

Calculation of Cosmic Ray Induced Single Event Upsets
PROGRAM CRUP, COSMIC RAY UPSET PROGRAM

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Calculation of Cosmic Ray Induced Single Event Upsets:

PROGRAM CRUP, COSMIC RAY UPSET PROGRAM

I. INTRODUCTION

Since the publication of our calculations on cosmic ray induced single event upsets in cosmic ray environments,^{1,2} interest has been expressed within the single event community for an export version of the computer program. The version of the program used for the calculations reported in the above mentioned references was run on the SEL 32-55 Data Acquisition Computer at the NRL Cyclotron. An export version of this program has been developed. The calculational method employed is the same as described in Refs. (1) and (2). Some small changes in the details of the calculational method, and an update in the 90 percent worst case environment furnished with this program are described. This export version does not have the scaling features contained in the original program, and it has been rewritten to be independent of the file structure of the SEL computer. The revised program runs correctly on the SEL 32-55. The intent of this documentation is to furnish sufficient information for a reasonably experienced FORTRAN programmer to convert the program to run on his computer. The export tape has been translated from the 7 track magnetic tape generated at the SEL computer to the more universally readable 9 track tape in a DEC VAX-11 readable format.

II. PROGRAM ORGANIZATION

The export tape contains two files. The first file is the complete FORTRAN program, ready for compilation. The second file, intended to be read in as data upon program execution, contains three cosmic ray environments in the form of differential LET spectra, written as card images. The first two environments in the second file are the solar minimum, and the solar maximum environments, respectively, identical to the environments used for the calculations reported in Refs. (1) and (2). The third environment, the 90 percent worst case environment, is a revised LET spectrum, based on new data that was furnished to us by J.H. Adams, Jr. of the NRL Space Science Division, since publication of Refs. (1) and (2). It should be remarked that the "90 percent worst case" in Ref. (1) is identical to the "10 percent worst case" discussed in Ref. (2).

Upon execution of the program, the three differential LET spectra are read into three sets of pre-dimensioned arrays, one set for each of the spectra. Each set consists of an alphanumeric identifier of 20 words, with an associated two dimensional array for the data, 2 x 1000 words. The first record for any LET spectrum is a title, up to 80 characters, followed by 250

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records, each containing four pairs of 10 character fields, each pair being a value of the LET spectrum, followed by the corresponding value of LET. The alphanumeric identifier and the data pairs for each spectrum are read into the arrays identified in Table I, with the index 1 on the two dimensional array corresponding to the value of LET, and the index 2 corresponding to the corresponding value for the differential LET spectrum.

TABLE I
Array Identifications

Index	Spectrum	Alphanumeric Identifier	LET Spectrum
1	Solar Minimum	TMIN(20)	SOLMIN(2,1000)
2	Solar Maximun	TMAX(20)	SOLMAX(2,1000)
3	90 Percent Worst Case	TWORST(20)	WORST(2,1000)

The program is designed to be run in an interactive mode from a terminal. The first prompt message asks for the cell dimensions: l, w, h , with $l > w > h$. Then, following the terminology in Ref. (1), values for the critical energy in MeV and the error conversion factor are requested. The next prompt message requests an index which identifies an environment for the particular calculation. These indices are tabulated in Table I. There is also an option that permits printout of the integral chord-length distribution and the selected LET spectrum. Upon completion of the calculation, the result is displayed on the terminal screen and stored for printout upon exit from the program. Arrays for storage of results with associated input parameters exist to store up to twenty results. Entering a carriage return at the first prompt message, which asks for the cell dimensions, causes the program to terminate with printout of the stored results.

A brief description of the subprograms is given in section III, and a complete listing of the program is contained in Appendix B. The subroutines M:IOEX, M:BLOCK, and INIT which occur early in the main program are specific to the particular SEL computer installation used for this work. These subroutines can be eliminated for most installations. Subroutine M:IOEX take care of a graceful exit if the program bombs out during execution. Subroutine M:BLOCK tells the system which SEL convention is used for data on logical unit 1, the magnetic tape. The function of INIT is to alert logical unit 5, the terminal used in an interactive mode in the program.

The numerical integration, utilizing a simple trapezoidal technique, is done in the body of the main program. Interpolation between values of the rapidly varying LET spectrum has generally been avoided by varying the integration intervals to agree with the tabular values of LET,

except for the case of the first integration interval which starts at $L = L_0$, the minimum value of LET which produces an event. In this case, a logarithmic interpolation technique is used. The integral chord-length distribution, $C(L)$, is calculated once and then stored in TABLE (2,512). During the calculation, required values of $C(L)$ are obtained by interpolation.

III. BRIEF DESCRIPTION OF SUBPROGRAMS

A brief description of the subprograms is given in this section. These descriptions should enable a serious user, who makes the effort, to find his way through the program for revision or independent use of the subprograms.

A. SUBROUTINE C1(XL,W,H,NTABLE).

This subroutine computes the integral chord-length distribution, $C(S)$, storing the results in TABLE(2,512). TABLE(1,N) contains a chord length, with the corresponding value of $C(S)$ stored in TABLE(2,N). The computations are performed for NTABLE values for each segment of the chord-length distribution. A segment is considered to be the portion of $C(S)$ between adjacent singularities in $C(S)$. The singularities are discussed in Appendix A and in the discussion of SUBROUTINE SING(XL,W,H). It should be noted that the tabulated values of $C(S)$ are for equally spaced values of S within each segment only, but each segment will generally have different spacing of the tabulated values.

The integral chord-length distribution was calculated in Ref. (1) by numerical integration of the expression for the differential chord-length distribution published by Pickel and Blandford.³ Since publication of Ref. (1), Warren Bendel of NRL has pointed out to me that the differential chord-length distribution can be integrated in closed form. The closed form approach has been used here. The analytic expressions for the indefinite integrals, due to Bendel, are given in Appendix A.

Subroutines SING and PERMSUM are called by this subroutine.

B. SUBROUTINE SING(XL,W,H).

This subroutine finds the singularities in $C(S)$ and arranges them monotonically in ascending order for insertion into SLIM(B). SLIM will contain NLIM entries, $NLIM \leq B$. The array SLIM contains the boundaries of the segments of $C(S)$. For this reason, SLIM(1) is set equal to zero; the next entries contain the singularities; and SLIM(NLIM) contains the maximum chord length for the particular cell.

C. FUNCTION F1(S,X,Y,Z). FUNCTION F2(S,X,Y,Z). FUNCTION F3(S,X,Y,Z).

Functions F1, F2, F3 evaluate Eqs. (6), (7), and (8), respectively, of Appendix A. Checks are made that the value of S is within the limits of validity for the particular function.

D. FUNCTION PERMSUM(S,XL,W,H).

This function sums over the permutations of x,y,z indicated in Eq. (1) of Appendix A and in Eq. (A-8) of Ref. (3). An appropriate choice between F1, F2, and F3 is made, depending on the relationship between S, X, Y, and Z.

E. SUBROUTINE READIN(A,T).

This utility subroutine reads the LET spectra from the source magnetic tape into the assigned arrays listed in Table I.

F. SUBROUTINE TRANSFER(T1,P1,T2,P2).

This subroutine transfers the selected LET spectrum from the arrays represented by T2 and P2 to the working arrays T1 and P1.

G. SUBROUTINE LAG(X1,X2,X3,X4,Y1,Y2,Y3,Y4,X,Y).

This is a four point Lagrangian interpolation routine. The values of the independent variable are known at X1, X2, X3, and X4; with associated values of the dependent variable at Y1, Y2, Y3, and Y4. This subroutine finds the value of Y at the value of the independent variable, X, and puts the value in Y.

