   2
18   10    2.83073E+00   -6.21767E-01   -1.27683E+00   4.28000E-02   12   2
18   11    2.75458E+00   -3.69701E-01   -2.10022E+00   4.28000E-02   12   2
18   12    1.88271E+00    6.26461E-02   -2.78503E+00   4.28000E-02   12   2
18   13   -1.88271E+00    0.0            0.0           4.28000E-02   12   2
19    1    1.91645E-01    3.21865E-05    0.0           4.28000E-02   12   2
19    2   -1.91645E-01   -1.54448E-01    7.83979E-01   4.28000E-02   12   2
19    3    2.74465E-02   -2.81079E-01    7.47205E-01   4.28000E-02   12   2
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19   4    3.44524E-01  -3.69457E-01   7.02285E-01   4.28000E-02   12   2
19   5    7.50542E-01  -4.31423E-01   6.36647E-01   4.28000E-02   12   2
19   6    1.21087E+00  -4.72144E-01   5.26753E-01   4.28000E-02   12   2
19   7    1.69734E+00  -4.96492E-01   3.34024E-01   4.28000E-02   12   2
19   8    2.15944E+00  -5.00771E-01   1.49844E-02   4.28000E-02   12   2
19   9    2.53846E+00  -4.70021E-01  -4.59289E-01   4.28000E-02   12   2
19  10    2.74216E+00  -3.80219E-01  -1.06896E+00   4.28000E-02   12   2
19  11    2.58449E+00  -2.07774E-01  -1.68232E+00   4.28000E-02   12   2
19  12    1.64306E+00   3.52021E-02  -2.01714E+00   4.28000E-02   12   2
19  13   -1.64306E+00   0.0           0.0           4.28000E-02   12   2
20   1    5.76755E-02   3.09348E-05   0.0           4.28000E-02   12   2
20   2   -5.76755E-02  -1.35797E-01   9.21852E-01   4.28000E-02   12   2
20   3    1.25922E-01  -2.35638E-01   9.08118E-01   4.28000E-02   12   2
20   4    4.09282E-01  -3.01295E-01   8.80420E-01   4.28000E-02   12   2
20   5    7.83667E-01  -3.34881E-01   8.22088E-01   4.28000E-02   12   2
20   6    1.21680E+00  -3.40896E-01   7.08019E-01   4.28000E-02   12   2
20   7    1.68290E+00  -3.26255E-01   5.02512E-01   4.28000E-02   12   2
20   8    2.12863E+00  -2.95019E-01   1.69439E-01   4.28000E-02   12   2
20   9    2.48893E+00  -2.44798E-01  -3.06905E-01   4.28000E-02   12   2
20  10    2.67130E+00  -1.72960E-01  -8.86669E-01   4.28000E-02   12   2
20  11    2.49909E+00  -8.63721E-02  -1.42719E+00   4.28000E-02   12   2
20  12    1.54345E+00   1.46261E-02  -1.68313E+00   4.28000E-02   12   2
20  13   -1.54345E+00   0.0           0.0           4.28000E-02   12   2
21   1   -2.07455E-02   3.23057E-05   0.0           4.28000E-02   12   2
21   2    2.07455E-02  -7.94768E-02   1.02887E+00   4.28000E-02   12   2
21   3    2.06113E-01  -1.60784E-01   1.03840E+00   4.28000E-02   12   2
21   4    4.54241E-01  -2.06363E-01   1.02726E+00   4.28000E-02   12   2
21   5    7.93196E-01  -2.16025E-01   9.76314E-01   4.28000E-02   12   2
21   6    1.19554E+00  -1.94467E-01   8.60129E-01   4.28000E-02   12   2
21   7    1.63717E+00  -1.48107E-01   6.47409E-01   4.28000E-02   12   2
21   8    2.06898E+00  -8.76259E-02   3.08459E-01   4.28000E-02   12   2
21   9    2.42582E+00  -2.36452E-02  -1.66836E-01   4.28000E-02   12   2
21  10    2.61142E+00   3.70627E-02  -7.37197E-01   4.28000E-02   12   2
21  11    2.48215E+00   5.42424E-02  -1.28907E+00   4.28000E-02   12   2
21  12    1.60603E+00  -9.20701E-03  -1.59951E+00   4.28000E-02   12   2
21  13   -1.60603E+00   0.0           0.0           4.28000E-02   12   2
22   1   -5.59246E-02   1.78240E-02   0.0           4.28000E-02   12   2
22   2    5.59246E-02  -1.78432E-02   1.10163E+00   4.28000E-02   12   2
22   3    2.35266E-01  -4.73992E-02   1.13719E+00   4.28000E-02   12   2
22   4    4.85883E-01  -7.94812E-02   1.14134E+00   4.28000E-02   12   2
22   5    7.88540E-01  -7.47597E-02   1.09689E+00   4.28000E-02   12   2
22   6    1.15677E+00  -3.54514E-02   9.78654E-01   4.28000E-02   12   2
22   7    1.57003E+00   3.26180E-02   7.61879E-01   4.28000E-02   12   2
22   8    1.98553E+00   1.17227E-01   4.28134E-01   4.28000E-02   12   2
22   9    2.33951E+00   2.04740E-01  -3.57321E-02   4.28000E-02   12   2
22  10    2.53934E+00   2.77819E-01  -6.18417E-01   4.28000E-02   12   2
22  11    2.47514E+00   2.84925E-01  -1.24666E+00   4.28000E-02   12   2
22  12    1.93470E+00  -4.83034E-02  -1.75157E+00   4.28000E-02   12   2
22  13   -1.93470E+00   0.0           0.0           4.28000E-02   12   2
23   1   -3.59293E-01   4.81907E-01   0.0           4.28000E-02   12   2
23   2    3.59293E-01   1.74328E-01   1.10861E+00   4.28000E-02   12   2
23   3    3.59293E-01   4.85785E-02   1.20381E+00   4.28000E-02   12   2
23   4    4.80921E-01   5.36106E-02   1.22465E+00   4.28000E-02   12   2
23   5    7.58057E-01   8.45150E-02   1.18615E+00   4.28000E-02   12   2
23   6    1.10535E+00   1.36641E-01   1.07067E+00   4.28000E-02   12   2
23   7    1.49043E+00   2.17349E-01   8.58048E-01   4.28000E-02   12   2
23   8    1.88362E+00   3.20673E-01   5.29651E-01   4.28000E-02   12   2
23   9    2.22937E+00   4.32334E-01   7.30914E-02   4.28000E-02   12   2
23  10    2.43604E+00   5.36259E-01  -5.06135E-01   4.28000E-02   12   2
23  11    2.39091E+00   6.21655E-01  -1.17454E+00   4.28000E-02   12   2
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23    12    1.93449E+00    6.21861E-01   -1.89937E+00    4.28000E-02    12    2
23    13   -1.93449E+00    0.0            0.0            4.28000E-02    12    2
24     2   -6.56208E-01    7.79346E-01    0.0            4.53000E-02    13    3
24     3    6.56208E-01    4.78312E-01    1.22984E+00    4.53000E-02    13    3
24     4    6.56208E-01    3.00593E-01    1.27746E+00    4.53000E-02    13    3
24     5    7.81502E-01    2.76827E-01    1.24292E+00    4.53000E-02    13    3
24     6    1.05722E+00    3.25620E-01    1.12445E+00    4.53000E-02    13    3
24     7    1.40858E+00    4.08603E-01    9.11577E-01    4.53000E-02    13    3
24     8    1.77557E+00    5.18146E-01    5.91141E-01    4.53000E-02    13    3
24     9    2.10833E+00    6.40873E-01    1.56729E-01    4.53000E-02    13    3
24    10    2.32872E+00    7.50484E-01   -3.76367E-01    4.53000E-02    13    3
24    11    2.33811E+00    8.04019E-01   -9.39004E-01    4.53000E-02    13    3
24    12    2.13982E+00    5.95840E-01   -1.34184E+00    4.53000E-02    13    3
24    13    4.75394E-01   -1.84748E+00   -2.56928E+00    4.53000E-02    13    3
24    14   -4.75394E-01    0.0            0.0            4.53000E-02    13    3
25     3   -9.64644E-01    1.08828E+00    0.0            4.91889E-02    14    4
25     4    9.64644E-01    7.75561E-01    1.24624E+00    4.91889E-02    14    4
25     5    9.64644E-01    5.89880E-01    1.23110E+00    4.91889E-02    14    4
25     6    1.09114E+00    5.55494E-01    1.11909E+00    4.91889E-02    14    4
25     7    1.35291E+00    6.11940E-01    9.09489E-01    4.91889E-02    14    4
25     8    1.67657E+00    7.12318E-01    6.00202E-01    4.91889E-02    14    4
25     9    1.98844E+00    8.33868E-01    1.93247E-01    4.91889E-02    14    4
25    10    2.21492E+00    9.49249E-01   -2.94311E-01    4.91889E-02    14    4
25    11    2.25774E+00    1.03074E+00   -8.18771E-01    4.91889E-02    14    4
25    12    2.13545E+00    1.03517E+00   -1.34535E+00    4.91889E-02    14    4
25    13    1.10308E+00    3.98777E-01   -1.77822E+00    4.91889E-02    14    4
25    14    4.14766E-01   -5.03735E-01   -1.41902E+00    4.91889E-02    14    4
25    15   -4.14766E-01    0.0            0.0            4.91889E-02    14    4
26     4   -1.26985E+00    1.38795E+00    0.0            5.30778E-02    15    5
26     5    1.26985E+00    1.07851E+00    1.13046E+00    5.30778E-02    15    5
26     6    1.26985E+00    8.97321E-01    1.03401E+00    5.30778E-02    15    5
26     7    1.39051E+00    8.59196E-01    8.37285E-01    5.30778E-02    15    5
26     8    1.62218E+00    9.14335E-01    5.44776E-01    5.30778E-02    15    5
26     9    1.89199E+00    1.01213E+00    1.70395E-01    5.30778E-02    15    5
26    10    2.11460E+00    1.11383E+00   -2.58967E-01    5.30778E-02    15    5
26    11    2.18660E+00    1.18595E+00   -6.91459E-01    5.30778E-02    15    5
26    12    2.12541E+00    1.19613E+00   -1.05991E+00    5.30778E-02    15    5
26    13    1.48882E+00    8.05030E-01   -1.22164E+00    5.30778E-02    15    5
26    14    8.74389E-01    3.39028E-01   -1.10513E+00    5.30778E-02    15    5
26    15    3.63818E-01   -4.50359E-01   -8.84006E-01    5.30778E-02    15    5
26    16   -3.63818E-01    0.0            0.0            5.30778E-02    15    5
27     5   -1.55657E+00    1.66354E+00    0.0            5.69667E-02    16    6
27     6    1.55657E+00    1.37284E+00    8.66058E-01    5.69667E-02    16    6
27     7    1.55657E+00    1.20448E+00    6.86599E-01    5.69667E-02    16    6
27     8    1.66570E+00    1.16036E+00    4.14732E-01    5.69667E-02    16    6
27     9    1.85701E+00    1.19582E+00    7.27473E-02    5.69667E-02    16    6
27    10    2.05427E+00    1.25698E+00   -2.98782E-01    5.69667E-02    16    6
27    11    2.14732E+00    1.29681E+00   -6.39472E-01    5.69667E-02    16    6
27    12    2.13457E+00    1.28752E+00   -8.80483E-01    5.69667E-02    16    6
27    13    1.74320E+00    1.02961E+00   -9.46029E-01    5.69667E-02    16    6
27    14    1.24609E+00    6.52749E-01   -8.55719E-01    5.69667E-02    16    6
27    15    7.69197E-01    2.41742E-01   -7.01567E-01    5.69667E-02    16    6
27    16    2.70753E-01   -4.01634E-01   -5.53127E-01    5.69667E-02    16    6
27    17   -2.70753E-01    0.0            0.0            5.69667E-02    16    6
28     6   -1.82116E+00    1.91621E+00    0.0            6.08555E-02    17    7
28     7    1.82116E+00    1.64794E+00    4.65116E-01    6.08555E-02    17    7
28     8    1.82116E+00    1.49032E+00    2.05731E-01    6.08555E-02    17    7
28     9    1.92078E+00    1.42566E+00   -1.14257E-01    6.08555E-02    17    7
28    10    2.07007E+00    1.40964E+00   -4.39863E-01    6.08555E-02    17    7
28    11    2.16507E+00    1.39164E+00   -7.01365E-01    6.08555E-02    17    7
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28   12   2.17865E+00   1.34694E+00  -8.39349E-01   6.08555E-02   17    7
28   13   1.93552E+00   1.15196E+00  -8.26204E-01   6.08555E-02   17    7
28   14   1.54431E+00   8.49600E-01  -7.04659E-01   6.08555E-02   17    7
28   15   1.10900E+00   5.05083E-01  -5.54657E-01   6.08555E-02   17    7
28   16   6.56936E-01   1.13539E-01  -4.21745E-01   6.08555E-02   17    7
28   17   1.37892E-01  -3.00776E-01  -3.12712E-01   6.08555E-02   17    7
28   18  -1.37892E-01   0.0           0.0           6.08555E-02   17    7
29    7  -2.10974E+00   2.20939E+00   0.0           6.47444E-02   18    8
29    8   2.10974E+00   1.91681E+00  -8.03139E-02   6.47444E-02   18    8
29    9   2.10974E+00   1.72524E+00  -4.13655E-01   6.47444E-02   18    8
29   10   2.19287E+00   1.60073E+00  -7.16271E-01   6.47444E-02   18    8
29   11   2.26661E+00   1.49778E+00  -9.05281E-01   6.47444E-02   18    8
29   12   2.27929E+00   1.39575E+00  -9.37688E-01   6.47444E-02   18    8
29   13   2.11269E+00   1.21612E+00  -8.27609E-01   6.47444E-02   18    8
29   14   1.79594E+00   9.60997E-01  -6.40658E-01   6.47444E-02   18    8
29   15   1.40147E+00   6.64468E-01  -4.54767E-01   6.47444E-02   18    8
29   16   9.70162E-01   3.46896E-01  -3.07630E-01   6.47444E-02   18    8
29   17   5.05518E-01  -2.58319E-02  -2.02119E-01   6.47444E-02   18    8
29   18  -1.69429E-02  -1.48459E-01  -1.15886E-01   6.47444E-02   18    8
29   19   1.69429E-02   0.0           0.0           6.47444E-02   18    8
30    8  -2.56704E+00   2.71861E+00   0.0           6.86333E-02   19    9
30    9   2.56704E+00   2.25496E+00  -8.93190E-01   6.86333E-02   19    9
30   10   2.56704E+00   1.87560E+00  -1.21397E+00   6.86333E-02   19    9
30   11   2.54253E+00   1.59585E+00  -1.31049E+00   6.86333E-02   19    9
30   12   2.47190E+00   1.40056E+00  -1.19119E+00   6.86333E-02   19    9
30   13   2.30009E+00   1.21054E+00  -9.40337E-01   6.86333E-02   19    9
30   14   2.01573E+00   9.87699E-01  -6.53834E-01   6.86333E-02   19    9
30   15   1.65017E+00   7.35546E-01  -4.04960E-01   6.86333E-02   19    9
30   16   1.23556E+00   4.66458E-01  -2.23050E-01   6.86333E-02   19    9
30   17   7.89289E-01   1.78748E-01  -1.02547E-01   6.86333E-02   19    9
30   18   3.16253E-01  -1.59071E-01  -2.15403E-02   6.86333E-02   19    9
30   19  -1.75912E-01   3.64600E-02   2.94635E-02   6.86333E-02   19    9
30   20   1.75912E-01   0.0           0.0           6.86333E-02   19    9
31    9  -3.22008E+00   3.42746E+00   0.0           7.25222E-02   20   10
31   10   3.22008E+00   2.76535E+00  -2.24218E+00   7.25222E-02   20   10
31   11   3.22008E+00   2.07841E+00  -2.10291E+00   7.25222E-02   20   10
31   12   2.97663E+00   1.56668E+00  -1.64822E+00   7.25222E-02   20   10
31   13   2.63238E+00   1.22978E+00  -1.14939E+00   7.25222E-02   20   10
31   14   2.26572E+00   9.76327E-01  -7.23205E-01   7.25222E-02   20   10
31   15   1.87761E+00   7.45727E-01  -3.95344E-01   7.25222E-02   20   10
31   16   1.46233E+00   5.15814E-01  -1.69268E-01   7.25222E-02   20   10
31   17   1.02296E+00   2.78899E-01  -2.77889E-02   7.25222E-02   20   10
31   18   5.77933E-01   1.35852E-02   5.65630E-02   7.25222E-02   20   10
31   19   8.99606E-02  -2.55977E-01   1.12214E-01   7.25222E-02   20   10
31   20  -3.04617E-01   2.31220E-01   1.43271E-01   7.25222E-02   20   10
31   21   3.04617E-01   0.0           0.0           7.25222E-02   20   10
32   10  -3.52038E+00   2.52829E+00   0.0           7.64111E-02   21   11
32   11   3.52038E+00   2.22382E+00  -3.85552E+00   7.64111E-02   21   11
32   12   3.52038E+00   1.67252E+00  -2.57679E+00   7.64111E-02   21   11
32   13   3.04628E+00   1.25287E+00  -1.49298E+00   7.64111E-02   21   11
32   14   2.55901E+00   9.55510E-01  -8.30906E-01   7.64111E-02   21   11
32   15   2.10439E+00   7.25581E-01  -4.05368E-01   7.64111E-02   21   11
32   16   1.66169E+00   5.23456E-01  -1.32829E-01   7.64111E-02   21   11
32   17   1.21429E+00   3.29472E-01   2.99479E-02   7.64111E-02   21   11
32   18   7.73532E-01   1.31160E-01   1.18551E-01   7.64111E-02   21   11
32   19   3.50806E-01  -1.33305E-01   1.69094E-01   7.64111E-02   21   11
32   20  -1.20773E-01  -3.19700E-01   2.11677E-01   7.64111E-02   21   11
32   21  -4.00900E-01   3.95607E-01   2.41140E-01   7.64111E-02   21   11
32   22   4.00900E-01   0.0           0.0           7.64111E-02   21   11
33   11  -3.04780E+00   5.17004E-01   0.0           8.02999E-02   22   12
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33    12    3.04780E+00    9.96149E-01   -3.78538E+00    8.02999E-02    22    12
33    13    3.08884E+00    9.52997E-01   -1.92001E+00    8.02999E-02    22    12
33    14    2.70931E+00    8.00611E-01   -9.76763E-01    8.02999E-02    22    12
33    15    2.26547E+00    6.37296E-01   -4.32286E-01    8.02999E-02    22    12
33    16    1.81432E+00    4.82546E-01   -1.04765E-01    8.02999E-02    22    12
33    17    1.35871E+00    3.36119E-01    8.38612E-02    8.02999E-02    22    12
33    18    9.14070E-01    1.93629E-01    1.80031E-01    8.02999E-02    22    12
33    19    4.98945E-01    4.34323E-02    2.21671E-01    8.02999E-02    22    12
33    20    1.26407E-01   -2.07179E-01    2.41960E-01    8.02999E-02    22    12
33    21   -2.54092E-01   -3.56025E-01    2.83560E-01    8.02999E-02    22    12
33    22   -4.75787E-01    5.32827E-01    3.74411E-01    8.02999E-02    22    12
33    23    4.75787E-01    0.0            0.0            8.02999E-02    22    12
34    11   -2.54386E+00   -7.40465E-02    0.0            8.28000E-02    22    12
34    12    2.54386E+00    4.36885E-01   -3.44793E+00    8.28000E-02    22    12
34    13    2.93175E+00    5.96150E-01   -1.97044E+00    8.28000E-02    22    12
34    14    2.72751E+00    5.77687E-01   -1.03316E+00    8.28000E-02    22    12
34    15    2.34721E+00    4.94810E-01   -4.43459E-01    8.28000E-02    22    12
34    16    1.91144E+00    3.96342E-01   -7.43501E-02    8.28000E-02    22    12
34    17    1.45439E+00    2.99337E-01    1.43039E-01    8.28000E-02    22    12
34    18    1.00293E+00    2.09245E-01    2.54883E-01    8.28000E-02    22    12
34    19    5.81143E-01    1.25906E-01    2.99800E-01    8.28000E-02    22    12
34    20    1.94004E-01    5.73703E-02    3.12270E-01    8.28000E-02    22    12
34    21   -1.58137E-01   -3.99152E-02    3.36452E-01    8.28000E-02    22    12
34    22   -3.79566E-01   -1.37471E-01    3.81972E-01    8.28000E-02    22    12
34    23    3.79566E-01    0.0            0.0            8.28000E-02    22    12
35    11   -2.29959E+00   -3.58892E-02    0.0            8.28000E-02    22    12
35    12    2.29959E+00    2.11768E-01   -2.19399E+00    8.28000E-02    22    12
35    13    2.80376E+00    3.41540E-01   -1.64126E+00    8.28000E-02    22    12
35    14    2.70623E+00    3.63114E-01   -9.70693E-01    8.28000E-02    22    12
35    15    2.38103E+00    3.28824E-01   -4.23229E-01    8.28000E-02    22    12
35    16    1.96385E+00    2.75679E-01   -3.64738E-02    8.28000E-02    22    12
35    17    1.50754E+00    2.21783E-01    2.08099E-01    8.28000E-02    22    12
35    18    1.05063E+00    1.73418E-01    3.42156E-01    8.28000E-02    22    12
35    19    6.24040E-01    1.29926E-01    4.01506E-01    8.28000E-02    22    12
35    20    2.32479E-01    9.09160E-02    4.21569E-01    8.28000E-02    22    12
35    21   -1.01555E-01    3.35471E-02    4.37250E-01    8.28000E-02    22    12
35    22   -3.46478E-01   -6.74279E-07    4.64019E-01    8.28000E-02    22    12
35    23    3.46478E-01    0.0            0.0            8.28000E-02    22    12
36    11   -2.19111E+00   -1.59401E-02    0.0            8.28000E-02    22    12
36    12    2.19111E+00    9.40466E-02   -1.70172E+00    8.28000E-02    22    12
36    13    2.73969E+00    1.59008E-01   -1.40503E+00    8.28000E-02    22    12
36    14    2.69090E+00    1.74549E-01   -8.96495E-01    8.28000E-02    22    12
36    15    2.39483E+00    1.60551E-01   -3.94983E-01    8.28000E-02    22    12
36    16    1.98680E+00    1.37278E-01    2.54586E-04    8.28000E-02    22    12
36    17    1.52850E+00    1.16033E-01    2.69899E-01    8.28000E-02    22    12
36    18    1.06703E+00    9.94005E-02    4.28701E-01    8.28000E-02    22    12
36    19    6.36641E-01    8.66242E-02    5.04274E-01    8.28000E-02    22    12
36    20    2.43150E-01    7.58060E-02    5.27679E-01    8.28000E-02    22    12
36    21   -7.55340E-02    4.94236E-02    5.29374E-01    8.28000E-02    22    12
36    22   -2.97731E-01   -8.94070E-08    5.27644E-01    8.28000E-02    22    12
36    23    2.97731E-01    0.0            0.0            8.28000E-02    22    12
37    11   -2.20792E+00    2.47138E-03    0.0            8.28000E-02    22    12
37    12    2.20792E+00   -1.45684E-02   -1.55414E+00    8.28000E-02    22    12
37    13    2.75542E+00   -3.05205E-02   -1.32187E+00    8.28000E-02    22    12
37    14    2.70454E+00   -4.43429E-02   -8.75845E-01    8.28000E-02    22    12
37    15    2.40534E+00   -5.49927E-02   -3.94594E-01    8.28000E-02    22    12
37    16    1.99315E+00   -6.14236E-02    1.01226E-02    8.28000E-02    22    12
37    17    1.52977E+00   -6.27196E-02    3.02649E-01    8.28000E-02    22    12
37    18    1.06287E+00   -5.85024E-02    4.86270E-01    8.28000E-02    22    12
37    19    6.27287E-01   -4.90199E-02    5.78600E-01    8.28000E-02    22    12
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37     20     2.29508E-01     -3.51908E-02     6.04005E-01     8.28000F-02     22     12
37     21    -9.21903E-02     -1.83043E-02     5.89344E-01     8.28000E-02     22     12
37     22    -3.15784E-01     -2.12342E-07     5.73749E-01     8.28000E-02     22     12
37     23     3.15784E-01      0.0             0.0             8.28000E-02     22     12
38     11     0.0              2.44764E-03     0.0             8.28000E-02     22     12
38     12     0.0             -1.53431E-02     0.0             8.28000E-02     22     12
38     13     0.0             -3.21453E-02     0.0             8.28000E-02     22     12
38     14     0.0             -4.68796E-02     0.0             8.28000E-02     22     12
38     15     0.0             -5.83991E-02     0.0             8.28000E-02     22     12
38     16     0.0             -6.54987E-02     0.0             8.28000E-02     22     12
38     17     0.0             -6.70673E-02     0.0             8.28000E-02     22     12
38     18     0.0             -6.26030E-02     0.0             8.28000E-02     22     12
38     19     0.0             -5.24258E-02     0.0             8.28000E-02     22     12
38     20     0.0             -3.75754E-02     0.0             8.28000E-02     22     12
38     21     0.0             -1.94678E-02     0.0             8.28000E-02     22     12
38     22     0.0              8.72995E-02     0.0             8.28000E-02     22     12
38     23     0.0              0.0             0.0             8.28000E-02     22     12

