```
        PROGRAM DIFI03
C  COEFFICIENT CORREL  TWO VALUES
C IGA=0 - ONLY TEXT IGA=1 - PICTURE LATEX TEXT
C  FOR USING THIS PROGRAMM YOU MAST TO DO :
C  pico difi03.f FOR MAKE NEW PROGRAM
C  AND THEN NEW TEXT BY OVN COMMAND :
C  g77 -v -fno-backslash -o be difi00.f bib.o
C ./be < bbe8al.dat > xxx.res (IGA=0) pico xxx.res
C ./be <bbe8al.dat > lafi.tex (IGA=1) latex ff.tex dvitops ff.dvi
C WITH IGA=1,2,4 CONTENT FILE FOR DONE OF FIGURE BY COMMANDS
C latex ff.tex dvitops ff.dvi AND SEE FIGURE IN FILE ff.ps
C  PRINT ON LAZER PRINTER lpr xxx.res cp ff.ps
C  DATA OF LAST REDACTION: 17 JUN 2005 LEPEKHIN
C
      COMMON /EVN/NFR,ZW,NVT,BY,BZ,NSB,
     *ISAG(27),IPER(44),IVTR(200),
     *XPE(21),YPE(21),FIP,ALP,XVT(21),YVT(4,21),
     *ZVT(4,21),ZPE(21)
      COMMON /CORREL/EE1(2,300),NCOR,RCA
      COMMON /DIMA/IDAY,MANS,JEAR
      COMMON /IGA/EE(20),WC,IGA,NST,XMA,YMA,SAA,SH,XIK2,SIG,CD,NX,NY,
     *INX,ISX,INY,ISY,NCIX,NCIY,AEV,X1,Y1,ADX,ADY,UX,UY,EW(20),NXIK,
     *AMM
      IDAY=20
      MANS=6
      JEAR=2005
      NSB=0
      NCOR=0
C CONSTANTS FOR FIGURE
C YOU MAST TO DETERM ALL CONSTANTS FOR MAKE FIGURE
C EE(K) - MASSIV FOR HISTIRGRAMME
C WC - LEFT AND DOWN PLACE FOR WRITING SCALE
      WC=8.0
C IGA=0 ONLI DISTRIB IGA=1 FIG HISTOGR AND CURVE IGA=2 HIST + POINTS
      IGA=0
C XMA YMA - SQARE OF FIGURE SA - WIDTH CHANN HIST IN MM SH - IN MRAD
      XMA=100.0
      YMA=100.0
      SAA=7.0
      SH=7.0
      SA=7.0
      CD=10.0
C NX NY NUMB OF RISKS IN OX AND OY
      NX=13
      NY=13
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C INX ISX INY ISY = FIRST AND STEP NUMBERS ALONG AXIS
      INX=10
      ISX=10
      INY=10
      ISY=10
C NCIX NCIY NUMBER OF SCRIPT ALONG AXIS
      NCIX=6
      NCIY=6
C AEV - NUMBER OF EVENTS X1 Y1 FIRST COORD SCRIPT ON AXIS
      X1=WC+2.0*SAA-2.0
      Y1=X1
C ADX ADY STEP ALONG AXIS FOR SCALE
      ADX=2.0*SAA
      ADY=ADX
C UX UY DOLIA XMA YMA COORD FOR SCRIPN IN FIG
      UX=0.7
      UY=0.9
C AMM - NUMB EVENTS/MM FIG
      AMM=1.0
      NSB=0
C PREPARE MM ELEMENTS MASSIVE F(K) K<1000 AND HISTOGRAMMING
      CALL DIFIEV
C      CALL QT
      IF (IGA.EQ.1) GO TO 7
      CALL PARCOR
      GO TO 77
    7 CALL FIGCOR
   77 STOP
      END
C
      SUBROUTINE DIFIEV
C  SUBR FOR READING 275 EVENTS FROM CAM B-10
C  DATA OF LAST REDACTION: 17 jun 2005 LEPEKHIN
C
      COMMON /CORREL/EE(2,300),NCOR,R
      COMMON /EVN/NFR,ZW,NVT,BY,BZ,NSB,
     *ISAG(27),IPER(44),IVTR(200),
     *XPE(21),YPE(21),FIP,ALP,XVT(21),YVT(4,21),
     *ZVT(4,21),ZPE(21)
      DIMENSION NNE(10),ZA(21),YA(21),XA(21),KKC(2)
      DIMENSION IIP(27),POPY(30),POPZ(30)
      DATA XW,XST/0.02125,1.22/
      IES=0
    4 READ (5,100) (IIP(K),K=1,27)
      IF (IIP(1).EQ.0) IES=2
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      IF (IES.GT.1) RETURN
      DO 14 K=1,27
