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A study of turbulent diffusion in the lower atmosphere using artificially produced electric space charge

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BIVANEPROG

```
0001      1      FORMAT(I2,3F10.5)
0002      2      FORMAT(12I5)
0003      3      FORMAT(9F12.3)
0004      5      FORMAT('1 DATA ANALYSIS')
0005      WRITE(6,5)
0006      7      FORMAT(3F10.3)
0007      8      FORMAT('MEAN COMPONENTS WRT EXPT FRAME')
0008      9      FORMAT('DOWNWIND VECTOR')
0009     10      FORMAT('TAU,USTAR,UDSHBR,VDSHBR,WDSHBR')
0010     11      FORMAT('1AUTOCOV UDASH,VDASH,WDASH')
0011     12      FORMAT(I5,3E12.3)
0012     13      FORMAT('1AUTOCOR UDASH,VDASH,WDASH')
0013     14      FORMAT('1ELEV,AZI,WSPD,ML,ML,UDASH,VDASH,WDASH,IC/ML')
0014     15      FORMAT('1XCOR UV,UW,VW')
0015     16      FORMAT(I5,6E12.3)
0016     17      FORMAT(8A4)
0017     18      FORMAT(2F10.3)
0018     19      FORMAT('ODT')
0019     20      FORMAT(3F15.2)
0020     21      FORMAT(4F10.1)
0021     22      FORMAT(4F15.1)
0022     23      FORMAT('1 AUTOCOV FM+TFM')
0023     24      FORMAT('1 XCOR FM1/TFM1,FM2/TFM2')
0024     25      FORMAT(I5,4E15.3)
0025      DIMENSION X(100),Y(100),Z(100)
0026      DIMENSION XX1(1000),XX2(1000),XX3(1000),XX4(1000),XX5(1000)
0027      DIMENSION XX6(1000)
0028      DIMENSION DATIME(8)
0029      DIMENSION R1(100),R2(100),R3(100),R4(100),R5(100),R6(100)
0030      DIMENSION R7(100),R8(100),R9(100)
0031      DIMENSION VDASH(1000),UWDASH(1000),XXX(100),YYY(100),ZZZ(100)
0032      DIMENSION DOWNU(1000),CROSSU(1000),VERTU(1000),UDASH(1000)
0033      DIMENSION E(1000),A(1000),U(1000),FM1(1000),FM2(1000),DU(500)
0034      DIMENSION X1(100),X2(100),Y1(100),Y2(100)
0035      DIMENSION SINFI1(100),SINFI2(100),TFM1(1000),TFM2(1000)
0036      DIMENSION FFM1(1000),FFM2(1000),FTFM1(1000),FTFM2(1000)
0037      DIMENSION XP(100),YP(100),ZP(100)
0038      RHO=1.293
0039      PI=3.142
0040      S1=0.
0041      S2=0.
0042      S3=0.
0043      UW=0.
0044      UDSHBR=0.
0045      VDSHBR=0.
0046      CURR=3.0E-07
0047      EPSLON=8.854E-12
0048      READ(5,17) DATIME
0049      WRITE(6,17) DATIME
0050      WRITE(8,17) DATIME
0051      READ(5,18) RUNTIM,H
0052      WRITE(6,18) RUNTIM,H
0053      READ(5,21) RRR1,RRR2,ALFA1,ALFA2
0054      WRITE(6,21) RRR1,RRR2,ALFA1,ALFA2
0055      ALFA1=ALFA1*PI/180.
```

```
0056      ALFA2=ALFA2*PI/180.
0057      XM1=RRR1*COS(ALFA1)
0058      YM1=RRR1*SIN(ALFA1)
0059      XM2=RRR2*COS(ALFA2)
0060      YM2=RRR2*SIN(ALFA2)
0061      READ(5,1)I1,A1,B1,C1
0062      READ(5,1)I2,A2,B2,C2
0063      READ(5,1)I3,A3,B3,C3
0064      READ(5,1)I4,A4,B4,C4
0065      READ(5,1)I5,A5,B5,C5
0066      READ(5,1)I6,A6,B6,C6
0067      J=999
0068      K=500
0069      N=0
0070      130 READ(5,2)M,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,I11
0071          IF(M-9999)I31,I32,I31
0072      131 N=N+1
0073          COMP=703./FLOAT(M)
0074          I1=IFIX(FLOAT(I1)*COMP)
0075          I2=IFIX(FLOAT(I2)*COMP)
0076          I3=IFIX(FLOAT(I3)*COMP)
0077          I4=IFIX(FLOAT(I4)*COMP)
0078          I5=IFIX(FLOAT(I5)*COMP)
0079          I6=IFIX(FLOAT(I6)*COMP)
0080          I7=IFIX(FLOAT(I7)*COMP)
0081          I8=IFIX(FLOAT(I8)*COMP)
0082          I9=IFIX(FLOAT(I9)*COMP)
0083          I10=IFIX(FLOAT(I10)*COMP)
0084          I11=IFIX(FLOAT(I11)*COMP)
0085          E(J)=(A1*FLOAT(I5)+B1)*C1
0086          E(J+1)=(A1*FLOAT(I11)+B1)*C1
0087          A(J)=(A2*FLOAT(I4)+B2)*C2
0088          A(J+1)=(A2*FLOAT(I10)+B2)*C2
0089          FM1(J)=(A3*FLOAT(I3)+B3)*C3
0090          FM1(J+1)=(A3*FLOAT(I9)+B3)*C3
0091          FM2(J)=(A4*FLOAT(I2)+B4)*C4
0092          FM2(J+1)=(A4*FLOAT(I8)+B4)*C4
0093          U(J)=(A5*FLOAT(I1)+B5)*C5
0094          U(J+1)=(A5*FLOAT(I7)+B5)*C5
0095          DU(K)=(A6*FLOAT(I6)+B6)*C6
0096          J=J-2
0097          K=K-1
0098          GO TO 130
0099      132 J=J+2
0100          K=K+1
0101          DO 140 JN=1,NN
0102              E(JN)=E(J)
0103              A(JN)=A(J)
0104              FM1(JN)=FM1(J)
0105              FM2(JN)=FM2(J)
0106              U(JN)=U(J)
0107      140 J=J+1
0108          DO 141 KN=1,N
0109              DU(KN)=DU(K)
0110      141 K=K+1
```

```
0111      L=NN/10
0112      FNN=FLOAT(NN)
0113      I MAX=NN
0114      DO 160 J=1,NN
0115      DOWNU(J)=U(J)*(COS(A(J)*PI/180.))
0116      CROSSU(J)=U(J)*(SIN(A(J)*PI/180.))
0117      VERTU(J)=U(J)*(SIN(E(J)*PI/180.))
0118      S1=S1+DOWNU(J)
0119      S2=S2+CROSSU(J)
0120      160  S3=S3+VERTU(J)
0121      S1=S1/FNN
0122      S2=S2/FNN
0123      S3=S3/FNN
0124      WRITE(6,8)
0125      WRITE(6,7) S1,S2,S3
0126      UBAR=SQRT(S1**2+S2**2)
0127      AVECT=(180./PI)*(ATAN(S2/S1))
0128      WRITE(6,9)
0129      WRITE(6,7) UBAR,AVECT
0130      DO 170 J=1,NN
0131      UDASH(J)=(U(J)*(COS((A(J)-AVECT)*(PI/180.))))-UBAR
0132      UDSHBR=UDSHBR+UDASH(J)
0133      VDASH(J)=(U(J)*(SIN((A(J)-AVECT)*(PI/180.))))
0134      VDSHBR=VDSHBR+VDASH(J)
0135      UWDASH(J)=UDASH(J)*VERTU(J)
0136      170  UW=UW+UWDASH(J)
0137      UWBAR=UW/FNN
0138      UDSHBR=UDSHBR/FNN
0139      VDSHBR=VDSHBR/FNN
0140      TAU=-RHO*UWBAR
0141      IF(UWBAR)200,200,201
0142      200  UWBAR=-UWBAR
0143      201  USTAR=SQRT(UWBAR)
0144      WRITE(6,10)
0145      WRITE(6,3) TAU,USTAR,UDSHBR,VDSHBR,S3
0146      WRITE(6,14)
0147      J=1
0148      K=1
0149      149  WRITE(6,3) E(J),A(J),U(J),FM1(J),FM2(J),UDASH(J),VDASH(J),VERTU(J)
           1,DU(K)
0150      J=J+1
0151      WRITE(6,3) E(J),A(J),U(J),FM1(J),FM2(J),UDASH(J),VDASH(J),VERTU(J)
0152      J=J+1
0153      K=K+1
0154      IF(N-K)150,149,149
0155      150  CONTINUE
0156      CALL AUTO(UDASH,NN,L,R1)
0157      CALL AUTO(VERTU,NN,L,R2)
0158      CALL AUTO(VDASH,NN,L,R3)
0159      WRITE(6,11)
0160      WRITE(6,12)(J,R1(J),R3(J),R2(J),J=1,L)
0161      RR1=R1(1)
0162      RR2=R2(1)
0163      RR3=R3(1)
0164      DO 180 J=1,L
```

```
0165      R1(J)=R1(J)/RR1
0166      R2(J)=R2(J)/RR2
0167      180  R3(J)=R3(J)/RR3
0168      WRITE(6,13)
0169      WRITE(6,12)(J,R1(J),R3(J),R2(J),J=1,L)
0170      CALL CROSS(UDASH,VDASH,NN,L,R4,R5)
0171      CALL CROSS(UDASH,VERTU,NN,L,R6,R7)
0172      CALL CROSS(VDASH,VERTU,NN,L,R8,R9)
0173      DO 300 J=1,L
0174      R4(J)=R4(J)/SQRT(RR1*RR3)
0175      R5(J)=R5(J)/SQRT(RR1*RR3)
0176      R6(J)=R6(J)/SQRT(RR1*RR2)
0177      R7(J)=R7(J)/SQRT(RR1*RR2)
0178      R8(J)=R8(J)/SQRT(RR2*RR3)
0179      R9(J)=R9(J)/SQRT(RR2*RR3)
0180      300  CONTINUE
0181      WRITE(6,15)
0182      WRITE(6,16)(J,R4(J),R5(J),R6(J),R7(J),R8(J),R9(J),J=1,L)
0183      DT=(RUNTIM*60.)/FNN
0184      WRITE(6,19)
0185      WRITE(6,7) DT
0186      WRITE(8,7) DT
0187      Q=CURR*DT
0188      I=1
0189      508  T=DT*(FLOAT(I))
0190      FLDL1=0.
0191      FLDL2=0.
0192      II=1
0193      502  JJ=I-II+1
0194      IF(JJ)500,500,501
0195      501  X(II)=U(JJ)*FLOAT(II)*DT*COS(A(JJ)*PI/180.)
0196      Y(II)=X(II)*(TAN(A(JJ)*(PI/180.)))
0197      Z(II)=H+(X(II)*(TAN(E(JJ)*(PI/180.))))
0198      IF(Z(II)-0.2)510,510,511
0199      510  Z(II)=0.2
0200      511  IF(X(II)-50.)503,503,500
0201      503  II=II+1
0202      GO TO 502
0203      500  CONTINUE
0204      MM=II+1
0205      DO 600 J=2,MM
0206      XXX(J)=X(J-1)
0207      YYY(J)=Y(J-1)
0208      600  ZZZ(J)=Z(J-1)
0209      X(1)=0.
0210      Y(1)=0.
0211      Z(1)=H
0212      DO 602 J=2,MM
0213      X(J)=XXX(J)
0214      Y(J)=YYY(J)
0215      602  Z(J)=ZZZ(J)
0216      DO 2000 J=1,MM
0217      XP(J)=X(J)
0218      YP(J)=Y(J)
0219      2000 ZP(J)=Z(J)
```

```
0220      DO 2010 J=1,MM
0221      IF(YP(J)-10.)2001,2001,2002
0222      2002 YP(J)=10.
0223      2001 IF(YP(J)+10.)2003,2003,2004
0224      2003 YP(J)=-10.
0225      2004 IF(ZP(J)-20.)2005,2005,2006
0226      2006 ZP(J)=20.
0227      2005 CONTINUE
0228      2010 CONTINUE
0229      WRITE(8) I,MM,(XP(J),YP(J),ZP(J),J=1,MM)
0230      DO 601 J=1,II
0231      X1(J)=X(J)+((X(J+1)-X(J))/2.)-XM1
0232      X2(J)=X1(J)+XM1-XM2
0233      Y1(J)=Y(J)+((Y(J+1)-Y(J))/2.)-YM1
0234      Y2(J)=Y1(J)+YM1-YM2
0235      R1(J)=SQRT(X1(J)**2+Y1(J)**2+Z(J)**2)
0236      R2(J)=SQRT(X2(J)**2+Y2(J)**2+Z(J)**2)
0237      SINFI1(J)=Z(J)/R1(J)
0238      SINFI2(J)=Z(J)/R2(J)
0239      R1(J)=R1(J)**2
0240      R2(J)=R2(J)**2
0241      IF(R1(J)-1.)1000,1000,1001
0242      1000 R1(J)=1.
0243      1001 IF(R2(J)-1.)1002,1002,1003
0244      1002 R2(J)=1.
0245      1003 FLDL1=FLDL1+(Q*SINFI1(J))/(2.*PI*EPSLON*R1(J))
0246      FLDL2=FLDL2+(Q*SINFI2(J))/(2.*PI*EPSLON*R2(J))
0247      601 CONTINUE
0248      TFM1(I)=FLDL1
0249      TFM2(I)=FLDL2
0250      I=I+1
0251      IF(I-IMAX)508,508,509
0252      509 CONTINUE
0253      NN1=NN-1
0254      DO 1100 J=2,NN1
0255      FFM1(J)=0.25*FM1(J-1)+0.5*FM1(J)+0.25*FM1(J+1)
0256      FFM2(J)=0.25*FM2(J-1)+0.5*FM2(J)+0.25*FM2(J+1)
0257      FTFM1(J)=0.25*TFM1(J-1)+0.5*TFM1(J)+0.25*TFM1(J+1)
0258      FTFM2(J)=0.25*TFM2(J-1)+0.5*TFM2(J)+0.25*TFM2(J+1)
0259      1100 CONTINUE
0260      DO 1101 J=2,NN1
0261      FM1(J)=FFM1(J)
0262      FM2(J)=FFM2(J)
0263      TFM1(J)=FTFM1(J)
0264      TFM2(J)=FTFM2(J)
0265      1101 CONTINUE
0266      CALL AUTO(FM1,NN,L,R1)
0267      CALL AUTO(TFM1,NN,L,R2)
0268      CALL AUTO(FM2,NN,L,R3)
0269      CALL AUTO(TFM2,NN,L,R4)
0270      WRITE(6,23)
0271      WRITE(6,25) (J,R1(J),R2(J),R3(J),R4(J),J=1,L)
0272      RR1=R1(1)
0273      RR2=R2(1)
0274      RR3=R3(1)
```

```
0275      RR4=R4(1)
0276      CALL CROSS(FM1,TFM1,NN,L,R5,R6)
0277      CALL CROSS(FM2,TFM2,NN,L,R7,R8)
0278      DO 700 J=1,L
0279      R5(J)=R5(J)/SQRT(RR1*RR2)
0280      R6(J)=R6(J)/SQRT(RR1*RR2)
0281      R7(J)=R7(J)/SQRT(RR3*RR4)
0282      R8(J)=R8(J)/SQRT(RR3*RR4)
0283      700 CONTINUE
0284      WRITE(6,24)
0285      WRITE(6,25) (J,R5(J),R6(J),R7(J),R8(J),J=1,L)
0286      DO 710 L=1,NN
0287      710 XX1(L)=(FLOAT(L-1))*DT
0288      FMMX1=1.
0289      DO 711 I=1,NN
0290      802 IF(FM1(I)-FMMX1)800,800,801
0291      801 FMMX1=FMMX1*1.1
0292      GO TO 802
0293      800 CONTINUE
0294      805 IF(TFM1(I)-FMMX1)803,803,804
0295      804 FMMX1=FMMX1*1.1
0296      GO TO 805
0297      803 CONTINUE
0298      711 CONTINUE
0299      FMMX2=1.
0300      DO 712 I=1,NN
0301      902 IF(FM2(I)-FMMX2)900,900,901
0302      901 FMMX2=FMMX2*1.1
0303      GO TO 902
0304      900 CONTINUE
0305      905 IF(TFM2(I)-FMMX2)903,903,904
0306      904 FMMX2=FMMX2*1.1
0307      GO TO 905
0308      903 CONTINUE
0309      712 CONTINUE
0310      DO 713 I=1,NN
0311      FM1(I)=FM1(I)/FMMX1
0312      TFM1(I)=TFM1(I)/FMMX1
0313      FM2(I)=FM2(I)/FMMX2
0314      713 TFM2(I)=TFM2(I)/FMMX2
0315      AXLTH=(FNN*DT)/10.0
0316      XPOS=0.5
0317      XPOS2=XPOS+AXLTH+2.0
0318      XPOS3=XPOS+0.5
0319      CALL PLTXMX(150.)
0320      CALL PAXIS(XPOS,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,10.0,1.0)
0321      CALL PAXIS(XPOS,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0322      CALL PSYMB(XPOS3,1.0,-0.1,DATIME,0.0,32)
0323      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS,0.5)
0324      CALL PLINE(XX1,FM1,NN,1,4,0,1.0)
0325      CALL PLINE(XX1,TFM1,NN,1,4,1,1.0)
0326      CALL PAXIS(XPOS2,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,10.0,1.0)
0327      CALL PAXIS(XPOS2,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0328      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS2,0.5)
0329      CALL PLINE(XX1,FM2,NN,1,4,2,1.0)
```