H. FUNCTION FINTERP(TABLE,NTABLE,X)
FUNCTION FINTERP1(TABLE,NMIN,NMAX,X)

FINTERP is a function designed for four point Lagrangian interpolation in a two dimensional array TABLE(2,NTABLE), where TABLE(1,N) contains the independent variable, and TABLE(2,N) contains the dependent variable. X is the value of the independent variable for interpolation.

FINTERP1 is a slightly modified version of FINTERP which was written to take care of a special situation when the revised 90 percent worst case LET spectrum was delivered to us with zeroes at the beginning and at the end of the array. Instead of having a full table of NTABLE values as in the case of FINTERP, FINTERP1 uses values of TABLE(1,N) and TABLE(2,N) for N between NMIN and NMAX, where the array contains non zero values of the dependent variable.

FINTERP and FINTERP1 call on SUBROUTINE LAG.

IV. ACKNOWLEDGEMENTS

The continued support and encouragement of J.C. Ritter during the course of this work is greatly appreciated. The treatment of the integral chord-length distribution, shown in Appendix A, is due W.L. Bendel of NRL.

References

1. P. Shapiro and E.L. Petersen, "Calculation of Cosmic Ray Induced Soft Upsets and Scaling in VLSI Devices," NRL Memorandum Report 4864, August 26, 1982.
2. E.L. Petersen, P. Shapiro, J.H. Adams, Jr., and E.A. Burke, "Calculation of Cosmic Ray Induced Soft Upsets and Scaling in VLSI Devices," IEEE Trans. Nucl. Sci. NS-29, 2055 (1982).
3. J.C. Pickel and J.T. Blandford, Jr., "Cosmic Ray Induced Errors in MOS Devices," IEEE Trans. Nucl. Sci. NS-27, 1006 (1980). Erratum, IEEE Trans. Nucl. Sci. NS-29, 2122 (1982).

APPENDIX A

INTEGRAL CHORD-LENGTH DISTRIBUTION

The analytic integration of the expression for the differential chord length-distribution due to Petroff, and reported in Ref. (3), was furnished to me by Warren Bendel of NRL.

We consider a rectangular parallelepiped of dimensions l , w , and h .

The normalized differential distribution function for pathlength S is called F and integrated to unity. It is given by

$$(3\pi/4)(lw + lh + wh) F(S, l, w, h) = \sum_6 N(S, x, y, z) \quad (1)$$

where the sum is over the six permutations of (l, w, h) as (x, y, z) . In each case, $N + N_0$ is three times the quantity g of Petroff.

The expression for N has three forms, depending upon the value of S relative to z and $(x^2 + z^2)^{1/2}$. As these expressions are complicated, we introduce symbols (below) for certain functions of the dimensions. We also define, with capital letters, two relationships with pathlength.

Symbols

$$r^2 = x^2 + y^2 + z^2$$

$$t^2 = x^2 + z^2$$

$$k = (x^2 - y^2/(x^2 + y^2))^{1/2}$$

$$m = y^2/(x^2 + y^2)$$

$$v = 3xyz^2$$

$$p^2 = S^2 - z^2$$

$$Q^2 = S^2 - x^2 - z^2$$

A few terms are common to all three regions of S and therefore can be treated uniformly for $0 \leq S \leq r$. These terms are

$$N_0 = 2x^2 \left[\frac{y^2}{t^2 r} - \frac{2}{r} + \frac{r}{x^2 + y^2} \right] = \frac{2}{r} \left[\frac{x^2 y^2}{x^2 + z^2} + \frac{x^2 z^2}{x^2 + y^2} - x^2 \right] \quad (2)$$

Summing over all six permutations, one finds that

$$\sum_6 N_0 = 0$$

and thus N_0 may be omitted (as it was) from Eq. (1).

For the first region, where $0 \leq S < z$, N is given by

$$N_1 = A_1 + B_1 S \quad (3)$$

$$\text{where } A_1 = (2/t)(x^2 - z^2) + 2mz \quad \text{and } B_1 = -(3xy/2rt)^2. \quad (4)$$

If $z \leq S < t$, the equation is

$$N_2 = A_2 + B_2 S + C_2/S^3 + (k - x)\frac{P}{S}(2 + z^2/S^2)$$

$$\text{where } A_2 = (2/t)(x^2 - z^2), B_2 = (9/4)(m - (xy/rt)^2), \text{ and } C_2 = v \tan^{-1}(y/x) - mz^4/4.$$

Finally, for $t \leq S \leq r$, Petroff's equation reduces to

$$N_3 = B_3 S + C_3/S^3 + k \frac{P}{S}(2 + z^2/S^2) + yz^2 \frac{Q}{S}(2/t^2 + 1/S^2) - (v/S^3) \cos^{-1}(x/P) \quad (5)$$

$$\text{where } B_3 = -\frac{9x^2}{4} \left[\frac{1}{x^2 + y^2} - \frac{1}{r^2} \right] \text{ and } C_3 = \frac{x^2 z^2}{4} \left[\frac{z^2}{x^2 + y^2} - 3 \right] + v \tan^{-1}(y/x).$$

Integration of N_1 , N_2 , and N_3 yields:

$$I_1 = \int N_1 dS = A_1 S + B_1 S^2/2 \quad (6)$$

$$I_2 = \int N_2 dS = A_2 S + B_2 S^2/2 - C_2/2S^2 + (k - x)E \quad (7)$$

$$\text{where } E = P(2 - z^2/2S^2) - (3z/2) \cos^{-1}(z/S)$$

$$\begin{aligned} I_3 = \int N_3 dS = & B_3 S^2/2 - C_3/2S^2 + kE \\ & + yz^2 [Q(2/t^2 - 1/2S^2) - (3/2t) \cos^{-1}(t/S)] \\ & - (3xy/2) [(P/S)^2 \cos^{-1}(x/P) - (x/t) \cos^{-1}(t/S)]. \end{aligned} \quad (8)$$

Inspection of the results of the integration indicates that there are six singularities in the calculation of $C(S)$ if the cell dimensions are nondegenerate. The number of singularities is reduced if two or more of the cell dimensions are identical. Integration of the differential chord-length distribution is performed in segments to take into account changes in the analytic expression as a singularity is crossed. The singularities occur at $S = w, h, l, w^2 + h^2, w^2 + d^2$, and $h^2 + l^2$.