   14 ISAG(K)=IIP(K)
  100 FORMAT (10(I6))
      NSB=NSB+1
      NFR=ISAG(4)
      LPER=ISAG(8)
      NPER=ISAG(7)
      LVTR=ISAG(10)
      NVT=ISAG(9)
      IR=NPER+NVT
      E=IR
      A=ISAG(5)
      B=ISAG(6)
      ZW=A/B
      BY=((ISAG(26)-ISAG(16))*XW)/E
      BZ=((ISAG(27)-ISAG(17))*ZW)/E
      CY=0.0
      CZ=0.0
      DO 11,K=1,IR
      A=ISAG(19)
      IF (K.GT.NPER) A=ISAG(20)
      CY=CY+BY
      CZ=CZ+BZ
      POPY(K)=CY
   11 POPZ(K)=CZ
      READ (5,100) (IPER(K),K=1,LPER)
      READ (5,100) (IVTR(K),K=1,LVTR)
      NC=2*NFR+1
      L=-NC
      DO 5 K=1,NVT
      L=L+NC
      DO 6 KK=1,NC
    6 NNE(KK)=IVTR(L+KK)
      M=K+NPER
      J=-1
      XVT(K)=XST*NNE(NC)
      DO 7 I=1,NFR
      J=J+2
      YVT(I,K)=XW*NNE(J)-POPY(M)
    7 ZVT(I,K)=ZW*NNE(J+1)-POPZ(M)
    5 CONTINUE
      DO 8 K=1,NPER
      I=(K-1)*3+1
      YPE(K)=XW*IPER(I)+POPY(K)
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      ZPE(K)=ZW*IPER(I+1)+POPZ(K)
      XPE(K)=XST*IPER(I+2)
    8 CONTINUE
      CALL TFTA(NPER,XPE,YPE,FIP)
      CALL TFTA(NPER,XPE,ZPE,ALP)
      N2=0
      DO 1 K=1,NFR
      I=ISAG(K+20)
      IF (I.NE.2) GO TO 1
      N2=N2+1
      KKC(N2)=K
      IF (N2.EQ.2) GO TO 2
    1 CONTINUE
    2 IF (N2.NE.2) GO TO 4
C ****** WITOUT THETA12 < 10 MRAD  ******
C      K1=KKC(1)
C      K2=KKC(2)
C      DO 9 K=1,NVT
C      XA(K)=XVT(K)
C      YA(K)=YVT(K1,K)-YVT(K2,K)
C      ZA(K)=ZVT(K1,K)-ZVT(K2,K)
C      XA(K)=XA(K)-XA(1)
C      YA(K)=YA(K)-YA(1)
C    9 ZA(K)=ZA(K)-ZA(1)
C      CALL TFTA(NVT,XA,YA,FER)
C      CALL TFTA(NVT,XA,ZA,A)
C      T=ATAN(SQRT(FER**2+A**2))*1000.0
C      IF (T.LT.10.0) GO TO 4
C ****** 17.06.05 ********
      LLL=0
      DO 22 L=1,2
      LLL=LLL+1
      LL=KKC(L)
      DO 12 K=1,NVT
      YA(K)=YVT(LL,K)
   12 ZA(K)=ZVT(LL,K)
      CALL TFTA(NVT,XVT,YA,FIL)
      CALL TFTA(NVT,XVT,ZA,A)
      AB=A-ALP
      FB=FIL-FIP
      X=1000.0*ATAN(SQRT(AB**2+FB**2))
      IF (X.GT.100.0) GO TO 4
      IF (LLL.EQ.2) GO TO 13
      NCOR=NCOR+1
      E1=X
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   13 J=1
      J2=2
      CALL CRND(R)
      IF (R.GT.0.5) GO TO 17
      J2=1
      J=2
   17 EE(J,NCOR)=X
      EE(J2,NCOR)=E1
   22 CONTINUE
      GO TO 4
      RETURN
      END
C
C      SUBROUTINE TEXT
C      A=0.0
C      RETURN
C      END
C
      SUBROUTINE TEXT
      PRINT 101
  101 FORMAT ('{\small'/
     *'\vspc'/
     *'{\begin {minipage}{11.5cm}'/
     *'{\bf Рис. 6\ }Этот рисунок получен проц difi03.f 20.06.05 '/
     *'корреляция углов $\theta_1\ $и $\theta_2\ $'/
     *' для частиц с Z=2 из массива '/
     *'bbe8al.dat '/
     *'R - это коэффициент парной корреляции.  '/
     *'Величина H=R*SQRT(N-1) в зксперименте = 3.23.'/
     *'Для надежности P=0.999, при отсутствии корреляций,'/
     *'она должна быть меньше чем 3.27.')