0330 CALL PLINE (XX1,TFM2,NN,1,4,3,1.0)
0331 CALL PLTEND
0332 STOP
0333 END

TOTAL MEMCRY REQUIREMENTS 01BCD8 BYTES
EXECUTION TERMINATED

DATA PROG

```
0001      6 FORMAT(I5,3F15.5)
0002      7 FORMAT(12I5)
0003      9 FORMAT('OACTUAL VALUES')
0004     10 FORMAT(I4,4F9.1,3F7.2,4F9.1)
0005     11 FORMAT('1 MEANS,STD.DEV.AND COEFF.VAR')
0006     12 FORMAT(F10.2,4F10.1,2F10.2,4F10.1)
0007     13 FORMAT('ORI')
0008     14 FORMAT(1F11.3)
0009     15 FORMAT('OST')
0010     16 FORMAT('1AUTOCOV,FM1,FM2,FM3,FM4')
0011     17 FORMAT(I4,4E15.3)
0012     18 FORMAT('1AUTOCOV,U,DU,DT')
0013     20 FORMAT('1AUTO-DERIVED STD DEV')
0014     22 FORMAT('1XCOR,FM1/FM2,FM1/FM3,FM1/FM4')
0015     23 FORMAT(I4,6E15.3)
0016     24 FORMAT('1XCOR,FM2/FM3,FM2/FM4,FM3/FM4')
0017     26 FORMAT('1XCOR,FM1/U,FM1/DU,FM1/DT')
0018     27 FORMAT('1XCOR,FM2/U,FM2/DU,FM2/DT')
0019     28 FORMAT('1XCOR,FM3/U,FM3/DU,FM3/DT')
0020     29 FORMAT('1XCOR,FM4/U,FM4/DU,FM4/DT')
0021     30 FORMAT('1XCOR,U/DU,U/DT,DU/DT')
0022     32 FORMAT(I4,3E15.3)
0023     33 FORMAT('1AUTOLENGTH')
0024     34 FORMAT(7F10.2)
0025     40 FORMAT(11F10.3)
0026     49 FORMAT('RUNTIM')
0027     50 FORMAT(1F10.1)
0028     51 FORMAT(4A4)
0029     53 FORMAT(I1)
0030     60 FORMAT('1DATA ANALYSIS')
0031     DIMENSION DATIME(4)
0032     DIMENSION FM1(1000),FM2(1000),FM3(1000),FM4(1000)
0033     DIMENSION U(1000),DU(1000),DT(1000)
0034     DIMENSION R1(200),R2(200),R3(200),R4(200),R5(200),R6(200),R7(200)
0035     DIMENSION R101(200),R102(200),R103(200),R104(200),R105(200)
0036     DIMENSION R106(200),R107(200),R108(200),R109(200),R110(200)
0037     DIMENSION R111(200),R112(200)
0038     DIMENSION R200(200),R201(200),R202(200),R203(200),R204(200)
0039     DIMENSION R205(200)
0040     DIMENSION R210(200),R211(200),R212(200),R213(200),R214(200)
0041     DIMENSION R215(200)
0042     DIMENSION R220(200),R221(200),R222(200),R223(200),R224(200)
0043     DIMENSION R225(200)
0044     DIMENSION R230(200),R231(200),R232(200),R233(200),R234(200)
0045     DIMENSION R235(200)
0046     DIMENSION R300(200),R301(200),R302(200),R303(200),R304(200)
0047     DIMENSION R305(200)
0048     DIMENSION FMS1(1000),FMS2(1000),FMS3(1000),FMS4(1000)
0049     DIMENSION X1(200),X2(200)
0050     DIMENSION XX1(1000),XX2(1000),XX3(1000),XX4(1000)
0051     DIMENSION XX5(1000),XX6(1000),XX7(1000)
0052     DIMENSION R102R(200),R104R(200),R106R(200)
0053     DIMENSION R108R(200),R110R(200),R112R(200)
0054     WRITE(4,60)
0055     READ(5,51) DATIME
```

```
0056      WRITE(4,51) DATIME
0057      READ(5,50) RUNTIM
0058      WRITE(4,49)
0059      WRITE(4,50) RUNTIM
0060      RUNTIM=60.0*RUNTIM
0061      READ(5,53) IDT
0062      WRITE(4,9)
0063      J=0
0064      100  READ(5,6)I,A,B,C
0065          J=J+1
0066          GO TO(101,102,103,104,105,106,107,108,109,110,111),I
0067      101  A1=A
0068          B1=B
0069          C1=C
0070          GO TO 100
0071      102  A2=A
0072          B2=B
0073          C2=C
0074          GO TO 100
0075      103  A3=A
0076          B3=B
0077          C3=C
0078          GO TO 100
0079      104  A4=A
0080          B4=B
0081          C4=C
0082          GO TO 100
0083      105  A5=A
0084          B5=B
0085          C5=C
0086          GO TO 100
0087      106  A6=A
0088          B6=B
0089          C6=C
0090          GO TO 100
0091      107  A7=A
0092          B7=B
0093          C7=C
0094          GO TO 100
0095      108  A8=A
0096          B8=B
0097          C8=C
0098          GO TO 100
0099      109  A9=A
0100          B9=B
0101          C9=C
0102          GO TO 100
0103      110  A10=A
0104          B10=B
0105          C10=C
0106          GO TO 100
0107      111  A11=A
0108          B11=B
0109          C11=C
0110          IF(J-11)126,120,126
```

```
0111      126  STOP
0112      120  CONTINUE
0113          J=999
0114          K=500
0115          NFND=0
0116      130  READ(5,7)M,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,I11
0117          IF(M-9999)131,132,131
0118      131  NFND=NFND+1
0119          COMP=703.0/FLOAT(M)
0120          U(K)=(A1*FLOAT(I1)+B1)*C1
0121          U(K)=U(K)*COMP
0122          DU(K)=(A6*FLOAT(I6)+B6)*C6
0123          DU(K)=DU(K)*COMP
0124          IF(1-IDT)600,601,600
0125      601  DT(K)=(A7*FLOAT(I7)+B7)*C7
0126          GO TO 602
0127      600  DT(K)=- (A7*FLOAT(I7)+B7)*C7
0128      602  CONTINUE
0129          DT(K)=DT(K)*COMP
0130          FM1(J)=(A2*FLOAT(I11)+B2)*C2
0131          FM1(J)=FM1(J)*CCMP
0132          FM1(J+1)=(A8*FLOAT(I5)+B8)*C8
0133          FM1(J+1)=FM1(J+1)*CCMP
0134          FM2(J)=(A3*FLOAT(I10)+B3)*C3
0135          FM2(J)=FM2(J)*COMP
0136          FM2(J+1)=(A9*FLOAT(I4)+B9)*C9
0137          FM2(J+1)=FM2(J+1)*CCMP
0138          FM3(J)=(A4*FLOAT(I9)+B4)*C4
0139          FM3(J)=FM3(J)*COMP
0140          FM3(J+1)=(A10*FLOAT(I3)+B10)*C10
0141          FM3(J+1)=FM3(J+1)*CCMP
0142          FM4(J)=(A5*FLOAT(I8)+B5)*C5
0143          FM4(J)=FM4(J)*CCMP
0144          FM4(J+1)=(A11*FLOAT(I2)+B11)*C11
0145          FM4(J+1)=FM4(J+1)*CCMP
0146          J=J-2
0147          K=K-1
0148          GO TO 130
0149      132  J=J+2
0150          K=K+1
0151          NM=2*NFND
0152          L=NM/10
0153          LS=L/2
0154          DO 140 JN=1,NM
0155          FM1(JN)=FM1(J)
0156          FM2(JN)=FM2(J)
0157          FM3(JN)=FM3(J)
0158          FM4(JN)=FM4(J)
0159      140  J=J+1
0160          DO 141 KN=1,NFND
0161          U(KN)=U(K)
0162          DU(KN)=DU(K)
0163          DT(KN)=DT(K)
0164      141  K=K+1
0165          D1=8.0
```

```
0166      D1=D1/2.0
0167      D2=C1*200.0
0168      D2=D2/10.0
0169      D3=C2*200.0
0170      D3=D3/10.0
0171      D4=C3*200.0
0172      D4=D4/10.0
0173      D5=C4*200.0
0174      D5=D5/10.0
0175      D6=3.5
0176      D6=D6/2.0
0177      D7=3.5
0178      D7=D7/2.0
0179      NMA=NM-1
0180      NFNDA=NFND-1
0181      DO 700 I=2,NMA
0182      Q2=((FM1(I-1)+FM1(I+1))/2.0)-FM1(I)
0183      IF(D2-Q2)701,702,702
0184      701 FM1(I)=(FM1(I-1)+FM1(I+1))/2.0
0185      702 CONTINUE
0186      Q3=((FM2(I-1)+FM2(I+1))/2.0)-FM2(I)
0187      IF(D3-Q3)703,704,704
0188      703 FM2(I)=(FM2(I-1)+FM2(I+1))/2.0
0189      704 CONTINUE
0190      Q4=((FM3(I-1)+FM3(I+1))/2.0)-FM3(I)
0191      IF(D4-Q4)705,706,706
0192      705 FM3(I)=(FM3(I-1)+FM3(I+1))/2.0
0193      706 CONTINUE
0194      Q5=((FM4(I-1)+FM4(I+1))/2.0)-FM4(I)
0195      IF(D5-Q5)707,700,700
0196      707 FM4(I)=(FM4(I-1)+FM4(I+1))/2.0
0197      700 CONTINUE
0198      DO 800 I=2,NFNDA
0199      Q1=((U(I-1)+U(I+1))/2.0)-U(I)
0200      IF(D1-Q1)801,802,802
0201      801 U(I)=(U(I-1)+U(I+1))/2.0
0202      802 CONTINUE
0203      Q6=((DU(I-1)+DU(I+1))/2.0)-DU(I)
0204      IF(D6-Q6)803,804,804
0205      803 DU(I)=(DU(I-1)+DU(I+1))/2.0
0206      804 CONTINUE
0207      Q7=((DT(I-1)+DT(I+1))/2.0)-DT(I)
0208      IF(D7-Q7)805,800,800
0209      805 DT(I)=(DT(I-1)+DT(I+1))/2.0
0210      800 CONTINUE
0211      FNM=FLOAT(NM)
0212      FNFND=FLOAT(NFND)
0213      J=1
0214      K=1
0215      149 WRITE(4,10) K,FM1(J),FM2(J),FM3(J),FM4(J),U(K),DU(K),DT(K),FM1(J+1
0216      1) ,FM2(J+1),FM3(J+1),FM4(J+1)
0217      IF(K-NFND)150,151,151
0218      150 J=J+2
0219      K=K+1
0219      GO TO 149
```

```
0220      151      SM1=0.0
0221              SM2=0.0
0222              SM3=0.0
0223              SM4=0.0
0224              SM5=0.0
0225              SM6=0.0
0226              SM7=0.0
0227              SM8=0.0
0228              SM9=0.0
0229              SM10=0.0
0230              SM11=0.0
0231              DO 160 J=1,NM
0232              SM2=SM2+FM1(J)
0233              SM3=SM3+FM2(J)
0234              SM4=SM4+FM3(J)
0235      160      SM5=SM5+FM4(J)
0236              DO 161 K=1,NFND
0237              SM1=SM1+U(K)
0238              SM6=SM6+DU(K)
0239      161      SM7=SM7+DT(K)
0240              SM1=SM1/FNFND
0241              SM2=SM2/FNM
0242              SM3=SM3/FNM
0243              SM4=SM4/FNM
0244              SM5=SM5/FNM
0245              SM6=SM6/FNFND
0246              SM7=SM7/FNFND
0247              WRITE(4,11)
0248              WRITE(4,12) SM1,SM2,SM3,SM4,SM5,SM6,SM7,SM8,SM9,SM10,SM11
0249              VAR1=0.0
0250              VAR2=0.0
0251              VAR3=0.0
0252              VAR4=0.0
0253              VAR5=0.0
0254              VAR6=0.0
0255              VAR7=0.0
0256              VAR8=0.0
0257              VAR9=0.0
0258              VAR10=0.0
0259              VAR11=0.0
0260              DO 170 J=1,NM
0261              VAR2=VAR2+(FM1(J)-SM2)**2
0262              VAR3=VAR3+(FM2(J)-SM3)**2
0263              VAR4=VAR4+(FM3(J)-SM4)**2
0264      170      VAR5=VAR5+(FM4(J)-SM5)**2
0265              DO 171 K=1,NFND
0266              VAR1=VAR1+(U(K)-SM1)**2
0267              VAR6=VAR6+(DU(K)-SM6)**2
0268      171      VAR7=VAR7+(DT(K)-SM7)**2
0269              SD1=SQRT(VAR1/FNFND)
0270              SD2=SQRT(VAR2/FNM)
0271              SD3=SQRT(VAR3/FNM)
0272              SD4=SQRT(VAR4/FNM)
0273              SD5=SQRT(VAR5/FNM)
0274              SD6=SQRT(VAR6/FNFND)
```

```
0275      SD7=SQRT(VAR7/FNFND)
0276      WRITE(4,12) SD1,SD2,SD3,SD4,SD5,SD6,SD7
0277      CV1=SD1/SM1
0278      CV2=SD2/SM2
0279      CV3=SD3/SM3
0280      CV4=SD4/SM4
0281      CV5=SD5/SM5
0282      CV6=SD6/SM6
0283      CV7=SD7/SM7
0284      WRITE(4,40) CV1,CV2,CV3,CV4,CV5,CV6,CV7
0285      G=9.81
0286      T=285.0
0287      DELZ=7.0
0288      GAMMA=0.01
0289      DELU=SM6/DELZ
0290      DELU=DELU**2
0291      DELT=-SM7/DELZ
0292      RI=(G*(DELT+GAMMA))/(T*DELU)
0293      WRITE(4,13)
0294      WRITE(4,14) RI
0295      ST=RUNTIM/FNFND
0296      ST=ST/2.0
0297      WRITE(4,15)
0298      WRITE(4,14) ST
0299      CALL AUTO(FM1,NM,L,R2)
0300      CALL AUTO(FM2,NM,L,R3)
0301      CALL AUTO(FM3,NM,L,R4)
0302      CALL AUTO(FM4,NM,L,R5)
0303      CALL AUTO(U,NFND,LS,P1)
0304      CALL AUTO(DU,NFND,LS,R6)
0305      CALL AUTO(DT,NFND,LS,R7)
0306      SMA1=SQRT(R1(1))
0307      SMA2=SQRT(R2(1))
0308      SMA3=SQRT(R3(1))
0309      SMA4=SQRT(R4(1))
0310      SMA5=SQRT(R5(1))
0311      SMA6=SQRT(R6(1))
0312      SMA7=SQRT(R7(1))
0313      WRITE(4,16)
0314      WRITE(4,17)(I,R2(I),R3(I),R4(I),R5(I),I=1,L)
0315      WRITE(4,18)
0316      WRITE(4,32)(I,R1(I),R6(I),P7(I),I=1,LS)
0317      WRITE(4,20)
0318      WRITE(4,12) SMA2,SMA3,SMA4,SMA5,SMA1,SMA6,SMA7
0319      RR1=R1(1)
0320      RR2=R2(1)
0321      RR3=R3(1)
0322      RR4=R4(1)
0323      RR5=R5(1)
0324      RR6=R6(1)
0325      RR7=R7(1)
0326      DO 180 I=1,L
0327      R2(I)=R2(I)/RR2
0328      R3(I)=R3(I)/RR3
0329      R4(I)=R4(I)/RR4
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0330      180      R5(I)=R5(I)/RR5
0331          DO 181 I=1,LS
0332          R1(I)=R1(I)/RR1
0333          R6(I)=R6(I)/RR6
0334      181      R7(I)=R7(I)/RR7
0335          CALL CROSS(FM1,FM2,NM,L,R101,R102)
0336          CALL CROSS(FM1,FM3,NM,L,R103,R104)
0337          CALL CROSS(FM1,FM4,NM,L,R105,R106)
0338          CALL CROSS(FM2,FM3,NM,L,R107,R108)
0339          CALL CROSS(FM2,FM4,NM,L,R109,R110)
0340          CALL CROSS(FM3,FM4,NM,L,R111,R112)
0341          DO 190 I=1,L
0342          R101(I)=R101(I)/(SMA2*SMA3)
0343          R102(I)=R102(I)/(SMA2*SMA3)
0344          R103(I)=R103(I)/(SMA2*SMA4)
0345          R104(I)=R104(I)/(SMA2*SMA4)
0346          R105(I)=R105(I)/(SMA2*SMA5)
0347          R106(I)=R106(I)/(SMA2*SMA5)
0348          R107(I)=R107(I)/(SMA3*SMA4)
0349          R108(I)=R108(I)/(SMA3*SMA4)
0350          R109(I)=R109(I)/(SMA3*SMA5)
0351          R110(I)=R110(I)/(SMA3*SMA5)
0352          R111(I)=R111(I)/(SMA4*SMA5)
0353      190      R112(I)=R112(I)/(SMA4*SMA5)
0354          WRITE(4,22)
0355          WRITE(4,23)(I,R101(I),R102(I),R103(I),R104(I),R105(I),R106(I),I=1,
1L)
0356          WRITE(4,24)
0357          WRITE(4,23)(I,R107(I),R108(I),R109(I),R110(I),R111(I),R112(I),I=1,
1L)
0358          J=1
0359          MNM=NM-1
0360          DO 200 JN=1,MNM,2
0361          FMS1(J)=(FM1(JN)+FM1(JN+1))/2.0
0362          FMS2(J)=(FM2(JN)+FM2(JN+1))/2.0
0363          FMS3(J)=(FM3(JN)+FM3(JN+1))/2.0
0364          FMS4(J)=(FM4(JN)+FM4(JN+1))/2.0
0365      200      J=J+1
0366          CALL CROSS(FMS1,U,NFND,LS,R200,R201)
0367          CALL CROSS(FMS1,DU,NFND,LS,R202,R203)
0368          CALL CROSS(FMS1,DT,NFND,LS,R204,R205)
0369          CALL CROSS(FMS2,U,NFND,LS,R210,R211)
0370          CALL CROSS(FMS2,DU,NFND,LS,R212,R213)
0371          CALL CROSS(FMS2,DT,NFND,LS,R214,R215)
0372          CALL CROSS(FMS3,U,NFND,LS,R220,R221)
0373          CALL CROSS(FMS3,DU,NFND,LS,R222,R223)
0374          CALL CROSS(FMS3,DT,NFND,LS,R224,R225)
0375          CALL CROSS(FMS4,U,NFND,LS,R230,R231)
0376          CALL CROSS(FMS4,DU,NFND,LS,R232,R233)
0377          CALL CROSS(FMS4,DT,NFND,LS,R234,R235)
0378          CALL CROSS(U,DU,NFND,LS,R300,R301)
0379          CALL CROSS(U,DT,NFND,LS,R302,R303)
0380          CALL CROSS(DU,DT,NFND,LS,R304,R305)
0381          DO 210 J=1,LS
0382          R200(J)=R200(J)/(SMA2*SMA1)

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0383      R201(J)=R201(J)/(SMA2*SMA1)
0384      R202(J)=R202(J)/(SMA2*SMA6)
0385      R203(J)=R203(J)/(SMA2*SMA6)
0386      R204(J)=R204(J)/(SMA2*SMA7)
0387      R205(J)=R205(J)/(SMA2*SMA7)
0388      R210(J)=R210(J)/(SMA3*SMA1)
0389      R211(J)=R211(J)/(SMA3*SMA1)
0390      R212(J)=R212(J)/(SMA3*SMA6)
0391      R213(J)=R213(J)/(SMA3*SMA6)
0392      R214(J)=R214(J)/(SMA3*SMA7)
0393      R215(J)=R215(J)/(SMA3*SMA7)
0394      R220(J)=R220(J)/(SMA4*SMA1)
0395      R221(J)=R221(J)/(SMA4*SMA1)
0396      R222(J)=R222(J)/(SMA4*SMA6)
0397      R223(J)=R223(J)/(SMA4*SMA6)
0398      R224(J)=R224(J)/(SMA4*SMA7)
0399      R225(J)=R225(J)/(SMA4*SMA7)
0400      R230(J)=R230(J)/(SMA5*SMA1)
0401      R231(J)=R231(J)/(SMA5*SMA1)
0402      R232(J)=R232(J)/(SMA5*SMA6)
0403      R233(J)=R233(J)/(SMA5*SMA6)
0404      R234(J)=R234(J)/(SMA5*SMA7)
0405      R235(J)=R235(J)/(SMA5*SMA7)
0406      R300(J)=R300(J)/(SMA1*SMA6)
0407      R301(J)=R301(J)/(SMA1*SMA6)
0408      R302(J)=R302(J)/(SMA1*SMA7)
0409      R303(J)=R303(J)/(SMA1*SMA7)
0410      R304(J)=R304(J)/(SMA6*SMA7)
0411      210 R305(J)=R305(J)/(SMA6*SMA7)
0412      WRITE(4,26)
0413      WRITE(4,23)(I,R200(I),R201(I),R202(I),R203(I),R204(I),R205(I),I=1,
1LS)
0414      WRITE(4,27)
0415      WRITE(4,23)(I,R210(I),R211(I),R212(I),R213(I),R214(I),R215(I),I=1,
1LS)
0416      WRITE(4,28)
0417      WRITE(4,23)(I,R220(I),R221(I),R222(I),R223(I),R224(I),R225(I),I=1,
1LS)
0418      WRITE(4,29)
0419      WRITE(4,23)(I,R230(I),R231(I),R232(I),R233(I),R234(I),R235(I),I=1,
1LS)
0420      WRITE(4,30)
0421      WRITE(4,23)(I,R300(I),R301(I),R302(I),R303(I),R304(I),R305(I),I=1,
1LS)
0422      AL1=0.0
0423      AL2=0.0
0424      AL3=0.0
0425      AL4=0.0
0426      AL5=0.0
0427      AL6=0.0
0428      AL7=0.0
0429      AL8=0.0
0430      AL9=0.0
0431      AL10=0.0
0432      AL11=0.0
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```
0433      DO 220 I=1,L
0434      AL2=AL2+(R2(I)*ST)
0435      AL3=AL3+(R3(I)*ST)
0436      AL4=AL4+(R4(I)*ST)
0437      220  AL5=AL5+(R5(I)*ST)
0438      DO 221 I=1,LS
0439      AL1=AL1+(R1(I)*2.0*ST)
0440      AL6=AL6+(R6(I)*2.0*ST)
0441      221  AL7=AL7+(R7(I)*2.0*ST)
0442      WRITE(4,33)
0443      WRITE(4,34) AL2,AL3,AL4,AL5,AL1,AL6,AL7
0444      VMAX1=200.0*C2
0445      VMAX2=200.0*C3
0446      VMAX3=200.0*C4
0447      VMAX4=200.0*C5
0448      IF(VMAX1-VMAX2)400,400,401
0449      400  VMAXF=VMAX2
0450      GO TO 411
0451      401  VMAXF=VMAX1
0452      411  IF(VMAXF-VMAX3)402,402,403
0453      402  VMAXF=VMAX3
0454      403  IF(VMAXF-VMAX4)404,404,405
0455      404  VMAXF=VMAX4
0456      405  CONTINUE
0457      VMAXF=VMAXF*1.20
0458      DO 410 J=1,NM
0459      FM1(J)=FM1(J)/VMAXF
0460      IF(FM1(J)-1.0)900,900,901
0461      901  FM1(J)=1.0
0462      900  FM2(J)=FM2(J)/VMAXF
0463      IF(FM2(J)-1.0)902,902,903
0464      903  FM2(J)=1.0
0465      902  FM3(J)=FM3(J)/VMAXF
0466      IF(FM3(J)-1.0)904,904,905
0467      905  FM3(J)=1.0
0468      904  FM4(J)=FM4(J)/VMAXF
0469      IF(FM4(J)-1.0)410,410,906
0470      906  FM4(J)=1.0
0471      410  CONTINUE
0472      DO 420 J=1,NFND
0473      U(J)=U(J)/8.0
0474      IF(U(J)-1.0)910,910,911
0475      911  U(J)=1.0
0476      910  DU(J)=DU(J)/3.5
0477      IF(DU(J)-1.0)912,912,913
0478      913  DU(J)=1.0
0479      912  DT(J)=DT(J)/3.5
0480      IF(DT(J)-1.0)420,420,914
0481      914  DT(J)=1.0
0482      420  CONTINUE
0483      DO 500 J=1,L
0484      500  X1(J)=FLOAT(J-1)*ST
0485      DO 501 J=1,LS
0486      501  X2(J)=FLOAT(J-1)*ST*2.0
0487      DO 502 J=1,NM
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0488      XX1(J)=FLOAT(J-1)*ST
0489      XX2(J)=FLOAT(J-1)*ST+(ST/6.0)
0490      XX3(J)=FLOAT(J-1)*ST+(ST/3.0)
0491      502  XX4(J)=FLOAT(J-1)*ST+(ST/2.0)
0492      DO 503 J=1,NFND
0493      XX5(J)=FLOAT(J-1)*2.0*ST+(ST*0.667)
0494      XX6(J)=FLOAT(J-1)*2.0*ST+(ST*0.833)
0495      503  XX7(J)=FLOAT(J-1)*2.0*ST+(ST*1.833)
0496      XTEST=X1(L)
0497      XTEST=XTEST/10.0
0498      XTEST=FLOAT(IFIX(XTEST))
0499      XTEST=XTEST*10.0
0500      XMIN=-(XTEST+10.0)
0501      AXLTH1=(XTEST/10.0)+1.0
0502      AXLTH2=(XX4(NM)/20.0)+1.0
0503      AXLTH3=2.0*AXLTH1
0504      XPOS2=2.0*AXLTH1+1.0+0.5
0505      XPOS3=3.0*AXLTH1+2.0+0.5
0506      XPOS4=XPOS2-AXLTH1
0507      M=L
0508      DO 504 J=1,L
0509      R102R(M)=R102(J)
0510      R104R(M)=R104(J)
0511      R106R(M)=R106(J)
0512      R108R(M)=R108(J)
0513      R110R(M)=R110(J)
0514      R112R(M)=R112(J)
0515      504  M=M-1
0516      DO 610 J=1,NFND
0517      IF(DT(J))611,610,610
0518      611  DT(J)=-DT(J)
0519      610  CONTINUE
0520      CALL PLTXMX(160.0)
0521      CALL PAXIS(0.5,0.5,'TIME (SEC)',-10,AXLTH1,0.0,0.0,10.0,1.0)
0522      CALL PAXIS(0.5,0.5,'AUTOCORRELATION',15,10.0,90.0,-1.0,0.2,1.0)
0523      CALL PSYMB(1.0,1.0,-0.1,'DPH76 C.D.JONES',0.0,15)
0524      CALL PSYMB(3.0,1.0,-0.1,DATIME,0.0,15)
0525      CALL PLTOFS(0.0,10.0,-1.0,0.2,0.5,0.5)
0526      CALL PLINE(X1,R2,L,1,4,0,1.0)
0527      CALL PLINE(X1,P3,L,1,4,1,1.0)
0528      CALL PLINE(X1,R4,L,1,4,2,1.0)
0529      CALL PLINE(X1,R5,L,1,4,3,1.0)
0530      CALL PLINE(X2,R1,LS,1,3,4,1.0)
0531      CALL PLINE(X2,P6,LS,1,3,5,1.0)
0532      CALL PLINE(X2,R7,LS,1,3,6,1.0)
0533      CALL PAXIS(XPOS4,0.5,'TIME (SEC)',-10,AXLTH3,0.0,XMIN,10.0,1.0)
0534      CALL PAXIS(XPOS2,0.5,'CROSSCORRELATION',16,10.0,90.0,-1.0,0.2,1.0)
0535      XPOS4=XPOS2-X1(L)/10.0
0536      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS4,0.5)
0537      CALL PLINE(X1,R102R,L,1,4,0,1.0)
0538      CALL PLINE(X1,R104R,L,1,4,1,1.0)
0539      CALL PLINE(X1,R106R,L,1,4,2,1.0)
0540      CALL PLINE(X1,R108R,L,1,4,3,1.0)
0541      CALL PLINE(X1,R110R,L,1,4,4,1.0)
0542      CALL PLINE(X1,R112R,L,1,4,5,1.0)
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```
0543      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS2,0.5)
0544      CALL PLINE(X1,R101,L,1,4,0,1.0)
0545      CALL PLINE(X1,R103,L,1,4,1,1.0)
0546      CALL PLINE(X1,R105,L,1,4,2,1.0)
0547      CALL PLINE(X1,R107,L,1,4,3,1.0)
0548      CALL PLINE(X1,R109,L,1,4,4,1.0)
0549      CALL PLINE(X1,R111,L,1,4,5,1.0)
0550      CALL PAXIS(XPOS3,0.5,'TIME (SEC)',-10,AXLTH2,0.0,0.0,20.0,1.0)
0551      CALL PAXIS(XPOS3,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0552      CALL PLTOFS(0.0,20.0,0.0,0.1,XPOS3,0.5)
0553      CALL PLINE(XX1,FM1,NM,1,4,0,1.0)
0554      CALL PLINE(XX2,FM2,NM,1,4,1,1.0)
0555      CALL PLINE(XX3,FM3,NM,1,4,2,1.0)
0556      CALL PLINE(XX4,FM4,NM,1,4,3,1.0)
0557      CALL PLINE(XX5,DT,NFND,1,3,6,1.0)
0558      CALL PLINE(XX6,DU,NFND,1,3,5,1.0)
0559      CALL PLINE(XX7,U,NFND,1,3,4,1.0)
0560      CALL PLTEND
0561      STOP
0562      END
```