PRESSURE DROP=        0.450736E-03  PSI
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ITER=    53          TIME= 1.99999E-02          CYCLE=  40     FVOL= 5.60305E-03
I        J            U              V                 P                H                SUR CELL        BOT CELL
1        11        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        12        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        13        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        14        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        15        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        16        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        17        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        18        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        19        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        20        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        21        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        22        1.50000E+00     0.0               0.0               8.28000E-02        22              12
1        23        1.50000E+00     0.0               0.0               8.28000E-02        22              12
2        11       -1.52584E+00     3.76861E-03       0.0               8.28000E-02        22              12
2        12        1.52584E+00    -2.24297E-02       1.38163E+00       8.28000E-02        22              12
2        13        1.53569E+00    -5.86293E-02       1.41678E+00       8.28000E-02        22              12
2        14        1.52830E+00    -8.73398E-02       1.50644E+00       8.28000E-02        22              12
2        15        1.52181E+00    -1.09463E-01       1.63942E+00       8.28000E-02        22              12
2        16        1.51601E+00    -1.25706E-01       1.80594E+00       8.28000E-02        22              12
2        17        1.51023E+00    -1.36094E-01       1.99741E+00       8.28000E-02        22              12
2        18        1.50339E+00    -1.39541E-01       2.20540E+00       8.28000E-02        22              12
2        19        1.49381E+00    -1.33273E-01       2.42002E+00       8.28000E-02        22              12
2        20        1.47923E+00    -1.12227E-01       2.62722E+00       8.28000E-02        22              12
2        21        1.45814E+00    -6.97995E-02       2.80445E+00       8.28000E-02        22              12
2        22        1.43114E+00     2.08616E-05       2.91595E+00       8.28000E-02        22              12
2        23       -1.43114E+00     0.0               0.0               8.28000E-02        22              12
3        11       -1.58820E+00     9.14556E-03       0.0               8.28000E-02        22              12
3        12        1.58820E+00    -5.40786E-02       1.30615E+00       8.28000E-02        22              12
3        13        1.60742E+00    -1.26801E-01       1.35325E+00       8.28000E-02        22              12
3        14        1.58421E+00    -1.83485E-01       1.45609E+00       8.28000E-02        22              12
3        15        1.56446E+00    -2.26733E-01       1.60051E+00       8.28000E-02        22              12
3        16        1.54743E+00    -2.58590E-01       1.77701E+00       8.28000E-02        22              12
3        17        1.53094E+00    -2.79480E-01       1.97811E+00       8.28000E-02        22              12
3        18        1.51142E+00    -2.87628E-01       2.19713E+00       8.28000E-02        22              12
3        19        1.48439E+00    -2.78085E-01       2.42692E+00       8.28000E-02        22              12
3        20        1.44197E+00    -2.40308E-01       2.65777E+00       8.28000E-02        22              12
3        21        1.37381E+00    -1.54802E-01       2.87148E+00       8.28000E-02        22              12
3        22        1.27844E+00     9.00030E-06       3.02113E+00       8.28000E-02        22              12
3        23       -1.27844E+00     0.0               0.0               8.28000E-02        22              12
4        11       -1.70333E+00     1.69007E-02       0.0               8.28000E-02        22              12
4        12        1.70333E+00    -9.98331E-02       1.15012E+00       8.28000E-02        22              12
4        13        1.72044E+00    -2.14428E-01       1.22619E+00       8.28000E-02        22              12
4        14        1.66508E+00    -2.96416E-01       1.35798E+00       8.28000E-02        22              12
4        15        1.62528E+00    -3.58071E-01       1.52518E+00       8.28000E-02        22              12
4        16        1.59255E+00    -4.03818E-01       1.72007E+00       8.28000E-02        22              12
4        17        1.56131E+00    -4.34716E-01       1.93770E+00       8.28000E-02        22              12
4        18        1.52584E+00    -4.49329E-01       2.17398E+00       8.28000E-02        22              12
4        19        1.47869E+00    -4.43540E-01       2.42553E+00       8.28000E-02        22              12
4        20        1.40670E+00    -4.07785E-01       2.69042E+00       8.28000E-02        22              12
4        21        1.27703E+00    -3.09660E-01       2.96996E+00       8.28000E-02        22              12
4        22        9.73016E-01     5.36442E-06       3.23531E+00       8.28000E-02        22              12
4        23       -9.73016E-01     0.0               0.0               8.28000E-02        22              12
5        11       -1.94770E+00     3.58886E-02       0.0               8.28000E-02        22              12
5        12        1.94770E+00    -2.11867E-01       8.36985E-01       8.28000E-02        22              12
5        13        1.84495E+00    -3.38107E-01       1.02061E+00       8.28000E-02        22              12
5        14        1.75983E+00    -4.34181E-01       1.20778E+00       8.28000E-02        22              12
5        15        1.69899E+00    -5.08924E-01       1.41045E+00       8.28000E-02        22              12
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5   16    1.64904E+00   -5.66209E-01    1.63135E+00    8.28000E-02    22    12
5   17    1.60212E+00   -6.07593E-01    1.87012E+00    8.28000E-02    22    12
5   18    1.55080E+00   -6.32917E-01    2.12576E+00    8.28000E-02    22    12
5   19    1.48610E+00   -6.40439E-01    2.39423E+00    8.28000E-02    22    12
5   20    1.39100E+00   -6.24522E-01    2.67391E+00    8.28000E-02    22    12
5   21    1.20700E+00   -5.53531E-01    2.97109E+00    8.28000E-02    22    12
5   22    6.90801E-01   -2.67400E-01    3.31964E+00    8.28000E-02    22    12
5   23   -6.90801E-01    0.0            0.0            8.28000E-02    22    12
6   11   -1.99009E+00   -3.45374E-01    0.0            8.02999E-02    22    12
6   12    1.99009E+00   -3.88352E-01    4.93505E-01    8.02999E-02    22    12
6   13    1.95294E+00   -4.97824E-01    7.67314E-01    8.02999E-02    22    12
6   14    1.85954E+00   -5.98911E-01    1.01161E+00    8.02999E-02    22    12
6   15    1.77979E+00   -6.80819E-01    1.25588E+00    8.02999E-02    22    12
6   16    1.71115E+00   -7.43776E-01    1.50781E+00    8.02999E-02    22    12
6   17    1.64339E+00   -7.85605E-01    1.77063E+00    8.02999E-02    22    12
6   18    1.56302E+00   -7.97980E-01    2.04540E+00    8.02999E-02    22    12
6   19    1.45293E+00   -7.64350E-01    2.32868E+00    8.02999E-02    22    12
6   20    1.29767E+00   -6.69723E-01    2.60048E+00    8.02999E-02    22    12
6   21    1.12305E+00   -5.84604E-01    2.79381E+00    8.02999E-02    22    12
6   22    1.12305E+00   -1.02285E+00    2.66986E+00    8.02999E-02    22    12
6   23   -1.12305E+00    0.0            0.0            8.02999E-02    22    12
7   10   -3.41045E-01    2.43297E+00    0.0            7.64111E-02    21    11
7   11    3.41045E-01    6.94889E-02   -2.33334E+00    7.64111E-02    21    11
7   12    2.53804E+00   -4.86083E-01    2.92177E-01    7.64111E-02    21    11
7   13    2.13914E+00   -6.74885E-01    4.88395E-01    7.64111E-02    21    11
7   14    1.97163E+00   -7.88537E-01    7.72065E-01    7.64111E-02    21    11
7   15    1.86226E+00   -8.72161E-01    1.06119E+00    7.64111E-02    21    11
7   16    1.77310E+00   -9.34979E-01    1.34724E+00    7.64111E-02    21    11
7   17    1.68537E+00   -9.77547E-01    1.63521E+00    7.64111E-02    21    11
7   18    1.58930E+00   -1.00420E+00    1.92917E+00    7.64111E-02    21    11
7   19    1.48860E+00   -1.04036E+00    2.22969E+00    7.64111E-02    21    11
7   20    1.41203E+00   -1.15631E+00    2.52954E+00    7.64111E-02    21    11
7   21    1.41203E+00   -1.44930E+00    2.79971E+00    7.64111E-02    21    11
7   22   -1.41203E+00    0.0            0.0            7.64111E-02    21    11
8    9   -1.07343E-01    4.83419E-01    0.0            7.25222E-02    20    10
8   10    1.07343E-01    2.88091E-02   -1.95420E+00    7.25222E-02    20    10
8   11    1.24129E+00   -8.84623E-01   -2.10275E+00    7.25222E-02    20    10
8   12    2.53714E+00   -8.83694E-01   -8.69040E-01    7.25222E-02    20    10
8   13    2.18901E+00   -9.34252E-01   -3.77455E-03    7.25222E-02    20    10
8   14    2.04657E+00   -1.01023E+00    4.65317E-01    7.25222E-02    20    10
8   15    1.93360E+00   -1.08256E+00    8.25780E-01    7.25222E-02    20    10
8   16    1.83683E+00   -1.14719E+00    1.14849E+00    7.25222E-02    20    10
8   17    1.74798E+00   -1.21067E+00    1.45749E+00    7.25222E-02    20    10
8   18    1.67211E+00   -1.29463E+00    1.76064E+00    7.25222E-02    20    10
8   19    1.62571E+00   -1.43365E+00    2.05629E+00    7.25222E-02    20    10
8   20    1.62571E+00   -1.65030E+00    2.33490E+00    7.25222E-02    20    10
8   21   -1.62571E+00    0.0            0.0            7.25222E-02    20    10
9    8   -4.57328E-02    1.58065E-01    0.0            6.86333E-02    19     9
9    9    4.57328E-02    2.86513E-03   -1.47841E+00    6.86333E-02    19     9
9   10    8.73002E-01   -7.73426E-01   -1.68303E+00    6.86333E-02    19     9
9   11    1.70744E+00   -1.24535E+00   -1.59220E+00    6.86333E-02    19     9
9   12    2.46606E+00   -1.17329E+00   -9.41626E-01    6.86333E-02    19     9
9   13    2.19971E+00   -1.18414E+00   -2.77323E-01    6.86333E-02    19     9
9   14    2.10297E+00   -1.24132E+00    1.91104E-01    6.86333E-02    19     9
9   15    2.00338E+00   -1.31206E+00    5.74154E-01    6.86333E-02    19     9
9   16    1.91740E+00   -1.39373E+00    9.16030E-01    6.86333E-02    19     9
9   17    1.85078E+00   -1.49795E+00    1.23500E+00    6.86333E-02    19     9
9   18    1.81437E+00   -1.64218E+00    1.53570E+00    6.86333E-02    19     9
9   19    1.81437E+00   -1.83346E+00    1.81561E+00    6.86333E-02    19     9
9   20   -1.81437E+00    0.0            0.0            6.86333E-02    19     9
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10      7    -1.10468E-02    6.53234E-02    0.0            6.47444E-02    18    8
10      8     1.10468E-02    7.75591E-03   -1.11617E+00    6.47444E-02    18    8
10      9     7.03528E-01   -6.59163E-01   -1.28025E+00    6.47444E-02    18    8
10     10     1.35075E+00   -1.14354E+00   -1.37009E+00    6.47444E-02    18    8
10     11     1.98944E+00   -1.42946E+00   -1.28459E+00    6.47444E-02    18    8
10     12     2.41640E+00   -1.37912E+00   -9.09654E-01    6.47444E-02    18    8
10     13     2.22925E+00   -1.40907E+00   -4.61733E-01    6.47444E-02    18    8
10     14     2.17013E+00   -1.47717E+00   -6.22998E-02    6.47444E-02    18    8
10     15     2.09184E+00   -1.56687E+00    3.06199E-01    6.47444E-02    18    8
10     16     2.02979E+00   -1.68083E+00    6.49700E-01    6.47444E-02    18    8
10     17     1.99563E+00   -1.82769E+00    9.69551E-01    6.47444E-02    18    8
10     18     1.99563E+00   -2.01145E+00    1.26338E+00    6.47444E-02    18    8
10     19    -1.99563E+00    0.0            0.0            6.47444E-02    18    8
11      6     6.42803E-02   -8.08661E-03    0.0            6.08555E-02    17    7
11      7    -6.42803E-02    4.58855E-02   -8.53063E-01    6.08555E-02    17    7
11      8     5.83964E-01   -5.34983E-01   -9.70521E-01    6.08555E-02    17    7
11      9     1.14562E+00   -9.83219E-01   -1.07684E+00    6.08555E-02    17    7
11     10     1.70707E+00   -1.34448E+00   -1.15781E+00    6.08555E-02    17    7
11     11     2.18358E+00   -1.54130E+00   -1.13921E+00    6.08555E-02    17    7
11     12     2.42136E+00   -1.54637E+00   -9.45019E-01    6.08555E-02    17    7
11     13     2.30660E+00   -1.62475E+00   -6.58700E-01    6.08555E-02    17    7
11     14     2.27308E+00   -1.72913E+00   -3.37599E-01    6.08555E-02    17    7
11     15     2.21573E+00   -1.85474E+00    4.23747E-03    6.08555E-02    17    7
11     16     2.17954E+00   -2.00658E+00    3.44850E-01    6.08555E-02    17    7
11     17     2.17954E+00   -2.19305E+00    6.65276E-01    6.08555E-02    17    7
11     18    -2.17954E+00    0.0            0.0            6.08555E-02    17    7
12      5     2.25256E-01   -1.72312E-01    0.0            5.69667E-02    16    6
12      6    -2.25256E-01    1.21242E-01   -6.55870E-01    5.69667E-02    16    6
12      7     4.61844E-01   -4.12186E-01   -7.35561E-01    5.69667E-02    16    6
12      8     9.73770E-01   -8.07625E-01   -8.23010E-01    5.69667E-02    16    6
12      9     1.50265E+00   -1.16961E+00   -9.30687E-01    5.69667E-02    16    6
12     10     1.98967E+00   -1.45614E+00   -1.05001E+00    5.69667E-02    16    6
12     11     2.35258E+00   -1.62750E+00   -1.12664E+00    5.69667E-02    16    6
12     12     2.50120E+00   -1.70845E+00   -1.08577E+00    5.69667E-02    16    6
12     13     2.44871E+00   -1.85253E+00   -9.34483E-01    5.69667E-02    16    6
12     14     2.42972E+00   -2.01133E+00   -6.86374E-01    5.69667E-02    16    6
12     15     2.39118E+00   -2.18922E+00   -3.60890E-01    5.69667E-02    16    6
12     16     2.39118E+00   -2.40379E+00   -6.92004E-03    5.69667E-02    16    6
12     17    -2.39118E+00    0.0            0.0            5.69667E-02    16    6
13      4     4.89141E-01   -5.01706E-01    0.0            5.30778E-02    15    5
13      5    -4.89141E-01    2.22603E-01   -4.79060E-01    5.30778E-02    15    5
13      6     3.12656E-01   -3.22777E-01   -5.47809E-01    5.30778E-02    15    5
13      7     7.75682E-01   -6.40970E-01   -6.12920E-01    5.30778E-02    15    5
13      8     1.29307E+00   -9.64475E-01   -6.97214E-01    5.30778E-02    15    5
13      9     1.79615E+00   -1.26204E+00   -8.37487E-01    5.30778E-02    15    5
13     10     2.23121E+00   -1.50693E+00   -1.03164E+00    5.30778E-02    15    5
13     11     2.53512E+00   -1.69200E+00   -1.23309E+00    5.30778E-02    15    5
13     12     2.67228E+00   -1.86545E+00   -1.36150E+00    5.30778E-02    15    5
13     13     2.69504E+00   -2.11521E+00   -1.36196E+00    5.30778E-02    15    5
13     14     2.71198E+00   -2.40139E+00   -1.18550E+00    5.30778E-02    15    5
13     15     2.71198E+00   -2.72663E+00   -8.40081E-01    5.30778E-02    15    5
13     16    -2.71198E+00    0.0            0.0            5.30778E-02    15    5
14      3     7.31743E-01   -9.78514E-01    0.0            4.91889E-02    14    4
14      4    -7.31743E-01    2.59309E-01   -2.37922E-01    4.91889E-02    14    4
14      5     4.30151E-02   -2.80227E-01   -3.31977E-01    4.91889E-02    14    4
14      6     5.25886E-01   -4.96420E-01   -4.05239E-01    4.91889E-02    14    4
14      7     1.03483E+00   -7.59165E-01   -4.68413E-01    4.91889E-02    14    4
14      8     1.55489E+00   -1.02462E+00   -5.81706E-01    4.91889E-02    14    4
14      9     2.04695E+00   -1.27890E+00   -7.82173E-01    4.91889E-02    14    4
14     10     2.47355E+00   -1.52461E+00   -1.08212E+00    4.91889E-02    14    4
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  14     11      2.80951E+00    -1.80281E+00    -1.45305E+00     4.91889E-02      14       4
  14     12      3.05869E+00    -2.19457E+00    -1.82922E+00     4.91889E-02      14       4
  14     13      3.21426E+00    -2.72099E+00    -2.08915E+00     4.91889E-02      14       4
  14     14      3.21426E+00    -3.23024E+00    -2.01976E+00     4.91889E-02      14       4
  14     15     -3.21426E+00     0.0             0.0             4.91889E-02      14       4
  15      2      9.63010E-01    -1.43458E+00     0.0             4.53000E-02      13       3
  15      3     -9.63010E-01     2.83690E-01     5.28888E-02     4.53000E-02      13       3
  15      4     -2.48505E-01    -2.06260E-01    -8.15780E-02     4.53000E-02      13       3
  15      5      2.28946E-01    -3.94763E-01    -1.56956E-01     4.53000E-02      13       3
  15      6      7.24122E-01    -5.95753E-01    -2.23014E-01     4.53000E-02      13       3
  15      7      1.25263E+00    -8.16575E-01    -3.07094E-01     4.53000E-02      13       3
  15      8      1.78617E+00    -1.05107E+00    -4.61886E-01     4.53000E-02      13       3
  15      9      2.30144E+00    -1.30909E+00    -7.34928E-01     4.53000E-02      13       3
  15     10      2.78517E+00    -1.62504E+00    -1.16403E+00     4.53000E-02      13       3
  15     11      3.23307E+00    -2.05447E+00    -1.78729E+00     4.53000E-02      13       3
  15     12      3.60375E+00    -2.60711E+00    -2.65943E+00     4.53000E-02      13       3
  15     13      3.60375E+00    -3.00200E+00    -3.53984E+00     4.53000E-02      13       3
  15     14     -3.60375E+00     0.0             0.0             4.53000E-02      13       3
  16      1      1.05455E+00    -1.82934E+00     0.0             4.28000E-02      12       2
  16      2     -1.05455E+00     2.16206E-01     2.02631E-01     4.28000E-02      12       2
  16      3     -5.40845E-01    -2.11809E-01     1.83090E-01     4.28000E-02      12       2
  16      4     -1.36463E-01    -3.25409E-01     1.03364E-01     4.28000E-02      12       2
  16      5      3.69142E-01    -4.67565E-01     4.30939E-02     4.28000E-02      12       2
  16      6      8.87182E-01    -6.32876E-01    -2.19758E-02     4.28000E-02      12       2
  16      7      1.42810E+00    -8.10773E-01    -1.29183E-01     4.28000E-02      12       2
  16      8      1.97163E+00    -9.98811E-01    -3.30537E-01     4.28000E-02      12       2
  16      9      2.49597E+00    -1.19594E+00    -6.88700E-01     4.28000E-02      12       2
  16     10      2.97363E+00    -1.38701E+00    -1.28853E+00     4.28000E-02      12       2
  16     11      3.32685E+00    -1.48211E+00    -2.27567E+00     4.28000E-02      12       2
  16     12      3.14532E+00    -1.01731E+00    -3.88205E+00     4.28000E-02      12       2
  16     13     -3.14532E+00     0.0             0.0             4.28000E-02      12       2
  17      1      5.46695E-01     3.71682E-01     0.0             4.28000E-02      12       2
  17      2     -5.46695E-01    -1.43217E-01     3.58323E-01     4.28000E-02      12       2
  17      3     -4.56290E-01    -2.28944E-01     3.78650E-01     4.28000E-02      12       2
  17      4     -2.90853E-03    -3.64346E-01     3.23295E-01     4.28000E-02      12       2
  17      5      4.87065E-01    -4.83907E-01     2.65102E-01     4.28000E-02      12       2
  17      6      1.01178E+00    -6.10245E-01     1.90687E-01     4.28000E-02      12       2
  17      7      1.55392E+00    -7.37820E-01     5.76670E-02     4.28000E-02      12       2
  17      8      2.08936E+00    -8.57174E-01    -1.89236E-01     4.28000E-02      12       2
  17      9      2.58268E+00    -9.45186E-01    -6.19224E-01     4.28000E-02      12       2
  17     10      2.96587E+00    -9.37319E-01    -1.33149E+00     4.28000E-02      12       2
  17     11      3.06852E+00    -6.75406E-01    -2.52531E+00     4.28000E-02      12       2
  17     12      2.36623E+00     1.14490E-01    -4.68331E+00     4.28000E-02      12       2
  17     13     -2.36623E+00     0.0             0.0             4.28000E-02      12       2
  18      1      5.05052E-01    -3.16836E-05     0.0             4.28000E-02      12       2
  18      2     -5.05052E-01    -4.22523E-02     6.52230E-01     4.28000E-02      12       2
  18      3     -2.64019E-01    -2.37195E-01     5.87656E-01     4.28000E-02      12       2
  18      4      1.17089E-01    -3.58857E-01     5.34951E-01     4.28000E-02      12       2
  18      5      5.81014E-01    -4.54103E-01     4.80971E-01     4.28000E-02      12       2
  18      6      1.09740E+00    -5.40914E-01     3.98103E-01     4.28000E-02      12       2
  18      7      1.63030E+00    -6.18354E-01     2.42839E-01     4.28000E-02      12       2
  18      8      2.14593E+00    -6.75719E-01    -3.78761E-02     4.28000E-02      12       2
  18      9      2.59590E+00    -6.89128E-01    -4.97977E-01     4.28000E-02      12       2
  18     10      2.88802E+00    -6.10198E-01    -1.17364E+00     4.28000E-02      12       2
  18     11      2.82731E+00    -3.65632E-01    -2.02340E+00     4.28000E-02      12       2
  18     12      1.94447E+00     6.19857E-02    -2.73594E+00     4.28000E-02      12       2