APPENDIX B

LISTING OF PROGRAM

```

* TYPE EXPORT1.FOR;1
*****FILE EXPORT(3/3/83)*****
C   PROGRAM CRUP
C   PROGRAM TO CALCULATE SOFT UPSETS DUE TO COSMIC RAYS
C   REQUIRES %ASSIGN: S=TY61 (TERMINAL)
C   REQUIRES %ASSIGN: S=MT,SOURCE (MAG TAPE)
C   REQUIRES %ASSIGN: LO=SLD,2000 (LINE PRINTER)
      INTEGER FILE
      DIMENSION PHITABLE(2,1000),XLL(20),WW(20),HH(20),
1 XLNTABLE(2,1000),TITLE(20),ERRRD(20),ECRIT(20),ERCONV(20),
2 LETF(20)
      COMMON/CL/TABLE(2,512),SLIM(8),MLIM,SOLMIN(2,1000),SOLMAX(2,1000),
1 WORST(2,1000),TMIN(20),TMAX(20),TWORST(20)
      DATA RND/2.38/,C3/1.25992105/,NPHI/1000/
      NCS=0
*****SEL DEPENDENT CODING
      CALL M:INDEX(87100,87100)
      CALL M:BLOCK('1')
      CALL INIT('5',8Z6RF00RC0,8Z00000000)
*****SEL DEPENDENT CODING
      CALL READ IN(SOLMIN,TMIN)
      CALL READ IN(SOLMAX,TMAX)
      CALL READ IN(WORST,TWORST)
4000 NCS=NCS+1
      IF(NCS.GT.20) GO TO 6012
      WRITE(5,8000)
      READ(5,9000) XLL(NCS),WW(NCS),HH(NCS)
      IF(XLL(NCS).EQ.0) GO TO 6010
      WRITE(5,9014)
      READ(5,9000) ECRIT(NCS),ERCONV(NCS)
7300 WRITE(5,8002)
C   SELECT SPECTRUM
      READ(5,9001) LETF(NCS)
      WRITE(5,8001)
      READ(5,9001) NP,NPR
      IF(LETF(NCS).EQ.1) CALL TRANSFER(TITLE,PHITABLE,TMIN,SOLMIN)
      IF(LETF(NCS).EQ.2) CALL TRANSFER(TITLE,PHITABLE,TMAX,SOLMAX)
      IF(LETF(NCS).EQ.3) CALL TRANSFER(TITLE,PHITABLE,TWORST,WORST)
      IF(LETF(NCS).GT.3) GO TO 6015
      IF(LETF(NCS).EQ.0) GO TO 6015
      FILE=LETF(NCS)
      IF(NPR.EQ.0) GO TO 2002
      PRINT 9013,TITLE
      PRINT 9010
      DO 3500 I=1,250
      I1=4*I-3
      I2=I1+3
3500 PRINT 9011,(PHITABLE(1,J),PHITABLE(2,J),J=I1,I2)
C   DETERMINE RANGE OF INDICES TO ELIMINATE ZEROES IN LET SPECTRUM
C   INDICES GO FROM L1 TO LMAX
C   DETERMINE L1
2002 DO 2005 I=1,1000
      IF(PHITABLE(2,I).NE.0.0) GO TO 2001
2005 CONTINUE
      PRINT 9015
      CALL EXIT
2001 L1=I
C   DETERMINE LMAX
      NTEST=NPHI
      DO 2500 I=1,1000

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```

      IF (PHITABLE(2,NTEST) .NE. 0.0) GO TO 2501
      NTEST=NTEST-1
2500 CONTINUE
2501 LMAX=NTEST
      DO 200 I=L1,LMAX
        XLNTABLE(1,I)=PHITABLE(1,I)
      200 XLNTABLE(2,I)=ALOG(PHITABLE(2,I))
        XL=XLL(NC5)
        W=WW(NC5)
        H=HH(NC5)
        SA=2.0*(XL*W + XL*H + W*H)
        SHAX=SQRT(XL*XL + W*W + H*H)
        OE=ECRIT(NC5)
        XL0P=OE/SHAX/RHO*1.0E4
        XNS=0
        XLMAX=PHITABLE(1,LMAX)
C      SET UP CHORD-LENGTH DISTRIBUTION
        NC=20
        CALL C1(XL,W,H,NC)
        NTABLE=(NLIM-1)*(NC-1)+1
C      OPTIONAL PRINTOUT OF C(5)
        IF (NP.EQ.0) GO TO 1551
        PRINT 9002
        PRINT 9008,XL,W,H
        PRINT 9004,(SLIM(I),I=1,NLIM)
        PRINT 9005
        NSEQ=NLIM
        NCT=0
        NTT=NC-1
        DO 1100 I=1,NSEQ
          IF (I.EQ.NSEQ) NTT=1
          DO 1110 J=1,NTT
            NCT=NCT+1
          1110 PRINT 9006,TABLE(1,NCT),TABLE(2,NCT)
          1100 PRINT 9016
        1551 WRITE(5,9007)
        DEP=ECRIT(NC5)
        IF (XL0P.LT.PHITABLE(1,L1)) XL0P=PHITABLE(1,L1)
        IF (XL0P.GT.PHITABLE(1,LMAX)) GO TO 1700
C      SPECIAL TREATMENT OF FIRST INTEGRATION INTERVAL
      2000 SUM=0
        ISTART=L1+1
        IF (XL0P.LE.PHITABLE(1,L1)) GO TO 1400
        LL=L1+1
        DO 1401 K=LL,LMAX
          IF (XL0P.LE.PHITABLE(1,K)) GO TO 1402
        1401 CONTINUE
      1402 ISTART=K+1
C      SPECIAL TREATMENT OF FIRST INTEGRATION INTERVAL
        X1=XL0P
        X2=PHITABLE(1,K)
        Y1=FINTERP1(XLNTABLE,L1,LMAX,XL0P)
        Y1=EXP(Y1)
        SL=DEP/RHO/X1*1.0E4
        C11=FINTERP(TABLE,NTABLE,SL)
        Y2=PHITABLE(2,K)
        SL=DEP/RHO/X2*1.0E4
        C2=FINTERP(TABLE,NTABLE,SL)
        IF (C11.LT.0) C11=0
        IF (C2.LT.0) C2=0

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```

      SUM=(Y1*(C11 + Y2*C2) *(X2-X1)
1400 FACTOR=OEP/RHO*1.0E4
      DO 1500 J=ISTART,LMAX
      X1=PHITABLE(1,J-1)
      X2=PHITABLE(1,J)
      SL1=FACTOR/X1
      SL2=FACTOR/X2
      C11=FINTERP(TABLE,NTABLE,SL1)
      C2=FINTERP(TABLE,NTABLE,SL2)
      IF(C11.LT.0)C11=0
      IF(C2.LT.0)C2=0
      PSUM=(C2*PHITABLE(2,J) + C11*PHITABLE(2,J-1))*(X2-X1)
1500 SUM=SUM+PSUM
C     XNS (INPUT IN EVENTS/BIT-DAY FOR PHI PER M**2 PER SECOND
C     PER STERAD PER LET UNIT
C     ERRBD IS ERRORS/BIT-DAY
      XNS=1.9577777*SA      *SUM*0.5
      ERRBD(NC      ERCONV(NCS)
      WRITE(5,5      ,XL,W,H,OEP,ERCONV(NCS),ERRBD(NCS)
      GO TO 6000
C     JUMP HERE IS XLUP OUTSIDE OF RANGE OF PHI(L)
1700 ERRBD(NCS)=0
      WRITE(5,9008)FILE,XL,W,H,OEP,ERCONV(NCS),ERRBD(NCS)
      GO TO 6000
C     PRINTOUT RESULTS
4010 PRINT 9012
      PRINT 9007
      NCS=NCS-1
      DO 3000 I=1,NCS
3000 PRINT 9008,LETF(I),XLL(I),WW(I),HH(I),ECRIT(I),ERCONV(I),
      1ERRBD(I)
C*****SEL DEPENDENT CODING
7100 CALL INIT('5',8Z6HF00HF0,8Z000000ZF)
C*****SEL DEPENDENT CODING
      CALL EXIT
601 WRITE(5,6011)
      GO TO 7100
6011 FORMAT(1H0,'PROGRAM CASE TABLES EXCEEDED',/)
6015 NCS=NCS-1
      WRITE(5,6016)
6016 FORMAT(1X,'INCORRECT INDEX',/)
      GO TO 6000
8000 FORMAT(1X,'ENTER L,W,H(3E11.4)',/,
      1 ' (L,GE,W,GE,H)',/, ' CR TO TERMINATE PROGRAM',/)
8001 FORMAT(1H0,'ENTER CHORO-DISTRIBUTION PRINT CONTROL',/
      1 ' SPECTRUM PRINT CONTROL(2I1)',/,
      2 ' 0 FOR NO PRINT, 1 FOR PRINT',/)
8002 FORMAT(1X,'ENTER SPECTRUM INDEX---',/,
      1 ' 1-SOLMIN',/, ' 2-SOLMAX',/, ' 3-90% WORST CASE',/)
8005 FORMAT(1X,1SA4)
9000 FORMAT(6E11.4)
9001 FORMAT(2I1)
9002 FORMAT(1H1,'INTEGRAL CHORO-LENGTH DISTRIBUTION')
9003 FORMAT(1H0,'L=',F7.2,3X,'W=',F7.2,3X,'H=',F7.2)
9004 FORMAT(1H0,'SINGULARITIES AT S=',0(F7.2,1H,))
9005 FORMAT(1H0,3X,1H5,11X,'C(S)')
9006 FORMAT(1X,F7.2,3X,1PE9.2)
9007 FORMAT(1H0,'LETFILE',10X,1HL,12X,1HW,12X,1HH,6X,'ECRIT',4X,
      1'ER CONV',2X,'ERRORS/BD',/)
9008 FORMAT(6X,11,3X,3(1PE11.4,2X),0PF7.2,2X,F5.1,4X,1PE9.2)

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```

9009 FORMAT(1X,F7.2,3(2X,1PE11.4))
9010 FORMAT(1M0,4(6X,1ML,0X,'PHI(L)',6X))
9011 FORMAT(1X,4(1PE10.4,2X,1PE10.4,5X))
9012 FORMAT(1H1)
9013 FORMAT(1M1, 20A4)
9014 FORMAT(1X,'ENTER ECRIT, ERROR CONVERSION FACTOR(2E11.4)',/)
9015 FORMAT(1H0,'**NULL FILE--CHECK INPUT DATA**')
9016 FORMAT(1HD)
      END
      FUNCTION FINTERP1(TABLE,NMIN,NMAX,X)
C      MODIFIED FOR USE WITH COSMIC2 SEPTEMBER 82
C      INTERPOLATION OVER INDICES FROM NMIN TO NMAX
C      DESIGNED TO IGNORE ZEROES IN LET SPECTRUM
C      DESIGNED FOR (NMAX-NMIN).CT.10
C      DESIGNED FOR NTABLE.CT.10
C      INTERPOLATION FUNCTION FOR DATA STORED IN TABLE(2,NMAX)
C      TABLE(1,N) IS INDEPENDENT VARIABLE
C      TABLE(2,N) IS DEPENDENT VARIABLE
C      X IS VALUE OF INDEPENDENT VARIABLE FOR EVALUATION OF FUNCTION
      DIMENSION TABLE(2,NMAX)
      T=(1.0 + 1.0E-5)*TABLE(1,NMAX)
      IF(X.LT.TABLE(1,NMIN) .OR. X.GT.T)GO TO 2000
C      COARSE GRID SEARCH
      N1=NMIN+9
      DO 500 I=N1,NAX,10
      IF(TABLE(1,I)-X) 500,600,600
500  CONTINUE
      600  ISTART=I-9
      DO 1000 I=ISTART,NMAX
      IF(X.LE.TABLE(1,I))GO TO 1500
1000  CONTINUE
      1500  N1=NMIN+8
      IF(I.LT.N1)I=8
      IF(I.GT.NMAX-1) I=NMAX-1
      X1=TABLE(1,I-2)
      X2=TABLE(1,I-1)
      X3=TABLE(1,I)
      X4=TABLE(1,I+1)
      Y1=TABLE(2,I-2)
      Y2=TABLE(2,I-1)
      Y3=TABLE(2,I)
      Y4=TABLE(2,I+1)
      Y=0
      CALL LAG(X1,X2,X3,X4,Y1,Y2,Y3,Y4,X,Y)
      FINTERP1=Y
      RETURN
2000  PRINT 2001,X
2001  FORMAT(1H0,'FINTERP1 ERROR, X OUT OF RANGE, X=',1PE11.4)
      CALL EXIT
      END
      SUBROUTINE C1(XL,W,H,NTABLE)
C      H.LE.W.LE.XL
C      REVISED 9/82, P. SMAPIRD,NRL
C      SUM DISTRIBUTION FOR MU-RANDOMNESS
C      REQUIRES COMMON/CL/TABLE(2,512) IN CALLING PROGRAM
C      TABLE(1,N) IS CHORD LENGTH
C      TABLE(2,N) IS CORRESPONDING SUM DISTRIBUTION
      DIMENSION FINT(7)
      COMMON/CL/TABLE(2, 512),SLIM(8),NLIM
      DATA PI/3.141593/,EPS/1.E-5/,EPS1/1.0E-6/