TOTAL MEMGRY REQUIREMENTS 020662 BYTES

"DPRO" DOES NOT EXIST.

```
0165      ZDASH=X(I)*TAN(BETA)
0166      Z(I)=H+(AZ*T*SIN(2.*PI*FZ*T))
0167      Z(I)=Z(I)+ZDASH
0168      IF(Z(I)-0.1)301,300,300
0169      301 Z(I)=0.1
0170      300 T=T+DELT
0171      DO 310 I=1,JMAX
0172      IF(AY)400,400,401
0173      400 Y(I)=0.0
0174      GO TO 402
0175      401 Y(I)=Y(I)/(AY*TMAX)
0176      402 CONTINUE
0177      IF(BETA)600,600,601
0178      600 Z(I)=Z(I)/(H+(AZ*TMAX))
0179      GO TO 310
0180      601 Z(I)=Z(I)/(H+(AZ*TMAX)+(X(JMAX)*TAN(BETA)))
0181      310 CONTINUE
0182      AXLTH=TMAX/2.0
0183      AXLTH1=XMAX/10.
0184      XPOS1=AXLTH+3.
0185      XPOS2=AXLTH+AXLTH1+6.
0186      CALL PLTXMX(100.)
0187      CALL PAXIS(0.5,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,2.0,1.0)
0188      CALL PAXIS(0.5,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0189      CALL PSYMB(1.0,1.0,-0.1,'DPH 76 C.D.JONES',0.0,16)
0190      CALL PSYMB(1.0,9.0,-0.1,RUN,0.0,15)
0191      CALL PLTOFS(0.0,2.0,0.0,0.1,0.5,0.5)
0192      CALL PLINE(XX,FM1,KMAX,1,4,0,1.0)
0193      CALL PLINE(XX,FM2,KMAX,1,4,1,1.0)
0194      CALL PLINE(XX,FM3,KMAX,1,4,2,1.0)
0195      CALL PAXIS(XPOS1,0.5,'DIST (M) X',-10,AXLTH1,0.0,0.0,10.0,1.0)
0196      CALL PAXIS(XPOS1,0.5,'DIST (M) Y',-10,10.0,90.0,-1.0,0.2,1.0)
0197      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS1,0.5)
0198      CALL PLINE(X,Y,JMAX,1,0,0,1.0)
0199      CALL PAXIS(XPOS2,0.5,'DIST (M) X',-10,AXLTH1,0.0,0.0,10.0,1.0)
0200      CALL PAXIS(XPOS2,0.5,'DIST (M) Z',-10,10.0,90.0,0.0,0.1,1.0)
0201      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS2,0.5)
0202      CALL PLINE(X,Z,JMAX,1,0,0,1.0)
0203      CALL PLTEND
0204      STOP
0205      END
```

TOTAL MEMORY REQUIREMENTS 020CAE BYTES

*** GLOBAL TIME LIMIT EXCEEDED AT A0509504

```
0111      C5(I)=C5(I)/(SM2*SM3)
0112      60  C6(I)=C6(I)/(SM2*SM3)
0113      WRITE(4,3)(I,A1(I),A2(I),A3(I),C1(I),C2(I),C3(I),C4(I),C5(I),C6(I)
1,I=1,L)
0114      SFM1=0.
0115      SFM2=0.
0116      SFM3=0.
0117      SKFM1=0.
0118      SKFM2=0.
0119      SKFM3=0.
0120      FKMAX=FLOAT(KMAX)
0121      DO 500 I=1,KMAX
0122      SFM1=SFM1+FM1(I)
0123      SFM2=SFM2+FM2(I)
0124      500 SFM3=SFM3+FM3(I)
0125      SFM1=SFM1/FKMAX
0126      SFM2=SFM2/FKMAX
0127      SFM3=SFM3/FKMAX
0128      DO 501 I=1,KMAX
0129      SKFM1=SKFM1+((FM1(I)-SFM1)**3)
0130      SKFM2=SKFM2+((FM2(I)-SFM2)**3)
0131      501 SKFM3=SKFM3+((FM3(I)-SFM3)**3)
0132      SKFM1=SKFM1/(FKMAX*(SM1**3))
0133      SKFM2=SKFM2/(FKMAX*(SM2**3))
0134      SKFM3=SKFM3/(FKMAX*(SM3**3))
0135      WRITE(4,8)
0136      WRITE(4,9) SFM1,SFM2,SFM3
0137      WRITE(4,9) SM1,SM2,SM3
0138      WRITE(4,9) SKFM1,SKFM2,SKFM3
0139      DO 70 K=1,KMAX
0140      70  XX(K)=FLOAT(K)*DDT
0141      KMAX1=KMAX-1
0142      FMMX=1.0
0143      DO 200 I=1,KMAX1
0144      102 IF(FM1(I)-FMMX)100,100,101
0145      101 FMMX=2.*FMMX
0146      GO TO 102
0147      100 CONTINUE
0148      105 IF(FM2(I)-FMMX)103,103,104
0149      104 FMMX=2.*FMMX
0150      GO TO 105
0151      103 CONTINUE
0152      108 IF(FM3(I)-FMMX)106,106,107
0153      107 FMMX=2.*FMMX
0154      GO TO 108
0155      106 CONTINUE
0156      200 CONTINUE
0157      DO 210 I=1,KMAX
0158      FM1(I)=FM1(I)/FMMX
0159      FM2(I)=FM2(I)/FMMX
0160      210 FM3(I)=FM3(I)/FMMX
0161      T=0.
0162      DO 300 I=1,JMAX
0163      X(I)=U*T
0164      Y(I)=AY*T*SIN(2.*PI*FY*T)
```

```
0056      IF(Z(I)-0.1)11,11,12
0057      11 Z(I)=0.1
0058      12 CONTINUE
0059      10 T=T+DELT
0060          JMAX1=JMAX-1
0061          DO 20 I=1,JMAX1
0062              DXX(I)=X(I+1)-X(I)
0063              DYY(I)=Y(I+1)-Y(I)
0064              DZZ(I)=Z(I+1)-Z(I)
0065              DS(I)=SQRT(DXX(I)**2+DYY(I)**2+DZZ(I)**2)
0066      20 CONTINUE
0067          DS(JMAX)=DS(JMAX1)
0068          DO 30 I=1,JMAX
0069              X1(I)=X(I)-XM1
0070              X2(I)=X(I)-XM2
0071              Y1(I)=Y(I)-YM1
0072              Y2(I)=Y(I)-YM2
0073              X3(I)=X(I)-XM3
0074      30 Y3(I)=Y(I)-YM3
0075          DO 40 I=1,JMAX
0076              R1(I)=SQRT(X1(I)**2+Y1(I)**2+Z(I)**2)
0077              R2(I)=SQRT(X2(I)**2+Y2(I)**2+Z(I)**2)
0078              R3(I)=SQRT(X3(I)**2+Y3(I)**2+Z(I)**2)
0079              SINFI1(I)=Z(I)/R1(I)
0080              SINFI2(I)=Z(I)/R2(I)
0081              SINFI3(I)=Z(I)/R3(I)
0082              R1(I)=R1(I)**2
0083              R2(I)=R2(I)**2
0084              R3(I)=R3(I)**2
0085              FLD1=FLD1+(RHO*SINFI1(I)*DS(I))/(2.0*PI*EPSLON*R1(I))
0086              FLD2=FLD2+(RHO*SINFI2(I)*DS(I))/(2.0*PI*EPSLON*R2(I))
0087              FLD3=FLD3+(RHO*SINFI3(I)*DS(I))/(2.0*PI*EPSLON*R3(I))
0088      40 CONTINUE
0089          FM1(II)=FLD1
0090          FM2(II)=FLD2
0091          FM3(II)=FLD3
0092          II=II+1
0093          DT=DT+DDT
0094          IF(KMAX-II)50,51,51
0095      50 WRITE(4,2)(FM1(I),FM2(I),FM3(I),I=1,KMAX)
0096          L=KMAX/2
0097          CALL AUTO(FM1,KMAX,L,A1)
0098          CALL AUTO(FM2,KMAX,L,A2)
0099          CALL AUTO(FM3,KMAX,L,A3)
0100          CALL CROSS(FM1,FM2,KMAX,L,C1,C2)
0101          CALL CROSS(FM1,FM3,KMAX,L,C3,C4)
0102          CALL CROSS(FM2,FM3,KMAX,L,C5,C6)
0103          SM1=SQRT(A1(1))
0104          SM2=SQRT(A2(1))
0105          SM3=SQRT(A3(1))
0106          DO 60 I=1,L
0107              C1(I)=C1(I)/(SM1*SM2)
0108              C2(I)=C2(I)/(SM1*SM2)
0109              C3(I)=C3(I)/(SM1*SM3)
0110              C4(I)=C4(I)/(SM1*SM3)
```

```
0001      DIMENSION X(1000),Y(1000),Z(1000),DXX(1000),DYY(1000),DZZ(1000)
0002      DIMENSION DS(1000),X1(1000),X2(1000),Y1(1000),Y2(1000),FM1(1000)
0003      DIMENSION FM2(1000),SINF11(1000),SINF12(1000),R1(1000),R2(1000)
0004      DIMENSION A1(1000),A2(1000),C1(1000),C2(1000)
0005      DIMENSION X3(1000),Y3(1000),FM3(1000),SINF13(1000),R3(1000)
0006      DIMENSION A3(1000),C3(1000),C4(1000),C5(1000),C6(1000)
0007      DIMENSION XX(1000)
0008      DIMENSION RUN(4)
0009      1 FORMAT('1TRIAL')
0010      WRITE(4,1)
0011      2 FORMAT(3E15.3)
0012      3 FORMAT(I4,3E15.3,6F10.3)
0013      4 FORMAT(8E15.3)
0014      5 FORMAT(6F10.3)
0015      6 FORMAT(4A4)
0016      7 FORMAT('1 OSC.PLUME')
0017      8 FORMAT('1 MEAN,SD,SKEW MILLS')
0018      9 FORMAT(3E15.3)
0019      WRITE(4,7)
0020      READ(5,6) RUN
0021      READ(5,5) RR1,RR2,RR3,ALFA1,ALFA2,ALFA3
0022      READ(5,5) AY,AZ,FY,FZ,U,H
0023      READ(5,5) DDT,DX,TMAX,XMAX,BETA
0024      WRITE(4,5) RR1,RR2,RR3,ALFA1,ALFA2,ALFA3
0025      WRITE(4,5) AY,AZ,FY,FZ,U,H
0026      WRITE(4,5) DDT,DX,TMAX,XMAX,BETA
0027      CURR=0.000001
0028      EPSLON=8.85E-12
0029      PI=3.14
0030      DELT=DX/U
0031      JMAX=IFIX(XMAX/DX)
0032      KMAX=IFIX(TMAX/DDT)
0033      RHO=CURR/U
0034      ALFA1=ALFA1*PI/180.0
0035      ALFA2=ALFA2*PI/180.0
0036      ALFA3=ALFA3*PI/180.0
0037      BETA=BETA*PI/180.
0038      XM1=RR1*COS(ALFA1)
0039      YM1=RR1*SIN(ALFA1)
0040      XM2=RR2*COS(ALFA2)
0041      YM2=RR2*SIN(ALFA2)
0042      XM3=RR3*COS(ALFA3)
0043      YM3=RR3*SIN(ALFA3)
0044      II=1
0045      DT=0.0
0046      51 FLD1=0.0
0047      FLD2=0.0
0048      FLD3=0.0
0049      T=0.0
0050      DO 10 I=1,JMAX
0051      X(I)=U*T
0052      Y(I)=AY*T*SIN(2.0*PI*FY*(T+DT))
0053      ZDASH=X(I)*TAN(BETA)
0054      Z(I)=H-AZ*T+SIN(2.0*PI*FZ*(T+DT))
0055      Z(I)=Z(I)+ZDASH
```

OSCPLM PROG

PLM POSN PROG

```
0001      11  FORMAT(8A4)
0002      12  FORMAT(F10.3)
0003      DIMENSION DATIME(8)
0004      DIMENSION XP(50),YP(50),ZP(50)
0005      REAL*8 TT
0006      XPOS=0.5
0007      IMAX=40
0008      IMIN=IMAX-20
0009      READ(3,11) DATIME
0010      CALL PLTXMX(160.)
0011      CALL PSYMB(1.0,10.0,-0.1,DATIME,0.0,32)
0012      CALL PSYMB(1.0,9.0,-0.1,'DPH76',0.0,5)
0013      READ(3,12) DT
0014      104  READ(3) I,MM,(XP(J),YP(J),ZP(J),J=1,MM)
0015      IF(I-IMIN)103,103,101
0016      101  IF(IMAX-I)100,102,102
0017      102  CONTINUE
0018      T=DT*FLOAT(I)
0019      XPOS1=XPOS+0.5
0020      MMM=MM-1
0021      TT=T
0022      CALL PAXIS(XPOS,2.5,'X (M)',-5,5.0,0.0,0.0,10.0,1.0)
0023      CALL PAXIS(XPOS,0.5,'Y (M)',5,4.0,90.0,10.0,-5.0,1.0)
0024      CALL PLTOFS(0.0,10.0,0.0,-5.0,XPOS,2.5)
0025      CALL PLINE(XP,YP,MMM,1,1,0,1.0)
0026      CALL PAXIS(XPOS,5.5,'X (M)',-5,5.0,0.0,0.0,10.0,1.0)
0027      CALL PAXIS(XPOS,5.5,'Z (M)',5,4.0,90.0,0.0,5.0,1.0)
0028      CALL PFNMBR(XPOS1,9.5,0.1,TT,0.0,'F10.2 =',0.0)
0029      CALL PLTOFS(0.0,10.0,0.0,5.0,XPOS,5.5)
0030      CALL PLINE(XP,ZP,MMM,1,1,0,1.0)
0031      XPOS=XPOS+6.5
0032      IF(IMAX-I)100,100,103
0033      103  GO TO 104
0034      100  CONTINUE
0035      CALL PLTEND
0036      STOP
0037      END
```

TOTAL MEMORY REQUIREMENTS 000786 BYTES
EXECUTION TERMINATED

PLM PROG

```

0001      1  FORMAT(4F15.7)
0002      2  FORMAT(T2,4F15.7)
0003      3  FORMAT(1F6.1,10E11.3)
0004      4  FORMAT(8F8.3,4E12.3)
0005      5  FORMAT(2F15.5,1F15.4,4F15.1)
0006      READ(5,1)SH,CURR
0007      READ(5,1)R,Z2,BETA
0008      READ(5,1)GKY,GKZ,U
0009      READ(5,1)SP,BP,QMIN
0010      WRITE(6,2)SH,CURR
0011      WRITE(6,1)R,Z2,BETA
0012      WRITE(6,1)GKY,GKZ,U
0013      WRITE(6,1)SP,BP,QMIN
0014      PI=3.14159
0015      EPSLON=8.854E-12
0016      50  R=-100.
0017      60  EX1=0.0
0018      EX2=0.0
0019      EY1=0.0
0020      EY2=0.0
0021      EZ1=0.0
0022      EZ2=0.0
0023      P=SP
0024      DP=10.
0025      BETRAD=BETA*PI/180.0
0026      70  DIFANG=2.0*(SQRT((9.21*GKY)/(U*(P+(DP/2.)))))
0027      DIFRAD=DIFANG*PI/180.0
0028      DALFA=DIFRAD/10.0
0029      SALFA=-DIFRAD/2.0
0030      BALFA=+DIFRAD/2.0
0031      HZ=SQRT((9.21*GKZ*(P+(DP/2.)))/U)
0032      DZ1=HZ/5.0
0033      DVOL=P*DP*DALFA*DZ1
0034      ALFA=SALFA
0035      80  AZI=-9.2104*((ALFA**2)/(DIFRAD**2))
0036      AZI=EXP(AZI)
0037      Z1=SH-HZ
0038      BZ1=SH+HZ+(DZ1/10.0)
0039      99  CONTINUE
0040      IF(Z1)100,100,101
0041      101  A=0.0
0042      ELLO=Z1-SH
0043      ELLO=-2.3026*((ELLO**2)/(HZ**2))
0044      CHI1=(AZI*(EXP(ELLO)))/HZ
0045      CHI1=(CHI1*4.6052*CURR)/(PI*U*P*DIFRAD)
0046      102  QSQD=(P*COS(ALFA)-R*COS(BETRAD))**2+(P*SIN(ALFA)-R*SIN(BETRAD))**2
          1+(Z1-Z2)**2
0047      Q=SQRT(QSQD)
0048      IF(Q-QMIN)98,104,104
0049      104  SINFI=(Z1-Z2)/Q
0050      IF(1.0+SINFI)200,201,201
0051      200  SINFI=-1.0
0052      GO TO 211
0053      201  CONTINUE
0054      IF(1.0-SINFI)210,211,211
0055      210  SINFI=+1.0
0056      211  CONTINUE
0057      FI=ARSIN(SINFI)

```

```
0058      COSFI=COS(FI)
0059      COSTHE=(P*COS(ALFA)-R*COS(BETRAD))/(Q*COSFI)
0060      IF(1.0+COSTHE)300,301,301
0061      300 COSTHE=-1.0
0062      GO TO 311
0063      301 CONTINUE
0064      IF(1.0-COSTHE)310,311,311
0065      310 COSTHE=+1.0
0066      311 CONTINUE
0067      THE=ARCOS(COSTHE)
0068      SINTE=SIN(THE)
0069      ELFLD1=-(CHI1*DVOL)/(4.0*PI*EPSLON*QSQD)
0070      EX1=EX1+ELFLD1*COSTHE*COSFI
0071      EZ1=EZ1+ELFLD1*SINFI
0072      VECT=P*SIN(ALFA)-R*SIN(BETRAD)
0073      IF(VECT)600,600,601
0074      600 ELFLD1=-ELFLD1
0075      601 EY1=EY1+ELFLD1*SINTE*COSFI
0076      IF(VECT)800,800,801
0077      800 ELFLD1=-ELFLD1
0078      801 CONTINUE
0079      98 CHI1=-CHI1
0080      Z1=-Z1
0081      A=A+1.5
0082      IF(2.0-A)100,100,102
0083      100 Z1=Z1+DZ1
0084      IF(BZ1-Z1)103,103,99
0085      103 Z1=0.0
0086      110 BZ1=HZ-SH-Z1+(DZ1/10.0)
0087      IF(BZ1)111,115,115
0088      115 A=0.0
0089      ELHI=Z1+SH
0090      ELHI=-2.3026*((ELHI**2)/(HZ**2))
0091      CHI2=(AZI*(EXP(ELHI)))/HZ
0092      CHI2=(CHI2*4.6052*CURRE)/(PI*U*P*DIFRAD)
0093      112 QSQD=(P*COS(ALFA)-R*COS(BETRAD))**2+(P*SIN(ALFA)-R*SIN(BETRAD))**2
      1+(Z1-Z2)**2
0094      IF(Q-QMIN)114,116,116
0095      116 SINFI=(Z1-Z2)/Q
0096      IF(1.0+SINFI)400,401,401
0097      400 SINFI=-1.0
0098      GO TO 411
0099      401 CONTINUE
0100      IF(1.0-SINFI)410,411,411
0101      410 SINFI=+1.0
0102      411 CONTINUE
0103      FI=ARSIN(SINFI)
0104      COSFI=COS(FI)
0105      COSTHE=(P*COS(ALFA)-R*COS(BETRAD))/(Q*COSFI)
0106      IF(1.0+COSTHE)500,501,501
0107      500 COSTHE=-1.0
0108      GO TO 511
0109      501 CONTINUE
0110      IF(1.0-COSTHE)510,511,511
0111      510 COSTHE=+1.0
0112      511 CONTINUE
0113      THE=ARCCS(COSTHE)
0114      SINTE=SIN(THE)
```

```
0115      ELFLD2=-(CHI2*DVOL)/(4.0*PI*EPSLON*QSOD)
0116      EX2=EX2+ELFLD2*COSTHE*COSFI
0117      FZ2=EZ2+ELFLD2*SINEI
0118      VECT=P*SIN(ALFA)-R*SIN(BETRAD)
0119      IF(VECT)700,700,701
0120      700 ELFLD2=-ELFLD2
0121      701 EY2=EY2+ELFLD2*SINTHE*COSFI
0122      IF(VECT)900,900,901
0123      900 ELFLD2=-ELFLD2
0124      901 CONTINUE
0125      114 CHI2=-CHI2
0126      Z1=-Z1
0127      A=A+1.5
0128      IF(2.0-A)113,113,112
0129      113 Z1=Z1+DZ1
0130      GO TO 110
0131      111 ALFA=ALFA+DALFA
0132      IF(BALFA+(DALFA/10.0)-ALFA)119,80,80
0133      119 EX=EX1+EX2
0134      EY=EY1+EY2
0135      EZ=EZ1+EZ2
0136      P=P+DP
0137      IF(BP+(DP/10.0)-P)120,120,70
0138      120 IF(R)1100,1100,1101
0139      1100 PLUDIM=0.
0140      GO TO 1102
0141      1101 PLUDIM=SQRT((9.21*GKZ*R)/U)
0142      1102 CONTINUE
0143      WRITE(6,5) GKY,GKZ,PLUDIM,R,EZ1,EZ2,EZ
0144      Z2=Z2+1.
0145      IF(0.9-Z2)130,60,60
0146      130 Z2=0.0
0147      R=R+20.
0148      IF(80.-R)140,60,60
0149      140 IF(200.-R)150,141,141
0150      141 R=R+10.
0151      GO TO 60
0152      150 IF(R-290.)1000,1000,1001
0153      1000 R=300.
0154      GO TO 60
0155      1001 R=R+190.
0156      IF(R-1000.)1010,1010,1011
0157      1010 CONTINUE
0158      GO TO 60
0159      1011 GKY=GKY*10.
0160      GKZ=GKZ*10.
0161      IF(110.-GKY)2000,50,50
0162      2000 STOP
0163      END
```