  18     13     -1.94447E+00     0.0             0.0             4.28000E-02      12       2
  19      1      3.71234E-01    -2.99811E-05     0.0             4.28000E-02      12       2
  19      2     -3.71234E-01    -1.35705E-01     7.81074E-01     4.28000E-02      12       2
  19      3     -1.50821E-01    -2.50479E-01     7.51263E-01     4.28000E-02      12       2
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19     4     1.97927E-01   -3.32440E-01    7.18331E-01   4.28000E-02    12    2
19     5     6.41585E-01   -3.93852E-01    6.74038E-01   4.28000E-02    12    2
19     6     1.14338E+00   -4.40465E-01    5.88549E-01   4.28000E-02    12    2
19     7     1.66225E+00   -4.72856E-01    4.18681E-01   4.28000E-02    12    2
19     8     2.15626E+00   -4.83336E-01    1.18378E-01   4.28000E-02    12    2
19     9     2.57061E+00   -4.57690E-01   -3.45537E-01   4.28000E-02    12    2
19    10     2.80459E+00   -3.73105E-01   -9.57161E-01   4.28000E-02    12    2
19    11     2.66188E+00   -2.05383E-01   -1.58297E+00   4.28000E-02    12    2
19    12     1.70755E+00    3.48258E-02   -1.92925E+00   4.28000E-02    12    2
19    13    -1.70755E+00    0.0            0.0           4.28000E-02    12    2
20     1     2.36839E-01   -3.39150E-05    0.0           4.28000E-02    12    2
20     2    -2.36839E-01   -1.36294E-01    9.09938E-01   4.28000E-02    12    2
20     3    -5.45666E-02   -2.33879E-01    8.95017E-01   4.28000E-02    12    2
20     4     2.50603E-01   -2.87288E-01    8.77825E-01   4.28000E-02    12    2
20     5     6.67299E-01   -3.13360E-01    8.43091E-01   4.28000E-02    12    2
20     6     1.15074E+00   -3.20831E-01    7.58082E-01   4.28000E-02    12    2
20     7     1.65545E+00   -3.13937E-01    5.80383E-01   4.28000E-02    12    2
20     8     2.13167E+00   -2.89005E-01    2.71098E-01   4.28000E-02    12    2
20     9     2.52473E+00   -2.42493E-01   -1.89167E-01   4.28000E-02    12    2
20    10     2.73631E+00   -1.73267E-01   -7.62961E-01   4.28000E-02    12    2
20    11     2.57724E+00   -8.74511E-02   -1.30617E+00   4.28000E-02    12    2
20    12     1.60666E+00    1.48351E-02   -1.56712E+00   4.28000E-02    12    2
20    13    -1.60666E+00    0.0            0.0           4.28000E-02    12    2
21     1     1.19100E-01   -3.27826E-05    0.0           4.28000E-02    12    2
21     2    -1.19100E-01   -1.19405E-01    1.01285E+00   4.28000E-02    12    2
21     3     2.37864E-02   -1.98844E-01    1.01381E+00   4.28000E-02    12    2
21     4     2.78224E-01   -2.26848E-01    1.01342E+00   4.28000E-02    12    2
21     5     6.60144E-01   -2.19595E-01    9.88303E-01   4.28000E-02    12    2
21     6     1.12171E+00   -1.90154E-01    9.05282E-01   4.28000E-02    12    2
21     7     1.61464E+00   -1.48780E-01    7.24099E-01   4.28000E-02    12    2
21     8     2.07765E+00   -9.40036E-02    4.13269E-01   4.28000E-02    12    2
21     9     2.46505E+00   -3.34917E-02   -4.21130E-02   4.28000E-02    12    2
21    10     2.67728E+00    2.63603E-02   -6.01268E-01   4.28000E-02    12    2
21    11     2.55746E+00    4.64152E-02   -1.15012E+00   4.28000E-02    12    2
21    12     1.66019E+00   -7.85344E-03   -1.46252E+00   4.28000E-02    12    2
21    13    -1.66019E+00    0.0            0.0           4.28000E-02    12    2
22     1     4.60020E-02   -3.83534E-02    0.0           4.28000E-02    12    2
22     2    -4.60020E-02   -1.12466E-01    1.08185E+00   4.28000E-02    12    2
22     3     4.72628E-02   -1.36271E-01    1.11010E+00   4.28000E-02    12    2
22     4     2.89814E-01   -1.48019E-01    1.12617E+00   4.28000E-02    12    2
22     5     6.26858E-01   -1.14281E-01    1.10940E+00   4.28000E-02    12    2
22     6     1.06078E+00   -5.25109E-02    1.02738E+00   4.28000E-02    12    2
22     7     1.54614E+00    1.69352E-02    8.43973E-01   4.28000E-02    12    2
22     8     1.99869E+00    9.69782E-02    5.40348E-01   4.28000E-02    12    2
22     9     2.38159E+00    1.81600E-01    1.01369E-01   4.28000E-02    12    2
22    10     2.60469E+00    2.55195E-01   -4.66199E-01   4.28000E-02    12    2
22    11     2.54421E+00    2.68624E-01   -1.08951E+00   4.28000E-02    12    2
22    12     1.97003E+00   -4.55166E-02   -1.59947E+00   4.28000E-02    12    2
22    13    -1.97003E+00    0.0            0.0           4.28000E-02    12    2
23     1    -1.75907E-01    2.68685E-01    0.0           4.28000E-02    12    2
23     2     1.75907E-01    4.36969E-02    1.12851E+00   4.28000E-02    12    2
23     3     1.75907E-01   -8.67331E-02    1.19129E+00   4.28000E-02    12    2
23     4     2.61190E-01   -5.77148E-02    1.21875E+00   4.28000E-02    12    2
23     5     5.68486E-01    1.48088E-03    1.20555E+00   4.28000E-02    12    2
23     6     9.81329E-01    8.20365E-02    1.12597E+00   4.28000E-02    12    2
23     7     1.44879E+00    1.80744E-01    9.56308E-01   4.28000E-02    12    2
23     8     1.89422E+00    2.86675E-01    6.61669E-01   4.28000E-02    12    2
23     9     2.27308E+00    3.96687E-01    2.30083E-01   4.28000E-02    12    2
23    10     2.50185E+00    5.00947E-01   -3.33400E-01   4.28000E-02    12    2
23    11     2.45510E+00    5.91291E-01   -9.93335E-01   4.28000E-02    12    2
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23   12    1.92920E+00    6.32680E-01   -1.71268E+00    4.28000E-02     12     2
23   13   -1.92920E+00    0.0            0.0            4.28000E-02     12     2
24    2   -4.24430E-01    5.27487E-01    0.0            4.53000E-02     13     3
24    3    4.24430E-01    2.75515E-01    1.22772E+00    4.53000E-02     13     3
24    4    4.24430E-01    1.10008E-01    1.28438E+00    4.53000E-02     13     3
24    5    5.49659E-01    1.29094E-01    1.28315E+00    4.53000E-02     13     3
24    6    8.89233E-01    2.22471E-01    1.20844E+00    4.53000E-02     13     3
24    7    1.33142E+00    3.41465E-01    1.03949E+00    4.53000E-02     13     3
24    8    1.76977E+00    4.67638E-01    7.52838E-01    4.53000E-02     13     3
24    9    2.14853E+00    5.93917E-01    3.40746E-01    4.53000E-02     13     3
24   10    2.39451E+00    7.02744E-01   -1.79582E-01    4.53000E-02     13     3
24   11    2.40810E+00    7.50392E-01   -7.31118E-01    4.53000E-02     13     3
24   12    2.15525E+00    5.21211E-01   -1.10100E+00    4.53000E-02     13     3
24   13    3.93555E-01   -1.83378E+00   -2.35490E+00    4.53000E-02     13     3
24   14   -3.93555E-01    0.0            0.0            4.53000E-02     13     3
25    3   -7.19405E-01    8.37632E-01    0.0            4.91889E-02     14     4
25    4    7.19405E-01    5.38564E-01    1.28517E+00    4.91889E-02     14     4
25    5    7.19405E-01    3.66460E-01    1.30744E+00    4.91889E-02     14     4
25    6    8.71138E-01    3.84804E-01    1.24265E+00    4.91889E-02     14     4
25    7    1.21782E+00    4.99983E-01    1.07727E+00    4.91889E-02     14     4
25    8    1.63399E+00    6.37643E-01    7.99633E-01    4.91889E-02     14     4
25    9    2.01295E+00    7.75103E-01    4.09367E-01    4.91889E-02     14     4
25   10    2.27652E+00    8.94737E-01   -7.46188E-02    4.91889E-02     14     4
25   11    2.33184E+00    9.72053E-01   -6.03912E-01    4.91889E-02     14     4
25   12    2.16737E+00    9.59763E-01   -1.13277E+00    4.91889E-02     14     4
25   13    1.07382E+00    2.70055E-01   -1.55951E+00    4.91889E-02     14     4
25   14    2.82177E-01   -4.15054E-01   -1.24562E+00    4.91889E-02     14     4
25   15   -2.82177E-01    0.0            0.0            4.91889E-02     14     4
26    4   -1.03942E+00    1.16325E+00    0.0            5.30778E-02     15     5
26    5    1.03942E+00    8.38789E-01    1.24660E+00    5.30778E-02     15     5
26    6    1.03942E+00    6.68166E-01    1.20220E+00    5.30778E-02     15     5
26    7    1.19991E+00    6.86325E-01    1.04956E+00    5.30778E-02     15     5
26    8    1.52106E+00    8.00823E-01    7.85711E-01    5.30778E-02     15     5
26    9    1.88009E+00    9.35612E-01    4.21473E-01    5.30778E-02     15     5
26   10    2.15381E+00    1.05394E+00   -1.41808E-02    5.30778E-02     15     5
26   11    2.25776E+00    1.12905E+00   -4.65321E-01    5.30778E-02     15     5
26   12    2.16963E+00    1.12676E+00   -8.56214E-01    5.30778E-02     15     5
26   13    1.47653E+00    7.18470E-01   -1.03661E+00    5.30778E-02     15     5
26   14    7.89789E-01    2.03816E-01   -9.54316E-01    5.30778E-02     15     5
26   15    2.19786E-01   -3.05112E-01   -7.50187E-01    5.30778E-02     15     5
26   16   -2.19786E-01    0.0            0.0            5.30778E-02     15     5
27    5   -1.36078E+00    1.48066E+00    0.0            5.69667E-02     16     6
27    6    1.36079E+00    1.15484E+00    1.06755E+00    5.69667E-02     16     6
27    7    1.36078E+00    9.91739E-01    9.36442E-01    5.69667E-02     16     6
27    8    1.51505E+00    9.97840E-01    6.93494E-01    5.69667E-02     16     6
27    9    1.79119E+00    1.08788E+00    3.57132E-01    5.69667E-02     16     6
27   10    2.06509E+00    1.18391E+00   -2.94140E-02    5.69667E-02     16     6
27   11    2.20327E+00    1.23916E+00   -3.98790E-01    5.69667E-02     16     6
27   12    2.18363E+00    1.22497E+00   -6.73135E-01    5.69667E-02     16     6
27   13    1.74401E+00    9.53780E-01   -7.67606E-01    5.69667E-02     16     6
27   14    1.18356E+00    5.54544E-01   -7.04950E-01    5.69667E-02     16     6
27   15    6.51049E-01    1.17298E-01   -5.74795E-01    5.69667E-02     16     6
27   16    1.33436E-01   -2.40825E-01   -4.36079E-01    5.69667E-02     16     6
27   17   -1.33436E-01    0.0            0.0            5.69667E-02     16     6
28    6   -1.67310E+00    1.78527E+00    0.0            6.08555E-02     17     7
28    7    1.67310E+00    1.46862E+00    7.32146E-01    6.08555E-02     17     7
28    8    1.67310E+00    1.30837E+00    5.08406E-01    6.08555E-02     17     7
28    9    1.81582E+00    1.28340E+00    1.95484E-01    6.08555E-02     17     7
28   10    2.03608E+00    1.31282E+00   -1.50089E-01    6.08555E-02     17     7
28   11    2.19151E+00    1.32474E+00   -4.47902E-01    6.08555E-02     17     7
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28   12    2.22177E+00   1.28607E+00  -6.25814E-01   6.08555E-02   17    7
28   13    1.94602E+00   1.08125E+00  -6.46152E-01   6.08555E-02   17    7
28   14    1.49933E+00   7.61101E-01  -5.52637E-01   6.08555E-02   17    7
28   15    1.00837E+00   3.98822E-01  -4.27195E-01   6.08555E-02   17    7
28   16    5.26836E-01  -3.51577E-05  -3.13187E-01   6.08555E-02   17    7
28   17    8.41174E-03  -1.43851E-01  -2.15628E-01   6.08555E-02   17    7
28   18   -8.41174E-03   0.0           0.0          6.08555E-02   17    7
29    7   -2.01629E+00   2.13479E+00   0.0          6.47444E-02   18    8
29    8    2.01629E+00   1.78683E+00   2.22712E-01   6.47444E-02   18    8
29    9    2.01629E+00   1.58358E+00  -9.24973E-02   6.47444E-02   18    8
29   10    2.13214E+00   1.48619E+00  -4.12275E-01   6.47444E-02   18    8
29   11    2.25960E+00   1.41716E+00  -6.43359E-01   6.47444E-02   18    8
29   12    2.30651E+00   1.33124E+00  -7.21910E-01   6.47444E-02   18    8
29   13    2.12695E+00   1.14781E+00  -6.48974E-01   6.47444E-02   18    8
29   14    1.76525E+00   8.78209E-01  -4.91475E-01   6.47444E-02   18    8
29   15    1.31648E+00   5.65823E-01  -3.32071E-01   6.47444E-02   18    8
29   16    8.47432E-01   2.40779E-01  -2.07883E-01   6.47444E-02   18    8
29   17    3.73932E-01  -1.29863E-01  -1.18262E-01   6.47444E-02   18    8
29   18   -1.39497E-01   3.04168E-03  -5.21137E-02   6.47444E-02   18    8
29   19    1.39497F-01   0.0           0.0          6.47444E-02   18    8
30    8   -2.52752E+00   2.69695E+00   0.0          6.86333E-02   19    9
30    9    2.52752E+00   2.17863E+00  -5.84589E-01   6.86333E-02   19    9
30   10    2.52752E+00   1.77777E+00  -9.06471E-01   6.86333E-02   19    9
30   11    2.52292E+00   1.51079E+00  -1.04419E+00   6.86333E-02   19    9
30   12    2.48196E+00   1.33290E+00  -9.78274E-01   6.86333E-02   19    9
30   13    2.31285E+00   1.14442E+00  -7.69957E-01   6.86333E-02   19    9
30   14    1.99553E+00   9.10944E-01  -5.14567E-01   6.86333E-02   19    9
30   15    1.57946E+00   6.44316E-01  -2.93566E-01   6.86333E-02   19    9
30   16    1.12418E+00   3.63726E-01  -1.37530E-01   6.86333E-02   19    9
30   17    6.64354F-01   6.93261F-02  -3.80900E-02   6.86333E-02   19    9
30   18    1.42832E-01  -2.16920E-01   2.17823E-02   6.86333E-02   19    9
30   19   -2.51031E-01   1.79028E-01   5.64961E-02   6.86333E-02   19    9
30   20    2.51031F-01   0.0           0.0          6.86333E-02   19    9
31    9   -3.22643E+00   3.44837E+00   0.0          7.25222E-02   20   10
31   10    3.22643E+00   2.73976E+00  -1.96529E+00   7.25222E-02   20   10
31   11    3.22643E+00   2.02648E+00  -1.84738E+00   7.25222E-02   20   10
31   12    2.99308E+00   1.50827E+00  -1.44730E+00   7.25222E-02   20   10
31   13    2.64797E+00   1.16849E+00  -9.95255E-01   7.25222E-02   20   10
31   14    2.25413E+00   9.06311E-01  -6.01571E-01   7.25222E-02   20   10
31   15    1.81930E+00   6.63143E-01  -3.02380E-01   7.25222E-02   20   10
31   16    1.36242E+00   4.21600F-01  -1.04404E-01   7.25222E-02   20   10
31   17    9.05922E-01   1.76679E-01   1.28574E-02   7.25222E-02   20   10
31   18    4.41772E-01  -1.26408E-01   8.13659E-02   7.25222E-02   20   10
31   19   -1.05915E-01  -2.71538E-01   1.21157E-01   7.25222E-02   20   10
31   20   -3.32621E-01   3.18212E-01   1.35741E-01   7.25222E-02   20   10
31   21    3.32621E-01   0.0           0.0          7.25222E-02   20   10
32   10   -3.56704E+00   2.57866E+00   0.0          7.64111E-02   21   11
32   11    3.56704E+00   2.23332E+00  -3.66030E+00   7.64111E-02   21   11
32   12    3.56704F+00   1.65141E+00  -2.41998E+00   7.64111E-02   21   11
32   13    3.08051E+00   1.21287E+00  -1.36504E+00   7.64111E-02   21   11
32   14    2.56127E+00   9.01457E-01  -7.30516E-01   7.64111E-02   21   11
32   15    2.05903E+00   6.58400E-01  -3.34511E-01   7.64111F-02   21   11
32   16    1.57386E+00   4.44025E-01  -9.26831E-02   7.64111E-02   21   11
32   17    1.10701E+00   2.40144E-01   4.29413E-02   7.64111E-02   21   11
32   18    6.62091E-01   1.67677E-02   1.11743E-01   7.64111E-02   21   11
32   19    1.83913E-01  -2.77079E-01   1.39561E-01   7.64111E-02   21   11
32   20   -2.63276E-01  -3.47385E-01   1.76296E-01   7.64111E-02   21   11
32   21   -4.35832E-01   4.31731E-01   2.16637E-01   7.64111E-02   21   11
32   22    4.35832E-01   0.0           0.0          7.64111E-02   21   11
33   11   -3.11198E+00   5.29461E-01   0.0          8.02999E-02   22   12
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33   12    3.11198E+00    9.90835E-01   -3.71175E+00    8.02999E-02    22    12
33   13    3.14085E+00    9.29658E-01   -1.83743E+00    8.02999E-02    22    12
33   14    2.72462E+00    7.64040E-01   -9.03791E-01    8.02999E-02    22    12
33   15    2.23143E+00    5.89248E-01   -3.85192E-01    8.02999E-02    22    12
33   16    1.73744E+00    4.23401E-01   -9.01049E-02    8.02999E-02    22    12
33   17    1.25986E+00    2.68429E-01    6.84052E-02    8.02999E-02    22    12
33   18    8.05579E-01    1.22951E-01    1.41312E-01    8.02999E-02    22    12
33   19    3.60823E-01   -6.45263E-02    1.67759E-01    8.02999E-02    22    12
33   20   -3.85652E-02   -2.92355E-01    1.99576E-01    8.02999E-02    22    12
33   21   -3.76844E-01   -3.52162E-01    2.57692E-01    8.02999E-02    22    12
33   22   -4.72621E-01    5.68898E-01    3.55654E-01    8.02999E-02    22    12
33   23    4.72621E-01    0.0            0.0            8.02999E-02    22    12
34   11   -2.61371E+00   -7.32214E-02    0.0            8.28000E-02    22    12
34   12    2.61371E+00    4.31957E-01   -3.44312E+00    8.28000E-02    22    12
34   13    2.99177E+00    5.83104E-01   -1.92529E+00    8.28000E-02    22    12
34   14    2.75018E+00    5.57187E-01   -9.86301E-01    8.28000E-02    22    12
34   15    2.32059E+00    4.66782E-01   -4.19116E-01    8.28000E-02    22    12
34   16    1.84335E+00    3.59396E-01   -8.23800E-02    8.28000E-02    22    12
34   17    1.36319E+00    2.54643E-01    1.05022E-01    8.28000E-02    22    12
34   18    8.96578E-01    1.62381E-01    1.96207E-01    8.28000E-02    22    12
34   19    4.49150E-01    8.09376E-02    2.32866E-01    8.28000E-02    22    12
34   20    3.87841E-02    2.51625E-03    2.53266E-01    8.28000E-02    22    12
34   21   -2.95171E-01   -8.02876E-02    3.09366E-01    8.28000E-02    22    12
34   22   -4.11642E-01   -1.42115E-01    3.63822E-01    8.28000E-02    22    12
34   23    4.11642E-01    0.0            0.0            8.28000E-02    22    12
35   11   -2.36974E+00   -3.58543E-02    0.0            8.28000E-02    22    12
35   12    2.36974E+00    2.11507E-01   -2.16981E+00    8.28000E-02    22    12
35   13    2.86568E+00    3.39345E-01   -1.60661E+00    8.28000E-02    22    12
35   14    2.73075E+00    3.59045E-01   -9.41151E-01    8.28000E-02    22    12
35   15    2.35735E+00    3.21775E-01   -4.17240E-01    8.28000E-02    22    12
35   16    1.90203E+00    2.62281E-01   -6.26241E-02    8.28000E-02    22    12
35   17    1.42371E+00    2.00711E-01    1.53611E-01    8.28000E-02    22    12
35   18    9.48385E-01    1.48189E-01    2.71430E-01    8.28000E-02    22    12
35   19    4.92861E-01    1.03873E-01    3.29578E-01    8.28000E-02    22    12
35   20    8.64214E-02    5.55745E-02    3.63551E-01    8.28000E-02    22    12
35   21   -2.29447E-01   -1.10601E-02    4.00997E-01    8.28000E-02    22    12
35   22   -4.22551E-01    2.64496E-07    4.44544E-01    8.28000E-02    22    12
35   23    4.22551E-01    0.0            0.0            8.28000E-02    22    12
36   11   -2.25544E+00   -1.67990E-02    0.0            8.28000E-02    22    12
36   12    2.25544E+00    9.90896E-02   -1.67178E+00    8.28000E-02    22    12
36   13    2.79769E+00    1.68028E-01   -1.37433E+00    8.28000E-02    22    12
36   14    2.71137E+00    1.87677E-01   -8.77388E-01    8.28000E-02    22    12
36   15    2.36920E+00    1.75669E-01   -4.01800E-01    8.28000E-02    22    12
36   16    1.92834E+00    1.48994E-01   -3.85092E-02    8.28000E-02    22    12
36   17    1.45143E+00    1.21070E-01    2.04435E-01    8.28000E-02    22    12
36   18    9.68473E-01    1.00721E-01    3.50684E-01    8.28000E-02    22    12
36   19    5.08464E-01    8.49044E-02    4.31247E-01    8.28000E-02    22    12
36   20    1.03976E-01    6.71063E-02    4.73804E-01    8.28000E-02    22    12
36   21   -1.91086E-01    2.82114E-02    5.00105E-01    8.28000E-02    22    12
36   22   -3.94727E-01    5.55068E-07    5.15602E-01    8.28000E-02    22    12
36   23    3.94727E-01    0.0            0.0            8.28000E-02    22    12
37   11   -2.25813E+00    3.94978E-04    0.0            8.28000E-02    22    12
37   12    2.25813E+00   -2.33460E-03   -1.52342E+00    8.28000E-02    22    12
37   13    2.80018E+00   -4.86180E-03   -1.29292E+00    8.28000E-02    22    12
37   14    2.71355E+00   -7.06584E-03   -8.62814E-01    8.28000E-02    22    12
37   15    2.37093E+00   -8.82056E-03   -4.08335E-01    8.28000E-02    22    12
37   16    1.92949E+00   -9.98147E-03   -3.25358E-02    8.28000E-02    22    12
37   17    1.45182E+00   -1.03734E-02    2.36385E-01    8.28000E-02    22    12
37   18    9.67962E-01   -9.85596E-03    4.11058E-01    8.28000E-02    22    12
37   19    5.07011E-01   -8.30453E-03    5.16161E-01    8.28000E-02    22    12
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37    20      1.01642E-01     -6.01669E-03     5.69505E-01     8.28000E-02     22     12
37    21     -1.93902E-01     -3.16161E-03     5.88842E-01     8.28000E-02     22     12
37    22     -3.97845E-01     -6.61239E-08     5.97645E-01     8.28000E-02     22     12
37    23      3.97845E-01      0.0             0.0             8.28000E-02     22     12
38    11      0.0              1.90698E-04     0.0             8.28000E-02     22     12
38    12      0.0             -2.42126E-03     0.0             8.28000E-02     22     12
38    13      0.0             -5.03625E-03     0.0             8.28000E-02     22     12
38    14      0.0             -7.38471E-03     0.0             8.28000E-02     22     12
38    15      0.0             -9.30450E-03     0.0             8.28000E-02     22     12
38    16      0.0             -1.06168E-02     0.0             8.28000E-02     22     12
38    17      0.0             -1.11068E-02     0.0             8.28000E-02     22     12
38    18      0.0             -1.06193E-02     0.0             8.28000E-02     22     12
38    19      0.0             -9.07199E-03     0.0             8.28000E-02     22     12
38    20      0.0             -6.44138E-03     0.0             8.28000E-02     22     12
38    21      0.0             -3.39940E-03     0.0             8.28000E-02     22     12
38    22      0.0              7.81115E-02     0.0             8.28000E-02     22     12
38    23      0.0              0.0             0.0             8.28000E-02     22     12