```

```

FMINUS=1.0-EP5
SMAX=SQRT(XL*XL + W*W +H*H)
CALL SING(XL,W,H)
NCT=(NLIM-1)*(NTABLE-1)+1
NSEG=NLIM-1
TABLE(1,NCT)=SMAX
TABLE(2,NCT)=0
NCT=1
CNORM=1.33333333/PI/(XL*W+XL*H+W*H)
C CHECK PARAMETERS
IF(H.GT.W) GO TO 8001
IF(W.GT.XL) GO TO 8001
N=NTABLE-1
C EVALUATE INTEGRAL OVER SEGMENTS 1 TO NSEG AND PUT IN FINT
DO 1000 I=1,NSEG
S2=SLIM(I+1)*FMINUS
S1=SLIM(I)
1000 FINT(I)=PERMSUM(S2,XL,W,H) -PERMSUM(S1,XL,W,H)
DO 2000 I=1,NSEG
C COMPUTE DELTA FOR THIS SEGMENT
DELTA=(SLIM(I+1)*FMINUS-SLIM(I))/(NTABLE-1)
C SUM UP CONTRIBUTIONS FROM SUCCEEDING SEGMENTS
FSUM=0
IF(I.EQ.NSEG) GO TO 2020
K=I+1
DO 2010 J=K,NSEG
2010 FSUM=FSUM + FINT(J)
2020 S2=SLIM(I+1)*FMINUS
FSUM=FSUM+PERMSUM(S2,XL,W,H)
DO 2000 J=1,N
S=SLIM(I)+(J-1)*DELTA
TABLE(1,NCT)=S
SUM=FSUM-PERMSUM(S,XL,W,H)
TABLE(2,NCT)=SUM*CNORM
IF (TABLE(2,NCT).LT.EP51) TABLE(2,NCT)=0
NCT=NCT+1
2000 CONTINUE
RETURN
C ERROR MESSAGES
8000 PRINT 9000
9000 FORMAT('C1(XL,ETC) ERROR, TOO MANY STEPS'//)
CALL EXIT
8001 PRINT 9001,XL,W,H
9001 FORMAT(1H0,'C1(',1PE11.4,',',1PE11.4,',',1PE11.4,') ERROR'//)
CALL EXIT
END
FUNCTION F1(S,X,Y,Z)
IF(S.GE.Z) GO TO 8000
XSQ=X*X
YSQ=Y*Y
ZSQ=Z*Z
TSQ=XSQ+ZSQ
RSQ =TSQ+YSQ
XM=YSQ/(XSQ+YSQ)
T=SQRT(TSQ)
A1=2.0/T*(XSQ-ZSQ)+2.0*XM*Z
B1=-2.25*XSQ*YSQ/RSQ/TSQ
F1=A1*S+0.3*B1*S*S
RETURN
8000 PRINT 1,S,X,Y,Z