SUPPROG

```
0001      1 FORMAT(1F10.2)
0002      2 FORMAT('0MFANS,MILLS,U,DU,DT')
0003      3 FORMAT(7E15.3)
0004      4 FORMAT('0SD,MILLS,U,DU,DT')
0005      5 FORMAT('0SKEW,MILLS,U,DU,DT')
0006      6 FORMAT(I5,3F15.5)
0007      7 FORMAT(12I5)
0008      8 FORMAT('1FURTHER STATISTICAL ANALYSIS SERIES 1')
0009      WRITE(6,8)
0010      9 FORMAT('1POWER SPECTRUM MILLS')
0011     10 FORMAT('1POWER SPECTRUM U,DU,DT')
0012     11 FORMAT(I5,4E15.3)
0013     12 FORMAT(I5,3E15.3)
0014     13 FORMAT('0KURTOSIS MILLS,U,DU,DT')
0015     14 FORMAT('1 COHERENCE FUNCTION MILLS')
0016     15 FORMAT(I5,6E15.3)
0017     16 FORMAT('1 PHASE ANGLE MILLS')
0018      DIMENSION R1(100),R2(100),R3(100),R4(100),R5(100),R6(100)
0019      DIMENSION R7(100),R8(100),R9(100),R10(100),R11(100),R12(100)
0020      DIMENSION PS1(100),PS2(100),PS3(100),PS4(100),PS5(100),PS6(100)
0021      DIMENSION CS1(100),CS2(100),CS3(100),CS4(100),CS5(100),CS6(100)
0022      DIMENSION FM1(1000),FM2(1000),FM3(1000),FM4(1000)
0023      DIMENSION U(1000),DU(1000),DT(1000)
0024      DIMENSION G1(100),G2(100),G3(100),G4(100),G5(50),G6(50),G7(50)
0025      DIMENSION XX1(100),XX2(100)
0026      DIMENSION PWF1(1000),PWF2(1000),PWF3(1000),PWF4(1000)
0027      DIMENSION PWU(1000),PWU(1000),PWDT(1000)
0028      READ(5,1) FF
0029      READ(5,1) RUNTIM
0030      J=0
0031     100 READ(5,6)I,A,B,C
0032      J=J+1
0033      GO TO(101,102,103,104,105,106,107,108,109,110,111),I
0034     101 A1=A
0035      B1=B
0036      C1=C
0037      GO TO 100
0038     102 A2=A
0039      B2=B
0040      C2=C
0041      GO TO 100
0042     103 A3=A
0043      B3=B
0044      C3=C
0045      GO TO 100
0046     104 A4=A
0047      B4=B
0048      C4=C
0049      GO TO 100
0050     105 A5=A
0051      B5=B
0052      C5=C
0053      GO TO 100
0054     106 A6=A
0055      B6=B
```

```
0056      C6=C
0057      GO TO 100
0058      107  A7=A
0059      B7=B
0060      C7=C
0061      GO TO 100
0062      108  A8=A
0063      B8=B
0064      C8=C
0065      GO TO 100
0066      109  A9=A
0067      B9=B
0068      C9=C
0069      GO TO 100
0070      110  A10=A
0071      B10=B
0072      C10=C
0073      GO TO 100
0074      111  A11=A
0075      B11=B
0076      C11=C
0077      IF(J-11)126,120,126
0078      126  STOP
0079      120  CONTINUE
0080      J=1000
0081      K=500
0082      NFND=0
0083      130  READ(5,7)M,I1,I11,I10,I9,I8,I6,I7,I5,I4,I3,I2
0084      IF(M-9999)131,132,131
0085      131  NFND=NFND+1
0086      COMP=703./FLOAT(M)
0087      U(K)=(A1*FLOAT(I1)+B1)*C1
0088      FM1(J-1)=(A2*FLOAT(I2)+B2)*C2
0089      FM2(J-1)=(A3*FLOAT(I3)+B3)*C3
0090      FM3(J-1)=(A4*FLOAT(I4)+B4)*C4
0091      FM4(J-1)=(A5*FLOAT(I5)+B5)*C5
0092      DU(K)=(A6*FLOAT(I6)+B6)*C6
0093      DT(K)=(A7*FLOAT(I7)+B7)*C7
0094      FM1(J)=(A8*FLOAT(I8)+B8)*C8
0095      FM2(J)=(A9*FLOAT(I9)+B9)*C9
0096      FM3(J)=(A10*FLOAT(I10)+B10)*C10
0097      FM4(J)=(A11*FLOAT(I11)+B11)*C11
0098      U(K)=U(K)*COMP
0099      FM1(J-1)=FM1(J-1)*CCMP
0100      FM2(J-1)=FM2(J-1)*CCMP
0101      FM3(J-1)=FM3(J-1)*CCMP
0102      FM4(J-1)=FM4(J-1)*CCMP
0103      DU(K)=DU(K)*COMP
0104      DT(K)=DT(K)*COMP
0105      FM1(J)=FM1(J)*COMP
0106      FM2(J)=FM2(J)*CCMP
0107      FM3(J)=FM3(J)*COMP
0108      FM4(J)=FM4(J)*CCMP
0109      J=J-2
0110      K=K-1
```

```
0111      GO TO 130
0112      132      J=J+2
0113      K=K+1
0114      NM=2*NFND
0115      DO 140 JN=1,NM
0116      FM1(JN)=FM1(J)
0117      FM2(JN)=FM2(J)
0118      FM3(JN)=FM3(J)
0119      FM4(JN)=FM4(J)
0120      140      J=J+1
0121      DO 141 KN=1,NFND
0122      U(KN)=U(K)
0123      DU(KN)=DU(K)
0124      DT(KN)=DT(K)
0125      141      K=K+1
0126      FNM=FLOAT(NM)
0127      FNFND=FLOAT(NFND)
0128      SM1=0.0
0129      SM2=0.0
0130      SM3=0.0
0131      SM4=0.0
0132      SM5=0.0
0133      SM6=0.0
0134      SM7=0.0
0135      SSD1=0.0
0136      SSD2=0.0
0137      SSD3=0.0
0138      SSD4=0.0
0139      SSD5=0.0
0140      SSD6=0.0
0141      SSD7=0.0
0142      SSK1=0.0
0143      SSK2=0.0
0144      SSK3=0.0
0145      SSK4=0.0
0146      SSK5=0.0
0147      SSK6=0.0
0148      SSK7=0.0
0149      DO 150 J=1,NM
0150      SM1=SM1+FM1(J)
0151      SM2=SM2+FM2(J)
0152      SM3=SM3+FM3(J)
0153      150      SM4=SM4+FM4(J)
0154      SM1=SM1/FNM
0155      SM2=SM2/FNM
0156      SM3=SM3/FNM
0157      SM4=SM4/FNM
0158      DO 151 J=1,NFND
0159      SM5=SM5+U(J)
0160      SM6=SM6+DU(J)
0161      151      SM7=SM7+DT(J)
0162      SM5=SM5/FNFND
0163      SM6=SM6/FNFND
0164      SM7=SM7/FNFND
0165      DO 160 J=1,NM
```

```
0166      SSD1=SSD1+(FM1(J)-SM1)**2
0167      SSD2=SSD2+(FM2(J)-SM2)**2
0168      SSD3=SSD3+(FM3(J)-SM3)**2
0169      160  SSD4=SSD4+(FM4(J)-SM4)**2
0170      SSD1=SQRT(SSD1/FNM)
0171      SSD2=SQRT(SSD2/FNM)
0172      SSD3=SQRT(SSD3/FNM)
0173      SSD4=SQRT(SSD4/FNM)
0174      DO 161 J=1,NFND
0175      SSD5=SSD5+(U(J)-SM5)**2
0176      SSD6=SSD6+(DU(J)-SM6)**2
0177      161  SSD7=SSD7+(DT(J)-SM7)**2
0178      SSD5=SQRT(SSD5/FNFND)
0179      SSD6=SQRT(SSD6/FNFND)
0180      SSD7=SQRT(SSD7/FNFND)
0181      DO 170 J=1,NM
0182      SSK1=SSK1+(FM1(J)-SM1)**3
0183      SSK2=SSK2+(FM2(J)-SM2)**3
0184      SSK3=SSK3+(FM3(J)-SM3)**3
0185      170  SSK4=SSK4+(FM4(J)-SM4)**3
0186      SSK1=SSK1/(FNM*(SSD1**3))
0187      SSK2=SSK2/(FNM*(SSD2**3))
0188      SSK3=SSK3/(FNM*(SSD3**3))
0189      SSK4=SSK4/(FNM*(SSD4**3))
0190      DO 171 J=1,NFND
0191      SSK5=SSK5+(U(J)-SM5)**3
0192      SSK6=SSK6+(DU(J)-SM6)**3
0193      171  SSK7=SSK7+(DT(J)-SM7)**3
0194      SSK5=SSK5/(FNFND*(SSD5**3))
0195      SSK6=SSK6/(FNFND*(SSD6**3))
0196      SSK7=SSK7/(FNFND*(SSD7**3))
0197      SK1=0.0
0198      SK2=0.0
0199      SK3=0.0
0200      SK4=0.0
0201      SK5=0.0
0202      SK6=0.0
0203      SK7=0.0
0204      DO 180 J=1,NM
0205      SK1=SK1+(FM1(J)-SM1)**4
0206      SK2=SK2+(FM2(J)-SM2)**4
0207      SK3=SK3+(FM3(J)-SM3)**4
0208      180  SK4=SK4+(FM4(J)-SM4)**4
0209      SK1=SK1/(FNM*(SSD1**4))
0210      SK2=SK2/(FNM*(SSD2**4))
0211      SK3=SK3/(FNM*(SSD3**4))
0212      SK4=SK4/(FNM*(SSD4**4))
0213      DO 181 J=1,NFND
0214      SK5=SK5+(U(J)-SM5)**4
0215      SK6=SK6+(DU(J)-SM6)**4
0216      181  SK7=SK7+(DT(J)-SM7)**4
0217      SK5=SK5/(FNFND*(SSD5**4))
0218      SK6=SK6/(FNFND*(SSD6**4))
0219      SK7=SK7/(FNFND*(SSD7**4))
0220      WRITE(6,2)
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0221      WRITE(6,3) SM1,SM2,SM3,SM4,SM5,SM6,SM7
0222      WRITE(6,4)
0223      WRITE(6,3) SSD1,SSD2,SSD3,SSD4,SSD5,SSD6,SSD7
0224      WRITE(6,5)
0225      WRITE(6,3) SSK1,SSK2,SSK3,SSK4,SSK5,SSK6,SSK7
0226      WRITE(6,13)
0227      WRITE(6,3) SK1,SK2,SK3,SK4,SK5,SK6,SK7
0228      L=NM/10
0229      LS=L/2
0230      DO 300 K=2,NM
0231      PWF1(K)=FM1(K)-FF*FM1(K-1)
0232      PWF2(K)=FM2(K)-FF*FM2(K-1)
0233      PWF3(K)=FM3(K)-FF*FM3(K-1)
0234      300 PWF4(K)=FM4(K)-FF*FM4(K-1)
0235      DO 301 K=2,NFND
0236      PWU(K)=U(K)-FF*U(K-1)
0237      PWDU(K)=DU(K)-FF*DU(K-1)
0238      301 PWDT(K)=DT(K)-FF*DT(K-1)
0239      DO 302 K=2,NM
0240      FM1(K)=PWF1(K)
0241      FM2(K)=PWF2(K)
0242      FM3(K)=PWF3(K)
0243      302 FM4(K)=PWF4(K)
0244      DO 303 K=2,NFND
0245      U(K)=PWU(K)
0246      DU(K)=PWDU(K)
0247      303 DT(K)=PWDT(K)
0248      CALL AUTO(FM1,NM,L,R1)
0249      CALL AUTO(FM2,NM,L,R2)
0250      CALL AUTO(FM3,NM,L,R3)
0251      CALL AUTO(FM4,NM,L,R4)
0252      CALL AUTO(U,NFND,LS,R5)
0253      CALL AUTO(DU,NFND,LS,R6)
0254      CALL AUTO(DT,NFND,LS,R7)
0255      DDT=(RUNTIM*60.)/FNM
0256      DELF=1./(2.*FLCAT(L-1)*DDT)
0257      CALL ASPECT(DELF,L,R1,G1)
0258      CALL ASPECT(DELF,L,R2,G2)
0259      CALL ASPECT(DELF,L,R3,G3)
0260      CALL ASPECT(DELF,L,R4,G4)
0261      CALL ASPECT(DELF,LS,R5,G5)
0262      CALL ASPECT(DELF,LS,R6,G6)
0263      CALL ASPECT(DELF,LS,R7,G7)
0264      WRITE(6,9)
0265      WRITE(6,11)(K,G1(K),G2(K),G3(K),G4(K),K=1,L)
0266      WRITE(6,10)
0267      WRITE(6,12)(K,G5(K),G6(K),G7(K),K=1,LS)
0268      CALL CROSS(FM1,FM2,NM,L,R1,R2)
0269      CALL CROSS(FM1,FM3,NM,L,R3,R4)
0270      CALL CROSS(FM1,FM4,NM,L,R5,R6)
0271      CALL CROSS(FM2,FM3,NM,L,R7,R8)
0272      CALL CROSS(FM2,FM4,NM,L,R9,R10)
0273      CALL CROSS(FM3,FM4,NM,L,R11,R12)
0274      CALL XSPECT(DELF,L,R1,R2,CS1,PS1)
0275      CALL XSPECT(DELF,L,R3,R4,CS2,PS2)
```

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0276      CALL XSPECT(DELFL,R5,R6,CS3,PS3)
0277      CALL XSPECT(DELFL,R7,R8,CS4,PS4)
0278      CALL XSPECT(DELFL,R9,R10,CS5,PS5)
0279      CALL XSPECT(DELFL,R11,R12,CS6,PS6)
0280      DO 400 K=1,L
0281          CS1(K)=CS1(K)/(G1(K)*G2(K))
0282          CS2(K)=CS2(K)/(G1(K)*G3(K))
0283          CS3(K)=CS3(K)/(G1(K)*G4(K))
0284          CS4(K)=CS4(K)/(G2(K)*G3(K))
0285          CS5(K)=CS5(K)/(G2(K)*G4(K))
0286      400  CS6(K)=CS6(K)/(G3(K)*G4(K))
0287          WRITE(6,14)
0288          WRITE(6,15)(K,CS1(K),CS2(K),CS3(K),CS4(K),CS5(K),CS6(K),K=1,L)
0289          WRITE(6,16)
0290          WRITE(6,15)(K,PS1(K),PS2(K),PS3(K),PS4(K),PS5(K),PS6(K),K=1,L)
0291          A1=0.
0292          A2=0.
0293          A3=0.
0294          A4=0.
0295          A5=0.
0296          A6=0
0297          A7=0
0298          DO 200 K=1,L
0299              IF(G1(K)-A1)201,201,202
0300      202  A1=G1(K)
0301      201  IF(G2(K)-A2)204,204,205
0302      205  A2=G2(K)
0303      204  IF(G3(K)-A3)206,206,207
0304      207  A3=G3(K)
0305      206  IF(G4(K)-A4)208,208,208
0306      208  A4=G4(K)
0307      200  CONTINUE
0308          DO 210 K=1,L
0309              G1(K)=G1(K)/A1
0310              G2(K)=G2(K)/A2
0311              G3(K)=G3(K)/A3
0312      210  G4(K)=G4(K)/A4
0313          DO 220 K=1,LS
0314              IF(G5(K)-A5)221,221,222
0315      222  A5=G5(K)
0316      221  IF(G6(K)-A6)223,223,224
0317      224  A6=G6(K)
0318      223  IF(G7(K)-A7)220,220,225
0319      225  A7=G7(K)
0320      220  CONTINUE
0321          DO 211 K=1,LS
0322              G5(K)=G5(K)/A5
0323              G6(K)=G6(K)/A6
0324      211  G7(K)=G7(K)/A7
0325          DO 230 K=1,L
0326      230  XX1(K)=DFLF*FLCAT(K)
0327          DO 231 K=1,LS
0328      231  XX2(K)=DELFL*FLQAT(K)
0329          CALL PLTXMX(120.)
0330          CALL PAXIS(0.5,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
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```
0331 CALL PAXIS(0.5,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0332 CALL PSYMB(1.0,1.0,-0.1,'DPH7A C.D. JONES',0.0,15)
0333 CALL PLTOFS(0.0,0.05,0.0,0.25,0.5,0.5)
0334 CALL PLINE(XX1,G1,L,1,5,0,1.0)
0335 CALL PAXIS(0.5,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0336 CALL PAXIS(0.5,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0337 CALL PLTOFS(0.0,0.05,0.0,0.25,0.5,5.5)
0338 CALL PLINE(XX1,G2,L,1,5,1,1.0)
0339 CALL PAXIS(10.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0340 CALL PAXIS(10.0,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0341 CALL PLTOFS(0.0,0.05,0.0,0.25,10.0,0.5)
0342 CALL PLINE(XX1,G3,L,1,5,2,1.0)
0343 CALL PAXIS(10.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0344 CALL PAXIS(10.0,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0345 CALL PLTOFS(0.0,0.05,0.0,0.25,10.0,5.5)
0346 CALL PLINE(XX1,G4,L,1,5,3,1.0)
0347 CALL PAXIS(20.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0348 CALL PAXIS(20.0,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0349 CALL PLTOFS(0.0,0.05,0.0,0.25,20.0,0.5)
0350 CALL PLINE(XX2,G5,LS,1,5,4,1.0)
0351 CALL PAXIS(20.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0352 CALL PAXIS(20.0,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0353 CALL PLTOFS(0.0,0.05,0.0,0.25,20.0,5.5)
0354 CALL PLINE(XX2,G6,LS,1,5,5,1.0)
0355 CALL PLINE(XX2,G7,LS,1,5,6,1.0)
0356 CALL PAXIS(30.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0357 CALL PAXIS(30.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0358 CALL PLTOFS(0.0,0.05,0.0,0.25,30.0,0.5)
0359 CALL PLINE(XX1,CS1,L,1,5,0,1.0)
0360 CALL PAXIS(30.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0361 CALL PAXIS(30.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0362 CALL PLTOFS(0.0,0.05,0.0,0.25,30.0,5.5)
0363 CALL PLINE(XX1,CS2,L,1,5,1,1.0)
0364 CALL PAXIS(40.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0365 CALL PAXIS(40.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0366 CALL PLTOFS(0.0,0.05,0.0,0.25,40.0,0.5)
0367 CALL PLINE(XX1,CS3,L,1,5,2,1.0)
0368 CALL PAXIS(40.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0369 CALL PAXIS(40.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0370 CALL PLTOFS(0.0,0.05,0.0,0.25,40.0,5.5)
0371 CALL PLINE(XX1,CS4,L,1,5,3,1.0)
0372 CALL PAXIS(50.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0373 CALL PAXIS(50.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0374 CALL PLTOFS(0.0,0.05,0.0,0.25,50.0,0.5)
0375 CALL PLINE(XX1,CS5,L,1,5,4,1.0)
0376 CALL PAXIS(50.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0377 CALL PAXIS(50.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0378 CALL PLTOFS(0.0,0.05,0.0,0.25,50.0,5.5)
0379 CALL PLINE(XX1,CS6,L,1,5,5,1.0)
0380 CALL PAXIS(60.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0381 CALL PAXIS(60.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0382 CALL PLTOFS(0.0,0.05,0.0,90.0,60.0,2.5)
0383 CALL PLINE(XX1,PS1,L,1,5,0,1.0)
0384 CALL PAXIS(60.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0385 CALL PAXIS(60.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
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0386      CALL PLTOFS(0.0,0.05,0.0,90.0,60.0,7.5)
0387      CALL PLINE(XX1,PS2,L,1,5,1,1.0)
0388      CALL PAXIS(70.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0389      CALL PAXIS(70.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0390      CALL PLTOFS(0.0,0.05,0.0,90.0,70.0,2.5)
0391      CALL PLINE(XX1,PS3,L,1,5,2,1.0)
0392      CALL PAXIS(70.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0393      CALL PAXIS(70.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0394      CALL PLTOFS(0.0,0.05,0.0,90.0,70.0,7.5)
0395      CALL PLINE(XX1,PS4,L,1,5,3,1.0)
0396      CALL PAXIS(80.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0397      CALL PAXIS(80.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0398      CALL PLTOFS(0.0,0.05,0.0,90.0,80.0,2.5)
0399      CALL PLINE(XX1,PS5,L,1,5,4,1.0)
0400      CALL PAXIS(80.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0401      CALL PAXIS(80.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0402      CALL PLTOFS(0.0,0.05,0.0,90.0,80.0,7.5)
0403      CALL PLINE(XX1,PS6,L,1,5,5,1.0)
0404      CALL PLTEND
0405      STOP
0406      END
```

TOTAL MEMCRY REQUIREMENTS 013B8E BYTES

```
0001      SUBROUTINE ASPECT(DELTA,L,R,G)
0002      DIMENSION G(100),P(100)
0003      DIMENSION GG(100)
0004      PI=3.142
0005      SGMA=0.
0006      M=L-1
0007      XM=FLOAT(M)
0008      DO 20 K=1,L
0009      KK=K-1
0010      KKK=2+KK-IFIX(2.*FLOAT(IFIX(0.5*FLOAT(KK))))
0011      DO 10 J=2,M
0012      THETA=(PI/XM)*FLOAT((J-1)*KK)
0013      101 IF(THETA-2.*PI)99,99,100
0014      100 THETA=THETA-2.*PI
0015      GO TO 101
0016      99 AA=R(J)*COS(THETA)
0017      10 SGMA=SGMA+AA
0018      BRKT=R(1)+2.*SGMA+((-1.)**KKK)*R(L)
0019      G(K)=BRKT/(XM*DELTA)
0020      SGMA=0.
0021      20 CONTINUE
0022      GG(1)=0.5*G(1)+0.5*G(2)
0023      GG(L)=0.5*G(L-1)+0.5*G(L)
0024      DO 30 K=2,M
0025      30 GG(K)=0.25*G(K-1)+0.5*G(K)+0.25*G(K+1)
0026      DO 40 K=1,L
0027      40 G(K)=GG(K)
0028      RETURN
0029      END
```

TOTAL MEMORY REQUIREMENTS 00063A BYTES

```
0001      SUBROUTINE XSPECT(DELFL,R,S,GXY,PHIXY)
0002      DIMENSION R(100),S(100),A(100),B(100)
0003      DIMENSION C(100),Q(100),GXY(100),PHIXY(100)
0004      DIMENSION CC(100),QQ(100)
0005      PI=3.142
0006      SGMA=0.
0007      SGMB=0.
0008      M=L-1
0009      XM=FLOAT(M)
0010      DO 5 I=1,L
0011          A(I)=(R(I)+S(I))/2.
0012      5    R(I)=(R(I)-S(I))/2.
0013          DO 20 K=1,L
0014              KK=K-1
0015              KKK=2+KK-IFIX(2.*FLOAT(IFIX(0.5*FLCAT(KK))))
0016              DO 10 J=2,M
0017                  THETA=(PI/XM)*FLOAT((J-1)*KK)
0018      101    IF(THETA-2.*PI)99,99,100
0019      100    THETA=THETA-2.*PI
0020          GO TO 101
0021      99    CONTINUE
0022          AA=A(J)*COS(THETA)
0023          BB=B(J)*SIN(THETA)
0024          SGMA=SGMA+AA
0025      10    SGMB=SGMB+BB
0026          BRKT=A(1)+2.*SGMA+((-1.)**KKK)*A(L)
0027          C(K)=BRKT/(XM*DELFL)
0028          Q(K)=2.*SGMB/(XM*DELFL)
0029          SGMA=0.
0030          SGMB=0.
0031      20    CONTINUE
0032          CC(1)=0.5*C(1)+0.5*C(2)
0033          CC(L)=0.5*C(L-1)+0.5*C(L)
0034          QQ(1)=0.5*Q(1)+0.5*Q(2)
0035          QQ(L)=0.5*Q(L-1)+0.5*Q(L)
0036          DO 30 K=2,M
0037              CC(K)=0.25*C(K-1)+0.5*C(K)+0.25*C(K+1)
0038      30    QQ(K)=0.25*Q(K-1)+0.5*Q(K)+0.25*Q(K+1)
0039          DO 50 K=1,L
0040              C(K)=CC(K)
0041      50    Q(K)=QQ(K)
0042          DO 40 I=1,L
0043              GXY(I)=C(I)**2+Q(I)**2
0044              PHIXY(I)=ATAN(Q(I)/C(I))
0045      40    PHIXY(I)=PHIXY(I)*360./6.284
0046          RETURN
0047      END
```

TOTAL MEMORY REQUIREMENTS 000F8A BYTES
EXECUTION TERMINATED

DATA PROG