PRESSURE DROP=        0.494136E-03  PSI
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ITER=  351        TIME= 2.99999E-02          CYCLE=  60     FVOL= 5.60403E-03
I       J         U              V                   P                   H              SUR CELL       BOT CELL
1      11      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      12      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      13      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      14      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      15      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      16      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      17      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      18      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      19      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      20      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      21      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      22      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
1      23      1.50000E+00     0.0                0.0                 8.28000E-02        22             12
2      11     -1.52595E+00     3.35407E-03        0.0                 8.28000E-02        22             12
2      12      1.52595E+00    -2.24564E-02        1.92779E+00         8.28000E-02        22             12
2      13      1.53578E+00    -5.87199E-02        1.96226E+00         8.28000E-02        22             12
2      14      1.52836E+00    -8.74553E-02        2.05164E+00         8.28000E-02        22             12
2      15      1.52106E+00    -1.09601E-01        2.18472E+00         8.28000E-02        22             12
2      16      1.51606E+00    -1.25865E-01        2.35163E+00         8.28000E-02        22             12
2      17      1.51026E+00    -1.36252E-01        2.54370E+00         8.28000E-02        22             12
2      18      1.50340E+00    -1.37683E-01        2.75247E+00         8.28000E-02        22             12
2      19      1.49379E+00    -1.33377E-01        2.96789E+00         8.28000E-02        22             12
2      20      1.47721E+00    -1.12278E-01        3.17591E+00         8.28000E-02        22             12
2      21      1.45815E+00    -6.98324E-02        3.35390E+00         8.28000E-02        22             12
2      22      1.43115E+00    -2.95043E-05        3.46615E+00         8.28000E-02        22             12
2      23     -1.43115E+00     0.0                0.0                 8.28000E-02        22             12
3      11     -1.53840E+00     9.20715E-03        0.0                 8.28000E-02        22             12
3      12      1.58840E+00    -5.41127E-02        1.84942E+00         8.28000E-02        22             12
3      13      1.60755E+00    -1.26875E-01        1.89572E+00         8.28000E-02        22             12
3      14      1.58432E+00    -1.93616E-01        1.99830E+00         8.28000E-02        22             12
3      15      1.56454E+00    -2.26890E-01        2.14293E+00         8.28000E-02        22             12
3      16      1.54750E+00    -2.58767E-01        2.31988E+00         8.28000E-02        22             12
3      17      1.53085E+00    -2.77638E-01        2.52165E+00         8.28000E-02        22             12
3      18      1.51143E+00    -2.87785E-01        2.74147E+00         8.28000E-02        22             12
3      19      1.48432E+00    -2.78179E-01        2.97214E+00         8.28000E-02        22             12
3      20      1.44191E+00    -2.40361E-01        3.20387E+00         8.28000E-02        22             12
3      21      1.37375E+00    -1.54791E-01        3.41832E+00         8.28000E-02        22             12
3      22      1.27850E+00    -1.68681E-05        3.56861E+00         8.28000E-02        22             12
3      23     -1.27850E+00     0.0                0.0                 8.28000E-02        22             12
4      11     -1.70363E+00     1.69529E-02        0.0                 8.28000E-02        22             12
4      12      1.70363E+00    -9.98648E-02        1.68962E+00         8.28000E-02        22             12
4      13      1.72067E+00    -2.14552E-01        1.76500E+00         8.28000E-02        22             12
4      14      1.66525E+00    -2.96601E-01        1.89669E+00         8.28000E-02        22             12
4      15      1.62539E+00    -3.58296E-01        2.06417E+00         8.28000E-02        22             12
4      16      1.59262E+00    -4.04045E-01        2.25971E+00         8.28000E-02        22             12
4      17      1.56131E+00    -4.34927E-01        2.47814E+00         8.28000E-02        22             12
4      18      1.52583E+00    -4.49520E-01        2.71535E+00         8.28000E-02        22             12
4      19      1.47858E+00    -4.43694E-01        2.96793E+00         8.28000E-02        22             12
4      20      1.40656E+00    -4.07858E-01        3.23382E+00         8.28000E-02        22             12
4      21      1.27672E+00    -3.09475E-01        3.51418E+00         8.28000E-02        22             12
4      22      9.73277E-01    -1.96695E-05        3.77983E+00         8.28000E-02        22             12
4      23     -9.73277E-01     0.0                0.0                 8.28000E-02        22             12
5      11     -1.94810E+00     3.59533E-02        0.0                 8.28000E-02        22             12
5      12      1.94810E+00    -2.11906E-01        1.37215E+00         8.28000E-02        22             12
5      13      1.84527E+00    -3.38233E-01        1.55522E+00         8.28000E-02        22             12
5      14      1.76007E+00    -4.34367E-01        1.74253E+00         8.28000E-02        22             12
5      15      1.69914E+00    -5.09139E-01        1.94577E+00         8.28000E-02        22             12
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5   16    1.64913E+00   -5.66429E-01    2.16750E+00   8.28000E-02   22   12
5   17    1.60213E+00   -6.07820E-01    2.40726E+00   8.28000E-02   22   12
5   18    1.55080E+00   -6.33135E-01    2.66358E+00   8.28000E-02   22   12
5   19    1.48596E+00   -6.40640E-01    2.93379E+00   8.28000E-02   22   12
5   20    1.39081E+00   -6.24664E-01    3.21472E+00   8.28000E-02   22   12
5   21    1.20664E+00   -5.53617E-01    3.51303E+00   8.28000E-02   22   12
5   22    6.91085E-01   -2.67510E-01    3.86265E+00   8.28000E-02   22   12
5   23   -6.91085E-01    0.0            0.0           8.28000E-02   22   12
6   11   -1.99043E+00   -3.45399E-01    0.0           8.02999E-02   22   12
6   12    1.99043E+00   -3.88313E-01    1.02320E+00   8.02999E-02   22   12
6   13    1.95326E+00   -4.97802E-01    1.29705E+00   8.02999E-02   22   12
6   14    1.85985E+00   -5.98963E-01    1.54187E+00   8.02999E-02   22   12
6   15    1.78000F+00   -6.80943E-01    1.78702E+00   8.02999E-02   22   12
6   16    1.71126E+00   -7.43930E-01    2.04012E+00   8.02999E-02   22   12
6   17    1.64338E+00   -7.85751E-01    2.30427E+00   8.02999E-02   22   12
6   18    1.56310E+00   -7.98226E-01    2.58041E+00   8.02999E-02   22   12
6   19    1.45281E+00   -7.64591E-01    2.86530E+00   8.02999E-02   22   12
6   20    1.29742E+00   -6.69912E-01    3.13876E+00   8.02999E-02   22   12
6   21    1.12271E+00   -5.84811E-01    3.33354E+00   8.02999E-02   22   12
6   22    1.12271E+00   -1.02242E+00    3.21137E+00   8.02999E-02   22   12
6   23   -1.12271E+00    0.0            0.0           8.02999E-02   22   12
7   10   -3.41310E-01    2.43352E+00    0.0           7.64111E-02   21   11
7   11    3.41310E-01    6.94256E-02   -1.80921E+00   7.64111E-02   21   11
7   12    2.53802E+00   -4.85765E-01    8.16040E-01   7.64111E-02   21   11
7   13    2.13945E+00   -6.74557E-01    1.01274E+00   7.64111E-02   21   11
7   14    1.97211E+00   -7.88378E-01    1.29747E+00   7.64111E-02   21   11
7   15    1.86258E+00   -8.72103E-01    1.58817E+00   7.64111E-02   21   11
7   16    1.77334E+00   -9.35044E-01    1.87585E+00   7.64111E-02   21   11
7   17    1.68537E+00   -9.77619E-01    2.16541E+00   7.64111E-02   21   11
7   18    1.58875E+00   -1.00382E+00    2.46072E+00   7.64111E-02   21   11
7   19    1.48847E+00   -1.03998E+00    2.76348E+00   7.64111E-02   21   11
7   20    1.41183E+00   -1.15598E+00    3.06529E+00   7.64111E-02   21   11
7   21    1.41183E+00   -1.44911E+00    3.33708E+00   7.64111E-02   21   11
7   22   -1.41183E+00    0.0            0.0           7.64111E-02   21   11
8    9   -1.05715E-01    4.83292E-01    0.0           7.25222E-02   20   10
8   10    1.05715E-01    3.00640E-02   -1.43948E+00   7.25222E-02   20   10
8   11    1.24235E+00   -8.83479E-01   -1.58499E+00   7.25222E-02   20   10
8   12    2.53753E+00   -8.82981E-01   -3.50850E-01   7.25222E-02   20   10
8   13    2.18942E+00   -9.33636E-01    5.15199E-01   7.25222E-02   20   10
8   14    2.04670E+00   -1.00926E+00    9.85406E-01   7.25222E-02   20   10
8   15    1.93404E+00   -1.08171E+00    1.34826E+00   7.25222E-02   20   10
8   16    1.83719E+00   -1.14645E+00    1.67333E+00   7.25222E-02   20   10
8   17    1.74820E+00   -1.21015E+00    1.98447E+00   7.25222E-02   20   10
8   18    1.67202E+00   -1.29438E+00    2.28960E+00   7.25222E-02   20   10
8   19    1.62566E+00   -1.43347E+00    2.58753E+00   7.25222E-02   20   10
8   20    1.62566E+00   -1.65026E+00    2.86852E+00   7.25222E-02   20   10
8   21   -1.62566E+00    0.0            0.0           7.25222E-02   20   10
9    8   -3.76457E-02    1.53255E-01    0.0           6.86333E-02   19    9
9    9    3.76457E-02    7.90463E-03   -9.75442E-01   6.86333E-02   19    9
9   10    8.74911E-01   -7.71963E-01   -1.17617E+00   6.86333E-02   19    9
9   11    1.70741E+00   -1.24348E+00   -1.08347E+00   6.86333E-02   19    9
9   12    2.46675E+00   -1.17172E+00   -4.30401E-01   6.86333E-02   19    9
9   13    2.20050E+00   -1.18295E+00    2.36048E-01   6.86333E-02   19    9
9   14    2.10347F+00   -1.24051F+00    7.06868E-01   6.86333E-02   19    9
9   15    2.00401E+00   -1.31145E+00    1.09244E+00   6.86333E-02   19    9
9   16    1.91788E+00   -1.39326E+00    1.43698E+00   6.86333E-02   19    9
9   17    1.85117E+00   -1.49765E+00    1.75860E+00   6.86333E-02   19    9
9   18    1.81454E+00   -1.64215E+00    2.06179E+00   6.86333E-02   19    9
9   19    1.81454E+00   -1.83365E+00    2.34420E+00   6.86333E-02   19    9
9   20   -1.81454E+00    0.0            0.0           6.86333E-02   19    9
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10    7    9.50960E-03    4.73859E-02    0.0            6.47444E-02    18    8
10    8   -9.50960E-03    1.88594E-02   -6.24961E-01    6.47444E-02    18    8
10    9    7.05770E-01   -6.58536E-01   -7.85599E-01    6.47444E-02    18    8
10   10    1.35152E+00   -1.14176E+00   -8.72715E-01    6.47444E-02    18    8
10   11    1.98972E+00   -1.42798E+00   -7.83515E-01    6.47444E-02    18    8
10   12    2.41729E+00   -1.37783E+00   -4.05170E-01    6.47444E-02    18    8
10   13    2.23039E+00   -1.40813E+00    4.59755E-02    6.47444E-02    18    8
10   14    2.17113E+00   -1.47673E+00    4.48602E-01    6.47444E-02    18    8
10   15    2.09270E+00   -1.56664E+00    8.20210E-01    6.47444E-02    18    8
10   16    2.03051E+00   -1.68084E+00    1.16673E+00    6.47444E-02    18    8
10   17    1.99620E+00   -1.82788E+00    1.48963E+00    6.47444E-02    18    8
10   18    1.99620E+00   -2.01206E+00    1.78642E+00    6.47444E-02    18    8
10   19   -1.99620E+00    0.0            0.0            6.47444E-02    18    8
11    6    1.04478E-01   -5.04358E-02    0.0            6.08555E-02    17    7
11    7   -1.04478E-01    6.51536E-02   -3.72982E-01    6.08555E-02    17    7
11    8    5.84198E-01   -5.36793E-01   -4.87413E-01    6.08555E-02    17    7
11    9    1.14590E+00   -9.83029E-01   -5.91240E-01    6.08555E-02    17    7
11   10    1.70706E+00   -1.34350E+00   -6.68544E-01    6.08555E-02    17    7
11   11    2.18392E+00   -1.54039E+00   -6.45139E-01    6.08555E-02    17    7
11   12    2.42241E+00   -1.54559E+00   -4.46836E-01    6.08555E-02    17    7
11   13    2.30804E+00   -1.62432E+00   -1.56693E-01    6.08555E-02    17    7
11   14    2.27446E+00   -1.72908E+00    1.68166E-01    6.08555E-02    17    7
11   15    2.21693E+00   -1.85503E+00    5.13679E-01    6.08555E-02    17    7
11   16    2.18057E+00   -2.00718E+00    8.57886E-01    6.08555E-02    17    7
11   17    2.18057E+00   -2.19410E+00    1.18171E+00    6.08555E-02    17    7
11   18   -2.18057E+00    0.0            0.0            6.08555E-02    17    7
12    5    3.13135E-01   -2.60280E-01    0.0            5.69667E-02    16    6
12    6   -3.13135E-01    1.63148E-01   -1.87129E-01    5.69667E-02    16    6
12    7    4.68004E-01   -4.17299E-01   -2.63113E-01    5.69667E-02    16    6
12    8    9.71140E-01   -8.09608E-01   -3.48833E-01    5.69667E-02    16    6
12    9    1.50070E+00   -1.16953E+00   -4.52333E-01    5.69667E-02    16    6
12   10    1.98909E+00   -1.45548E+00   -5.66332E-01    5.69667E-02    16    6
12   11    2.35298E+00   -1.62689E+00   -6.38361E-01    5.69667E-02    16    6
12   12    2.50259E+00   -1.70817E+00   -5.93548E-01    5.69667E-02    16    6
12   13    2.45055E+00   -1.85266E+00   -4.38260E-01    5.69667E-02    16    6
12   14    2.43150E+00   -2.01188E+00   -1.85979E-01    5.69667E-02    16    6
12   15    2.39289E+00   -2.19027E+00    1.43706E-01    5.69667E-02    16    6
12   16    2.39288E+00   -2.40553E+00    5.01841E-01    5.69667E-02    16    6
12   17   -2.39289E+00    0.0            0.0            5.69667E-02    16    6
13    4    5.87948E-01   -6.61784E-01    0.0            5.30778E-02    15    5
13    5   -5.87948E-01    2.51803E-01   -1.81175E-03    5.30778E-02    15    5
13    6    2.85802E-01   -3.55445E-01   -8.80899E-02    5.30778E-02    15    5
13    7    7.57038E-01   -6.48490E-01   -1.53537E-01    5.30778E-02    15    5
13    8    1.28454E+00   -9.66236E-01   -2.27879E-01    5.30778E-02    15    5
13    9    1.79224E+00   -1.26162E+00   -3.62984E-01    5.30778E-02    15    5
13   10    2.23008E+00   -1.50595E+00   -5.52304E-01    5.30778E-02    15    5
13   11    2.53586E+00   -1.69137E+00   -7.50178E-01    5.30778E-02    15    5
13   12    2.67429E+00   -1.86545E+00   -8.75182E-01    5.30778E-02    15    5
13   13    2.69769E+00   -2.11601E+00   -8.71838E-01    5.30778E-02    15    5
13   14    2.71468E+00   -2.40312E+00   -6.90964E-01    5.30778E-02    15    5
13   15    2.71468E+00   -2.72938E+00   -3.40679E-01    5.30778E-02    15    5
13   16   -2.71468E+00    0.0            0.0            5.30778E-02    15    5
14    3    8.14218E-01   -1.14995E+00    0.0            4.91889E-02    14    4
14    4   -8.14218E-01    2.71674E-01    2.35222E-01    4.91889E-02    14    4
14    5   -4.02717E-02   -2.83602E-01    1.45929E-01    4.91889E-02    14    4
14    6    4.99696E-01   -5.00464E-01    7.21553E-02    4.91889E-02    14    4
14    7    1.01229E+00   -7.59254E-01    2.54207E-03    4.91889E-02    14    4
14    8    1.54409E+00   -1.02240E+00   -1.10211E-01    4.91889E-02    14    4
14    9    2.04252E+00   -1.27615E+00   -3.07996E-01    4.91889E-02    14    4
14   10    2.47283E+00   -1.52227E+00   -6.05898E-01    4.91889E-02    14    4
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14   11    2.81150E+00   -1.80174E+00   -9.75422E-01   4.91889E-02   14   4
14   12    3.06252E+00   -2.19536E+00   -1.34953E+00   4.91889E-02   14   4
14   13    3.21882E+00   -2.72372E+00   -1.60636E+00   4.91889E-02   14   4
14   14    3.21882E+00   -3.23486E+00   -1.53242E+00   4.91889E-02   14   4
14   15   -3.21882E+00    0.0            0.0           4.91889E-02   14   4
15    2    1.06056E+00   -1.59167E+00    0.0           4.53000E-02   13   3
15    3   -1.06056E+00    3.09124E-01    5.23289E-01   4.53000E-02   13   3
15    4   -3.43295E-01   -1.68333E-01    3.77990E-01   4.53000E-02   13   3
15    5    1.81106E-01   -3.92783E-01    3.07313E-01   4.53000E-02   13   3
15    6    6.92038E-01   -5.87795E-01    2.46554E-01   4.53000E-02   13   3
15    7    1.23053E+00   -8.09061E-01    1.64305E-01   4.53000E-02   13   3
15    8    1.77568E+00   -1.04387E+00    9.80341E-03   4.53000E-02   13   3
15    9    2.29844E+00   -1.30335E+00   -2.62579E-01   4.53000E-02   13   3
15   10    2.78677E+00   -1.62164E+00   -6.92201E-01   4.53000E-02   13   3
15   11    3.23832E+00   -2.05438E+00   -1.31660E+00   4.53000E-02   13   3
15   12    3.61114E+00   -2.61061E+00   -2.18982E+00   4.53000E-02   13   3
15   13    3.61114E+00   -3.00838E+00   -3.06914E+00   4.53000E-02   13   3
15   14   -3.61114E+00    0.0            0.0           4.53000E-02   13   3
16    1    1.12908E+00   -2.00020E+00    0.0           4.28000E-02   12   2
16    2   -1.12908E+00    2.19827E-01    5.99878E-01   4.28000E-02   12   2
16    3   -6.45922E-01   -2.00566E-01    6.21440E-01   4.28000E-02   12   2
16    4   -2.27058E-01   -3.18417E-01    5.45402E-01   4.28000E-02   12   2
16    5    3.15319E-01   -4.54490E-01    4.96821E-01   4.28000E-02   12   2
16    6    8.52371E-01   -6.17048E-01    4.38801E-01   4.28000E-02   12   2
16    7    1.40782E+00   -7.96801E-01    3.36624E-01   4.28000E-02   12   2
16    8    1.96359E+00   -9.87419E-01    1.37044E-01   4.28000E-02   12   2
16    9    2.49546E+00   -1.18718E+00   -2.22265E-01   4.28000E-02   12   2
16   10    2.97907E+00   -1.38215E+00   -8.25067E-01   4.28000E-02   12   2
16   11    3.33686E+00   -1.48205E+00   -1.81791E+00   4.28000E-02   12   2
16   12    3.15618E+00   -1.02078E+00   -3.42959E+00   4.28000E-02   12   2
16   13   -3.15618E+00    0.0            0.0           4.28000E-02   12   2
17    1    6.19922E-01    4.06061E-01    0.0           4.28000E-02   12   2
17    2   -6.19922E-01   -1.10161E-01    7.45527E-01   4.28000E-02   12   2
17    3   -5.54609E-01   -2.02742E-01    7.97355E-01   4.28000E-02   12   2
17    4   -8.81881E-02   -3.43535E-01    7.54906E-01   4.28000E-02   12   2
17    5    4.32919E-01   -4.62767E-01    7.05105E-01   4.28000E-02   12   2
17    6    9.76674E-01   -5.88816E-01    6.38731E-01   4.28000E-02   12   2
17    7    1.53561E+00   -7.18375E-01    5.12520E-01   4.28000E-02   12   2
17    8    2.08505E+00   -8.41419E-01    2.68835E-01   4.28000E-02   12   2
17    9    2.58664E+00   -9.33863E-01   -1.62295E-01   4.28000E-02   12   2
17   10    2.97604E+00   -9.30790E-01   -8.80127E-01   4.28000E-02   12   2
17   11    3.08295E+00   -6.73365E-01   -2.08430E+00   4.28000E-02   12   2
17   12    2.37948E+00    1.14112E-01   -4.25748E+00   4.28000E-02   12   2
17   13   -2.37948E+00    0.0            0.0           4.28000E-02   12   2
18    1    6.07938E-01    3.45893E-05    0.0           4.28000E-02   12   2
18    2   -6.07938E-01   -1.21158E-02    1.05640E+00   4.28000E-02   12   2
18    3   -3.63074E-01   -2.06307E-01    9.89636E-01   4.28000E-02   12   2
18    4    4.08118E-02   -3.37096E-01    9.44515E-01   4.28000E-02   12   2
18    5    5.25266E-01   -4.30726E-01    9.01162E-01   4.28000E-02   12   2
18    6    1.06138E+00   -5.16588E-01    8.28928E-01   4.28000E-02   12   2
18    7    1.61360E+00   -5.95662E-01    6.81913E-01   4.28000E-02   12   2
18    8    2.14516E+00   -6.56601E-01    4.06160E-01   4.28000E-02   12   2
18    9    2.60485E+00   -6.75065E-01   -5.36291E-02   4.28000E-02   12   2
18   10    2.90364E+00   -6.01653E-01   -7.33918E-01   4.28000E-02   12   2
18   11    2.84701E+00   -3.62433E-01   -1.59190E+00   4.28000E-02   12   2
18   12    1.96143E+00    6.14142E-02   -2.31048E+00   4.28000E-02   12   2
18   13   -1.96143E+00    0.0            0.0           4.28000E-02   12   2
19    1    4.82832E-01    3.44515E-05    0.0           4.28000E-02   12   2
19    2   -4.82832E-01   -1.26807E-01    1.16510E+00   4.28000E-02   12   2
19    3   -2.58532E-01   -2.32800E-01    1.13459E+00   4.28000E-02   12   2
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19     4     1.19097E-01   -3.12170E-01    1.10765E+00    4.28000E-02    12    2
19     5     5.84413E-01   -3.72139E-01    1.07296E+00    4.28000E-02    12    2
19     6     1.10617E+00   -4.17544E-01    9.98498E-01    4.28000E-02    12    2
19     7     1.64594E+00   -4.50337E-01    8.39200E-01    4.28000E-02    12    2
19     8     2.15820E+00   -4.63562E-01    5.46450E-01    4.28000E-02    12    2
19     9     2.58419E+00   -4.42618E-01    8.58023E-02    4.28000E-02    12    2
19    10     2.82566E+00   -3.63558E-01   -5.26891E-01    4.28000E-02    12    2
19    11     2.68713E+00   -2.01465E-01   -1.15652E+00    4.28000E-02    12    2
19    12     1.72906E+00    3.41320E-02   -1.50522E+00    4.28000E-02    12    2
19    13    -1.72906E+00    0.0            0.0            4.28000E-02    12    2
20     1     3.51415E-01    3.42727E-05    0.0            4.28000E-02    12    2
20     2    -3.51415E-01   -1.33207E-01    1.28235E+00    4.28000E-02    12    2