C     *'Таким образом, гипотеза независимости этих величин отвергается.')
      PRINT 102
  102 FORMAT ('\end{minipage}}}'/
     *'\normalsize')
      RETURN
      END
C
        SUBROUTINE PARCOR
C  DATA OF LAST REDACTION: 15 JUN 2005 LEPEKHIN
C
      COMMON /CORREL/F(2,300),NCOR,R
      COMMON /DIMA/IDAY,MANS,JEAR
      COMMON /IGA/EE(20),WC,IGA,NST,XMA,YMA,SAA,SH,XIK2,SIG,CD,NX,NY,
     *INX,ISX,INY,ISY,NCIX,NCIY,AEV,X1,Y1,ADX,ADY,UX,UY,EW(20),NXIK,
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     *AMM
      DIMENSION SR(2),SS(2),XX(2),XX2(2),PS(3),P1(3),PR(3)
      DATA PS/1.96,2.576,3.291/
      DATA P1/1.956,2.553,3.226/
      IF (IGA.EQ.1) GO TO 13
      PRINT 611,IDAY,MANS,JEAR
  611 FORMAT (2X,'CORRELATION OF ANGLES THETA B-10 Z=2'/2X,
     *'NAME OF INIT. PROCED. IN CATAL =PCFARM difi03.f'/2X,
     *'ALL MASSIV bbe8al.dat',3I5)
   13 DO 12 K=1,2
      XX(K)=0.0
   12 XX2(K)=0.0
      DO 11 K=1,2
      DO 10 L=1,NCOR
      XX(K)=XX(K)+F(K,L)
   10 XX2(K)=XX2(K)+F(K,L)**2
   11 CONTINUE
      ANX=NCOR
      AA=100.0/ANX
      DO 1 K=1,3
    1 PR(K)=PS(K)+(P1(K)-PS(K))*AA
      DO 14 K=1,2
      SR(K)=XX(K)/ANX
      SX2=XX2(K)
      SXX=XX(K)
   14 SS(K)=SQRT((SX2-((SXX**2)/ANX))/(ANX-1.0))
      RR=0.0
      DO 15 K=1,NCOR
   15 RR=RR+(F(1,K)-SR(1))*(F(2,K)-SR(2))
      R=RR/(SS(1)*SS(2)*(ANX-1.0))
      H=R*SQRT(ANX-1.0)
      IF (IGA.GT.0) GO TO 16
      PRINT 619,NCOR,R,H,(PR(K),K=1,3)
  619 FORMAT (2X,' FOR EVENTS WITOUT THETA12 < 10 MRAD'/
     *2X,'NUMBER OF VALUES = ',I4,2X,'COEFFIC CORREL R= ',F10.4/
     *2X,'EXPERIMENTAL VALUE H=R*SQRT(NCOR-1.0)=',F10.4/
     *2X,'FOR NADEJNOCT = 0.95 0.99 0.999 CRITICH VAVUES H ='/2X,
     *2X,3F10.3)
      GO TO 77
   16 CALL FIGCOR
   77 RETURN
      END
C
      SUBROUTINE NAM(N,X,Y)
      GO TO (1,2,3),N
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    1 PRINT 101,X,Y
  101 FORMAT ('\put(',F6.2,',',F6.2,'){${\bf \theta_1}$}')
      GO TO 77
    2 PRINT 102,X,Y
  102 FORMAT ('\put(',F6.2,',',F6.2,'){${\bf \theta_2}$}')
      GO TO 77
    3 PRINT 103,X,Y
  103 FORMAT ('\put(',F6.2,',',F6.2,'){$\circ $}')
   77 RETURN
      END
C
      SUBROUTINE NAMXI(X,Y,A)
      PRINT 101,X,Y,A
  101 FORMAT ('\put(',F6.2,',',F6.2,'){$ R =$\bf',F6.2,'}')