```
0001      6 FORMAT(I5,3F15.5)
0002      7 FORMAT(12I5)
0003      9 FORMAT('OACTUAL VALUES')
0004     10 FORMAT(I4,4F9.1,3F7.2,4F9.1)
0005     11 FORMAT('1 MEANS,STD.DEV.AND COEFF.VAR')
0006     12 FORMAT(F10.2,4F10.1,2F10.2,4F10.1)
0007     13 FORMAT('ORI')
0008     14 FORMAT(1F11.3)
0009     15 FORMAT('OST')
0010     16 FORMAT('1AUTOCOV,FM1,FM2,FM3,FM4')
0011     17 FORMAT(I4,4E15.3)
0012     18 FORMAT('1AUTOCOV,U,DU,DT')
0013     20 FORMAT('1AUTO-DERIVED STD DEV')
0014     22 FORMAT('1XCOR,FM1/FM2,FM1/FM3,FM1/FM4')
0015     23 FORMAT(I4,6E15.3)
0016     24 FORMAT('1XCOR,FM2/FM3,FM2/FM4,FM3/FM4')
0017     26 FORMAT('1XCOR,FM1/U,FM1/DU,FM1/DT')
0018     27 FORMAT('1XCOR,FM2/U,FM2/DU,FM2/DT')
0019     28 FORMAT('1XCOR,FM3/U,FM3/DU,FM3/DT')
0020     29 FORMAT('1XCOR,FM4/U,FM4/DU,FM4/DT')
0021     30 FORMAT('1XCOR,U/DU,U/DT,DU/DT')
0022     32 FORMAT(I4,3E15.3)
0023     33 FORMAT('1AUTOLENGTH')
0024     34 FORMAT(7F10.2)
0025     40 FORMAT(11F10.3)
0026     49 FORMAT('RUNTIM')
0027     50 FORMAT(1F10.1)
0028     51 FORMAT(4A4)
0029     53 FORMAT(11)
0030     60 FORMAT('1DATA ANALYSIS')
0031     DIMENSION DATIME(4)
0032     DIMENSION FM1(1000),FM2(1000),FM3(1000),FM4(1000)
0033     DIMENSION U(1000),DU(1000),DT(1000)
0034     DIMENSION R1(200),R2(200),R3(200),R4(200),R5(200),R6(200),R7(200)
0035     DIMENSION R101(200),R102(200),R103(200),R104(200),R105(200)
0036     DIMENSION R106(200),R107(200),R108(200),R109(200),R110(200)
0037     DIMENSION R111(200),R112(200)
0038     DIMENSION R200(200),R201(200),R202(200),R203(200),R204(200)
0039     DIMENSION R205(200)
0040     DIMENSION R210(200),R211(200),R212(200),R213(200),R214(200)
0041     DIMENSION R215(200)
0042     DIMENSION R220(200),R221(200),R222(200),R223(200),R224(200)
0043     DIMENSION R225(200)
0044     DIMENSION R230(200),R231(200),R232(200),R233(200),R234(200)
0045     DIMENSION R235(200)
0046     DIMENSION R300(200),R301(200),R302(200),R303(200),R304(200)
0047     DIMENSION R305(200)
0048     DIMENSION FMS1(1000),FMS2(1000),FMS3(1000),FMS4(1000)
0049     DIMENSION X1(200),X2(200)
0050     DIMENSION XX1(1000),XX2(1000),XX3(1000),XX4(1000)
0051     DIMENSION XX5(1000),XX6(1000),XX7(1000)
0052     DIMENSION R102R(200),R104R(200),R106R(200)
0053     DIMENSION R108R(200),R110R(200),R112R(200)
0054     WRITE(4,60)
0055     READ(5,51) DATIME
```

```
0056      WRITE(4,51) DATIME
0057      READ(5,50) RUNTIM
0058      WRITE(4,49)
0059      WRITE(4,50) RUNTIM
0060      RUNTIM=60.0*RUNTIM
0061      READ(5,53) IDT
0062      WRITE(4,9)
0063      J=0
0064      100 READ(5,6)I,A,B,C
0065      J=J+1
0066      GO TO(101,102,103,104,105,106,107,108,109,110,111),I
0067      101 A1=A
0068      B1=B
0069      C1=C
0070      GO TO 100
0071      102 A2=A
0072      B2=B
0073      C2=C
0074      GO TO 100
0075      103 A3=A
0076      B3=B
0077      C3=C
0078      GO TO 100
0079      104 A4=A
0080      B4=B
0081      C4=C
0082      GO TO 100
0083      105 A5=A
0084      B5=B
0085      C5=C
0086      GO TO 100
0087      106 A6=A
0088      B6=B
0089      C6=C
0090      GO TO 100
0091      107 A7=A
0092      B7=B
0093      C7=C
0094      GO TO 100
0095      108 A8=A
0096      B8=B
0097      C8=C
0098      GO TO 100
0099      109 A9=A
0100      B9=B
0101      C9=C
0102      GO TO 100
0103      110 A10=A
0104      B10=B
0105      C10=C
0106      GO TO 100
0107      111 A11=A
0108      B11=B
0109      C11=C
0110      IF(J-11)126,120,126
```

```
0111      126  STOP
0112      120  CONTINUE
0113          J=999
0114          K=500
0115          NFND=0
0116      130  READ(5,7)M,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,I11
0117          IF(M-9999)131,132,131
0118      131  NFND=NFND+1
0119          COMP=703.0/FLCAT(M)
0120          U(K)=(A1*FLOAT(I1)+B1)*C1
0121          U(K)=U(K)*COMP
0122          DU(K)=(A6*FLCAT(I6)+B6)*C6
0123          DU(K)=DU(K)*COMP
0124          IF(1-IDT)600,601,600
0125      601  DT(K)=(A7*FLOAT(I7)+B7)*C7
0126          GO TO 602
0127      600  DT(K)=- (A7*FLCAT(I7)+B7)*C7
0128      602  CONTINUE
0129          DT(K)=DT(K)*COMP
0130          FM1(J)=(A2*FLCAT(I11)+B2)*C2
0131          FM1(J)=FM1(J)*COMP
0132          FM1(J+1)=(A8*FLOAT(I5)+B8)*C8
0133          FM1(J+1)=FM1(J+1)*CCMP
0134          FM2(J)=(A3*FLOAT(I10)+B3)*C3
0135          FM2(J)=FM2(J)*COMP
0136          FM2(J+1)=(A9*FLOAT(I4)+B9)*C9
0137          FM2(J+1)=FM2(J+1)*CCMP
0138          FM3(J)=(A4*FLCAT(I9)+B4)*C4
0139          FM3(J)=FM3(J)*COMP
0140          FM3(J+1)=(A10*FLOAT(I3)+B10)*C10
0141          FM3(J+1)=FM3(J+1)*CCMP
0142          FM4(J)=(A5*FLCAT(I8)+B5)*C5
0143          FM4(J)=FM4(J)*COMP
0144          FM4(J+1)=(A11*FLOAT(I2)+B11)*C11
0145          FM4(J+1)=FM4(J+1)*CCMP
0146          J=J-2
0147          K=K-1
0148          GO TO 130
0149      132  J=J+2
0150          K=K+1
0151          NM=2*NFND
0152          L=NM/10
0153          LS=L/2
0154          DO 140 JN=1,NM
0155          FM1(JN)=FM1(J)
0156          FM2(JN)=FM2(J)
0157          FM3(JN)=FM3(J)
0158          FM4(JN)=FM4(J)
0159      140  J=J+1
0160          DO 141 KN=1,NFND
0161          U(KN)=U(K)
0162          DU(KN)=DU(K)
0163          DT(KN)=DT(K)
0164      141  K=K+1
0165          D1=8.0
```

```
0166      D1=D1/2.0
0167      D2=C1*200.0
0168      D2=D2/10.0
0169      D3=C2*200.0
0170      D3=D3/10.0
0171      D4=C3*200.0
0172      D4=D4/10.0
0173      D5=C4*200.0
0174      D5=D5/10.0
0175      D6=3.5
0176      D6=D6/2.0
0177      D7=3.5
0178      D7=D7/2.0
0179      NMA=NM-1
0180      NFNDA=NFND-1
0181      DO 700 I=2,NMA
0182      Q2=((FM1(I-1)+FM1(I+1))/2.0)-FM1(I)
0183      IF(D2-Q2)701,702,702
0184      701 FM1(I)=(FM1(I-1)+FM1(I+1))/2.0
0185      702 CONTINUE
0186      Q3=((FM2(I-1)+FM2(I+1))/2.0)-FM2(I)
0187      IF(D3-Q3)703,704,704
0188      703 FM2(I)=(FM2(I-1)+FM2(I+1))/2.0
0189      704 CONTINUE
0190      Q4=((FM3(I-1)+FM3(I+1))/2.0)-FM3(I)
0191      IF(D4-Q4)705,706,706
0192      705 FM3(I)=(FM3(I-1)+FM3(I+1))/2.0
0193      706 CONTINUE
0194      Q5=((FM4(I-1)+FM4(I+1))/2.0)-FM4(I)
0195      IF(D5-Q5)707,700,700
0196      707 FM4(I)=(FM4(I-1)+FM4(I+1))/2.0
0197      700 CONTINUE
0198      DO 800 I=2,NFNDA
0199      Q1=((U(I-1)+U(I+1))/2.0)-U(I)
0200      IF(D1-Q1)801,802,802
0201      801 U(I)=(U(I-1)+U(I+1))/2.0
0202      802 CONTINUE
0203      Q6=((DU(I-1)+DU(I+1))/2.0)-DU(I)
0204      IF(D6-Q6)803,804,804
0205      803 DU(I)=(DU(I-1)+DU(I+1))/2.0
0206      804 CONTINUE
0207      Q7=((DT(I-1)+DT(I+1))/2.0)-DT(I)
0208      IF(D7-Q7)805,800,800
0209      805 DT(I)=(DT(I-1)+DT(I+1))/2.0
0210      800 CONTINUE
0211      FNY=FLOAT(NM)
0212      FNFND=FLOAT(NFND)
0213      J=1
0214      K=1
0215      149 WRITE(4,10) K,FM1(J),FM2(J),FM3(J),FM4(J),U(K),DU(K),DT(K),FM1(J+1
0216      1) ,FM2(J+1) ,FM3(J+1) ,FM4(J+1)
0217      IF(K-NFND)150,151,151
0218      150 J=J+2
0219      K=K+1
0219      GO TO 149
```

```
0220      151  SM1=0.0
0221          SM2=0.0
0222          SM3=0.0
0223          SM4=0.0
0224          SM5=0.0
0225          SM6=0.0
0226          SM7=0.0
0227          SM8=0.0
0228          SM9=0.0
0229          SM10=0.0
0230          SM11=0.0
0231          DO 160 J=1,NM
0232          SM2=SM2+FM1(J)
0233          SM3=SM3+FM2(J)
0234          SM4=SM4+FM3(J)
0235      160  SM5=SM5+FM4(J)
0236          DO 161 K=1,NFND
0237          SM1=SM1+U(K)
0238          SM6=SM6+DU(K)
0239      161  SM7=SM7+DT(K)
0240          SM1=SM1/FNFND
0241          SM2=SM2/FNM
0242          SM3=SM3/FNM
0243          SM4=SM4/FNM
0244          SM5=SM5/FNM
0245          SM6=SM6/FNFND
0246          SM7=SM7/FNFND
0247          WRITE(4,11)
0248          WRITE(4,12) SM1,SM2,SM3,SM4,SM5,SM6,SM7,SM8,SM9,SM10,SM11
0249          VAR1=0.0
0250          VAR2=0.0
0251          VAR3=0.0
0252          VAR4=0.0
0253          VAR5=0.0
0254          VAR6=0.0
0255          VAR7=0.0
0256          VAR8=0.0
0257          VAR9=0.0
0258          VAR10=0.0
0259          VAR11=0.0
0260          DO 170 J=1,NM
0261          VAR2=VAR2+(FM1(J)-SM2)**2
0262          VAR3=VAR3+(FM2(J)-SM3)**2
0263          VAR4=VAR4+(FM3(J)-SM4)**2
0264      170  VAR5=VAR5+(FM4(J)-SM5)**2
0265          DO 171 K=1,NFND
0266          VAR1=VAR1+(U(K)-SM1)**2
0267          VAR6=VAR6+(DU(K)-SM6)**2
0268      171  VAR7=VAR7+(DT(K)-SM7)**2
0269          SD1=SQRT(VAR1/FNFND)
0270          SD2=SQRT(VAR2/FNM)
0271          SD3=SQRT(VAR3/FNM)
0272          SD4=SQRT(VAR4/FNM)
0273          SD5=SQRT(VAR5/FNM)
0274          SD6=SQRT(VAR6/FNFND)
```

```
0275      SD7=SQRT(VAR7/FNFND)
0276      WRITE(4,12) SD1,SD2,SD3,SD4,SD5,SD6,SD7
0277      CV1=SD1/SM1
0278      CV2=SD2/SM2
0279      CV3=SD3/SM3
0280      CV4=SD4/SM4
0281      CV5=SD5/SM5
0282      CV6=SD6/SM6
0283      CV7=SD7/SM7
0284      WRITE(4,40) CV1,CV2,CV3,CV4,CV5,CV6,CV7
0285      G=9.81
0286      T=285.0
0287      DELZ=7.0
0288      GAMMA=0.01
0289      DELU=SM6/DELZ
0290      DELU=DELU**2
0291      DELT=-SM7/DELZ
0292      RI=(G*(DELT+GAMMA))/(T*DELU)
0293      WRITE(4,13)
0294      WRITE(4,14) RI
0295      ST=RUNTIM/FNFND
0296      ST=ST/2.0
0297      WRITE(4,15)
0298      WRITE(4,14) ST
0299      CALL AUTO(FM1,NM,L,R2)
0300      CALL AUTO(FM2,NM,L,R3)
0301      CALL AUTO(FM3,NM,L,R4)
0302      CALL AUTO(FM4,NM,L,P5)
0303      CALL AUTO(U,NFND,LS,R1)
0304      CALL AUTO(DU,NFND,LS,R6)
0305      CALL AUTO(DT,NFND,LS,R7)
0306      SMA1=SQRT(R1(1))
0307      SMA2=SQRT(R2(1))
0308      SMA3=SQRT(R3(1))
0309      SMA4=SQRT(R4(1))
0310      SMA5=SQRT(R5(1))
0311      SMA6=SQRT(R6(1))
0312      SMA7=SQRT(R7(1))
0313      WRITE(4,16)
0314      WRITE(4,17)(I,R2(I),R3(I),R4(I),R5(I),I=1,L)
0315      WRITE(4,18)
0316      WRITE(4,32)(I,R1(I),R6(I),R7(I),I=1,LS)
0317      WRITE(4,20)
0318      WRITE(4,12) SMA2,SMA3,SMA4,SMA5,SMA1,SMA6,SMA7
0319      RR1=R1(1)
0320      RR2=R2(1)
0321      RR3=R3(1)
0322      RR4=R4(1)
0323      RR5=R5(1)
0324      RR6=R6(1)
0325      RR7=R7(1)
0326      DO 180 I=1,L
0327      R2(I)=R2(I)/RR2
0328      R3(I)=R3(I)/RR3
0329      R4(I)=R4(I)/RR4
```

```
0330      180  R5(I)=R5(I)/RR5
0331          DO 181 I=1,LS
0332          R1(I)=R1(I)/RR1
0333          R6(I)=R6(I)/RR6
0334      181  R7(I)=R7(I)/RR7
0335          CALL CROSS(FM1,FM2,NM,L,R101,R102)
0336          CALL CROSS(FM1,FM3,NM,L,R103,R104)
0337          CALL CROSS(FM1,FM4,NM,L,R105,R106)
0338          CALL CROSS(FM2,FM3,NM,L,R107,R108)
0339          CALL CROSS(FM2,FM4,NM,L,R109,R110)
0340          CALL CROSS(FM3,FM4,NM,L,R111,R112)
0341          DO 190 I=1,L
0342          R101(I)=R101(I)/(SMA2*SMA3)
0343          R102(I)=R102(I)/(SMA2*SMA3)
0344          R103(I)=R103(I)/(SMA2*SMA4)
0345          R104(I)=R104(I)/(SMA2*SMA4)
0346          R105(I)=R105(I)/(SMA2*SMA5)
0347          R106(I)=R106(I)/(SMA2*SMA5)
0348          R107(I)=R107(I)/(SMA3*SMA4)
0349          R108(I)=R108(I)/(SMA3*SMA4)
0350          R109(I)=R109(I)/(SMA3*SMA5)
0351          R110(I)=R110(I)/(SMA3*SMA5)
0352          R111(I)=R111(I)/(SMA4*SMA5)
0353      190  R112(I)=R112(I)/(SMA4*SMA5)
0354          WRITE(4,22)
0355          WRITE(4,23)(I,R101(I),R102(I),R103(I),R104(I),R105(I),R106(I),I=1,
1L)
0356          WRITE(4,24)
0357          WRITE(4,23)(I,R107(I),R108(I),R109(I),R110(I),R111(I),R112(I),I=1,
1L)
0358          J=1
0359          MNM=NM-1
0360          DO 200 JN=1,MNM,2
0361          FMS1(J)=(FM1(JN)+FM1(JN+1))/2.0
0362          FMS2(J)=(FM2(JN)+FM2(JN+1))/2.0
0363          FMS3(J)=(FM3(JN)+FM3(JN+1))/2.0
0364          FMS4(J)=(FM4(JN)+FM4(JN+1))/2.0
0365      200  J=J+1
0366          CALL CROSS(FMS1,U,NFND,LS,R200,R201)
0367          CALL CROSS(FMS1,DU,NFND,LS,R202,R203)
0368          CALL CROSS(FMS1,DT,NFND,LS,R204,R205)
0369          CALL CROSS(FMS2,U,NFND,LS,R210,R211)
0370          CALL CROSS(FMS2,DU,NFND,LS,R212,R213)
0371          CALL CROSS(FMS2,DT,NFND,LS,R214,R215)
0372          CALL CROSS(FMS3,U,NFND,LS,R220,R221)
0373          CALL CROSS(FMS3,DU,NFND,LS,R222,R223)
0374          CALL CROSS(FMS3,DT,NFND,LS,R224,R225)
0375          CALL CROSS(FMS4,U,NFND,LS,R230,R231)
0376          CALL CROSS(FMS4,DU,NFND,LS,R232,R233)
0377          CALL CROSS(FMS4,DT,NFND,LS,R234,R235)
0378          CALL CROSS(U,DU,NFND,LS,R300,R301)
0379          CALL CROSS(U,DT,NFND,LS,R302,R303)
0380          CALL CROSS(DU,DT,NFND,LS,R304,R305)
0381          DO 210 J=1,LS
0382          R200(J)=R200(J)/(SMA2*SMA1)
```

```
0383      R201(J)=R201(J)/(SMA2*SMA1)
0384      R202(J)=R202(J)/(SMA2*SMA6)
0385      R203(J)=R203(J)/(SMA2*SMA6)
0386      R204(J)=R204(J)/(SMA2*SMA7)
0387      R205(J)=R205(J)/(SMA2*SMA7)
0388      R210(J)=R210(J)/(SMA3*SMA1)
0389      R211(J)=R211(J)/(SMA3*SMA1)
0390      R212(J)=R212(J)/(SMA3*SMA6)
0391      R213(J)=R213(J)/(SMA3*SMA6)
0392      R214(J)=R214(J)/(SMA3*SMA7)
0393      R215(J)=R215(J)/(SMA3*SMA7)
0394      R220(J)=R220(J)/(SMA4*SMA1)
0395      R221(J)=R221(J)/(SMA4*SMA1)
0396      R222(J)=R222(J)/(SMA4*SMA6)
0397      R223(J)=R223(J)/(SMA4*SMA6)
0398      R224(J)=R224(J)/(SMA4*SMA7)
0399      R225(J)=R225(J)/(SMA4*SMA7)
0400      R230(J)=R230(J)/(SMA5*SMA1)
0401      R231(J)=R231(J)/(SMA5*SMA1)
0402      R232(J)=R232(J)/(SMA5*SMA6)
0403      R233(J)=R233(J)/(SMA5*SMA6)
0404      R234(J)=R234(J)/(SMA5*SMA7)
0405      R235(J)=R235(J)/(SMA5*SMA7)
0406      R300(J)=R300(J)/(SMA1*SMA6)
0407      R301(J)=R301(J)/(SMA1*SMA6)
0408      R302(J)=R302(J)/(SMA1*SMA7)
0409      R303(J)=R303(J)/(SMA1*SMA7)
0410      R304(J)=R304(J)/(SMA6*SMA7)
0411      210 R305(J)=R305(J)/(SMA6*SMA7)
0412      WRITE(4,26)
0413      WRITE(4,23)(I,R200(I),R201(I),R202(I),R203(I),R204(I),R205(I),I=1,
1LS)
0414      WRITE(4,27)
0415      WRITE(4,23)(I,R210(I),R211(I),R212(I),R213(I),R214(I),R215(I),I=1,
1LS)
0416      WRITE(4,28)
0417      WRITE(4,23)(I,R220(I),R221(I),R222(I),R223(I),R224(I),R225(I),I=1,
1LS)
0418      WRITE(4,29)
0419      WRITE(4,23)(I,R230(I),R231(I),R232(I),R233(I),R234(I),R235(I),I=1,
1LS)
0420      WRITE(4,30)
0421      WRITE(4,23)(I,R300(I),R301(I),R302(I),R303(I),R304(I),R305(I),I=1,
1LS)
0422      AL1=0.0
0423      AL2=0.0
0424      AL3=0.0
0425      AL4=0.0
0426      AL5=0.0
0427      AL6=0.0
0428      AL7=0.0
0429      AL8=0.0
0430      AL9=0.0
0431      AL10=0.0
0432      AL11=0.0
```

```
0433      DO 220 I=1,L
0434      AL2=AL2+(R2(I)*ST)
0435      AL3=AL3+(R3(I)*ST)
0436      AL4=AL4+(R4(I)*ST)
0437      220  AL5=AL5+(R5(I)*ST)
0438      DO 221 I=1,LS
0439      AL1=AL1+(R1(I)*2.0*ST)
0440      AL6=AL6+(R6(I)*2.0*ST)
0441      221  AL7=AL7+(R7(I)*2.0*ST)
0442      WRITE(4,33)
0443      WRITE(4,34) AL2,AL3,AL4,AL5,AL1,AL6,AL7
0444      VMAX1=200.0*C2
0445      VMAX2=200.0*C3
0446      VMAX3=200.0*C4
0447      VMAX4=200.0*C5
0448      IF(VMAX1-VMAX2)400,400,401
0449      400  VMAXF=VMAX2
0450      GO TO 411
0451      401  VMAXF=VMAX1
0452      411  IF(VMAXF-VMAX3)402,402,403
0453      402  VMAXF=VMAX3
0454      403  IF(VMAXF-VMAX4)404,404,405
0455      404  VMAXF=VMAX4
0456      405  CONTINUE
0457      VMAXF=VMAXF*1.20
0458      DO 410 J=1,NM
0459      FM1(J)=FM1(J)/VMAXF
0460      IF(FM1(J)-1.0)900,900,901
0461      901  FM1(J)=1.0
0462      900  FM2(J)=FM2(J)/VMAXF
0463      IF(FM2(J)-1.0)902,902,903
0464      903  FM2(J)=1.0
0465      902  FM3(J)=FM3(J)/VMAXF
0466      IF(FM3(J)-1.0)904,904,905
0467      905  FM3(J)=1.0
0468      904  FM4(J)=FM4(J)/VMAXF
0469      IF(FM4(J)-1.0)410,410,906
0470      906  FM4(J)=1.0
0471      410  CONTINUE
0472      DO 420 J=1,NFND
0473      U(J)=U(J)/8.0
0474      IF(U(J)-1.0)910,910,911
0475      911  U(J)=1.0
0476      910  DU(J)=DU(J)/3.5
0477      IF(DU(J)-1.0)912,912,913
0478      913  DU(J)=1.0
0479      912  DT(J)=DT(J)/3.5
0480      IF(DT(J)-1.0)420,420,914
0481      914  DT(J)=1.0
0482      420  CONTINUE
0483      DO 500 J=1,L
0484      500  X1(J)=FLOAT(J-1)*ST
0485      DO 501 J=1,LS
0486      501  X2(J)=FLOAT(J-1)*ST*2.0
0487      DO 502 J=1,NM
```