```

```

1 FORMAT(1H0,'F1(',1PE11.4,3(' ',1PE11.4),') ERROR')
CALL EXIT
END
FUNCTION F2(S,X,Y,Z)
XSQ=X*X
YSQ=Y*Y
ZSQ=Z*Z
SSQ=S*S
TSQ=XSQ+ZSQ
T=SQRT(TSQ)
RSQ=TSQ+YSQ
R=SQRT(RSQ)
IF(S.LT.Z) GO TO 8000
IF(S.GE.T) GO TO 8000
A2=2.0/T*(XSQ-ZSQ)
XM=YSQ/(XSQ+YSQ)
B2=2.25*(XM-XSQ*YSQ/RSQ/TSQ)
XK=(XSQ-YSQ)/SQRT(XSQ+YSQ)
U=3.0*X*Y*ZSQ
C2=U*ATAN(Y/X)-XM*ZSQ*ZSQ*0.25
P=SQRT(SSQ-ZSQ)
W=Z/S
IF(ABS(1.0-W).LE.1.0E-5) W=1.0
E=P*(2.0-0.5*ZSQ/SSQ)-1.5*Z*ACOS(W)
F2=A2*5+0.5*B2*SSQ-0.5*C2/SSQ+(XK-X)*E
RETURN
8000 PRINT 1,S,X,Y,Z
1 FORMAT(1H0,'F2(',1PE11.4,3(' ',1PE11.4),') ERROR')
CALL EXIT
END
FUNCTION F3(S,X,Y,Z)
SSQ=S*S
XSQ=X*X
YSQ=Y*Y
ZSQ=Z*Z
TSQ=XSQ+ZSQ
T=SQRT(TSQ)
IF(S.LT.T) GO TO 8000
RSQ=TSQ+YSQ
B3=-2.25*XSQ*(1.0/(XSQ+YSQ)-1.0/RSQ)
U=3.0*X*Y*ZSQ
C3=0.25*XSQ*ZSQ*(ZSQ/(XSQ+YSQ)-3.0)+U*ATAN(Y/X)
P=SQRT(SSQ-ZSQ)
W1=SSQ-TSQ
IF(W1.LT.0.0)W1=0.0
Q=SQRT(W1)
XK=(XSQ-YSQ)/SQRT(XSQ+YSQ)
E=P*(2.0-ZSQ*0.5/SSQ)-1.5*Z*ACOS(Z/S)
W2=X/P
IF(ABS(1.0-W2).LE.1.0E-4) W2=1.0
W2=ACOS(W2)
F3=0.5*SSQ*B3-C3*0.5/SSQ+XK*E+Y*ZSQ*(Q*(2.0/TSQ-0.5/SSQ)
1 -1.5/T*ACOS(T/S))-1.5*X*Y*(P*P/SSQ*W2
2 -X/T*ACOS(T/S))
RETURN
8000 PRINT 1,S,X,Y,Z
1 FORMAT(1H0,'F3(',1PE11.4,3(' ',1PE11.4),') ERROR')
CALL EXIT
END
FUNCTION PERMSUM(S,XL,W,H)

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```

      DIMENSION IX(6),IY(6),IZ(6),D(3)
      DATA IX/1,2,1,2,3,3/,IY/2,1,3,3,2,1/,IZ/ 3,3,2,1,1,2/
      SMAX=SQRT(XL*XL+W*W+H*H)
      PERMSUM=0
      D(1)=XL
      D(2)=W
      D(3)=H
C     THIS LOOP HANDLES PERMUTATIONS OVER X,Y,Z
      DO 1000 NP=1,6
      X=D(IX(NP))
      Y=D(IY(NP))
      Z=D(IZ(NP))
      T=SQRT(X*X+Z*Z)
      IF(S.LT.Z) GO TO 1500
      IF(S.LT.T) GO TO 1700
      IF(S.LE.SMAX) GO TO 1800
C     S.GT.SMAX
      PERMSUM=0
      RETURN
C     S.LT.Z
      1500 PERMSUM=PERMSUM+F1(S,X,Y,Z)
      GO TO 1000
C     S.GE.Z .AND. S.LT.T
      1700 PERMSUM=PERMSUM+F2(S,X,Y,Z)
      GO TO 1000
C     S.GE.T .AND. S.LT.SMAX
      1800 PERMSUM=PERMSUM+F3(S,X,Y,Z)
      1000 CONTINUE
      RETURN
      END
C     SUBROUTINE SING(XL,W,H)
      SETS UP ORDERED TABLE OF SINGULARITIES
      DIMENSION T(3)
      COMMON/CL/TABLE(2,512),SLIM(8),NLIM
      SLIM(1)=0
      SLIM(2)=H
      N=2
      IF(H.EQ.W) GO TO 100
      N=N+1
      100 SLIM(N)=W
      IF(XL.EQ.W) GO TO 200
      N=N+1
      SLIM(N)=XL
      200 NT=0
      X=SQRT(H*H+W*W)
      IF(X.EQ.XL) GO TO 250
      NT=1
      T(1)=X
      250 Y=SQRT(H*H+XL*XL)
      IF(NT.EQ.1 .AND. Y.EQ.T(1)) GO TO 300
      NT=2
      T(NT)=Y
      300 Y=SQRT(XL*XL+W*W)
      IF(Y.EQ.T(NT)) GO TO 400
      NT=NT+1
      T(NT)=Y
      400 DO 500 I=1,NT
      JF=N+I
      500 SLIM(JF)=T(I)
      NLIM=N+NT+1

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      SLIM(NLIM)=SQRT(XL*XL+W*W+H*H)
C      SORT SLIM INTO ASCENDING ORDER
      DO 1000 I=1,3
      DO 1000 J=2,NLIM
      IF(SLIM(J-1).LT.SLIM(J)) GO TO 1000
      X=SLIM(J-1)
      SLIM(J-1)=SLIM(J)
      SLIM(J)=X
1000  CONTINUE
      RETURN
      END
      SUBROUTINE READIN(A,T)
      DIMENSION A(2,1000),T(20)
      READ(1,3004) T
      DO 100 I=1,250
      I1=4*I-3
      I2=I1+3
      READ(1,8008) (A(2,J),A(1,J),J=I1,I2)
100  CONTINUE
8008  FORMAT(8E10.4)
8004  FORMAT(20A4)
      END
      SUBROUTINE TRANSFER(T1,P1,T2,P2)
      DIMENSION T1(20),T2(20),P1(2,1000),P2(2,1000)
      DO 100 I=1,20
100  T1(I)=T2(I)
      DO 200 I=1,2
      DO 200 J=1,1000
200  P1(I,J)=P2(I,J)
      RETURN
      END
      FUNCTION FINTERP(TABLE,NTABLE,X)
C      DESIGNED FOR NTABLE.GT.10
C      INTERPOLATION FUNCTION FOR DATA STORED IN TABLE(2,NTABLE)
C      TABLE(1,N) IS INDEPENDENT VARIABLE
C      TABLE(2,N) IS DEPENDENT VARIABLE
C      X IS VALUE OF INDEPENDENT VARIABLE FOR EVALUATION OF FUNCTION
      DIMENSION TABLE(2,NTABLE)
      T=(1.0 + 1.0E-5)*TABLE(1,NTABLE)
      IF(X.LT.TABLE(1,1) .OR. X.GT.T)GO TO 2000
C      COARSE GRID SEARCH
      DO 300 I=10,NTABLE,10
      IF(TABLE(1,I)-X) 300,600,600
300  CONTINUE
400  ISTART=I-9
      DO 1000 I=ISTART,NTABLE
      IF(X.LE.TABLE(1,I))GO TO 1500
1000  CONTINUE
1500  IF(I.LT.3) I=3
      IF(I.GT.NTABLE-1) I=NTABLE-1
      X1=TABLE(1,I-2)
      X2=TABLE(1,I-1)
      X3=TABLE(1,I)
      X4=TABLE(1,I+1)
      Y1=TABLE(2,I-2)
      Y2=TABLE(2,I-1)
      Y3=TABLE(2,I)
      Y4=TABLE(2,I+1)
      Y=0
      CALL LAG(X1,X2,X3,X4,Y1,Y2,Y3,Y4,X,Y)