      RETURN
      END
C
      SUBROUTINE NAMXII(X,Y,I)
      PRINT 101,X,Y,I
  101 FORMAT ('\put(',F6.2,',',F6.2,'){$\Sigma N=$\bf',I4,'}')
      RETURN
      END
C
      SUBROUTINE BEG(X,Y)
      PRINT 103,X,Y
  103 FORMAT (
     *'\begin{table}[t]'/
     *'\begin{picture}(',F5.1,',',F5.1,')')
      RETURN
      END
C
      SUBROUTINE FRAM(XN,YN,X,Y)
      PRINT 101,XN,YN,X,Y
  101 FORMAT ('\thicklines',
     *'\put(',F5.1,',',F5.1,'){\framebox(',F5.1,',',F5.1,')}')
      RETURN
      END
C
      SUBROUTINE ENCT
      PRINT 119
  119 FORMAT (
     *'\end{picture}')
      CALL TEXT
      PRINT 102
  102 FORMAT (
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     *'\end{table}')
      RETURN
      END
C
      SUBROUTINE PRCDOT(X,Y)
      PRINT 101,X,Y
  101 FORMAT (
     *'\put(',F6.2,',',F6.2,'){$\cdot$}')
      RETURN
      END
C
      SUBROUTINE LINEC(X,Y,DL,IX,IY)
      PRINT 101,X,Y,IX,IY,DL
  101 FORMAT (
     *'\put(',F6.2,',',F6.2,'){\line(',I2,',',I2,'){',F6.2,'}}')
      RETURN
      END
C
      SUBROUTINE RISKI(XG1,XGST,NX,DX,YGC,STPY,YV1,YVST,NY,DY,
     *XVC,STPX)
C XG1 YV1 FIRST X AND Y COORD ALONG OX OY AXIS
C XGST YVST STEPS ALONG OX OY AXIS
C NX NY NUMBER OF RISKS ALONG OX OY
C DX DY LENGTH OF RISKS IN MM OX OY
C YGC=WC Y COORD DOWN LINE (AXIS OX)
C STPY=XMA DISTANCE BETWEEN VERTICAL LINES
C STPX=YMA DISTANCE BETWEEN GORISONAL LINES
C XVC=WC X COORD FIRST VERTICAL LINES (OY)
      X=XG1
      Y=YGC
      YY=Y+STPY
      DO 1 K=1,NX
      CALL LINEC(X,Y,DX,0,1)
      CALL LINEC(X,YY,DX,0,-1)
    1 X=X+XGST
      Y=YV1
      X=XVC
      XX=X+STPX
      DO 2 K=1,NY
      CALL LINEC(X,Y,DY,1,0)
      CALL LINEC(XX,Y,DY,-1,0)
    2 Y=Y+YVST
      RETURN
      END
C
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      SUBROUTINE PRIDE(X,Y,N,DX,A,ST)
      DO 1 K=1,N
      XX=X
      PRINT 101,XX,Y,A
  101 FORMAT (
     *'\put(',F6.2,',',F6.2,'){$\bf',F4.2,'$}')
      X=X+DX
    1 A=A+ST
      RETURN
      END
C
      SUBROUTINE PRINTI(X,Y,J,D,N,IN,IS)
      DO 1 K=1,N
      PRINT 101,X,Y,IN
  101 FORMAT (
     *'\put(',F6.2,',',F6.2,'){${\bf ',I4,'}$}')
      IF (J.EQ.0) X=X+D
      IF (J.NE.0) Y=Y+D
    1 IN=IN+IS
      RETURN
      END