```
0488      XX1(J)=FLOAT(J-1)*ST
0489      XX2(J)=FLOAT(J-1)*ST+(ST/6.0)
0490      XX3(J)=FLOAT(J-1)*ST+(ST/3.0)
0491      502  XX4(J)=FLOAT(J-1)*ST+(ST/2.0)
0492      DO 503 J=1,NFND
0493      XX5(J)=FLOAT(J-1)*2.0*ST+(ST*0.667)
0494      XX6(J)=FLOAT(J-1)*2.0*ST+(ST*0.833)
0495      503  XX7(J)=FLOAT(J-1)*2.0*ST+(ST*1.833)
0496      XTEST=X1(L)
0497      XTEST=XTEST/10.0
0498      XTEST=FLOAT(IFIX(XTEST))
0499      XTEST=XTEST*10.0
0500      XMIN=-(XTEST+10.0)
0501      AXLTH1=(XTEST/10.0)+1.0
0502      AXLTH2=(XX4(NM)/20.0)+1.0
0503      AXLTH3=2.0*AXLTH1
0504      XPOS2=2.0*AXLTH1+1.0+0.5
0505      XPOS3=3.0*AXLTH1+2.0+0.5
0506      XPOS4=XPOS2-AXLTH1
0507      M=L
0508      DO 504 J=1,L
0509      R102R(M)=R102(J)
0510      R104R(M)=R104(J)
0511      R106R(M)=R106(J)
0512      R108R(M)=R108(J)
0513      R110R(M)=R110(J)
0514      R112R(M)=R112(J)
0515      504  M=M-1
0516      DO 610 J=1,NFND
0517      IF(DT(J))611,610,610
0518      611  DT(J)=-DT(J)
0519      610  CONTINUE
0520      CALL PLTXMX(160.0)
0521      CALL PAXIS(0.5,0.5,'TIME (SEC)',-10,AXLTH1,0.0,0.0,10.0,1.0)
0522      CALL PAXIS(0.5,0.5,'AUTOCORRELATION',15,10.0,90.0,-1.0,0.2,1.0)
0523      CALL PSYMB(1.0,1.0,-0.1,'DPH76 C.D.JCNES',0.0,15)
0524      CALL PSYMB(3.0,1.0,-0.1,DATIME,0.0,15)
0525      CALL PLTOFS(0.0,10.0,-1.0,C.2,0.5,0.5)
0526      CALL PLINE(X1,R2,L,1,4,0,1.0)
0527      CALL PLINE(X1,R3,L,1,4,1,1.0)
0528      CALL PLINE(X1,R4,L,1,4,2,1.0)
0529      CALL PLINE(X1,R5,L,1,4,3,1.0)
0530      CALL PLINE(X2,R1,LS,1,3,4,1.0)
0531      CALL PLINE(X2,R6,LS,1,3,5,1.0)
0532      CALL PLINE(X2,R7,LS,1,3,6,1.0)
0533      CALL PAXIS(XPOS4,0.5,'TIME (SEC)',-10,AXLTH3,0.0,XMIN,10.0,1.0)
0534      CALL PAXIS(XPOS2,0.5,'CROSSCORRELATION',16,10.0,90.0,-1.0,0.2,1.0)
0535      XPOS4=XPOS2-X1(L)/10.0
0536      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS4,0.5)
0537      CALL PLINE(X1,R102R,L,1,4,0,1.0)
0538      CALL PLINE(X1,R104R,L,1,4,1,1.0)
0539      CALL PLINE(X1,R106R,L,1,4,2,1.0)
0540      CALL PLINE(X1,R108R,L,1,4,3,1.0)
0541      CALL PLINE(X1,R110R,L,1,4,4,1.0)
0542      CALL PLINE(X1,R112R,L,1,4,5,1.0)
```

```
0543      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS2,0.5)
0544      CALL PLINE(X1,R101,L,1,4,0,1.0)
0545      CALL PLINE(X1,R103,L,1,4,1,1.0)
0546      CALL PLINE(X1,R105,L,1,4,2,1.0)
0547      CALL PLINE(X1,R107,L,1,4,3,1.0)
0548      CALL PLINE(X1,R109,L,1,4,4,1.0)
0549      CALL PLINE(X1,R111,L,1,4,5,1.0)
0550      CALL PAXIS(XPOS3,0.5,'TIME (SEC)',-10,AXLTH2,0.0,0.0,20.0,1.0)
0551      CALL PAXIS(XPOS3,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0552      CALL PLTOFS(0.0,20.0,0.0,0.1,XPOS3,0.5)
0553      CALL PLINE(XX1,FM1,NM,1,4,0,1.0)
0554      CALL PLINE(XX2,FM2,NM,1,4,1,1.0)
0555      CALL PLINE(XX3,FM3,NM,1,4,2,1.0)
0556      CALL PLINE(XX4,FM4,NM,1,4,3,1.0)
0557      CALL PLINE(XX5,DT,NFND,1,3,6,1.0)
0558      CALL PLINE(XX6,DU,NFND,1,3,5,1.0)
0559      CALL PLINE(XX7,U,NFND,1,3,4,1.0)
0560      CALL PLTEND
0561      STOP
0562      END
```

TOTAL MEMORY REQUIREMENTS 020662 BYTES
"DPRO" DOES NOT EXIST.

PLN PROG

```

0001      1  FORMAT(4F15.7)
0002      2  FORMAT(T2,4F15.7)
0003      3  FORMAT(1F6.1,10E11.3)
0004      4  FORMAT(8F8.3,4E12.3)
0005      5  FORMAT(2F15.5,1F15.4,4F15.1)
0006      READ(5,1)SH,CURR
0007      READ(5,1)R,Z2,BETA
0008      READ(5,1)GKY,GKZ,U
0009      READ(5,1)SP,BP,QMIN
0010      WRITE(6,2)SH,CURR
0011      WRITE(6,1)R,Z2,BETA
0012      WRITE(6,1)GKY,GKZ,U
0013      WRITE(6,1)SP,BP,QMIN
0014      PI=3.14159
0015      EPSLON=8.854E-12
0016      50  R=-100.
0017      60  EX1=0.0
0018      EX2=0.0
0019      EY1=0.0
0020      FY2=0.0
0021      EZ1=0.0
0022      EZ2=0.0
0023      P=SP
0024      DP=10.
0025      BETRAD=BETA*PI/180.0
0026      70  DIFANG=2.0*(SQRT((9.21*GKY)/(U*(P+(DP/2.))))))
0027      DIFRAD=DIFANG*PI/180.0
0028      DALFA=DIFRAD/10.0
0029      SALFA=-DIFRAD/2.0
0030      BALFA=+DIFRAD/2.0
0031      HZ=SQRT((9.21*GKZ*(P+(DP/2.)))/U)
0032      DZ1=HZ/5.0
0033      DVOL=P*DP*DALFA*DZ1
0034      ALFA=SALFA
0035      80  AZI=-9.2104*((ALFA**2)/(DIFRAD**2))
0036      AZI=EXP(AZI)
0037      Z1=SH-HZ
0038      BZ1=SH+HZ+(DZ1/10.0)
0039      99  CONTINUE
0040      IF(Z1)100,100,101
0041      101  A=0.0
0042      ELLO=Z1-SH
0043      ELLO=-2.3026*((ELLO**2)/(HZ**2))
0044      CHI1=(AZI*(EXP(ELLO)))/HZ
0045      CHI1=(CHI1*4.6052*CURR)/(PI*U*P*DIFRAD)
0046      102  QSQD=(P*COS(ALFA)-R*COS(BETRAD))**2+(P*SIN(ALFA)-R*SIN(BETRAD))**2
           1+(Z1-Z2)**2
0047      Q=SQRT(QSQD)
0048      IF(Q-QMIN)98,104,104
0049      104  SINFI=(Z1-Z2)/Q
0050      IF(1.0+SINFI)200,201,201
0051      200  SINFI=-1.0
0052      GO TO 211
0053      201  CONTINUE
0054      IF(1.0-SINFI)210,211,211
0055      210  SINFI=+1.0
0056      211  CONTINUE
0057      FI=ARSIN(SINFI)

```

```
0058      COSFI=COS(FI)
0059      COSTHE=(P*COS(ALFA)-R*COS(BETRAD))/(Q*COSFI)
0060      IF(1.0+COSTHE)300,301,301
0061 300    COSTHE=-1.0
0062      GO TO 311
0063 301    CONTINUE
0064      IF(1.0-COSTHE)310,311,311
0065 310    COSTHE=+1.0
0066 311    CONTINUE
0067      THE=ARCCOS(COSTHE)
0068      SINTE=SIN(THE)
0069      ELFLD1=-(CHI1*DVOL)/(4.0*PI*EPSLON*QSQD)
0070      EX1=EX1+ELFLD1*COSTHE*COSFI
0071      EZ1=EZ1+ELFLD1*SINFI
0072      VECT=P*SIN(ALFA)-R*SIN(BETRAD)
0073      IF(VECT)600,600,601
0074 600    ELFLD1=-ELFLD1
0075 601    EY1=EY1+ELFLD1*SINTE*COSFI
0076      IF(VECT)800,800,801
0077 800    ELFLD1=-ELFLD1
0078 801    CONTINUE
0079 98     CHI1=-CHI1
0080      Z1=-Z1
0081      A=A+1.5
0082      IF(2.0-A)100,100,102
0083 100    Z1=Z1+DZ1
0084      IF(BZ1-Z1)103,103,99
0085 103    Z1=0.0
0086 110    BZ1=HZ-SH-Z1+(DZ1/10.0)
0087      IF(BZ1)111,115,115
0088 115    A=0.0
0089      ELHI=Z1+SH
0090      ELHI=-2.3026*((ELHI**2)/(HZ**2))
0091      CHI2=(AZI*(EXP(ELHI)))/HZ
0092      CHI2=(CHI2*4.6052*CURR)/(PI*U*P*DIFRAD)
0093 112    QSQD=(P*COS(ALFA)-R*COS(BETRAD))**2+(P*SIN(ALFA)-R*SIN(BETRAD))**2
1+(Z1-Z2)**2
0094      IF(Q-QMIN)114,116,116
0095 116    SINFI=(Z1-Z2)/Q
0096      IF(1.0+SINFI)400,401,401
0097 400    SINFI=-1.0
0098      GO TO 411
0099 401    CONTINUE
0100      IF(1.0-SINFI)410,411,411
0101 410    SINFI=+1.0
0102 411    CONTINUE
0103      FI=ARSIN(SINFI)
0104      COSFI=COS(FI)
0105      COSTHE=(P*COS(ALFA)-R*COS(BETRAD))/(Q*COSFI)
0106      IF(1.0+COSTHE)500,501,501
0107 500    COSTHE=-1.0
0108      GO TO 511
0109 501    CONTINUE
0110      IF(1.0-COSTHE)510,511,511
0111 510    COSTHE=+1.0
0112 511    CONTINUE
0113      THE=ARCCOS(COSTHE)
0114      SINTE=SIN(THE)
```

```
0115      ELFLD2=-(CHI2*DVOL)/(4.0*PI*EPSLON*QSQD)
0116      EX2=EX2+ELFLD2*COSTHE*COSFI
0117      EZ2=EZ2+ELFLD2*SINFI
0118      VECT=P*SIN(ALFA)-R*SIN(BETRAD)
0119      IF(VECT)700,700,701
0120      700 ELFLD2=-ELFLD2
0121      701 EY2=EY2+ELFLD2*SINTHE*COSFI
0122      IF(VECT)900,900,901
0123      900 ELFLD2=-ELFLD2
0124      901 CONTINUE
0125      114 CHI2=-CHI2
0126      Z1=-Z1
0127      A=A+1.5
0128      IF(2.0-A)113,113,112
0129      113 Z1=Z1+DZ1
0130      GO TO 110
0131      111 ALFA=ALFA+DALFA
0132      IF(BALFA+(DALFA/10.0)-ALFA)119,80,80
0133      119 EX=EX1+EX2
0134      EY=EY1+EY2
0135      EZ=EZ1+EZ2
0136      P=P+DP
0137      IF(BP+(DP/10.0)-P)120,120,70
0138      120 IF(R)1100,1100,1101
0139      1100 PLUDIM=0.
0140      GO TO 1102
0141      1101 PLUDIM=SQRT((9.21*GKZ*R)/U)
0142      1102 CONTINUE
0143      WRITE(6,5) GKY,GKZ,PLUDIM,R,EZ1,EZ2,EZ
0144      Z2=Z2+1.
0145      IF(0.9-Z2)130,60,60
0146      130 Z2=0.0
0147      R=R+20.
0148      IF(80.-R)140,60,60
0149      140 IF(200.-R)150,141,141
0150      141 R=R+10.
0151      GO TO 60
0152      150 IF(R-290.)1000,1000,1001
0153      1000 R=300.
0154      GO TO 60
0155      1001 R=R+190.
0156      IF(R-1000.)1010,1010,1011
0157      1010 CONTINUE
0158      GO TO 60
0159      1011 GKY=GKY*10.
0160      GKZ=GKZ*10.
0161      IF(110.-GKY)2000,50,50
0162      2000 STOP
0163      END
```

```
0001      DIMENSION X(1000),Y(1000),Z(1000),DX(1000),DYY(1000),DZZ(1000)
0002      DIMENSION DS(1000),X1(1000),X2(1000),Y1(1000),Y2(1000),FM1(1000)
0003      DIMENSION FM2(1000),SINF1(1000),SINF2(1000),R1(1000),R2(1000)
0004      DIMENSION A1(1000),A2(1000),C1(1000),C2(1000)
0005      DIMENSION X3(1000),Y3(1000),FM3(1000),SINF3(1000),R3(1000)
0006      DIMENSION A3(1000),C3(1000),C4(1000),C5(1000),C6(1000)
0007      DIMENSION XX(1000)
0008      DIMENSION RUN(4)
0009      1 FORMAT('1TRIAL')
0010      WRITE(4,1)
0011      2 FORMAT(3E15.3)
0012      3 FORMAT(14,3E15.3,6F10.3)
0013      4 FORMAT(8E15.3)
0014      5 FORMAT(6F10.3)
0015      6 FORMAT(4A4)
0016      7 FORMAT('1 OSC.PLUME')
0017      8 FORMAT('1 MEAN,SD,SKEW MILLS')
0018      9 FORMAT(3E15.3)
0019      WRITE(4,7)
0020      READ(5,6) RUN
0021      READ(5,5) RR1,RR2,RR3,ALFA1,ALFA2,ALFA3
0022      READ(5,5) AY,AZ,FY,FZ,U,H
0023      READ(5,5) DDT,DX,TMAX,XMAX,BETA
0024      WRITE(4,5) RR1,RR2,RR3,ALFA1,ALFA2,ALFA3
0025      WRITE(4,5) AY,AZ,FY,FZ,U,H
0026      WRITE(4,5) DDT,DX,TMAX,XMAX,BETA
0027      CURR=0.000001
0028      EPSLON=8.85E-12
0029      PI=3.14
0030      DELT=DX/U
0031      JMAX=IFIX(XMAX/DX)
0032      KMAX=IFIX(TMAX/DDT)
0033      RHQ=CURR/U
0034      ALFA1=ALFA1*PI/180.0
0035      ALFA2=ALFA2*PI/180.0
0036      ALFA3=ALFA3*PI/180.0
0037      BETA=BETA*PI/180.0
0038      XM1=RR1*COS(ALFA1)
0039      YM1=RR1*SIN(ALFA1)
0040      XM2=RR2*COS(ALFA2)
0041      YM2=RR2*SIN(ALFA2)
0042      XM3=RR3*COS(ALFA3)
0043      YM3=RR3*SIN(ALFA3)
0044      II=1
0045      DT=0.0
0046      51 FLD1=0.0
0047      FLD2=0.0
0048      FLD3=0.0
0049      T=0.0
0050      DO 10 I=1,JMAX
0051      X(I)=U*T
0052      Y(I)=AY*T*SIN(2.0*PI*FY*(T+DT))
0053      ZDASH=X(I)*TAN(BETA)
0054      Z(I)=H+AZ*T*SIN(2.0*PI*FZ*(T+DT))
0055      Z(I)=Z(I)+ZDASH
```

OSCP LN PROG

```
0056      IF(Z(I)-0.1)11,11,12
0057      11 Z(I)=0.1
0058      12 CONTINUE
0059      10 T=T+DELT
0060      JMAX1=JMAX-1
0061      DO 20 I=1,JMAX1
0062      DXX(I)=X(I+1)-X(I)
0063      DYY(I)=Y(I+1)-Y(I)
0064      DZZ(I)=Z(I+1)-Z(I)
0065      DS(I)=SQRT(DXX(I)**2+DYY(I)**2+DZZ(I)**2)
0066      20 CONTINUE
0067      DS(JMAX)=DS(JMAX1)
0068      DO 30 I=1,JMAX
0069      X1(I)=X(I)-XM1
0070      X2(I)=X(I)-XM2
0071      Y1(I)=Y(I)-YM1
0072      Y2(I)=Y(I)-YM2
0073      X3(I)=X(I)-XM3
0074      30 Y3(I)=Y(I)-YM3
0075      DO 40 I=1,JMAX
0076      R1(I)=SQRT(X1(I)**2+Y1(I)**2+Z(I)**2)
0077      R2(I)=SQRT(X2(I)**2+Y2(I)**2+Z(I)**2)
0078      R3(I)=SQRT(X3(I)**2+Y3(I)**2+Z(I)**2)
0079      SINFI1(I)=Z(I)/R1(I)
0080      SINFI2(I)=Z(I)/R2(I)
0081      SINFI3(I)=Z(I)/R3(I)
0082      R1(I)=R1(I)**2
0083      R2(I)=R2(I)**2
0084      R3(I)=R3(I)**2
0085      FLD1=FLD1+(RHO*SINFI1(I)*DS(I))/(2.0*PI*EPSLON*R1(I))
0086      FLD2=FLD2+(RHO*SINFI2(I)*DS(I))/(2.0*PI*EPSLON*R2(I))
0087      FLD3=FLD3+(RHO*SINFI3(I)*DS(I))/(2.0*PI*EPSLON*R3(I))
0088      40 CONTINUE
0089      FM1(II)=FLD1
0090      FM2(II)=FLD2
0091      FM3(II)=FLD3
0092      II=II+1
0093      DT=DT+DDT
0094      IF(KMAX-II)50,51,51
0095      50 WRITE(4,2)(FM1(I),FM2(I),FM3(I),I=1,KMAX)
0096      L=KMAX/2
0097      CALL AUTO(FM1,KMAX,L,A1)
0098      CALL AUTO(FM2,KMAX,L,A2)
0099      CALL AUTO(FM3,KMAX,L,A3)
0100      CALL CRGSS(FM1,FM2,KMAX,L,C1,C2)
0101      CALL CROSS(FM1,FM3,KMAX,L,C3,C4)
0102      CALL CRGSS(FM2,FM3,KMAX,L,C5,C6)
0103      SM1=SQRT(A1(1))
0104      SM2=SQRT(A2(1))
0105      SM3=SQRT(A3(1))
0106      DO 60 I=1,L
0107      C1(I)=C1(I)/(SM1*SM2)
0108      C2(I)=C2(I)/(SM1*SM2)
0109      C3(I)=C3(I)/(SM1*SM3)
0110      C4(I)=C4(I)/(SM1*SM3)
```

```
0111      C5(I)=C5(I)/(SM2*SM3)
0112      60  C6(I)=C6(I)/(SM2*SM3)
0113      WRITE(4,3)(I,A1(I),A2(I),A3(I),C1(I),C2(I),C3(I),C4(I),C5(I),C6(I)
1,I=1,L)
0114      SFM1=0.
0115      SFM2=0.
0116      SFM3=0.
0117      SKFM1=0.
0118      SKFM2=0.
0119      SKFM3=0.
0120      FKMAX=FLOAT(KMAX)
0121      DO 500 I=1,KMAX
0122      SFM1=SFM1+FM1(I)
0123      SFM2=SFM2+FM2(I)
0124      500  SFM3=SFM3+FM3(I)
0125      SFM1=SFM1/FKMAX
0126      SFM2=SFM2/FKMAX
0127      SFM3=SFM3/FKMAX
0128      DO 501 I=1,KMAX
0129      SKFM1=SKFM1+((FM1(I)-SFM1)**3)
0130      SKFM2=SKFM2+((FM2(I)-SFM2)**3)
0131      501  SKFM3=SKFM3+((FM3(I)-SFM3)**3)
0132      SKFM1=SKFM1/(FKMAX*(SM1**3))
0133      SKFM2=SKFM2/(FKMAX*(SM2**3))
0134      SKFM3=SKFM3/(FKMAX*(SM3**3))
0135      WRITE(4,8)
0136      WRITE(4,9) SFM1,SFM2,SFM3
0137      WRITE(4,9) SM1,SM2,SM3
0138      WRITE(4,9) SKFM1,SKFM2,SKFM3
0139      DO 70 K=1,KMAX
0140      70  XX(K)=FLOAT(K)*DDT
0141      KMAX1=KMAX-1
0142      FMMX=1.0
0143      DO 200 I=1,KMAX1
0144      102 IF(FM1(I)-FMMX)100,100,101
0145      101 FMMX=2.*FMMX
0146      GO TO 102
0147      100 CONTINUE
0148      105 IF(FM2(I)-FMMX)103,103,104
0149      104 FMMX=2.*FMMX
0150      GO TO 105
0151      103 CONTINUE
0152      108 IF(FM3(I)-FMMX)106,106,107
0153      107 FMMX=2.*FMMX
0154      GO TO 108
0155      106 CONTINUE
0156      200 CONTINUE
0157      DO 210 I=1,KMAX
0158      FM1(I)=FM1(I)/FMMX
0159      FM2(I)=FM2(I)/FMMX
0160      210  FM3(I)=FM3(I)/FMMX
0161      T=0.
0162      DO 300 I=1,JMAX
0163      X(I)=U*T
0164      Y(I)=AY*T*SIN(2.*PI*FY*T)
```