20     3    -1.65382E-01   -2.27650E-01    1.26314E+00    4.28000E-02    12    2
20     4     1.65696E-01   -2.74884E-01    1.24759E+00    4.28000E-02    12    2
20     5     6.07212E-01   -2.98000E-01    1.22126E+00    4.28000E-02    12    2
20     6     1.11159E+00   -3.03499E-01    1.14789E+00    4.28000E-02    12    2
20     7     1.63803E+00   -2.95472E-01    9.82457E-01    4.28000E-02    12    2
20     8     2.13503E+00   -2.71984E-01    6.83601E-01    4.28000E-02    12    2
20     9     2.54212E+00   -2.29326E-01    2.30542E-01    4.28000E-02    12    2
20    10     2.76219E+00   -1.64975E-01   -3.39491E-01    4.28000E-02    12    2
20    11     2.60733E+00   -8.40638E-02   -8.82134E-01    4.28000E-02    12    2
20    12     1.63211E+00    1.42329E-02   -1.14341E+00    4.28000E-02    12    2
20    13    -1.63211E+00    0.0            0.0            4.28000E-02    12    2
21     1     2.13449E-01    3.37958E-05    0.0            4.28000E-02    12    2
21     2    -2.13449E-01   -1.39847E-01    1.38070E+00    4.28000E-02    12    2
21     3    -9.26857E-02   -2.13551E-01    1.36977E+00    4.28000E-02    12    2
21     4     1.81521E-01   -2.29605E-01    1.36633E+00    4.28000E-02    12    2
21     5     5.92927E-01   -2.15120E-01    1.34851E+00    4.28000E-02    12    2
21     6     1.07938E+00   -1.82470E-01    1.27776E+00    4.28000E-02    12    2
21     7     1.59457E+00   -1.38405E-01    1.11006E+00    4.28000E-02    12    2
21     8     2.08070E+00   -8.33152E-02    8.12330E-01    4.28000E-02    12    2
21     9     2.48485E+00   -2.52583E-02    3.68301E-01    4.28000E-02    12    2
21    10     2.70693E+00    3.07613E-02   -1.82717E-01    4.28000E-02    12    2
21    11     2.59101E+00    4.73064E-02   -7.27336E-01    4.28000E-02    12    2
21    12     1.68669E+00   -8.03167E-03   -1.03900E+00    4.28000E-02    12    2
21    13    -1.68669E+00    0.0            0.0            4.28000E-02    12    2
22     1     1.34743E-01   -8.08019E-02    0.0            4.28000E-02    12    2
22     2    -1.34743E-01   -1.60599E-01    1.44083E+00    4.28000E-02    12    2
22     3    -6.79744E-02   -1.85653E-01    1.45454E+00    4.28000E-02    12    2
22     4     1.72671E-01   -1.76680E-01    1.46606E+00    4.28000E-02    12    2
22     5     5.42986E-01   -1.26046E-01    1.45646E+00    4.28000E-02    12    2
22     6     1.01025E+00   -5.59576E-02    1.38697E+00    4.28000E-02    12    2
22     7     1.52445E+00    1.51317E-02    1.21747E+00    4.28000E-02    12    2
22     8     1.99927E+00    9.76676E-02    9.29873E-01    4.28000E-02    12    2
22     9     2.40186E+00    1.81814E-01    5.05143E-01    4.28000E-02    12    2
22    10     2.63664E+00    2.53082E-01   -5.14735E-02    4.28000E-02    12    2
22    11     2.57837E+00    2.65295E-01   -6.67932E-01    4.28000E-02    12    2
22    12     1.99271E+00   -4.49770E-02   -1.17728E+00    4.28000E-02    12    2
22    13    -1.99271E+00    0.0            0.0            4.28000E-02    12    2
23     1    -4.38470E-02    1.22020E-01    0.0            4.28000E-02    12    2
23     2     4.38470E-02   -5.90487E-02    1.49421E+00    4.28000E-02    12    2
23     3     4.38470E-02   -1.72422E-01    1.52409E+00    4.28000E-02    12    2
23     4     1.12984E-01   -1.11805E-01    1.54996E+00    4.28000E-02    12    2
23     5     4.60934E-01   -2.86152E-02    1.54416E+00    4.28000E-02    12    2
23     6     9.22044E-01    6.08198E-02    1.47353E+00    4.28000E-02    12    2
23     7     1.42295E+00    1.63730E-01    1.32320E+00    4.28000E-02    12    2
23     8     1.89029E+00    2.74248E-01    1.04695E+00    4.28000E-02    12    2
23     9     2.29142E+00    3.86225E-01    6.31579E-01    4.28000E-02    12    2
23    10     2.53455E+00    4.89729E-01    8.05807E-02    4.28000E-02    12    2
23    11     2.49050E+00    5.79423E-01   -5.69784E-01    4.28000E-02    12    2
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23    12     1.93327E+00    6.39692E-01   -1.28249E+00    4.28000E-02    12    2
23    13    -1.93327E+00    0.0            0.0            4.28000E-02    12    2
24     2    -2.53620E-01    3.40622E-01    0.0            4.53000E-02    13    3
24     3     2.53620E-01    1.27938E-01    1.56315E+00    4.53000E-02    13    3
24     4     2.53620E-01   -1.47501E-02    1.61360E+00    4.53000E-02    13    3
24     5     3.88187E-01    5.90051E-02    1.61399E+00    4.53000E-02    13    3
24     6     8.03263E-01    1.79433E-01    1.55739E+00    4.53000E-02    13    3
24     7     1.29631E+00    3.07833E-01    1.40871E+00    4.53000E-02    13    3
24     8     1.75937E+00    4.40559E-01    1.14097E+00    4.53000E-02    13    3
24     9     2.16266E+00    5.71108E-01    7.44651E-01    4.53000E-02    13    3
24    10     2.42699E+00    6.80159E-01    2.35745E-01    4.53000E-02    13    3
24    11     2.44853E+00    7.22711E-01   -3.05152E-01    4.53000E-02    13    3
24    12     2.17404E+00    4.78599E-01   -6.54429E-01    4.53000E-02    13    3
24    13     3.46197E-01   -1.83249E+00   -1.93964E+00    4.53000E-02    13    3
24    14    -3.46197E-01    0.0            0.0            4.53000E-02    13    3
25     3    -5.30805E-01    6.41916E-01    0.0            4.91889E-02    14    4
25     4     5.30805E-01    3.60884E-01    1.62374E+00    4.91889E-02    14    4
25     5     5.30805E-01    2.16287E-01    1.65079E+00    4.91889E-02    14    4
25     6     7.22070E-01    2.98585E-01    1.60464E+00    4.91889E-02    14    4
25     7     1.15078E+00    4.46133E-01    1.45894E+00    4.91889E-02    14    4
25     8     1.61125E+00    5.96319E-01    1.19793E+00    4.91889E-02    14    4
25     9     2.01990E+00    7.41049E-01    8.19933E-01    4.91889E-02    14    4
25    10     2.30598E+00    8.63734E-01    3.41472E-01    4.91889E-02    14    4
25    11     2.37516E+00    9.38116E-01   -1.88504E-01    4.91889E-02    14    4
25    12     2.19791E+00    9.13918E-01   -7.20484E-01    4.91889E-02    14    4
25    13     1.06888E+00    1.81206E-01   -1.15081E+00    4.91889E-02    14    4
25    14     1.90857E-01   -3.63299E-01   -8.79210E-01    4.91889E-02    14    4
25    15    -1.90857E-01    0.0            0.0            4.91889E-02    14    4
26     4    -8.63015E-01    9.91569E-01    0.0            5.30778E-02    15    5
26     5     8.63015E-01    6.54750E-01    1.60695E+00    5.30778E-02    15    5
26     6     8.63015E-01    5.11871E-01    1.58547E+00    5.30778E-02    15    5
26     7     1.07253E+00    5.91197E-01    1.45233E+00    5.30778E-02    15    5
26     8     1.46391E+00    7.40580E-01    1.20103E+00    5.30778E-02    15    5
26     9     1.87105E+00    8.91498E-01    8.43100E-01    5.30778E-02    15    5
26    10     2.18219E+00    1.01701E+00    4.05141E-01    5.30778E-02    15    5
26    11     2.29936E+00    1.09386E+00   -5.79878E-02    5.30778E-02    15    5
26    12     2.20653E+00    1.08511E+00   -4.67682E-01    5.30778E-02    15    5
26    13     1.48274E+00    6.65511E-01   -6.69917E-01    5.30778E-02    15    5
26    14     7.51840E-01    9.67426E-02   -6.17568E-01    5.30778E-02    15    5
26    15     1.06206E-01   -2.04442E-01   -4.38634E-01    5.30778E-02    15    5
26    16    -1.06206E-01    0.0            0.0            5.30778E-02    15    5
27     5    -1.21165E+00    1.34172E+00    0.0            5.69667E-02    16    6
27     6     1.21165E+00    9.88250E-01    1.46610E+00    5.69667E-02    16    6
27     7     1.21165E+00    8.47202E-01    1.36044E+00    5.69667E-02    16    6
27     8     1.40904E+00    9.02831E-01    1.12820E+00    5.69667E-02    16    6
27     9     1.74800E+00    1.02759E+00    7.92223E-01    5.69667E-02    16    6
27    10     2.06939E+00    1.14195E+00    3.94742E-01    5.69667E-02    16    6
27    11     2.23638E+00    1.20581E+00    4.56712E-03    5.69667E-02    16    6
27    12     2.22153E+00    1.19060E+00   -2.97770E-01    5.69667E-02    16    6
27    13     1.75804E+00    9.11476E-01   -4.21226E-01    5.69667E-02    16    6
27    14     1.16137E+00    4.96262E-01   -3.85421E-01    5.69667E-02    16    6
27    15     5.83880E-01    1.19574E-02   -2.81200E-01    5.69667E-02    16    6
27    16     1.76233E-02   -1.13590E-01   -1.59033E-01    5.69667E-02    16    6
27    17    -1.76233E-02    0.0            0.0            5.69667E-02    16    6
28     6    -1.55556E+00    1.67909E+00    0.0            6.08555E-02    17    7
28     7     1.55556E+00    1.33041E+00    1.16315E+00    6.08555E-02    17    7
28     8     1.55556E+00    1.18186E+00    9.56368E-01    6.08555E-02    17    7
28     9     1.73430E+00    1.19574E+00    6.41569E-01    6.08555E-02    17    7
28    10     2.00778E+00    1.25821E+00    2.78973E-01    6.08555E-02    17    7
28    11     2.20556E+00    1.28945E+00   -4.66040E-02    6.08555E-02    17    7
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28   12    2.25397E+00    1.25656E+00   -2.57871E-01    6.08555E-02    17    7
28   13    1.96590E+00    1.04673E+00   -3.10205E-01    6.08555E-02    17    7
28   14    1.48862E+00    7.14932E-01   -2.45029E-01    6.03555E-02    17    7
28   15    9.59671E-01    3.33928E-01   -1.43608E-01    6.08555E-02    17    7
28   16    4.44930E-01   -9.93078E-02   -5.23865E-02    6.08555E-02    17    7
28   17   -1.04479E-01   -1.12473E-02    2.67699E-02    6.06555E-02    17    7
28   18    1.04479E-01    0.0            0.0            6.08555E-02    17    7
29    7   -1.93186E+00    2.06180E+00    0.0            6.47444E-02    18    8
29    8    1.93186E+00    1.68028E+00    6.67323E-01    6.47444E-02    18    8
29    9    1.93186E+00    1.47999E+00    3.57711E-01    6.47444E-02    18    8
29   10    2.07462E+00    1.41222E+00    2.05963E-02    6.47444E-02    18    8
29   11    2.24525E+00    1.37198E+C0   -2.44504E-01    6.47444E-02    18    8
29   12    2.32419E+00    1.30079E+00   -3.61451E-01    6.47444E-02    18    8
29   13    2.14596E+00    1.11731E+00   -3.23038E-01    6.47444E-02    18    8
29   14    1.76391E+00    8.38204E-01   -1.94625E-01    6.47444E-02    18    8
29   15    1.28228E+00    5.11118E-01   -5.99439E-02    6.47444E-02    18    8
29   16    7.80298E-01    1.71094E-01    3.76372E-02    6.47444E-02    18    8
29   17    2.57096E-01   -1.95498E-01    1.01209E-01    6.47444E-02    18    8
29   18   -2.19279E-01    1.32752E-01    1.33067E-01    6.47444E-02    18    8
29   19    2.19279E-01    0.0            0.0            6.47444E-02    18    8
30    8   -2.47449E+00    2.65435E+00    0.0            6.86333E-02    19    9
30    9    2.47449E+00    2.10418E+00   -1.45484E-01    6.86333E-02    19    9
30   10    2.47449E+00    1.69875E+00   -4.73629E-01    6.86333E-02    19    9
30   11    2.48808E+00    1.45255E+00   -6.47838E-01    6.86333E-02    19    9
30   12    2.47842E+00    1.29618E+00   -6.27334E-01    6.85333E-02    19    9
30   13    2.32556E+00    1.11409E+00   -4.57913E-01    6.86333E-02    19    9
30   14    2.00029E+00    8.74430E-01   -2.32784E-01    6.86333E-02    19    9
30   15    1.55803E+00    5.94848E-01   -3.82637E-02    6.86333E-02    19    9
30   16    1.06920E+00    3.01939E-01    8.85383E-02    6.86333E-02    19    9
30   17    5.76304E-01   -2.16999E-02    1.56341E-01    6.86333E-02    19    9
30   18   -1.00593E-02   -2.33925E-01    1.91821E-01    6.85333E-02    19    9
30   19   -2.77182E-01    2.67525E-01    1.95357E-01    6.86333E-02    19    9
30   20    2.77182E-01    0.0            0.0            6.86333E-02    19    9
31    9   -3.20071E+00    3.43132E+00    0.0            7.25222E-02    20   10
31   10    3.20071E+00    2.69503E+00   -1.54762E+00    7.25222E-02    20   10
31   11    3.20071E+00    1.97252E+00   -1.45679E+00    7.25222E-02    20   10
31   12    2.98171E+00    1.46224E+00   -1.10904E+00    7.25222E-02    20   10
31   13    2.65236E+00    1.13090E+00   -7.02878E-01    7.25222E-02    20   10
31   14    2.25330E+00    8.67677E-01   -3.41608E-01    7.25222E-02    20   10
31   15    1.80721E+00    6.15042E-01   -7.00620E-02    7.25222E-02    20   10
31   16    1.32C01E+00    3.60751E-01    9.70286E-02    7.25222E-02    20   10
31   17    8.37930E-01    9.54427E-02    1.81674E-01    7.25222E-02    20   10
31   18    2.92440E-01   -2.11254E-01    2.09105E-01    7.25222E-02    20   10
31   19   -2.05740E-01   -2.83688E-01    2.12412E-01    7.25222E-02    20   10
31   20   -3.46853E-01    3.49006E-01    2.02404E-01    7.25222E-02    20   10
31   21    3.46853E-01    0.0            0.0            7.25222E-02    20   10
32   10   -3.57177E+00    2.59602E+C0    0.0            7.64111E-02    21   11
32   11    3.57177E+00    2.21981E+00   -3.30049E+00    7.64111E-02    21   11
32   12    3.57177E+00    1.62156E+00   -2.11049E+00    7.64111E-02    21   11
32   13    3.07065E+00    1.17719E+00   -1.09929E+00    7.64111E-02    21   11
32   14    2.57066E+00    8.62126E-01   -4.97499E-01    7.64111E-02    21   11
32   15    2.05394E+00    6.11972E-01   -1.30876E-01    7.64111E-02    21   11
32   16    1.54078E+00    3.88133E-01    7.65204E-02    7.64111E-02    21   11
32   17    1.04850E+00    1.74692E-01    1.74344E-01    7.64111E-02    21   11
32   18    5.69085E-01   -1.05793E-01    2.06210E-01    7.64111E-02    21   11
32   19    2.07874E-02   -3.35464E-01    2.06481E-01    7.64111E-02    21   11
32   20   -3.10603E-01   -3.72219E-01    2.19088E-01    7.64111E-02    21   11
32   21   -4.65744E-01    4.51654E-01    2.48591E-01    7.64111E-02    21   11
32   22    4.65744E-01    0.0            0.0            7.64111E-02    21   11
33   11   -3.13455E+00    5.34536E-01    0.0            8.02999E-02    22   12
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33      12      3.13455E+00      9.77819E-01     -3.45406E+00      8.02999E-02      22      12
33      13      3.16453E+00      9.02907E-01     -1.61206E+00      8.02999E-02      22      12
33      14      2.74239E+00      7.28789E-01     -7.01771E-01      8.02999E-02      22      12
33      15      2.23280E+00      5.47442E-01     -2.12584E-01      8.02999E-02      22      12
33      16      1.70992E+00      3.75957E-01      4.44362E-02      8.02999E-02      22      12
33      17      1.20492E+00      2.17363E-01      1.60085E-01      8.02999E-02      22      12
33      18      7.30269E-01      5.39416E-02      1.92115E-01      8.02999E-02      22      12
33      19      2.52216E-01     -1.80699E-01      1.84347E-01      8.02999E-02      22      12
33      20     -1.91661E-01     -3.01290E-01      2.01354E-01      8.02999E-02      22      12
33      21     -4.27165E-01     -3.40404E-01      2.56030E-01      8.02999E-02      22      12
33      22     -4.59097E-01      5.97270E-01      3.29962E-01      8.02999E-02      22      12
33      23      4.59097E-01      0.0              0.0              8.02999E-02      22      12
34      11     -2.64724E+00     -7.16007E-02      0.0              8.28000E-02      22      12
34      12      2.64724E+00      4.22470E-01     -3.25338E+00      8.28000E-02      22      12
34      13      3.02697E+00      5.61943E-01     -1.73402E+00      8.28000E-02      22      12
34      14      2.77619E+00      5.27670E-01     -8.11300E-01      8.28000E-02      22      12
34      15      2.32678E+00      4.32386E-01     -2.74715E-01      8.28000E-02      22      12
34      16      1.81802E+00      3.22782E-01      2.03049E-02      8.28000E-02      22      12
34      17      1.30756E+00      2.18717E-01      1.60968E-01      8.28000E-02      22      12
34      18      8.20177E-01      1.27561E-01      2.07786E-01      8.28000E-02      22      12
34      19      3.39557E-01      3.90080E-02      2.07540E-01      8.28000E-02      22      12
34      20     -8.93827E-02     -6.46914E-02      2.26019E-01      8.28000E-02      22      12
34      21     -3.85329E-01     -1.07108E-01      2.74637E-01      8.28000E-02      22      12
34      22     -4.24648E-01     -1.42035E-01      3.16356E-01      8.28000E-02      22      12
34      23      4.24648E-01      0.0              0.0              8.28000E-02      22      12
35      11     -2.41114E+00     -3.46904E-02      0.0              8.28000E-02      22      12
35      12      2.41114E+00      2.04692E-01     -1.98089E+00      8.28000E-02      22      12
35      13      2.90951E+00      3.23773E-01     -1.42427E+00      8.28000E-02      22      12
35      14      2.76255E+00      3.37600E-01     -7.80442E-01      8.28000E-02      22      12
35      15      2.36596E+00      2.97876E-01     -2.93311E-01      8.28000E-02      22      12
35      16      1.87639E+00      2.38696E-01      1.41737E-02      8.28000E-02      22      12
35      17      1.36667E+00      1.78761E-01      1.80086E-01      8.28000E-02      22      12
35      18      9.71227E-01      1.27001E-01      2.52609E-01      8.28000E-02      22      12
35      19      3.88689E-01      7.71857E-02      2.76151E-01      8.28000E-02      22      12
35      20     -2.74599E-02      1.44045E-02      2.91930E-01      8.28000E-02      22      12
35      21     -3.20553E-01     -5.12723E-02      3.20792E-01      8.28000E-02      22      12
35      22     -4.75217E-01     -1.28150E-06      3.59470E-01      8.28000E-02      22      12
35      23      4.75217E-01      0.0              0.0              8.28000E-02      22      12
36      11     -2.30109E+00     -1.61681E-02      0.0              8.28000E-02      22      12
36      12      2.30109E+00      9.54072E-02     -1.46692E+00      8.28000E-02      22      12
36      13      2.84585E+00      1.59951E-01     -1.18225E+00      8.28000E-02      22      12
36      14      2.74546E+00      1.77270E-01     -7.17165E-01      8.28000E-02      22      12
36      15      2.37752E+00      1.65547E-01     -2.88724E-01      8.28000E-02      22      12
36      16      1.90077E+00      1.40809E-01      1.87372E-02      8.28000E-02      22      12
36      17      1.39339E+00      1.13722E-01      2.05565E-01      8.28000E-02      22      12
36      18      8.93510E-01      9.11279E-02      3.02265E-01      8.28000E-02      22      12
36      19      4.08374E-01      7.11678E-02      3.43838E-01      8.28000E-02      22      12
36      20     -6.24166E-04      4.39584E-02      3.60534E-01      8.28000E-02      22      12
36      21     -2.83818E-01      6.71621E-03      3.71718E-01      8.28000E-02      22      12
36      22     -4.68592E-01     -8.34465E-07      3.83498E-01      8.28000E-02      22      12
36      23      4.68592E-01      0.0              0.0              8.28000E-02      22      12
37      11     -2.30016E+00     -1.35060E-04      0.0              8.28000E-02      22      12
37      12      2.30016E+00      8.06708E-04     -1.28617E+00      8.28000E-02      22      12
37      13      2.84477E+00      1.69643E-03     -1.07432E+00      8.28000E-02      22      12
37      14      2.74474E+00      2.42904E-03     -6.88904E-01      8.28000E-02      22      12
37      15      2.37699E+00      2.96715E-03     -2.96502E-01      8.28000E-02      22      12
37      16      1.90052E+00      3.23860E-03      1.14098E-02      8.28000E-02      22      12
37      17      1.39341E+00      3.21294E-03      2.16080E-01      8.28000E-02      22      12
37      18      8.93585E-01      3.13645E-03      3.34551E-01      8.28000E-02      22      12
37      19      4.08803E-01      2.70132E-03      3.93027E-01      8.28000E-02      22      12
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37     20      6.61608E-05      2.00016E-03     4.12683E-01     8.28000E-02      22      12
37     21     -2.82892E-01      1.05805E-03     4.16935E-01     8.28000E-02      22      12
37     22     -4.67549E-01      8.61473E-09     4.19231E-01     8.28000E-02      22      12
37     23      4.67549E-01      0.0             0.0             8.28000E-02      22      12
38     11      0.0             -1.74036E-04     0.0             8.28000E-02      22      12
38     12      0.0              8.86254E-04     0.0             8.28000E-02      22      12
38     13      0.0              1.89810E-03     0.0             8.28000E-02      22      12
38     14      0.0              2.61275E-03     0.0             8.28000E-02      22      12
38     15      0.0              3.19245E-03     0.0             8.28000E-02      22      12
38     16      0.0              3.50009E-03     0.0             8.28000E-02      22      12
38     17      0.0              3.40158E-03     0.0             8.28000E-02      22      12
38     18      0.0              3.42938E-03     0.0             8.28000E-02      22      12
38     19      0.0              2.95625E-03     0.0             8.28000E-02      22      12
38     20      0.0              2.20738E-03     0.0             8.28000E-02      22      12
38     21      0.0              1.17888E-03     0.0             8.28000E-02      22      12
38     22      0.0              5.26876E-02     0.0             8.28000E-02      22      12
38     23      0.0              0.0             0.0             8.28000E-02      22      12