```

```

FINTERP=Y
RETURN
2000 PRINT 2001,X
2001 FORMAT(1H0,'FINTERP ERROR, X OUT OF RANGE, X=',1PE11.4)
CALL EXIT
END
SUBROUTINE LAG(X1,X2,X3,X4,Y1,Y2,Y3,Y4,X,Y)
IF(X1-X)40,200,40
40 IF(X2-X)41,201,41
41 IF(X3-X)42,202,42
42 IF(X4-X)50,203,50
50 A1=1.0/(X-X1)
51 A2=1.0/(X-X2)
55 A3=1.0/(X-X3)
56 A4=1.0/(X-X4)
60 AT=1.0/(A1*A2*A3*A4)
70 B1=1.0/((X1-X2)*(X1-X3)*(X1-X4))
B2=1.0/((X2-X1)*(X2-X3)*(X2-X4))
B3=1.0/((X3-X1)*(X3-X2)*(X3-X4))
B4=1.0/((X4-X1)*(X4-X2)*(X4-X3))
80 Y=AT*(Y1*A1*B1+Y2*A2*B2+Y3*A3*B3+Y4*A4*B4)
100 RETURN
200 Y=Y1
RETURN
201 Y=Y2
RETURN
202 Y=Y3
RETURN
203 Y=Y4
RETURN
END

```

* TYPE EXPORT2.DAT

E LETFILES SOLAR MINIMUM DIFFERENTIAL

5.1322E+041.6671E+002.3386E+041.6837E+001.1607E+041.7004E+008.4474E+031.7173E+00
7.2722E+031.7344E+006.2708E+031.7516E+003.5168E+031.7690E+001.4321E+041.7866E+00
3.0152E+031.8043E+002.7810E+031.8223E+002.7083E+031.8404E+002.6349E+031.8507E+00
2.5608E+031.8771E+002.4039E+031.8958E+002.4103E+031.9146E+002.2890E+031.9137E+00
2.1564E+031.9529E+002.0225E+031.9723E+001.8894E+031.9919E+001.8053E+032.0117E+00
1.7204E+032.0317E+001.6347E+032.0519E+001.5481E+032.0723E+001.4606E+032.0929E+00
1.3973E+032.1137E+001.3349E+032.1347E+001.2718E+032.1359E+001.2082E+032.1773E+00
1.1439E+032.1989E+001.0789E+032.2208E+001.0143E+032.2429E+009.7680E+022.2652E+00
9.3889E+022.2877E+009.0060E+022.3104E+008.6194E+022.3334E+008.2289E+022.3566E+00
7.8345E+022.3800E+007.4362E+022.4036E+007.0339E+022.4275E+006.6277E+022.4516E+00
6.2580E+022.4760E+006.0995E+022.5006E+005.9394E+022.5253E+005.7777E+022.5506E+00
5.6143E+022.5759E+005.4494E+022.6015E+005.2828E+022.6274E+005.1146E+022.6335E+00
4.9447E+022.6799E+004.7731E+022.7065E+004.5998E+022.7334E+004.4248E+022.7606E+00
4.2400E+022.7880E+004.0695E+022.8157E+003.8892E+022.8437E+003.7287E+022.8719E+00
3.5970E+022.9005E+003.4640E+022.9293E+003.3297E+022.9584E+003.1940E+022.9878E+00
3.0569E+023.0175E+002.9185E+023.0475E+002.7788E+023.0778E+002.6376E+023.1084E+00
2.4951E+023.1393E+002.3519E+023.1705E+002.2758E+023.2020E+002.1990E+023.2338E+00
2.1214E+023.2659E+002.0430E+023.2984E+001.9639E+023.3312E+001.8840E+023.3643E+00
1.8038E+023.3977E+001.7217E+023.4315E+001.6394E+023.4656E+001.5563E+023.5000E+00
1.4723E+023.5348E+001.3875E+023.5699E+001.3018E+023.6054E+001.2310E+023.6413E+00
1.1995E+023.6774E+001.1678E+023.7140E+001.1357E+023.7509E+001.1033E+023.7882E+00
1.0705E+023.8258E+001.0375E+023.8639E+001.0041E+023.9023E+009.7040E+013.9410E+00
9.3635E+013.9802E+009.0196E+014.0198E+008.6723E+014.0597E+008.3215E+014.1001E+00
7.9673E+014.1408E+007.6096E+014.1820E+007.2483E+014.2235E+006.8834E+014.2655E+00
6.5148E+014.3079E+006.1426E+014.3507E+005.8106E+014.3939E+005.6477E+014.4376E+00
5.4832E+014.4817E+005.3171E+014.5263E+005.1493E+014.5712E+004.9798E+014.6167E+00
4.8087E+014.6626E+004.6358E+014.7089E+004.4613E+014.7537E+004.2850E+014.8030E+00
4.1069E+014.8507E+003.9271E+014.8989E+003.7455E+014.9476E+003.5620E+014.9968E+00
3.3768E+015.0464E+003.1897E+015.0966E+003.0488E+015.1472E+002.9486E+015.1984E+00
2.8473E+015.2300E+002.7451E+015.3022E+002.6418E+015.3549E+002.5375E+015.4081E+00
2.4322E+015.4619E+002.3258E+015.5162E+002.2184E+015.5710E+002.1099E+015.6263E+00
2.0003E+015.6823E+001.8894E+015.7387E+001.7779E+015.7958E+001.6847E+015.8534E+00
1.6413E+015.9115E+001.5974E+015.9703E+001.5530E+016.0296E+001.5082E+016.0896E+00
1.4630E+016.1501E+001.4173E+016.2112E+001.3712E+016.2729E+001.3246E+016.3333E+00
1.2776E+016.3982E+001.2300E+016.4618E+001.1820E+016.5261E+001.1336E+016.5909E+00
1.0846E+016.6364E+004.0483E+026.7226E+001.8302E+026.7894E+001.3770E+026.8569E+00
1.1868E+026.9250E+001.0507E+026.9938E+009.4862E+017.0633E+001.9816E+027.1335E+00
6.2123E+017.2044E+005.8027E+017.2760E+005.7148E+017.3483E+005.6310E+017.4214E+00
5.5463E+017.4951E+005.4608E+017.5696E+005.3810E+017.6449E+005.2398E+017.7208E+00
5.0458E+017.7976E+004.8499E+017.8751E+004.6521E+017.9533E+004.4868E+018.0234E+00
4.3298E+018.1122E+004.1714E+018.1928E+004.0113E+018.2743E+003.8497E+018.3565E+00
3.7172E+018.4395E+003.5957E+018.5234E+003.4788E+018.6081E+003.3654E+018.6937E+00
3.2510E+018.7801E+003.1333E+018.8673E+003.0186E+018.9555E+002.9270E+019.0445E+00
2.8427E+019.1344E+002.7574E+019.2251E+002.6714E+019.3168E+002.5844E+019.4094E+00
2.4966E+019.5029E+002.4080E+019.5974E+002.3184E+019.6928E+002.2280E+019.7891E+00
2.1388E+019.8844E+002.0987E+019.9846E+002.0426E+011.0084E+012.0261E+011.0184E+01
1.9893E+011.0285E+011.9521E+011.0388E+011.9146E+011.0491E+011.8766E+011.0595E+01
1.8883E+011.0700E+011.7997E+011.0807E+011.7606E+011.0914E+011.7211E+011.1023E+01
1.6813E+011.1132E+011.6410E+011.1243E+011.6004E+011.1354E+011.5591E+011.1467E+01
1.5158E+011.1581E+011.4722E+011.1676E+011.4516E+011.1813E+011.3915E+011.1930E+01
1.3510E+011.2049E+011.3101E+011.2168E+011.2688E+011.2289E+011.2271E+011.2411E+01
1.1850E+011.2535E+011.1424E+011.2659E+011.1105E+011.2783E+011.0818E+011.2912E+01
1.0528E+011.3041E+011.0235E+011.3170E+019.9400E+001.3301E+019.6416E+001.3433E+01
9.3402E+001.3567E+019.0359E+001.3702E+018.7285E+001.3838E+018.4180E+001.3975E+01
8.1045E+001.4114E+017.7879E+001.4254E+017.4681E+001.4396E+017.1562E+001.4539E+01
7.0057E+001.4684E+016.8638E+001.4830E+016.7210E+001.4977E+017.3979E+001.5126E+01
6.7916E+001.5276E+016.5512E+001.5428E+016.3638E+001.5581E+016.1849E+001.5736E+01