```
0165      ZDASH=X(I)*TAN(BETA)
0166      Z(I)=H+(AZ*T*SIN(2.*PI*FZ*T))
0167      Z(I)=Z(I)+ZDASH
0168      IF(Z(I)-0.1)301,300,300
0169      301 Z(I)=0.1
0170      300 T=T+DELT
0171      DO 310 I=1,JMAX
0172      IF(AY)400,400,401
0173      400 Y(I)=0.0
0174      GO TO 402
0175      401 Y(I)=Y(I)/(AY*TMAX)
0176      402 CONTINUE
0177      IF(BETA)600,600,601
0178      600 Z(I)=Z(I)/(H+(AZ*TMAX))
0179      GO TO 310
0180      601 Z(I)=Z(I)/(H+(AZ*TMAX)+(X(JMAX)*TAN(BETA)))
0181      310 CONTINUE
0182      AXLTH=TMAX/2.0
0183      AXLTH1=XMAX/10.
0184      XPOS1=AXLTH+3.
0185      XPOS2=AXLTH+AXLTH1+6.
0186      CALL PLTXMX(100.)
0187      CALL PAXIS(0.5,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,2.0,1.0)
0188      CALL PAXIS(0.5,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0189      CALL PSYMB(1.0,1.0,-0.1,'DPH 76 C.D.JONES',0.0,16)
0190      CALL PSYMB(1.0,9.0,-0.1,RUN,0.0,15)
0191      CALL PLTOFS(0.0,2.0,0.0,0.1,0.5,0.5)
0192      CALL PLINE(XX,FM1,KMAX,1,4,0,1.0)
0193      CALL PLINE(XX,FM2,KMAX,1,4,1,1.0)
0194      CALL PLINE(XX,FM3,KMAX,1,4,2,1.0)
0195      CALL PAXIS(XPOS1,0.5,'DIST (M) X',-10,AXLTH1,0.0,0.0,10.0,1.0)
0196      CALL PAXIS(XPOS1,0.5,'DIST (M) Y',-10,10.0,90.0,-1.0,0.2,1.0)
0197      CALL PLTOFS(0.0,10.0,-1.0,0.2,XPOS1,0.5)
0198      CALL PLINE(X,Y,JMAX,1,0,0,1.0)
0199      CALL PAXIS(XPOS2,0.5,'DIST (M) X',-10,AXLTH1,0.0,0.0,10.0,1.0)
0200      CALL PAXIS(XPOS2,0.5,'DIST (M) Z',-10,10.0,90.0,0.0,0.1,1.0)
0201      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS2,0.5)
0202      CALL PLINE(X,Z,JMAX,1,0,0,1.0)
0203      CALL PLTEND
0204      STOP
0205      END
```

*** GLOBAL TIME LIMIT EXCEEDED AT 905099B2

PLMPOSN PROG

```

0001      11      FORMAT(8A4)
0002      12      FORMAT(F10.2)
0003      DIMENSION DATIME(8)
0004      DIMENSION XP(50),YP(50),ZP(50)
0005      REAL*8 TT
0006      XPCS=C.5
0007      IMAX=40
0008      IMIN=IMAX-20
0009      READ(3,11) DATIME
0010      CALL PLTXMX(16C.)
0011      CALL PSYMB(1.C,10.0,-0.1,DATIME,C.C,32)
0012      CALL PSYMB(1.C,9.0,-0.1,'DPH76',C.C,5)
0013      READ(3,12) DT
0014      104      READ(3) I,MM,(XP(J),YP(J),ZP(J),J=1,MM)
0015      IF(I=IMIN)103,103,101
0016      101      IF(IMAX-I)100,102,102
0017      102      CONTINUE
0018      T=DT*FLCAT(I)
0019      XPCS1=XPCS+C.5
0020      MMM=MM-1
0021      TT=T
0022      CALL PAXIS(XPCS,2.5,'X (M)',-5,5.C,C.C,0.C,10.C,1.0)
0023      CALL PAXIS(XPCS,0.5,'Y (M)',5,4.C,9C.C,10.C,-5.C,1.0)
0024      CALL PLTCFS(0.C,10.C,C.0,-5.0,XPCS,2.5)
0025      CALL PLINE(XP,YP,MMM,1,1,C,1.0)
0026      CALL PAXIS(XPCS,5.5,'X (M)',-5,5.C,C.0,0.C,10.C,1.0)
0027      CALL PAXIS(XPCS,5.5,'Z (M)',5,4.C,9C.0,C.C,5.C,1.0)
0028      CALL PFMMBR(XPCS1,9.5,0.1,TT,C.C,'F10.2 *',0.C)
0029      CALL PLTCFS(0.0,10.C,0.C,5.C,XPCS,5.5)
0030      CALL PLINE(XP,ZP,MMM,1,1,C,1.0)
0031      XPCS=XPCS+6.5
0032      IF(IMAX-I)100,100,103
0033      103      GO TO 104
0034      100      CONTINUE
0035      CALL PLTEND
0036      STOP
0037      END

```

TOTAL MEMORY REQUIREMENTS 000786 BYTES
EXECUTION TERMINATED

```
0001      SUBROUTINE XSPECT(DELFL,L,R,S,GXY,PHIXY)
0002      DIMENSION R(100),S(100),A(100),B(100)
0003      DIMENSION C(100),Q(100),GXY(100),PHIXY(100)
0004      DIMENSION CC(100),QQ(100)
0005      PI=3.142
0006      SGMA=0.
0007      SGMB=0.
0008      M=L-1
0009      XM=FLOAT(M)
0010      DO 5 I=1,L
0011          A(I)=(R(I)+S(I))/2.
0012      5      B(I)=(R(I)-S(I))/2.
0013          DO 20 K=1,L
0014              KK=K-1
0015              KKK=2+KK-IFIX(2.*FLOAT(IFIX(0.5*FLOAT(KK))))
0016              DO 10 J=2,M
0017                  THETA=(PI/XM)*FLOAT((J-1)*KK)
0018      101      IF(THETA-2.*PI)99,99,100
0019      100      THETA=THETA-2.*PI
0020              GO TO 101
0021      99      CONTINUE
0022              AA=A(J)*COS(THETA)
0023              BB=B(J)*SIN(THETA)
0024              SGMA=SGMA+AA
0025      10      SGMB=SGMB+BB
0026              BRKT=A(1)+2.*SGMA+((-1.)**KKK)*A(L)
0027              C(K)=BRKT/(XM*DELFL)
0028              Q(K)=2.*SGMB/(XM*DELFL)
0029              SGMA=0.
0030              SGMB=0.
0031      20      CONTINUE
0032              CC(1)=0.5*C(1)+0.5*C(2)
0033              CC(L)=0.5*C(L-1)+0.5*C(L)
0034              QQ(1)=0.5*Q(1)+0.5*Q(2)
0035              QQ(L)=0.5*Q(L-1)+0.5*Q(L)
0036              DO 30 K=2,M
0037                  CC(K)=0.25*C(K-1)+0.5*C(K)+0.25*C(K+1)
0038      30      QQ(K)=0.25*Q(K-1)+0.5*Q(K)+0.25*Q(K+1)
0039              DO 50 K=1,L
0040                  C(K)=CC(K)
0041      50      Q(K)=QQ(K)
0042              DO 40 I=1,L
0043                  GXY(I)=C(I)**2+Q(I)**2
0044                  PHIXY(I)=ATAN(Q(I)/C(I))
0045      40      PHIXY(I)=PHIXY(I)*360./6.284
0046      RETURN
0047      END
```

TOTAL MEMORY REQUIREMENTS 000F8A BYTES
EXECUTION TERMINATED

```
0001      SUBROUTINE ASPECT(DELTA,L,R,G)
0002      DIMENSION G(100),R(100)
0003      DIMENSION GG(100)
0004      PI=3.142
0005      SGMA=0.
0006      M=L-1
0007      XM=FLOAT(M)
0008      DO 20 K=1,L
0009      KK=K-1
0010      KKK=2+KK-IFIX(2.*FLOAT(IFIX(0.5*FLOAT(KK))))
0011      DO 10 J=2,M
0012      THETA=(PI/XM)*FLOAT((J-1)*KK)
0013      101 IF(THETA-2.*PI)99,99,100
0014      100 THETA=THETA-2.*PI
0015      GO TO 101
0016      99 AA=R(J)*COS(THETA)
0017      10 SGMA=SGMA+AA
0018      BRKT=R(1)+2.*SGMA+((-1.)**KKK)*R(L)
0019      G(K)=BRKT/(XM*DELTA)
0020      SGMA=0.
0021      20 CONTINUE
0022      GG(1)=0.5*G(1)+0.5*G(2)
0023      GG(L)=0.5*G(L-1)+0.5*G(L)
0024      DO 30 K=2,M
0025      30 GG(K)=0.25*G(K-1)+0.5*G(K)+0.25*G(K+1)
0026      DO 40 K=1,L
0027      40 G(K)=GG(K)
0028      RETURN
0029      END
```

TOTAL MEMORY REQUIREMENTS 00063A BYTES

```
0386      CALL PLTOFS(0.0,0.05,0.0,90.0,60.0,7.5)
0387      CALL PLINE(XX1,PS2,L,1,5,1,1.0)
0388      CALL PAXIS(70.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0389      CALL PAXIS(70.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0390      CALL PLTOFS(0.0,0.05,0.0,90.0,70.0,2.5)
0391      CALL PLINE(XX1,PS3,L,1,5,2,1.0)
0392      CALL PAXIS(70.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0393      CALL PAXIS(70.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0394      CALL PLTOFS(0.0,0.05,0.0,90.0,70.0,7.5)
0395      CALL PLINE(XX1,PS4,L,1,5,3,1.0)
0396      CALL PAXIS(80.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0397      CALL PAXIS(80.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0398      CALL PLTOFS(0.0,0.05,0.0,90.0,80.0,2.5)
0399      CALL PLINE(XX1,PS5,L,1,5,4,1.0)
0400      CALL PAXIS(80.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0401      CALL PAXIS(80.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0402      CALL PLTOFS(0.0,0.05,0.0,90.0,80.0,7.5)
0403      CALL PLINE(XX1,PS6,L,1,5,5,1.0)
0404      CALL PLTEND
0405      STOP
0406      END
```

TOTAL MEMGRY REQUIREMENTS 013B8E BYTES

```
0331 CALL PAXIS(0.5,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0332 CALL PSYMB(1.0,1.0,-0.1,'DPH76 C.D.JONES',0.0,15)
0333 CALL PLTOFS(0.0,0.05,0.0,0.25,0.5,0.5)
0334 CALL PLINE(XX1,G1,L,1,5,0,1.0)
0335 CALL PAXIS(0.5,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0336 CALL PAXIS(0.5,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0337 CALL PLTOFS(0.0,0.05,0.0,0.25,0.5,5.5)
0338 CALL PLINE(XX1,G2,L,1,5,1,1.0)
0339 CALL PAXIS(10.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0340 CALL PAXIS(10.0,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0341 CALL PLTOFS(0.0,0.05,0.0,0.25,10.0,0.5)
0342 CALL PLINE(XX1,G3,L,1,5,2,1.0)
0343 CALL PAXIS(10.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0344 CALL PAXIS(10.0,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0345 CALL PLTOFS(0.0,0.05,0.0,0.25,10.0,5.5)
0346 CALL PLINE(XX1,G4,L,1,5,3,1.0)
0347 CALL PAXIS(20.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0348 CALL PAXIS(20.0,0.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0349 CALL PLTOFS(0.0,0.05,0.0,0.25,20.0,0.5)
0350 CALL PLINE(XX2,G5,LS,1,5,4,1.0)
0351 CALL PAXIS(20.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0352 CALL PAXIS(20.0,5.5,'RELATIVE PSD',12,4.0,90.0,0.0,0.25,1.0)
0353 CALL PLTOFS(0.0,0.05,0.0,0.25,20.0,5.5)
0354 CALL PLINE(XX2,G6,LS,1,5,5,1.0)
0355 CALL PLINE(XX2,G7,LS,1,5,6,1.0)
0356 CALL PAXIS(30.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0357 CALL PAXIS(30.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0358 CALL PLTOFS(0.0,0.05,0.0,0.25,30.0,0.5)
0359 CALL PLINE(XX1,CS1,L,1,5,0,1.0)
0360 CALL PAXIS(30.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0361 CALL PAXIS(30.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0362 CALL PLTOFS(0.0,0.05,0.0,0.25,30.0,5.5)
0363 CALL PLINE(XX1,CS2,L,1,5,1,1.0)
0364 CALL PAXIS(40.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0365 CALL PAXIS(40.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0366 CALL PLTOFS(0.0,0.05,0.0,0.25,40.0,0.5)
0367 CALL PLINE(XX1,CS3,L,1,5,2,1.0)
0368 CALL PAXIS(40.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0369 CALL PAXIS(40.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0370 CALL PLTOFS(0.0,0.05,0.0,0.25,40.0,5.5)
0371 CALL PLINE(XX1,CS4,L,1,5,3,1.0)
0372 CALL PAXIS(50.0,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0373 CALL PAXIS(50.0,0.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0374 CALL PLTOFS(0.0,0.05,0.0,0.25,50.0,0.5)
0375 CALL PLINE(XX1,CS5,L,1,5,4,1.0)
0376 CALL PAXIS(50.0,5.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0377 CALL PAXIS(50.0,5.5,'COHERENCY SPECTRUM',18,4.0,90.0,0.0,0.25,1.0)
0378 CALL PLTOFS(0.0,0.05,0.0,0.25,50.0,5.5)
0379 CALL PLINE(XX1,CS6,L,1,5,5,1.0)
0380 CALL PAXIS(60.0,2.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0381 CALL PAXIS(60.0,0.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
0382 CALL PLTOFS(0.0,0.05,0.0,90.0,60.0,2.5)
0383 CALL PLINE(XX1,PS1,L,1,5,0,1.0)
0384 CALL PAXIS(60.0,7.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
0385 CALL PAXIS(60.0,5.5,'PHASE SPECTRUM',14,4.0,90.0,-180.0,90.0,1.0)
```

```
0276      CALL XSPECT(DELFL,R5,R6,CS3,PS3)
0277      CALL XSPECT(DELFL,R7,R8,CS4,PS4)
0278      CALL XSPECT(DELFL,R9,R10,CS5,PS5)
0279      CALL XSPECT(DELFL,R11,R12,CS6,PS6)
0280      DO 400 K=1,L
0281          CS1(K)=CS1(K)/(G1(K)*G2(K))
0282          CS2(K)=CS2(K)/(G1(K)*G3(K))
0283          CS3(K)=CS3(K)/(G1(K)*G4(K))
0284          CS4(K)=CS4(K)/(G2(K)*G3(K))
0285          CS5(K)=CS5(K)/(G2(K)*G4(K))
0286          400 CS6(K)=CS6(K)/(G3(K)*G4(K))
0287          WRITE(6,14)
0288          WRITE(6,15)(K,CS1(K),CS2(K),CS3(K),CS4(K),CS5(K),CS6(K),K=1,L)
0289          WRITE(6,16)
0290          WRITE(6,15)(K,PS1(K),PS2(K),PS3(K),PS4(K),PS5(K),PS6(K),K=1,L)
0291          A1=0.
0292          A2=0.
0293          A3=0.
0294          A4=0.
0295          A5=0.
0296          A6=0
0297          A7=0
0298          DO 200 K=1,L
0299              IF(G1(K)-A1)201,201,202
0300          202 A1=G1(K)
0301          201 IF(G2(K)-A2)204,204,205
0302          205 A2=G2(K)
0303          204 IF(G3(K)-A3)206,206,207
0304          207 A3=G3(K)
0305          206 IF(G4(K)-A4)200,200,208
0306          208 A4=G4(K)
0307          200 CONTINUE
0308          DO 210 K=1,L
0309              G1(K)=G1(K)/A1
0310              G2(K)=G2(K)/A2
0311              G3(K)=G3(K)/A3
0312          210 G4(K)=G4(K)/A4
0313          DO 220 K=1,LS
0314              IF(G5(K)-A5)221,221,222
0315          222 A5=G5(K)
0316          221 IF(G6(K)-A6)223,223,224
0317          224 A6=G6(K)
0318          223 IF(G7(K)-A7)220,220,225
0319          225 A7=G7(K)
0320          220 CONTINUE
0321          DO 211 K=1,LS
0322              G5(K)=G5(K)/A5
0323              G6(K)=G6(K)/A6
0324          211 G7(K)=G7(K)/A7
0325          DO 230 K=1,L
0326          230 XX1(K)=DELFL*FLOAT(K)
0327          DO 231 K=1,LS
0328          231 XX2(K)=DELFL*FLOAT(K)
0329          CALL PLTXMX(120.)
0330          CALL PAXIS(0.5,0.5,'FREQUENCY (HZ)',-14,7.0,0.0,0.0,0.05,1.0)
```

```
0221      WRITE(6,3) SM1,SM2,SM3,SM4,SM5,SM6,SM7
0222      WRITE(6,4)
0223      WRITE(6,3) SSD1,SSD2,SSD3,SSD4,SSD5,SSD6,SSD7
0224      WRITE(6,5)
0225      WRITE(6,3) SSK1,SSK2,SSK3,SSK4,SSK5,SSK6,SSK7
0226      WRITE(6,13)
0227      WRITE(6,3) SK1,SK2,SK3,SK4,SK5,SK6,SK7
0228      L=NM/10
0229      LS=L/2
0230      DO 300 K=2,NM
0231      PWF1(K)=FM1(K)-FF*FM1(K-1)
0232      PWF2(K)=FM2(K)-FF*FM2(K-1)
0233      PWF3(K)=FM3(K)-FF*FM3(K-1)
0234      300 PWF4(K)=FM4(K)-FF*FM4(K-1)
0235      DO 301 K=2,NFND
0236      PWU(K)=U(K)-FF*U(K-1)
0237      PWDU(K)=DU(K)-FF*DU(K-1)
0238      301 PWDT(K)=DT(K)-FF*DT(K-1)
0239      DO 302 K=2,NM
0240      FM1(K)=PWF1(K)
0241      FM2(K)=PWF2(K)
0242      FM3(K)=PWF3(K)
0243      302 FM4(K)=PWF4(K)
0244      DO 303 K=2,NFND
0245      U(K)=PWU(K)
0246      DU(K)=PWDU(K)
0247      303 DT(K)=PWDT(K)
0248      CALL AUTO(FM1,NM,L,R1)
0249      CALL AUTO(FM2,NM,L,R2)
0250      CALL AUTO(FM3,NM,L,R3)
0251      CALL AUTO(FM4,NM,L,R4)
0252      CALL AUTO(U,NFND,LS,R5)
0253      CALL AUTO(DU,NFND,LS,R6)
0254      CALL AUTO(DT,NFND,LS,R7)
0255      DDT=(RUNTIM*60.)/FNM
0256      DELF=1./(2.*FLCAT(L-1)*DDT)
0257      CALL ASPECT(DELF,L,R1,G1)
0258      CALL ASPECT(DELF,L,R2,G2)
0259      CALL ASPECT(DELF,L,R3,G3)
0260      CALL ASPECT(DELF,L,R4,G4)
0261      CALL ASPECT(DELF,LS,R5,G5)
0262      CALL ASPECT(DELF,LS,R6,G6)
0263      CALL ASPECT(DELF,LS,R7,G7)
0264      WRITE(6,9)
0265      WRITE(6,11)(K,G1(K),G2(K),G3(K),G4(K),K=1,L)
0266      WRITE(6,10)
0267      WRITE(6,12)(K,G5(K),G6(K),G7(K),K=1,LS)
0268      CALL CROSS(FM1,FM2,NM,L,R1,R2)
0269      CALL CROSS(FM1,FM3,NM,L,R3,R4)
0270      CALL CROSS(FM1,FM4,NM,L,R5,R6)
0271      CALL CROSS(FM2,FM3,NM,L,R7,R8)
0272      CALL CROSS(FM2,FM4,NM,L,R9,R10)
0273      CALL CROSS(FM3,FM4,NM,L,R11,R12)
0274      CALL XSPECT(DELF,L,R1,R2,CS1,PS1)
0275      CALL XSPECT(DELF,L,R3,R4,CS2,PS2)
```

```
0166      SSD1=SSD1+(FM1(J)-SM1)**2
0167      SSD2=SSD2+(FM2(J)-SM2)**2
0168      SSD3=SSD3+(FM3(J)-SM3)**2
0169      160  SSD4=SSD4+(FM4(J)-SM4)**2
0170      SSD1=SQRT(SSD1/FNM)
0171      SSD2=SQRT(SSD2/FNM)
0172      SSD3=SQRT(SSD3/FNM)
0173      SSD4=SQRT(SSD4/FNM)
0174      DO 161 J=1,NFND
0175      SSD5=SSD5+(U(J)-SM5)**2
0176      SSD6=SSD6+(DU(J)-SM6)**2
0177      161  SSD7=SSD7+(DT(J)-SM7)**2
0178      SSD5=SQRT(SSD5/FNFND)
0179      SSD6=SQRT(SSD6/FNFND)
0180      SSD7=SQRT(SSD7/FNFND)
0181      DO 170 J=1,NM
0182      SSK1=SSK1+(FM1(J)-SM1)**3
0183      SSK2=SSK2+(FM2(J)-SM2)**3
0184      SSK3=SSK3+(FM3(J)-SM3)**3
0185      170  SSK4=SSK4+(FM4(J)-SM4)**3
0186      SSK1=SSK1/(FNM*(SSD1**3))
0187      SSK2=SSK2/(FNM*(SSD2**3))
0188      SSK3=SSK3/(FNM*(SSD3**3))
0189      SSK4=SSK4/(FNM*(SSD4**3))
0190      DO 171 J=1,NFND
0191      SSK5=SSK5+(U(J)-SM5)**3
0192      SSK6=SSK6+(DU(J)-SM6)**3
0193      171  SSK7=SSK7+(DT(J)-SM7)**3
0194      SSK5=SSK5/(FNFND*(SSD5**3))
0195      SSK6=SSK6/(FNFND*(SSD6**3))
0196      SSK7=SSK7/(FNFND*(SSD7**3))
0197      SK1=0.0
0198      SK2=0.0
0199      SK3=0.0
0200      SK4=0.0
0201      SK5=0.0
0202      SK6=0.0
0203      SK7=0.0
0204      DO 180 J=1,NM
0205      SK1=SK1+(FM1(J)-SM1)**4
0206      SK2=SK2+(FM2(J)-SM2)**4
0207      SK3=SK3+(FM3(J)-SM3)**4
0208      180  SK4=SK4+(FM4(J)-SM4)**4
0209      SK1=SK1/(FNM*(SSD1**4))
0210      SK2=SK2/(FNM*(SSD2**4))
0211      SK3=SK3/(FNM*(SSD3**4))
0212      SK4=SK4/(FNM*(SSD4**4))
0213      DO 181 J=1,NFND
0214      SK5=SK5+(U(J)-SM5)**4
0215      SK6=SK6+(DU(J)-SM6)**4
0216      181  SK7=SK7+(DT(J)-SM7)**4
0217      SK5=SK5/(FNFND*(SSD5**4))
0218      SK6=SK6/(FNFND*(SSD6**4))
0219      SK7=SK7/(FNFND*(SSD7**4))
0220      WRITE(6,2)
```

```
0111      GO TO 130
0112      132      J=J+2
0113      K=K+1
0114      NM=2*NFND
0115      DO 140 JN=1,NM
0116      FM1(JN)=FM1(J)
0117      FM2(JN)=FM2(J)
0118      FM3(JN)=FM3(J)
0119      FM4(JN)=FM4(J)
0120      140      J=J+1
0121      DO 141 KN=1,NFND
0122      U(KN)=U(K)
0123      DU(KN)=DU(K)
0124      DT(KN)=DT(K)
0125      141      K=K+1
0126      FNM=FLOAT(NM)
0127      FNFND=FLOAT(NFND)
0128      SM1=0.0
0129      SM2=0.0
0130      SM3=0.0
0131      SM4=0.0
0132      SM5=0.0
0133      SM6=0.0
0134      SM7=0.0
0135      SSD1=0.0
0136      SSD2=0.0
0137      SSD3=0.0
0138      SSD4=0.0
0139      SSD5=0.0
0140      SSD6=0.0
0141      SSD7=0.0
0142      SSK1=0.0
0143      SSK2=0.0
0144      SSK3=0.0
0145      SSK4=0.0
0146      SSK5=0.0
0147      SSK6=0.0
0148      SSK7=0.0
0149      DO 150 J=1,NM
0150      SM1=SM1+FM1(J)
0151      SM2=SM2+FM2(J)
0152      SM3=SM3+FM3(J)
0153      150      SM4=SM4+FM4(J)
0154      SM1=SM1/FNM
0155      SM2=SM2/FNM
0156      SM3=SM3/FNM
0157      SM4=SM4/FNM
0158      DO 151 J=1,NFND
0159      SM5=SM5+U(J)
0160      SM6=SM6+DU(J)
0161      151      SM7=SM7+DT(J)
0162      SM5=SM5/FNFND
0163      SM6=SM6/FNFND
0164      SM7=SM7/FNFND
0165      DO 160 J=1,NM
```