PRESSURE DROP=        0.565016E-03  PSI
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NTYPE=   5
NY=  20
DN=  10.0
ERR=   0.100000
LENGTH(XL)=   0.140000
PITCH(TTY)=   0.042800
TOTAL WIDTH(TTY1)=   0.082800
A=   0.040000
EANG=   0.0

CONVERSION FACTOR FOR TRAJECTORY PLOTTING =          0.571429E+02
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DIA OF DROPLET =       30.00 MICRON

TERMINAL VELOCITY =         0.257621E-01

TRAP  INITIAL POSITION =        0.0       VZ=    0.930863D+00  Z=    0.157323D-01  VY=    0.227445D+00  Y=    0.692218D-03
                                     TIME STEP SIZE=           0.000306

TRAP  INITIAL POSITION =        0.002140  VZ=    0.135741D+01  Z=    0.221947D-01  VY=    0.118846D+01  Y=    0.718655D-02
                                     TIME STEP SIZE=           0.000294

TRAP  INITIAL POSITION =        0.004280  VZ=    0.258649D+01  Z=    0.461496D-01  VY=    0.243963D+01  Y=    0.311268D-01
                                     TIME STEP SIZE=           0.000272

     TPF=        0.020000

TRAP  INITIAL POSITION =        0.027820  VZ=    0.307723D+01  Z=    0.119836D+00  VY=   -0.163925D+01  Y=    0.431656D-01
                                     TIME STEP SIZE=           0.000297

     TPF=       -0.020000

TRAP  INITIAL POSITION =        0.029960  VZ=    0.295118D+01  Z=    0.117379D+00  VY=   -0.170547D+01  Y=    0.456319D-01
                                     TIME STEP SIZE=           0.000260

TRAP  INITIAL POSITION =        0.032100  VZ=    0.272628D+01  Z=    0.115185D+00  VY=   -0.170273D+01  Y=    0.476226D-01
                                     TIME STEP SIZE=           0.000259

TRAP  INITIAL POSITION =        0.034240  VZ=    0.228344D+01  Z=    0.111671D+00  VY=   -0.149873D+01  Y=    0.512309D-01
                                     TIME STEP SIZE=           0.000261

TRAP  INITIAL POSITION =        0.036380  VZ=    0.162098D+01  Z=    0.105378D+00  VY=   -0.107608D+01  Y=    0.574892D-01
                                     TIME STEP SIZE=           0.000289

