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        PROGRAM DIFI00
C  RELEY DISTRIBUTION EXPER DATA ANGLES THETA OR PT
C IGA=0,3 - ONLY TEXT IGA=1,2,4 - PICTURE LATEX TEXT
C IGA=3 - RESULTS FOR SMES 2 REHLEY IGA=4 FIGURE SMES 2 REL
C  FOR USING THIS PROGRAMM YOU MAST TO DO :
C  pico difi00.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, IGA=3) pico xxx.res
C ./be <bbe8al.dat > lafi.tex (IGA=1,2,4) 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 difi00.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 /SMS/XQ,AA,S1,S2,PL
      COMMON /DIMA/IDAY,MANS,JEAR
      COMMON /AXXX/AXX,XX,XX2,X
      COMMON /NHI/NHI(84),IHI,NLM,GR,SA
      COMMON /ELEF/F(1000),MM
      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
      DIMENSION EXI(20),EXR(20)
      DATA EXI/0.0,0.0,0.0,13.8,15.9,16.8,18.5,20.2,21.7,
     *23.2,24.7,26.2,27.7,29.1,30.6,32.0,33.4,34.8,36.2,37.2/
      IDAY=20
      MANS=6
      JEAR=2005
      NSB=0
C CONSTANTS FOR SMES 2 RELEY DISTR A S1 S2
      AA=0.344
      S1=11.328
      S2=22.435
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=4
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C NST - NUMBER OF USED CHANNALS OF HISOGR
c      NST=13
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=5.0
C XIK2 - XI**2 SIG - CONST REL DISTR CD - NUMB OF EVENTS IN MM FIG
C      XIK2=7.97
C      SIG=20.0
      CD=10
C NX NY NUMB OF RISKS IN OX AND OY
      NX=13
      NY=9
C INX ISX INY ISY = FIRST AND STEP NUMBERS ALONG AXIS
      INX=10
      ISX=10
      INY=10
      ISY=20
C NCIX NCIY NUMBER OF SCRIPT ALONG AXIS
      NCIX=5
      NCIY=4
C AEV - NUMBER OF EVENTS X1 Y1 FIRST COORD SCRIPT ON AXIS
C      AEV=540.0
      X1=WC+2.0*SAA-2.0
      Y1=WC+CD-2.0
C ADX ADY STEP ALONG AXIS FOR SCALE
      ADX=2.0*SAA
      ADY=CD*2.0
C UX UY DOLIA XMA YMA COORD FOR SCRIPN IN FIG
      UX=0.7
      UY=0.9
C EXIK(K) VALUES EVENTS MAST BE FOR REL DISTR NXIK - NUM EL EXIK(K)
      NXIK=11
C AMM - NUMB EVENTS/MM FIG
      AMM=1.0
      GR=0.0
      SA=5.0
      MM=0
      NSB=0
      NLM=84
      IHI=1
      DO 1 K=1,NLM
    1 NHI(K)=0
      AXX=0.0
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      XX=0.0
      XX2=0.0
C PREPARE MM ELEMENTS MASSIVE F(K) K<1000 AND HISTOGRAMMING
      CALL DIFIEV
C      CALL QT
      CALL PREP
      IF (IGA.EQ.1) GO TO 7
      IF (IGA.EQ.2) GO TO 7
      IF (IGA.EQ.4) GO TO 6
      CALL PRIDIS
      GO TO 77
    6 CALL SMES
    7 CALL FIGREL
   77 STOP
      END
C
      SUBROUTINE DIFIEV
C  SUBR FOR READING 275 EVENTS FROM CAM B-10
C  DATA OF LAST REDACTION: 26 MAY 2005 LEPEKHIN
C
      COMMON /AXXX/AXX,XX,XX2,X
      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 /ELEF/F(1000),MM
      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
      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)
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      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)
      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
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    2 IF (N2.NE.2) GO TO 4
C ******    ONLY FOR 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   **********
      DO 22 L=1,2
      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 (MM.EQ.1000) GO TO 4
      IF (X.GT.100.0) GO TO 4
      MM=MM+1
      F(MM)=X
      CALL AHI
   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}'/
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     *'{\bf Рис. 4\ }Этот рисунок получен проц difi00.f 20.06.05 '/
     *'with bib.o (bib.f) с данными из файла bbe8al.dat. '/
     *'Гистограмма - это  эксперимент.'/