6	0102E+001	3893E+016	0451E+001	6031E+015	6393E+001	6210E+013	4753E+001	6371E+01
3	0163E+001	6534E+015	1562E+001	6698E+014	9942E+001	6864E+014	8341E+001	7032E+01
1	6760E+001	7201E+014	5149E+001	7372E+014	3511E+001	7545E+014	2511E+001	7719E+01
4	1522E+001	7895E+014	0530E+001	8073E+013	9531E+001	8253E+013	8522E+001	8434E+01
3	7502E+001	8617E+013	6473E+001	0802E+013	5440E+001	8989E+013	4399E+001	9170E+01
4	3340E+001	9368E+013	2286E+001	9561E+013	1214E+001	9755E+013	0131E+001	9932E+01
2	9040E+002	0150E+012	7997E+002	0350E+012	7052E+002	0552E+012	6399E+002	0757E+01
2	3618E+002	0963E+012	4891E+002	1171E+012	4156E+002	1382E+012	3414E+002	1394E+01
2	2664E+002	1809E+012	1907E+002	2026E+012	1143E+002	2245E+012	0380E+002	2466E+01
1	9611E+002	2689E+011	8834E+002	2914E+011	8049E+002	3142E+011	7279E+002	3372E+01
1	6911E+002	3604E+011	6540E+002	3839E+011	6166E+002	4076E+011	3787E+002	4315E+01
1	5405E+002	4557E+011	5019E+002	4801E+011	4629E+002	5047E+011	4247E+002	5295E+01
1	9868E+002	5548E+011	3485E+002	3802E+011	3098E+002	6050E+011	2708E+002	6317E+01
1	2313E+002	6579E+011	5814E+002	6843E+011	2995E+002	7110E+011	8002E+002	7379E+01
1	1441E+002	7651E+011	1043E+002	7926E+011	0661E+002	8204E+011	0292E+002	8484E+01
1	0533E+002	8767E+019	4950E+012	9053E+019	1636E+012	9342E+018	8395E+012	9633E+01
0	5122E+012	9928E+018	1858E+019	0225E+017	8823E+019	0526E+017	6699E+019	0829E+01
7	4479E+019	1135E+017	2236E+013	1445E+016	9971E+013	1757E+016	7695E+013	2073E+01
6	5419E+013	2392E+016	3124E+013	2714E+016	0640E+013	3039E+013	6533E+013	3067E+01
5	6209E+013	3699E+015	3880E+013	4034E+015	1834E+013	4372E+015	0479E+013	4713E+01
4	9175E+013	5058E+014	7858E+013	5407E+014	6527E+013	5759E+014	5190E+013	6114E+01
4	3844E+013	6473E+014	2505E+013	6836E+014	1142E+013	7202E+013	9766E+013	7371E+01
3	8377E+013	7945E+013	6973E+013	8322E+013	5555E+013	8703E+013	4124E+013	9087E+01
3	2739E+013	9476E+013	1976E+013	9868E+013	1222E+014	0265E+013	0466E+014	0665E+01
2	9691E+014	1069E+012	8900E+014	1477E+011	0388E+004	1889E+013	9618E+014	2306E+01
4	4057E+014	2726E+013	9170E+014	3151E+013	6590E+014	3380E+013	4327E+014	4013E+01
3	2351E+014	4450E+014	1876E+014	4892E+012	7389E+014	5338E+012	6237E+014	5789E+01
2	5341E+014	6244E+012	4442E+014	6703E+012	3779E+014	7167E+012	346E+014	7636E+01
2	2909E+014	8110E+012	2320E+014	8588E+012	1718E+014	9071E+012	1109E+014	9538E+01
2	0504E+013	0031E+011	9951E+013	0548E+011	9393E+013	1051E+011	8866E+013	1358E+01
1	8364E+013	2071E+011	7863E+013	2588E+011	7405E+013	3111E+011	6943E+013	3639E+01
1	6476E+013	4172E+011	6005E+013	4710E+011	5529E+013	5254E+011	5048E+013	5803E+01
1	4569E+013	6357E+011	4118E+013	6918E+011	3642E+013	7483E+011	3202E+013	8055E+01
1	2744E+013	8632E+011	2378E+013	9214E+011	2043E+013	9803E+011	9085E+006	0397E+01
7	9513E+014	0997E+013	2242E+016	1604E+014	3191E+016	2216E+013	8620E+016	2834E+01
3	5303E+016	3459E+013	2618E+016	4089E+016	1418E+016	4726E+012	3680E+016	5370E+01
2	2775E+016	6019E+012	2341E+016	6675E+012	1903E+016	7338E+012	1491E+016	8007E+01
2	1125E+016	8683E+012	0789E+016	9366E+012	0104E+017	0055E+011	9415E+017	0732E+01
1	8721E+017	1455E+011	8068E+017	2165E+011	7520E+017	2882E+011	6966E+017	3606E+01
1	6407E+017	4338E+011	5842E+017	3077E+011	5297E+017	3823E+011	4830E+017	6377E+01
1	4359E+017	7938E+011	3885E+017	8106E+011	3406E+017	8882E+011	2925E+017	9666E+01
1	2486E+018	0458E+011	2103E+018	1258E+011	1784E+018	2065E+013	0829E+018	2881E+01
1	9322E+018	3705E+011	6898E+018	4537E+011	5811E+018	5377E+011	4816E+018	6225E+01
1	3985E+018	7082E+011	7959E+018	7948E+011	1969E+018	8822E+011	1537E+018	9705E+01
1	1305E+019	0596E+011	1080E+019	1497E+011	0863E+019	2406E+011	0643E+019	3324E+01
1	0424E+019	4252E+011	0151E+019	5189E+019	8594E+029	6135E+019	5647E+029	7090E+01
9	2801E+029	8055E+019	0317E+029	9030E+018	8056E+021	0001E+028	5772E+021	0101E+02
8	3466E+021	0201E+028	1136E+021	0303E+027	8905E+021	0405E+027	6661E+021	0508E+02
7	4399E+021	0613E+027	2120E+021	0718E+026	2505E+011	0825E+023	0214E+011	0932E+02
2	3968E+011	1041E+022	1637E+011	1151E+021	9521E+011	1262E+021	7883E+011	1374E+02
3	2711E+011	1487E+021	3223E+011	1601E+021	2634E+011	1716E+021	2407E+011	1832E+02
1	2178E+011	1950E+021	1946E+011	2049E+021	1715E+011	2189E+021	1504E+011	2310E+02
1	1148E+011	2432E+021	0742E+011	2556E+021	0332E+011	2681E+029	9182E+021	2807E+02
9	3955E+021	2934E+029	2727E+021	3062E+028	9773E+021	3192E+028	6970E+021	3323E+02
8	4140E+021	3456E+029	7719E+021	3590E+028	3008E+021	3725E+027	7474E+021	3861E+02
7	4458E+021	3999E+027	1852E+021	4138E+026	9268E+021	4278E+026	6743E+021	4420E+02
6	7101E+021	4564E+026	2631E+021	4708E+026	0832E+021	4855E+025	9055E+021	5002E+02
5	7261E+021	5151E+025	5449E+021	5302E+025	3621E+021	5454E+025	1780E+021	5608E+02
4	9970E+021	5763E+024	8328E+021	5919E+024	7336E+021	6077E+024	6351E+021	6237E+02
4	5367E+021	6399E+024	4373E+021	6562E+024	3970E+021	6726E+021	0933E+011	6892E+02