TRAP  INITIAL POSITION =        0.038520  VZ=    0.712511D+00  Z=    0.934442D-01  VY=   -0.229457D+00  Y=    0.693715D-01
                                     TIME STEP SIZE=           0.000313

TRAP  INITIAL POSITION =        0.040660  VZ=   -0.181978D-02  Z=    0.727154D-01  VY=    0.275907D+00  Y=    0.754430D-01
                                     TIME STEP SIZE=           0.000317

TRAP  INITIAL POSITION =        0.042800  VZ=    0.147746D+01  Z=    0.495295D-03  VY=    0.338128D-02  Y=    0.428005D-01
                                     TIME STEP SIZE=           0.000336
```

```
COLLECTION EFFICIENCY =         0.480000
```

```
DIA OF DROPLET =      40.00 MICRON

TERMINAL VELOCITY =        0.448854E-01

TRAP  INITIAL POSITION =        0.0       VZ=    0.922458D+00  Z=    0.157190D-01  VY=    0.172826D+00  Y=    0.448949D-03
                                      TIME STEP SIZE=          0.000399

TRAP  INITIAL POSITION =        0.002140  VZ=    0.112352D+01  Z=    0.195675D-01  VY=    0.703855D+00  Y=    0.442876D-02
                                      TIME STEP SIZE=          0.000374

TRAP  INITIAL POSITION =        0.004280  VZ=    0.135614D+01  Z=    0.231885D-01  VY=    0.101255D+01  Y=    0.811060D-02
                                      TIME STEP SIZE=          0.000352

TRAP  INITIAL POSITION =        0.006420  VZ=    0.295470D+01  Z=    0.545399D-01  VY=    0.272830D+01  Y=    0.394686D-01
                                      TIME STEP SIZE=          0.000370

     TPF=        0.005000

TRAP  INITIAL POSITION =        0.019260  VZ=    0.280389D+01  Z=    0.119021D+00  VY=   -0.154567D+01  Y=    0.439110D-01
                                      TIME STEP SIZE=          0.000332

     TPF=        0.0

TRAP  INITIAL POSITION =        0.021400  VZ=    0.269325D+01  Z=    0.117359D+00  VY=   -0.160643D+01  Y=    0.457066D-01
                                      TIME STEP SIZE=          0.000307

TRAP  INITIAL POSITION =        0.023540  VZ=    0.269287D+01  Z=    0.117413D+00  VY=   -0.159484D+01  Y=    0.455335D-01
                                      TIME STEP SIZE=          0.000307

TRAP  INITIAL POSITION =        0.025680  VZ=    0.251319D+01  Z=    0.115559D+00  VY=   -0.155089D+01  Y=    0.473227D-01
                                      TIME STEP SIZE=          0.000307

TRAP  INITIAL POSITION =        0.027820  VZ=    0.223245D+01  Z=    0.113026D+00  VY=   -0.141525D+01  Y=    0.500033D-01
                                      TIME STEP SIZE=          0.000306

TRAP  INITIAL POSITION =        0.029960  VZ=    0.199088D+01  Z=    0.110873D+00  VY=   -0.136268D+01  Y=    0.520145D-01
                                      TIME STEP SIZE=          0.000319

TRAP  INITIAL POSITION =        0.032100  VZ=    0.193592D+01  Z=    0.110384D+00  VY=   -0.132388D+01  Y=    0.524581D-01
                                      TIME STEP SIZE=          0.000322

TRAP  INITIAL POSITION =        0.034240  VZ=    0.156823D+01  Z=    0.106394D+00  VY=   -0.107035D+01  Y=    0.565565D-01
```

```
                                  TIME STEP SIZE=        0.000343

TRAP  INITIAL POSITION =        0.036380  VZ=    0.120774D+01  Z=    0.101530D+00  VY=   -0.717322D+00  Y=    0.613431D-01
                                      TIME STEP SIZE=        0.000366

TRAP  INITIAL POSITION =        0.038520  VZ=    0.971794D+00  Z=    0.982026D-01  VY=   -0.534006D+00  Y=    0.646657D-01
                                      TIME STEP SIZE=        0.000361

TRAP  INITIAL POSITION =        0.040660  VZ=    0.359903D-02  Z=    0.817649D-01  VY=    0.126566D+00  Y=    0.810863D-01
                                      TIME STEP SIZE=        0.000444

TRAP  INITIAL POSITION =        0.042800  VZ=    0.145757D+01  Z=    0.631133D-03  VY=    0.254709D-02  Y=    0.428005D-01
                                      TIME STEP SIZE=        0.000433

     COLLECTION EFFICIENCY =        0.750000
```

```
DIA OF DROPLET =      50.00 MICRON

TERMINAL VELOCITY =         0.684637E-01

TRAP  INITIAL POSITION =       0.0       VZ=    0.961004D+00  Z=    0.152415D-01  VY=    0.108688D+00  Y=    0.200130D-03
                                     TIME STEP SIZE=          0.000493

TRAP  INITIAL POSITION =       0.002140  VZ=    0.104475D+01  Z=    0.184278D-01  VY=    0.466656D+00  Y=    0.323353D-02
                                     TIME STEP SIZE=          0.000405

TRAP  INITIAL POSITION =       0.004280  VZ=    0.127213D+01  Z=    0.218034D-01  VY=    0.715085D+00  Y=    0.661729D-02
                                     TIME STEP SIZE=          0.000381

TRAP  INITIAL POSITION =       0.006420  VZ=    0.158815D+01  Z=    0.309820D-01  VY=    0.137452D+01  Y=    0.159815D-01
                                     TIME STEP SIZE=          0.000420

TRAP  INITIAL POSITION =       0.008560  VZ=    0.256580D+01  Z=    0.503952D-01  VY=    0.243041D+01  Y=    0.353874D-01
                                     TIME STEP SIZE=          0.000359

TRAP  INITIAL POSITION =       0.010700  VZ=    0.240459D+01  Z=    0.115316D+00  VY=   -0.133534D+01  Y=    0.475956D-01
                                     TIME STEP SIZE=          0.000357

TRAP  INITIAL POSITION =       0.012840  VZ=    0.241840D+01  Z=    0.116026D+00  VY=   -0.139157D+01  Y=    0.468189D-01
                                     TIME STEP SIZE=          0.000353

TRAP  INITIAL POSITION =       0.014980  VZ=    0.228063D+01  Z=    0.114596D+00  VY=   -0.133786D+01  Y=    0.483360D-01
                                     TIME STEP SIZE=          0.000351

TRAP  INITIAL POSITION =       0.017120  VZ=    0.200763D+01  Z=    0.111744D+00  VY=   -0.115992D+01  Y=    0.512610D-01
                                     TIME STEP SIZE=          0.000367

TRAP  INITIAL POSITION =       0.019260  VZ=    0.179336D+01  Z=    0.108794D+00  VY=   -0.973092D+00  Y=    0.541925D-01
                                     TIME STEP SIZE=          0.000403

TRAP  INITIAL POSITION =       0.021400  VZ=    0.170118D+01  Z=    0.108761D+00  VY=   -0.101825D+01  Y=    0.541528D-01
                                     TIME STEP SIZE=          0.000390

TRAP  INITIAL POSITION =       0.023540  VZ=    0.159101D+01  Z=    0.107362D+00  VY=   -0.954018D+00  Y=    0.555840D-01
                                     TIME STEP SIZE=          0.000400

TRAP  INITIAL POSITION =       0.025680  VZ=    0.145465D+01  Z=    0.105252D+00  VY=   -0.802817D+00  Y=    0.578084D-01
                                     TIME STEP SIZE=          0.000423
```

```
TRAP  INITIAL POSITION =       0.027820  VZ=    0.131141D+01  Z=    0.102513D+00  VY=   -0.643632D+00  Y=    0.603031D-01
                                        TIME STEP SIZE=       0.000400

TRAP  INITIAL POSITION =       0.029960  VZ=    0.122710D+01  Z=    0.102683D+00  VY=   -0.715484D+00  Y=    0.601529D-01
                                        TIME STEP SIZE=       0.000411

TRAP  INITIAL POSITION =       0.032100  VZ=    0.113877D+01  Z=    0.101450D+00  VY=   -0.603430D+00  Y=    0.615759D-01
                                        TIME STEP SIZE=       0.000431

TRAP  INITIAL POSITION =       0.034240  VZ=    0.105089D+01  Z=    0.999908D-01  VY=   -0.546599D+00  Y=    0.630140D-01
                                        TIME STEP SIZE=       0.000438

TRAP  INITIAL POSITION =       0.036380  VZ=    0.887635D+00  Z=    0.976981D-01  VY=   -0.408361D+00  Y=    0.651900D-01
                                        TIME STEP SIZE=       0.000411

TRAP  INITIAL POSITION =       0.038520  VZ=    0.802864D+00  Z=    0.967441D-01  VY=   -0.362544D+00  Y=    0.662018D-01
                                        TIME STEP SIZE=       0.000446

TRAP  INITIAL POSITION =       0.040660  VZ=    0.498306D+00  Z=    0.919647D-01  VY=   -0.140171D+00  Y=    0.709757D-01
                                        TIME STEP SIZE=       0.000472

TRAP  INITIAL POSITION =       0.042800  VZ=    0.143352D+01  Z=    0.747612D-03  VY=    0.202987D-02  Y=    0.428005D-01
                                        TIME STEP SIZE=       0.000522

    COLLECTION EFFICIENCY =        1.000000
```

```
DIA OF DROPLET =      60.00 MICRON

TERMINAL VELOCITY =        0.959484E-01

TRAP  INITIAL POSITION =       0.0       VZ=    0.101432D+01  Z=    0.153415D-01  VY=    0.824107D-01  Y=    0.146319D-03
                                     TIME STEP SIZE=         0.000567

TRAP  INITIAL POSITION =       0.002140  VZ=    0.103643D+01  Z=    0.176723D-01  VY=    0.280344D+00  Y=    0.266328D-02
                                     TIME STEP SIZE=         0.000437

TRAP  INITIAL POSITION =       0.004280  VZ=    0.123331D+01  Z=    0.205875D-01  VY=    0.477927D+00  Y=    0.553907D-02
                                     TIME STEP SIZE=         0.000407

TRAP  INITIAL POSITION =       0.006420  VZ=    0.138198D+01  Z=    0.266763D-01  VY=    0.946744D+00  Y=    0.115884D-01
                                     TIME STEP SIZE=         0.000444

TRAP  INITIAL POSITION =       0.008560  VZ=    0.162916D+01  Z=    0.336928D-01  VY=    0.132627D+01  Y=    0.186374D-01
                                     TIME STEP SIZE=         0.000446

TRAP  INITIAL POSITION =       0.010700  VZ=    0.237378D+01  Z=    0.497877D-01  VY=    0.218332D+01  Y=    0.347164D-01
                                     TIME STEP SIZE=         0.000395

TRAP  INITIAL POSITION =       0.012840  VZ=    0.181183D+01  Z=    0.108142D+00  VY=   -0.728221D+00  Y=    0.546997D-01
                                     TIME STEP SIZE=         0.000437

TRAP  INITIAL POSITION =       0.014980  VZ=    0.175592D+01  Z=    0.106551D+00  VY=   -0.625909D+00  Y=    0.566754D-01
                                     TIME STEP SIZE=         0.000411

TRAP  INITIAL POSITION =       0.017120  VZ=    0.173562D+01  Z=    0.105507D+00  VY=   -0.523906D+00  Y=    0.575451D-01
                                     TIME STEP SIZE=         0.000449

TRAP  INITIAL POSITION =       0.019260  VZ=    0.153860D+01  Z=    0.103856D+00  VY=   -0.487603D+00  Y=    0.590139D-01
                                     TIME STEP SIZE=         0.000444

TRAP  INITIAL POSITION =       0.021400  VZ=    0.148936D+01  Z=    0.102874D+00  VY=   -0.423820D+00  Y=    0.601468D-01
                                     TIME STEP SIZE=         0.000428

TRAP  INITIAL POSITION =       0.023540  VZ=    0.143142D+01  Z=    0.101781D+00  VY=   -0.334216D+00  Y=    0.614944D-01
                                     TIME STEP SIZE=         0.000472

TRAP  INITIAL POSITION =       0.025680  VZ=    0.137511D+01  Z=    0.100480D+00  VY=   -0.279696D+00  Y=    0.626422D-01
                                     TIME STEP SIZE=         0.000464
```

```
TRAP  INITIAL POSITION =        0.027820  VZ=    0.123032D+01  Z=    0.993443D-01  VY=   -0.259174D+00  Y=     0.635359D-01
                                         TIME STEP SIZE=        0.000458

TRAP  INITIAL POSITION =        0.029960  VZ=    0.115333D+01  Z=    0.987884D-01  VY=   -0.245750D+00  Y=     0.641873D-01
                                         TIME STEP SIZE=        0.000452

TRAP  INITIAL POSITION =        0.032100  VZ=    0.107653D+01  Z=    0.977277D-01  VY=   -0.183802D+00  Y=     0.652494D-01
                                         TIME STEP SIZE=        0.000511

TRAP  INITIAL POSITION =        0.034240  VZ=    0.101981D+01  Z=    0.967494D-01  VY=   -0.144886D+00  Y=     0.663295D-01
                                         TIME STEP SIZE=        0.000506

TRAP  INITIAL POSITION =        0.036380  VZ=    0.915350D+00  Z=    0.955682D-01  VY=   -0.112762D+00  Y=     0.675191D-01
                                         TIME STEP SIZE=        0.000496

TRAP  INITIAL POSITION =        0.038520  VZ=    0.825377D+00  Z=    0.947505D-01  VY=   -0.105998D+00  Y=     0.681902D-01
                                         TIME STEP SIZE=        0.000489

TRAP  INITIAL POSITION =        0.040660  VZ=    0.615086D+00  Z=    0.921475D-01  VY=   -0.131491D-01  Y=     0.707326D-01
                                         TIME STEP SIZE=        0.000559

TRAP  INITIAL POSITION =        0.042800  VZ=    0.140572D+01  Z=    0.844104D-03  VY=    0.167779D-02  Y=     0.428004D-01
                                         TIME STEP SIZE=        0.000601