```
0056      C6=C
0057      GO TO 100
0058 107   A7=A
0059      B7=B
0060      C7=C
0061      GO TO 100
0062 108   A8=A
0063      B8=B
0064      C8=C
0065      GO TO 100
0066 109   A9=A
0067      B9=B
0068      C9=C
0069      GO TO 100
0070 110   A10=A
0071      B10=B
0072      C10=C
0073      GO TO 100
0074 111   A11=A
0075      B11=B
0076      C11=C
0077      IF(J-11)26,120,126
0078 126   STOP
0079 120   CONTINUE
0080      J=1000
0081      K=500
0082      NFND=0
0083 130   READ(5,7)M,I1,I11,I10,I9,I8,I6,I7,I5,I4,I3,I2
0084      IF(M-9999)131,132,131
0085 131   NFND=NFND+1
0086      COMP=703./FLOAT(M)
0087      U(K)=(A1*FLOAT(I1)+B1)*C1
0088      FM1(J-1)=(A2*FLOAT(I2)+B2)*C2
0089      FM2(J-1)=(A3*FLOAT(I3)+B3)*C3
0090      FM3(J-1)=(A4*FLOAT(I4)+B4)*C4
0091      FM4(J-1)=(A5*FLOAT(I5)+B5)*C5
0092      DU(K)=(A6*FLOAT(I6)+B6)*C6
0093      DT(K)=(A7*FLOAT(I7)+B7)*C7
0094      FM1(J)=(A8*FLOAT(I8)+B8)*C8
0095      FM2(J)=(A9*FLOAT(I9)+B9)*C9
0096      FM3(J)=(A10*FLOAT(I10)+B10)*C10
0097      FM4(J)=(A11*FLOAT(I11)+B11)*C11
0098      U(K)=U(K)*COMP
0099      FM1(J-1)=FM1(J-1)*COMP
0100      FM2(J-1)=FM2(J-1)*COMP
0101      FM3(J-1)=FM3(J-1)*COMP
0102      FM4(J-1)=FM4(J-1)*COMP
0103      DU(K)=DU(K)*COMP
0104      DT(K)=DT(K)*COMP
0105      FM1(J)=FM1(J)*COMP
0106      FM2(J)=FM2(J)*COMP
0107      FM3(J)=FM3(J)*COMP
0108      FM4(J)=FM4(J)*COMP
0109      J=J-2
0110      K=K-1
```

SUPPROG

```
0001      1 FORMAT(1F10.2)
0002      2 FORMAT('OMEANS,MILLS,U,DU,DT')
0003      3 FORMAT(7E15.3)
0004      4 FORMAT('OSD,MILLS,U,DU,DT')
0005      5 FORMAT('OSKEW,MILLS,U,DU,DT')
0006      6 FORMAT(I5,3F15.5)
0007      7 FORMAT(12I5)
0008      8 FORMAT('1FURTHER STATISTICAL ANALYSIS SERIES 1')
0009      WRITE(6,8)
0010      9 FORMAT('1POWER SPECTRUM MILLS')
0011     10 FORMAT('1POWER SPECTRUM U,DU,DT')
0012     11 FORMAT(I5,4E15.3)
0013     12 FORMAT(I5,3E15.3)
0014     13 FORMAT('OKURTOSIS MILLS,U,DU,DT')
0015     14 FORMAT('1 COHERENCE FUNCTION MILLS')
0016     15 FORMAT(I5,6E15.3)
0017     16 FORMAT('1 PHASE ANGLE MILLS')
0018      DIMENSION R1(100),R2(100),R3(100),R4(100),R5(100),R6(100)
0019      DIMENSION R7(100),R8(100),R9(100),R10(100),R11(100),R12(100)
0020      DIMENSION PS1(100),PS2(100),PS3(100),PS4(100),PS5(100),PS6(100)
0021      DIMENSION CS1(100),CS2(100),CS3(100),CS4(100),CS5(100),CS6(100)
0022      DIMENSION FM1(1000),FM2(1000),FM3(1000),FM4(1000)
0023      DIMENSION U(1000),DU(1000),DT(1000)
0024      DIMENSION G1(100),G2(100),G3(100),G4(100),G5(50),G6(50),G7(50)
0025      DIMENSION XX1(100),XX2(100)
0026      DIMENSION PWFM1(1000),PWFM2(1000),PWFM3(1000),PWFM4(1000)
0027      DIMENSION PWU(1000),PWDU(1000),PWDT(1000)
0028      READ(5,1) FF
0029      READ(5,1) RUNTIM
0030      J=0
0031     100 READ(5,6) I,A,B,C
0032      J=J+1
0033      GO TO(101,102,103,104,105,106,107,108,109,110,111),I
0034     101 A1=A
0035      B1=B
0036      C1=C
0037      GO TO 100
0038     102 A2=A
0039      B2=B
0040      C2=C
0041      GO TO 100
0042     103 A3=A
0043      B3=B
0044      C3=C
0045      GO TO 100
0046     104 A4=A
0047      B4=B
0048      C4=C
0049      GO TO 100
0050     105 A5=A
0051      B5=B
0052      C5=C
0053      GO TO 100
0054     106 A6=A
0055      B6=B
```

BIVANEPROG

```
0001      1      FORMAT(I2,3F10.5)
0002      2      FORMAT(12I5)
0003      3      FORMAT(9F12.3)
0004      5      FORMAT('1 DATA ANALYSIS')
0005      WRITE(6,5)
0006      7      FORMAT(3F10.3)
0007      8      FORMAT('MFAN COMPONENTS WRT EXPT FRAME')
0008      9      FORMAT('DOWNWIND VECTOR')
0009     10      FORMAT('TAU,USTAR,UDSHBR,VDSHBR,WDSHBR')
0010     11      FORMAT('1AUTOCOV UDASH,VDASH,WDASH')
0011     12      FORMAT(I5,3E12.3)
0012     13      FORMAT('1AUTOCOR UDASH,VDASH,WDASH')
0013     14      FORMAT('1ELEV,AZI,WSPD,ML,ML,UDASH,VDASH,WDASH,IC/ML')
0014     15      FORMAT('1XCOR UV,UW,VW')
0015     16      FORMAT(I5,6E12.3)
0016     17      FORMAT(8A4)
0017     18      FORMAT(2F10.3)
0018     19      FORMAT('ODT')
0019     20      FORMAT(3F15.2)
0020     21      FORMAT(4F10.1)
0021     22      FORMAT(4F15.1)
0022     23      FORMAT('1 AUTOCOV FM+TFM')
0023     24      FORMAT('1 XCOR FM1/TFM1,FM2/TFM2')
0024     25      FORMAT(I5,4E15.3)
0025      DIMENSION X(100),Y(100),Z(100)
0026      DIMENSION XX1(1000),XX2(1000),XX3(1000),XX4(1000),XX5(1000)
0027      DIMENSION XX6(1000)
0028      DIMENSION DATIME(8)
0029      DIMENSION R1(100),R2(100),R3(100),R4(100),R5(100),R6(100)
0030      DIMENSION R7(100),R8(100),R9(100)
0031      DIMENSION VDASH(1000),UWDASH(1000),XXX(100),YYY(100),ZZZ(100)
0032      DIMENSION DCWNU(1000),CROSSU(1000),VERTU(1000),UDASH(1000)
0033      DIMENSION E(1000),A(1000),U(1000),FM1(1000),FM2(1000),DU(500)
0034      DIMENSION X1(100),X2(100),Y1(100),Y2(100)
0035      DIMENSION SINFI1(100),SINFI2(100),TFM1(1000),TFM2(1000)
0036      DIMENSION FFM1(1000),FFM2(1000),FTFM1(1000),FTFM2(1000)
0037      DIMENSION XP(100),YP(100),ZP(100)
0038      RHO=1.293
0039      PI=3.142
0040      S1=0.
0041      S2=0.
0042      S3=0.
0043      UW=0.
0044      UDSHBR=0.
0045      VDSHBR=0.
0046      CURR=3.CE-07
0047      EPSLON=8.854E-12
0048      READ(5,17) DATIME
0049      WRITE(6,17) DATIME
0050      WRITE(8,17) DATIME
0051      READ(5,18) RUNTIM,H
0052      WRITE(6,18) RUNTIM,H
0053      READ(5,21) RRR1,RRR2,ALFA1,ALFA2
0054      WRITE(6,21) RPP1,RPP2,ALFA1,ALFA2
0055      ALFA1=ALFA1*PI/180.
```

```
0056      ALFA2=ALFA2*PI/180.
0057      XM1=RRR1*COS(ALFA1)
0058      YM1=RRR1*SIN(ALFA1)
0059      XM2=RRR2*COS(ALFA2)
0060      YM2=RRR2*SIN(ALFA2)
0061      READ(5,1)I1,A1,B1,C1
0062      READ(5,1)I2,A2,B2,C2
0063      READ(5,1)I3,A3,B3,C3
0064      READ(5,1)I4,A4,B4,C4
0065      READ(5,1)I5,A5,B5,C5
0066      READ(5,1)I6,A6,B6,C6
0067      J=999
0068      K=500
0069      N=0
0070      130 READ(5,2)M,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,I11
0071          IF(M-9999)131,132,131
0072      131 N=N+1
0073          COMP=703./FLCAT(M)
0074          I1=IFIX(FLOAT(I1)*COMP)
0075          I2=IFIX(FLOAT(I2)*COMP)
0076          I3=IFIX(FLOAT(I3)*COMP)
0077          I4=IFIX(FLOAT(I4)*COMP)
0078          I5=IFIX(FLOAT(I5)*COMP)
0079          I6=IFIX(FLOAT(I6)*COMP)
0080          I7=IFIX(FLOAT(I7)*COMP)
0081          I8=IFIX(FLOAT(I8)*COMP)
0082          I9=IFIX(FLOAT(I9)*COMP)
0083          I10=IFIX(FLOAT(I10)*COMP)
0084          I11=IFIX(FLOAT(I11)*COMP)
0085          E(J)=(A1*FLCAT(I5)+B1)*C1
0086          E(J+1)=(A1*FLCAT(I11)+B1)*C1
0087          A(J)=(A2*FLCAT(I4)+B2)*C2
0088          A(J+1)=(A2*FLCAT(I10)+B2)*C2
0089          FM1(J)=(A3*FLCAT(I3)+B3)*C3
0090          FM1(J+1)=(A3*FLCAT(I9)+B3)*C3
0091          FM2(J)=(A4*FLCAT(I2)+B4)*C4
0092          FM2(J+1)=(A4*FLCAT(I8)+B4)*C4
0093          U(J)=(A5*FLCAT(I1)+B5)*C5
0094          U(J+1)=(A5*FLCAT(I7)+B5)*C5
0095          DU(K)=(A6*FLCAT(I6)+B6)*C6
0096          J=J-2
0097          K=K-1
0098          GO TO 130
0099      132 J=J+2
0100          K=K+1
0101          NN=2*N
0102          DO 140 JN=1,NN
0103              E(JN)=E(J)
0104              A(JN)=A(J)
0105              FM1(JN)=FM1(J)
0106              FM2(JN)=FM2(J)
0107              U(JN)=U(J)
0108      140 J=J+1
0109          DO 141 KN=1,N
0110              DU(KN)=DU(K)
```

```
0111      141      K=K+1
0112                L=NN/10
0113                FNN=FLOAT(NN)
0114                JMAX=NN
0115                DO 160 J=1,NN
0116                DOWNU(J)=U(J)*(COS(A(J)*PI/180.))
0117                CROSSU(J)=U(J)*(SIN(A(J)*PI/180.))
0118                VEPTU(J)=U(J)*(SIN(E(J)*PI/180.))
0119                S1=S1+DCWNU(J)
0120                S2=S2+CROSSU(J)
0121      160      S3=S3+VERTU(J)
0122                S1=S1/FNN
0123                S2=S2/FNN
0124                S3=S3/FNN
0125                WRITE(6,8)
0126                WRITE(6,7) S1,S2,S3
0127                UBAR=SQRT(S1**2+S2**2)
0128                AVECT=(180./PI)*(ATAN(S2/S1))
0129                WRITE(6,9)
0130                WRITE(6,7) UBAR,AVECT
0131                DO 170 J=1,NN
0132                UDASH(J)=(U(J)*(COS((A(J)-AVECT)*(PI/180.))))-UBAR
0133                UDSHBR=UDSHBR+UDASH(J)
0134                VDASH(J)=(U(J)*(SIN((A(J)-AVECT)*(PI/180.))))
0135                VDSHBR=VDSHBR+VDASH(J)
0136                UWDASH(J)=UDASH(J)*VERTU(J)
0137      170      UW=UW+UWDASH(J)
0138                UWBAR=UW/FNN
0139                UDSHBR=UDSHBR/FNN
0140                VDSHBR=VDSHBR/FNN
0141                TAU=-RHO*UWBAR
0142                IF(UWBAR)200,200,201
0143      200      UWBAR=-UWBAR
0144      201      USTAR=SQRT(UWBAR)
0145                WRITE(6,10)
0146                WRITE(6,3) TAU,USTAR,UDSHBR,VDSHBR,S3
0147                WRITE(6,14)
0148                J=1
0149                K=1
0150      149      WRITE(6,3) E(J),A(J),U(J),FM1(J),FM2(J),UDASH(J),VDASH(J),VERTU(J)
                1,DU(K)
0151                J=J+1
0152                WRITE(6,3) E(J),A(J),U(J),FM1(J),FM2(J),UDASH(J),VDASH(J),VERTU(J)
0153                J=J+1
0154                K=K+1
0155                IF(N-K)150,149,149
0156      150      CONTINUE
0157                CALL AUTO(UDASH,NN,L,R1)
0158                CALL AUTO(VERTU,NN,L,R2)
0159                CALL AUTO(VDASH,NN,L,R3)
0160                WRITE(6,11)
0161                WRITE(6,12)(J,R1(J),R3(J),R2(J),J=1,L)
0162                PR1=R1(1)
0163                RR2=R2(1)
0164                RR3=R3(1)
```

```
0165      DO 180 J=1,L
0166      R1(J)=R1(J)/RR1
0167      R2(J)=R2(J)/RR2
0168      180  R3(J)=R3(J)/RR3
0169      WRITE(6,13)
0170      WRITE(6,12)(J,R1(J),R3(J),R2(J),J=1,L)
0171      CALL CROSS(UDASH,VDASH,NN,L,R4,R5)
0172      CALL CROSS(UDASH,VERTU,NN,L,R6,R7)
0173      CALL CROSS(VDASH,VERTU,NN,L,R8,R9)
0174      DO 300 J=1,L
0175      R4(J)=R4(J)/SQRT(RR1*RR3)
0176      R5(J)=R5(J)/SQRT(RR1*RR3)
0177      R6(J)=R6(J)/SQRT(RR1*RR2)
0178      R7(J)=R7(J)/SQRT(RR1*RR2)
0179      R8(J)=R8(J)/SQRT(RR2*RR3)
0180      R9(J)=R9(J)/SQRT(RR2*RR3)
0181      300  CONTINUE
0182      WRITE(6,15)
0183      WRITE(6,16)(J,R4(J),R5(J),R6(J),R7(J),R8(J),R9(J),J=1,L)
0184      DT=(RUNTIM*60.)/FNN
0185      WRITE(6,19)
0186      WRITE(6,7) DT
0187      WRITE(8,7) DT
0188      Q=CURR*DT
0189      I=1
0190      508  T=DT*(FLOAT(I))
0191      FLDL1=0.
0192      FLDL2=0.
0193      II=1
0194      502  JJ=I-II+1
0195      IF(JJ)500,500,501
0196      501  X(II)=U(JJ)*FLCAT(II)*DT*COS(A(JJ)*PI/180.)
0197      Y(II)=X(II)*(TAN(A(JJ)*(PI/180.)))
0198      Z(II)=H+(X(II)*(TAN(E(JJ)*(PI/180.))))
0199      IF(Z(II)-0.2)510,510,511
0200      510  Z(II)=0.2
0201      511  IF(X(II)-50.)503,503,500
0202      503  II=II+1
0203      GO TO 502
0204      500  CONTINUE
0205      MM=II+1
0206      DO 600 J=2,MM
0207      XXX(J)=X(J-1)
0208      YYY(J)=Y(J-1)
0209      600  ZZZ(J)=Z(J-1)
0210      X(1)=0.
0211      Y(1)=0.
0212      Z(1)=H
0213      DO 602 J=2,MM
0214      X(J)=XXX(J)
0215      Y(J)=YYY(J)
0216      602  Z(J)=ZZZ(J)
0217      DO 2000 J=1,MM
0218      XP(J)=X(J)
0219      YP(J)=Y(J)
```

```
0220      2000  ZP(J)=Z(J)
0221          DO 2010 J=1,MM
0222          IF(YP(J)-10.)2001,2001,2002
0223      2002  YP(J)=10.
0224      2001  IF(YP(J)+10.)2003,2003,2004
0225      2003  YP(J)=-10.
0226      2004  IF(ZP(J)-20.)2005,2005,2006
0227      2006  ZP(J)=20.
0228      2005  CONTINUE
0229      2010  CONTINUE
0230          WRITE(8) I,MM,(XP(J),YP(J),ZP(J),J=1,MM)
0231          DO 601 J=1,II
0232          X1(J)=X(J)+((X(J+1)-X(J))/2.)-XM1
0233          X2(J)=X1(J)+XM1-XM2
0234          Y1(J)=Y(J)+((Y(J+1)-Y(J))/2.)-YM1
0235          Y2(J)=Y1(J)+YM1-YM2
0236          R1(J)=SQRT(X1(J)**2+Y1(J)**2+Z(J)**2)
0237          R2(J)=SQRT(X2(J)**2+Y2(J)**2+Z(J)**2)
0238          SINFI1(J)=Z(J)/R1(J)
0239          SINFI2(J)=Z(J)/R2(J)
0240          R1(J)=R1(J)**2
0241          R2(J)=R2(J)**2
0242          IF(R1(J)-1.)1000,1000,1001
0243      1000  R1(J)=1.
0244      1001  IF(R2(J)-1.)1002,1002,1003
0245      1002  R2(J)=1.
0246      1003  FLDL1=FLDL1+(Q*SINFI1(J))/(2.*PI*EPSLON*R1(J))
0247          FLDL2=FLDL2+(Q*SINFI2(J))/(2.*PI*EPSLON*R2(J))
0248      601  CONTINUE
0249          TFM1(I)=FLDL1
0250          TFM2(I)=FLDL2
0251          I=I+1
0252          IF(I-IMAX)508,508,509
0253      509  CONTINUE
0254          NN1=NN-1
0255          DO 1100 J=2,NN1
0256          FFM1(J)=0.25*FM1(J-1)+0.5*FM1(J)+0.25*FM1(J+1)
0257          FFM2(J)=0.25*FM2(J-1)+0.5*FM2(J)+0.25*FM2(J+1)
0258          FTFM1(J)=0.25*TFM1(J-1)+0.5*TFM1(J)+0.25*TFM1(J+1)
0259          FTFM2(J)=0.25*TFM2(J-1)+0.5*TFM2(J)+0.25*TFM2(J+1)
0260      1100  CONTINUE
0261          DO 1101 J=2,NN1
0262          FM1(J)=FFM1(J)
0263          FM2(J)=FFM2(J)
0264          TFM1(J)=FTFM1(J)
0265          TFM2(J)=FTFM2(J)
0266      1101  CONTINUE
0267          CALL AUTO(FM1,NN,L,R1)
0268          CALL AUTO(TFM1,NN,L,R2)
0269          CALL AUTO(FM2,NN,L,R3)
0270          CALL AUTO(TFM2,NN,L,R4)
0271          WRITE(6,23)
0272          WRITE(6,25) (J,R1(J),R2(J),R3(J),R4(J),J=1,L)
0273          RR1=R1(1)
0274          RR2=R2(1)
```

```
0275      RR3=R3(1)
0276      RR4=R4(1)
0277      CALL CRCSS(FM1,TFM1,NN,L,R5,R6)
0278      CALL CROSS(FM2,TFM2,NN,L,R7,R8)
0279      DO 700 J=1,L
0280      R5(J)=R5(J)/SQRT(RR1*RR2)
0281      R6(J)=R6(J)/SQRT(RR1*RR2)
0282      R7(J)=R7(J)/SQRT(RR3*RR4)
0283      R8(J)=R8(J)/SQRT(RR3*RR4)
0284      700 CONTINUE
0285      WRITE(6,24)
0286      WRITE(6,25) (J,R5(J),R6(J),R7(J),R8(J),J=1,L)
0287      DO 710 L=1,NN
0288      710 XX1(L)=(FLOAT(L-1))*DT
0289      FMMX1=1.
0290      DO 711 I=1,NN
0291      802 IF(FM1(I)-FMMX1)800,800,801
0292      801 FMMX1=FMMX1*1.1
0293      GO TO 802
0294      800 CONTINUE
0295      805 IF(TFM1(I)-FMMX1)803,803,804
0296      804 FMMX1=FMMX1*1.1
0297      GO TO 805
0298      803 CONTINUE
0299      711 CONTINUE
0300      FMMX2=1.
0301      DO 712 I=1,NN
0302      902 IF(FM2(I)-FMMX2)900,900,901
0303      901 FMMX2=FMMX2*1.1
0304      GO TO 902
0305      900 CONTINUE
0306      905 IF(TFM2(I)-FMMX2)903,903,904
0307      904 FMMX2=FMMX2*1.1
0308      GO TO 905
0309      903 CONTINUE
0310      712 CONTINUE
0311      DO 713 I=1,NN
0312      FM1(I)=FM1(I)/FMMX1
0313      TFM1(I)=TFM1(I)/FMMX1
0314      FM2(I)=FM2(I)/FMMX2
0315      713 TFM2(I)=TFM2(I)/FMMX2
0316      AXLTH=(FNN*DT)/10.0
0317      XPOS=0.5
0318      XPOS2=XPOS+AXLTH+2.0
0319      XPOS3=XPOS+0.5
0320      CALL PLTXMX(150.)
0321      CALL PAXIS(XPOS,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,10.0,1.0)
0322      CALL PAXIS(XPOS,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0323      CALL PSYMB(XPOS3,1.0,-0.1,DATIME,0.0,32)
0324      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS,0.5)
0325      CALL PLINE(XX1,FM1,NN,1,4,0,1.0)
0326      CALL PLINE(XX1,TFM1,NN,1,4,1,1.0)
0327      CALL PAXIS(XPOS2,0.5,'TIME (SEC)',-10,AXLTH,0.0,0.0,10.0,1.0)
0328      CALL PAXIS(XPOS2,0.5,'ARB UNITS',9,10.0,90.0,0.0,0.1,1.0)
0329      CALL PLTOFS(0.0,10.0,0.0,0.1,XPOS2,0.5)
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```
0330      CALL PLINE (XX1,FM2,NN,1,4,2,1.0)
0331      CALL PLINE (XX1,TFM2,NN,1,4,3,1.0)
0332      CALL PLTEND
0333      STOP
0334      END
```

TOTAL MEMORY REQUIREMENTS 01BCE4 BYTES
EXECUTION TERMINATED