C
      SUBROUTINE CRND(R)
C GENERATION OF RANDOM DISTRIB  NUMBER FROM 1.0 TO 0.0
C 1 DECEMBER LEPEKHIN
      DIMENSION C(50)
      DATA INI,E/0,1.0/
      DATA C/
     *  2.0,3.0,5.0,7.0,11.0,13.0,17.0,19.0,23.0,29.0,31.0,
     *37.0,41.0,43.0,47.0,53.0,59.0,61.0,63.0,71.0,73.0,79.0,83.0,
     *89.0,97.0,101.0,103.0,107.0,109.0,113.0,127.0,131.0,137.0,
     *139.0,149.0,151.0,157.0,163.0,167.0,173.0,179.0,181.0,
     *191.0,193.0,197.0,199.0,211.0,223.0,223.0,229.0/
      IF (INI.GT.1) GO TO 2
      DO 1 K=1,50
    1 C(K)=SQRT(C(K))
      INI=2
    2 I=50.0*RND()+1
      IF (I.GT.50) I=50
      R=RND()+C(I)
      C(I)=R
      R=AMOD(R,E)
      RETURN
      END
      FUNCTION RND()
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      DATA I,M,L,A/272667285,2147483646,65539,0.4656613E-9/
    1 J=I*L
      IF (I) 5,6,6
    5 J=J+M+1
    6 I=J
      R=I
      R=R*A
      IF (R.LT.0.0) GO TO 1
      IF (R.GT.1.0) GO TO 1
      RND=R
      RETURN
      END
C
      SUBROUTINE TFTA(N,X,Y,F)
      DIMENSION X(11),Y(11)
      A=N
      XQ=0.0
      SY=0.0
      SX=0.0
      SXY=0.0
      DO 1 K=1,N
      XQ=XQ+(X(K)**2)/A
      SX=SX+X(K)/A
      SY=SY+Y(K)/A
      SXY=SXY+(X(K)*Y(K))/A
    1 F=((SXY-SX*SY)/(XQ-SX**2))
      RETURN
      END
C
      SUBROUTINE FIGCOR
C  DATA OF LAST REDACTION: 15 JUN 2005 LEPEKHIN
      COMMON /CORREL/EE(2,300),NCR,R
      COMMON /IGA/E(20),WC,IGA,NST,XMA,YMA,SA,SH,XIK2,SIG,CD,NX,NY,
     *INX,ISX,INY,ISY,NCIX,NCIY,AEV,X1,Y1,ADX,ADY,UX,UY,EXIK(20),NXIK,
     *AMM
      DATA C/2.0/
      DIMENSION XNA(2),YNA(2)
      X=XMA+WC
      Y=YMA+WC
      CALL BEG(X,Y)
      CALL FRAM(WC,WC,XMA,YMA)
      J=2
      CALL PRINTI(C,Y1,J,ADY,NCIY,INY,ISY)
      J=0
      CALL PRINTI(X1,C,J,ADX,NCIX,INX,ISX)
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      XG1=WC+SA
      YV1=XG1
      CALL RISKI(XG1,SA,NX,C,WC,YMA,YV1,SA,NY,
     *C,WC,XMA)
      DO 7 K=1,NCR
      X=EE(1,K)+WC
      Y=EE(2,K)+WC
    7 CALL NAM(3,X,Y)
      XNA(1)=C
      YNA(1)=WC+YMA-5.0
      YNA(2)=C
      XNA(2)=XMA
      DO 8 K=1,2
      X=XNA(K)
      Y=YNA(K)
    8 CALL NAM (K,X,Y)
      X=XMA*UX+WC
      Y=YMA*UY+WC
      CALL NAMXI(X,Y,R)
      CALL ENCT
      RETURN
      END
```