     *' Кривая получена с    '/
     *' константой из эксперимента. Файл difi00.f с IGA=4 ')
      PRINT 102
  102 FORMAT ('\end{minipage}}}'/
     *'\normalsize')
      RETURN
      END
C
        SUBROUTINE PRIDIS
C  DATA OF LAST REDACTION: 10 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 /SMS/XQ,AA,SSS1,SSS2,P
      COMMON /DIMA/IDAY,MANS,JEAR
      COMMON /AXXX/AXX,XX,XX2,X
      COMMON /NHI/NHI(84),IHI,NLM,GR,SA
      COMMON /ELEF/F(1000),MM
      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
      DIMENSION EXI(20),EXR(20)
      DATA EXI/0.0,0.0,0.0,13.8,15.9,16.8,18.5,20.2,21.7,
     *23.2,24.7,26.2,27.7,29.1,30.6,32.0,33.4,34.8,36.2,37.2/
      PRINT 611,IDAY,MANS,JEAR
  611 FORMAT (2X,'RELEY DIST ANGLES THETA B-10 Z=2'/2X,
     *'NAME OF INIT. PROCED. IN CATAL =PCFARM difi00.f'/2X,
     *' 540 исключены углы тета больше 100 мрад.',3I5)
C     *'ALL MASSIV bbe8al.dat',3I5)
      S2=XX2/(2.0*AEV)
      S22=2.0*S2
      SIG=SQRT(S2)
      PRINT 619,GR,SA,SIG
  619 FORMAT ('LEFT GRAN HIST=',
     *2X,F10.5,2X,'STEP OF HIS.=',2X,F10.5/2X,
     *' VALUE OF RELEY CONST.=',2X,F10.5)
      IK=NLM-4
      LI=AXX
      LLKI=0
      L=0
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      NST=4
      DO 42 M=1,IK
      L=L+NHI(M)
      LLKI=LLKI+1
      IF (L.EQ.LI) GO TO 51
   42 CONTINUE
   51 CONTINUE
      PRINT 203,(NHI(M),M=1,LLKI)
      C=EXI(NXIK)
      PRINT 251,NXIK,XIK2,C
  251 FORMAT (
     *'CHISLO ST.SV=',2X,I3,2X,'EXP XI**2=',
     *2X,F6.2,2X,'KRIT XI',2X,F5.2/
     *'OJIDAEMOE  RASPREDELENIE RELEYA ')
      PRINT 252,(EW(M),M=1,NXIK)
  252 FORMAT (10F6.2)
      IK=IK+1
  203 FORMAT (2X,10I6)
      PRINT 205,(NHI(M),M=IK,NLM)
  205 FORMAT (2X,'OVER LEFT GRAN =',I6,2X,'GREATER HIST=',I6/2X,
     *'EVENTS IN HISIOG=',I6,2X,'ALL EVENTS=',I6)
  102 FORMAT (2X,10('*'),2X,'NUMBER OF HISTOGRAMM=',I4,2X,10('*'))
  104 FORMAT ('EXAMINATIONS OF HIPOTESYS RELEY. DISTRIB.')
      PRINT 104
      CALL ELEFUN(S2)
      PRINT 105,IDAY,MANS,JEAR
  105 FORMAT (/20('*'),2X,I2,'.',I2,'.',I4,2X,20('*'))
      IF (IGA.EQ.0) GO TO 77
      CALL SMES
      PRINT 105,IDAY,MANS,JEAR
   77 RETURN
      END
C
        SUBROUTINE SMES
      COMMON /DIMA/IDAY,MANS,JEAR
      COMMON /AXXX/AXX,XX,XX2,XHIS
      COMMON /NHI/NHI(84),IHI,NLM,GR,SA
      COMMON /ELEF/F(1000),MM
      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
      COMMON /SMS/X,A,S1,S2,P
      IF (IGA.EQ.4) GO TO 11
      PRINT 611,IDAY,MANS,JEAR
  611 FORMAT (2X,'SMES OF 2 RELEY DIST ANGLES THETA'/2X,
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     *'ALL MASSIV bbe8al.dat',3I5)
   11 AN=AEV*5.0
      X=SA/2.0
      DO 1 K=1,NST
      CALL PLOTN
      X=X+SA
    1 EW(K)=P*AN
      XIK2=0.0
      DO 2 K=1,NST
      C=NHI(K)
    2 XIK2=XIK2+(C-EW(K))**2/EW(K)
      IF (IGA.EQ.4) GO TO 77
      PRINT 303,XIK2,A,S1,S2
  303 FORMAT ('XIK2=',F10.3,2X,'FOR A S1 S2 =',3F7.3)
      PRINT 304,(EW(K),K=1,NST)
  304 FORMAT (10F6.1)
      W=0.0
      I=AEV
      C=1.0
      DO 3 K=1,I
      X=F(K)
      CALL FUNRAS
      W=W+((2.0*C-1.0)/(2.0*AEV)-P)**2
    3 C=C+1.0
      PRINT 305,W
  305 FORMAT ('CRAMERS-MIZES PARAM W**2=',F10.3)
      RETURN
   77 RETURN
      END
C
      SUBROUTINE FUNRAS
      COMMON /SMS/X,A,S1,S2,P
      P=A*(1.0-EXP(-(X**2/(2.0*S1**2))))+
     *(1.0-A)*(1.0-EXP(-(X**2/(2.0*S2**2))))
      RETURN
      END
C
      SUBROUTINE PLOTN
      COMMON /SMS/X,A,S1,S2,P
      P=(A*X/S1**2)*EXP(-X**2/(2.0*S1**2))+
     *((1.0-A)*X/S2**2)*EXP(-X**2/(2.0*S2**2))
      RETURN
      END
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