     COLLECTION EFFICIENCY =        1.000000
```

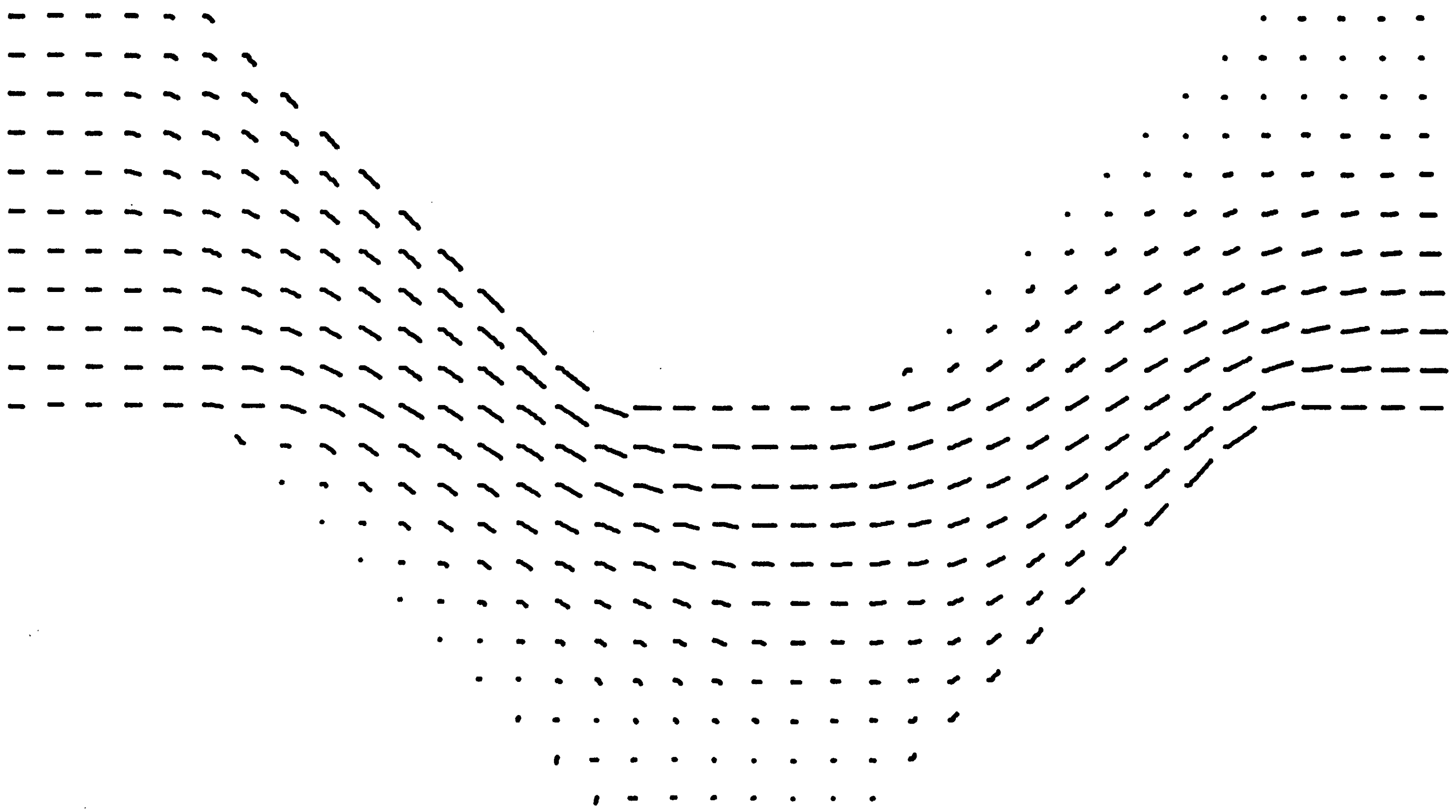

Fig. B.1 Velocity Distribution of Air Flow for the Sample Problem at Cycle 20

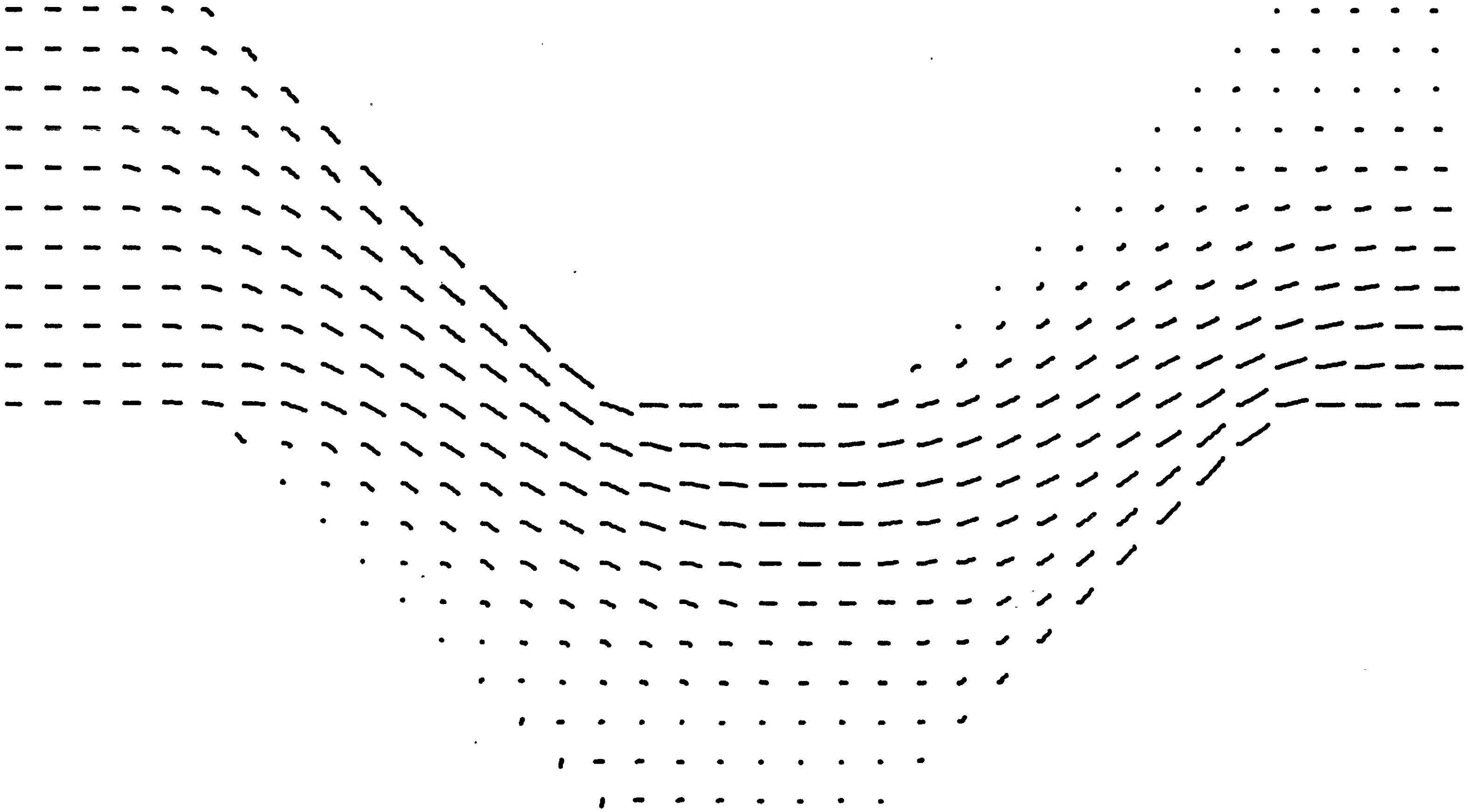

Fig. B.2 Velocity Distribution of Air Flow for the Sample Problem at Cycle 40

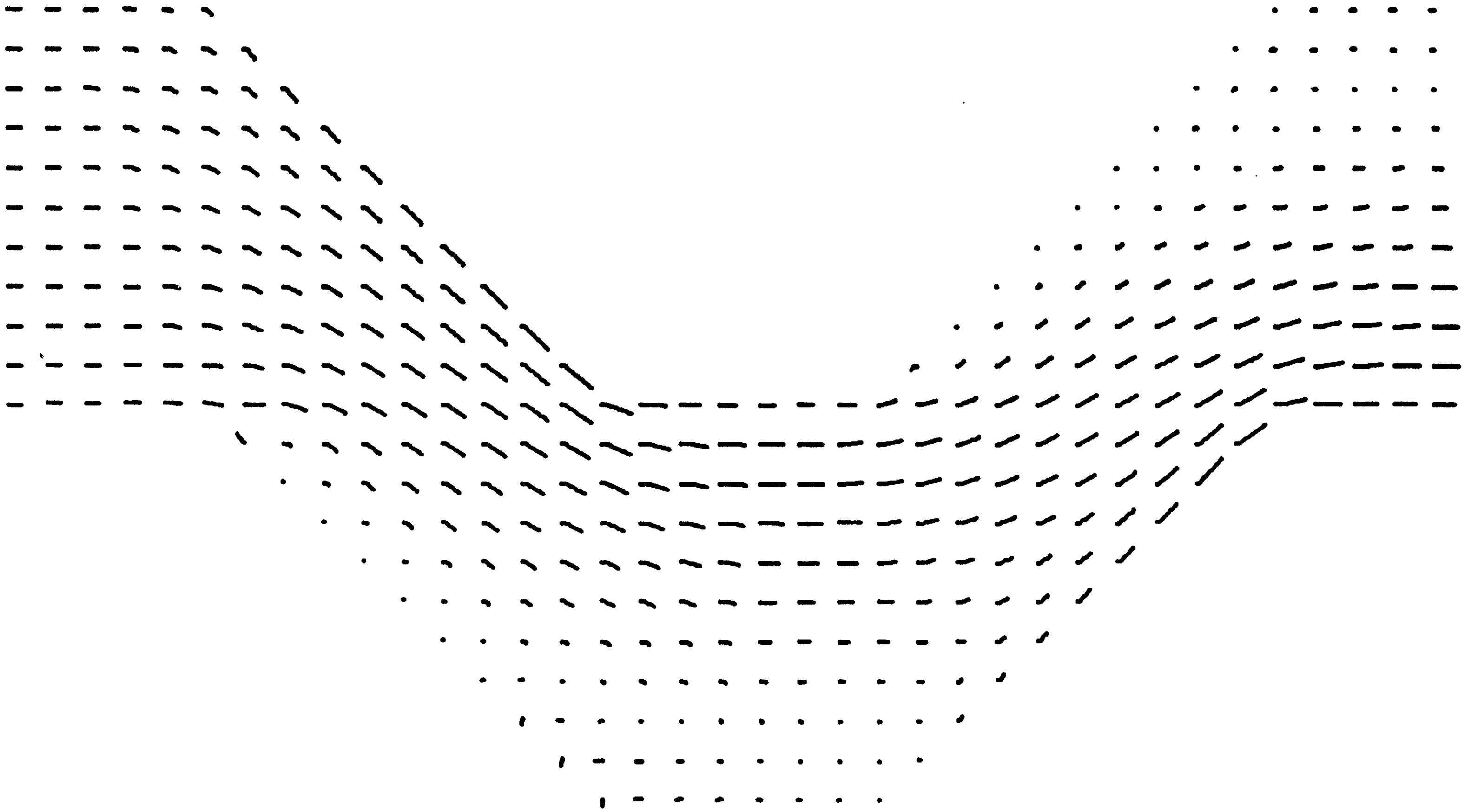

Fig. B.3 Velocity Distribution of Air Flow for the Sample Problem at Cycle 60

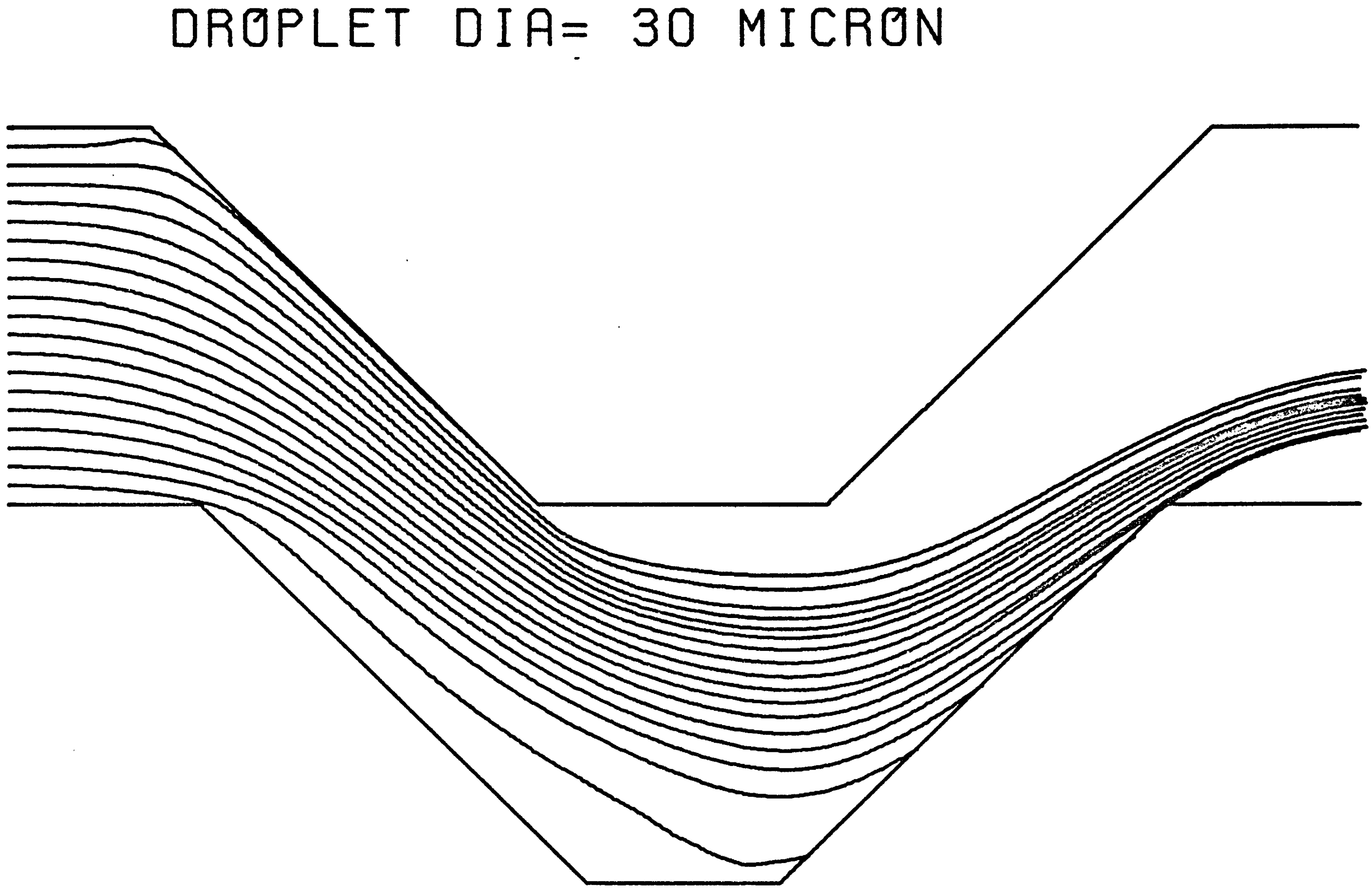

Fig. B.4 Droplet Trajectory Plot for the Sample Problem

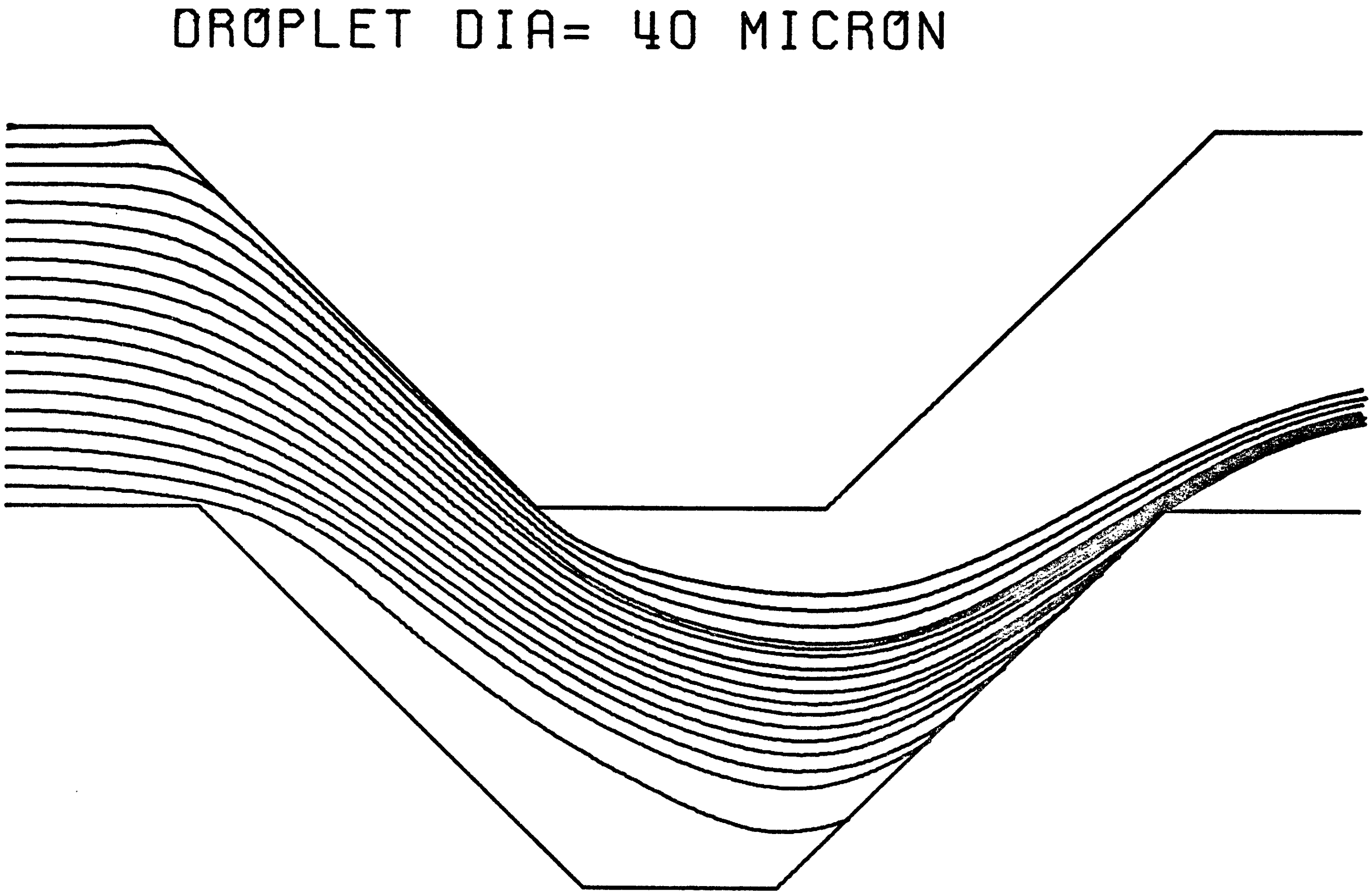

Fig. B.5 Droplet Trajectory Plot for the Sample Problem

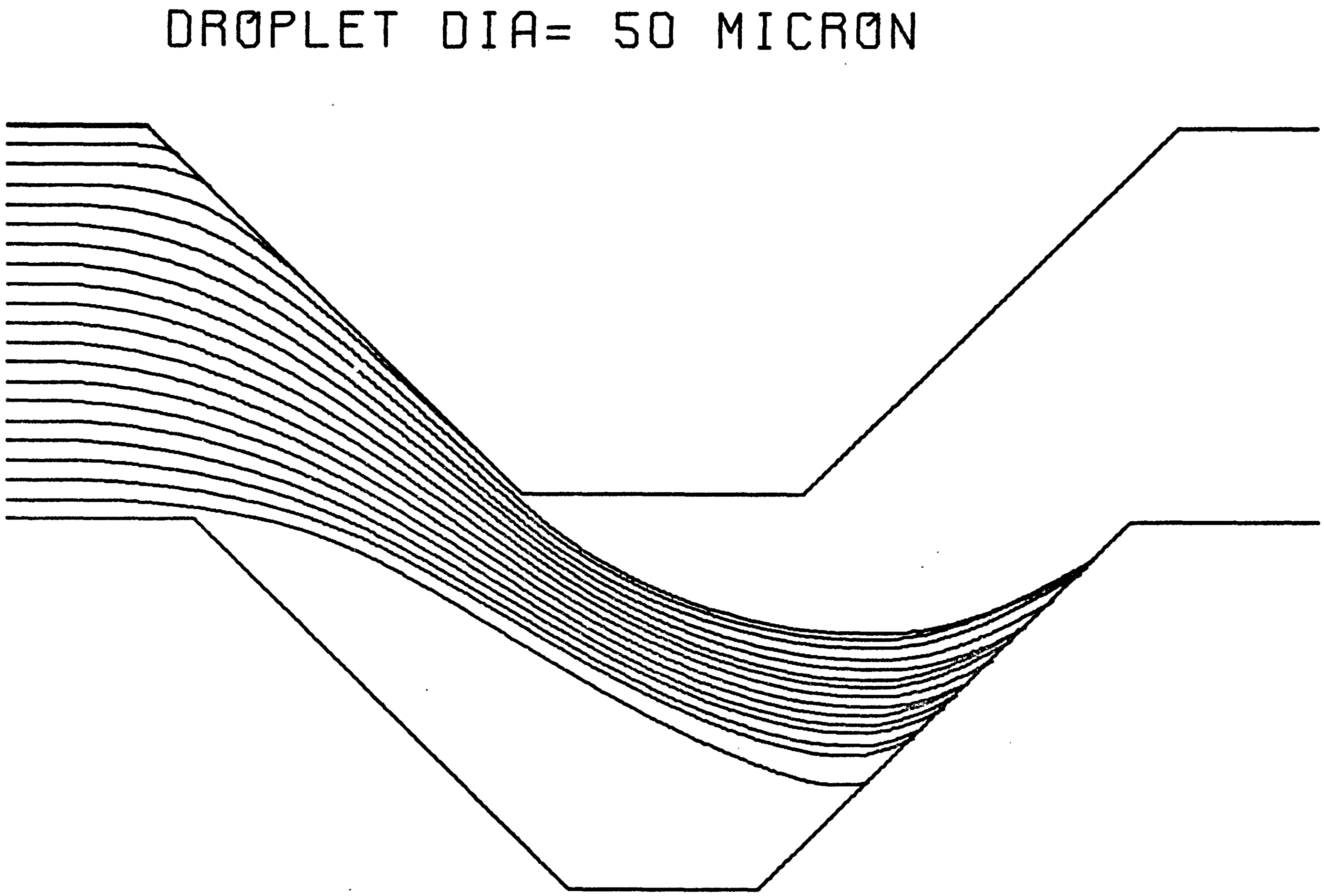

Fig. B.6 Droplet Trajectory Plot for the Sample Problem

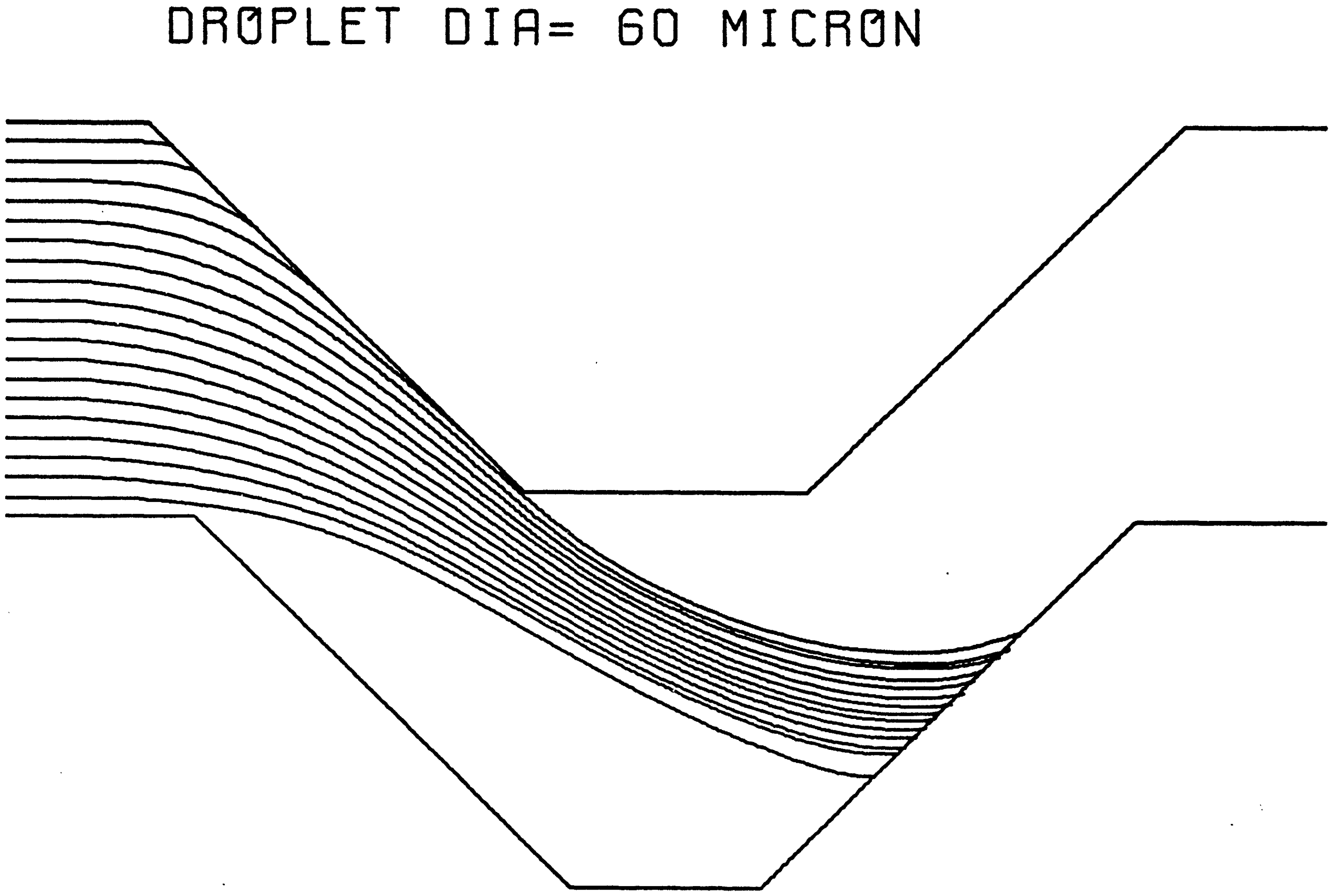

Fig. B.7 Droplet Trajectory Plot for the Sample Problem