6. 3018E-021. 7040E+023. 7914E-021. 7230E+023. 4469E-021. 7401E+023. 1325E-021. 7574E+02
 4. 8968E-021. 7749E+026. 2560E-021. 7925E+024. 2760E-021. 8103E+024. 1331E-021. 8283E+02
 4. 0289E-021. 8465E+023. 9328E-021. 8448E+023. 8361E-021. 8834E+023. 7387E-021. 9021E+02
 3. 6414E-021. 9210E+023. 5319E-021. 9401E+023. 4144E-021. 9594E+023. 2958E-021. 9788E+02
 3. 1759E-021. 9985E+023. 0648E-022. 0184E+024. 2114E-022. 0384E+023. 2903E-022. 0587E+02
 3. 0940E-022. 0792E+022. 9504E-022. 0998E+022. 8377E-022. 1207E+022. 7338E-022. 1418E+02
 2. 6442E-022. 1681E+022. 8146E-022. 1846E+022. 4314E-022. 2063E+022. 3539E-022. 2282E+02
 8. 2774E-022. 2508E+022. 2053E-022. 2727E+022. 1333E-022. 2953E+022. 0608E-022. 3181E+02
 1. 9954E-022. 3411E+021. 9432E-022. 3644E+021. 8906E-022. 3879E+021. 8374E-022. 4116E+02
 6. 8192E-022. 4836E+023. 8612E-022. 4598E+023. 2631E-022. 4843E+023. 0265E-022. 5090E+02
 2. 8104E-022. 5339E+022. 6380E-022. 5591E+023. 9591E-022. 5845E+022. 1614E-022. 6102E+02
 2. 0796E-022. 6361E+022. 0295E-022. 6623E+021. 9788E-022. 6888E+021. 9287E-022. 7155E+02
 1. 8800E-022. 7425E+021. 8342E-022. 7698E+021. 7754E-022. 7973E+021. 7149E-022. 8251E+02
 2. 5606E-022. 8532E+021. 9438E-022. 8815E+021. 8118E-022. 9102E+021. 7296E-022. 9391E+02
 1. 6572E-022. 9683E+021. 5895E-022. 9978E+021. 7487E-023. 0276E+021. 4418E-023. 0577E+02
 1. 3980E-023. 0881E+021. 3514E-023. 1188E+021. 3098E-023. 1498E+021. 2477E-023. 1811E+02
 1. 2272E-023. 2127E+021. 1865E-023. 2446E+021. 1494E-023. 2768E+021. 1145E-023. 3094E+02
 3. 4405E-023. 3423E+022. 2095E-023. 3755E+021. 8767E-023. 4091E+021. 7323E-023. 4430E+02
 1. 6133E-023. 4772E+021. 5143E-023. 5117E+021. 2154E-023. 5166E+021. 2289E-023. 5819E+02
 1. 1810E-023. 6175E+021. 1519E-023. 6534E+021. 1245E-023. 6897E+021. 0969E-023. 7264E+02
 1. 0725E-023. 7634E+021. 0511E-023. 8009E+021. 1351E-023. 8306E+021. 0500E-023. 8760E+02
 1. 0059E-023. 9153E+021. 7050E-023. 9542E+021. 3987E-023. 9931E+021. 0995E-023. 0332E+02
 9. 1962E-034. 0733E+028. 4487E-034. 1138E+028. 1632E-034. 1547E+027. 9105E-034. 1960E+02
 7. 6717E-034. 2977E+027. 4417E-034. 2798E+027. 2093E-034. 3223E+021. 0810E-024. 3653E+02
 8. 6204E-034. 4086E+027. 9185E-034. 4525E+027. 5451E-034. 4967E+027. 2145E-034. 5414E+02
 6. 9187E-034. 5865E+027. 9851E-034. 6321E+026. 2142E-034. 6782E+026. 0018E-034. 7247E+02
 5. 8187E-034. 7716E+025. 6354E-034. 8190E+025. 4523E-034. 8669E+027. 6150E-034. 9153E+02
 6. 1828E-034. 9642E+025. 7089E-035. 0135E+025. 4439E-035. 0633E+025. 2111E-035. 1136E+02
 5. 0021E-035. 1645E+025. 2744E-035. 2158E+024. 5693E-035. 2676E+024. 4249E-035. 3200E+02
 4. 2992E-035. 3729E+024. 1763E-035. 4263E+021. 0164E-025. 4802E+026. 4706E-035. 5346E+02
 5. 1724E-035. 5897E+024. 7138E-035. 6452E+024. 4460E-035. 7013E+024. 2204E-035. 7580E+02
 4. 0214E-035. 8152E+024. 6161E-035. 8730E+023. 5759E-035. 9314E+023. 4459E-035. 9903E+02
 3. 3340E-036. 0499E+027. 0040E-036. 1100E+024. 6050E-036. 1707E+023. 8550E-036. 2320E+02
 3. 5498E-036. 2940E+023. 3575E-036. 3565E+023. 2040E-036. 4197E+023. 0684E-036. 4835E+02
 3. 4218E-036. 5479E+022. 7623E-036. 6130E+022. 6695E-036. 6787E+022. 5864E-036. 7451E+02
 6. 9714E-036. 8122E+024. 3987E-036. 8799E+023. 7297E-036. 9482E+023. 4228E-037. 0173E+02
 3. 1627E-037. 0870E+022. 9475E-037. 1575E+024. 1101E-037. 2286E+022. 4150E-037. 3004E+02
 2. 8044E-037. 3730E+022. 2314E-037. 4463E+023. 0839E-037. 5203E+022. 5153E-037. 5950E+02
 2. 3862E-037. 6705E+022. 2303E-037. 7447E+022. 1291E-037. 8237E+022. 0336E-037. 9015E+02
 2. 1595E-037. 9800E+021. 8229E-038. 0593E+021. 7506E-038. 1394E+021. 6886E-038. 2203E+02
 3. 9486E-038. 3020E+022. 6719E-038. 3845E+022. 2924E-038. 4679E+022. 1285E-038. 5520E+02
 1. 9942E-038. 6370E+021. 8846E-038. 7229E+022. 3276E-038. 8095E+021. 6021E-038. 8971E+02
 1. 5281E-038. 9855E+022. 5311E-039. 0748E+021. 9371E-039. 1650E+021. 7462E-039. 2561E+02
 1. 6500E-039. 3481E+021. 5721E-039. 4410E+021. 4967E-039. 5348E+021. 6712E-039. 6296E+02
 1. 3109E-039. 7258E+024. 6306E-039. 8220E+022. 5159E-039. 9196E+021. 9594E-031. 0018E+03
 1. 7889E-031. 0118E+031. 6069E-031. 0218E+031. 5154E-031. 0320E+031. 4263E-031. 0422E+03
 1. 8071E-031. 0526E+031. 2011E-031. 0631E+032. 2785E-031. 0736E+031. 6896E-031. 0843E+03
 1. 4940E-031. 0951E+031. 3944E-031. 1060E+031. 3185E-031. 1169E+031. 2487E-031. 1280E+03
 1. 4809E-031. 1393E+032. 1039E-031. 1506E+031. 8202E-031. 1620E+033. 6397E-031. 1736E+03
 4. 3276E-031. 1852E+033. 7321E-031. 1970E+033. 3443E-031. 2089E+033. 0190E-031. 2209E+03
 6. 1512E-031. 2331E+032. 0398E-031. 2453E+031. 8643E-031. 2577E+031. 7969E-031. 2702E+03
 1. 7385E-031. 2828E+031. 4825E-031. 2956E+031. 6272E-031. 3084E+031. 5753E-031. 3213E+03
 2. 3371E-031. 3346E+031. 7720E-031. 3478E+031. 5259E-031. 3612E+031. 4018E-031. 3748E+03
 1. 3243E-031. 3884E+031. 2551E-031. 4022E+031. 1882E-031. 4162E+031. 2654E-031. 4302E+03
 1. 0438E-031. 4444E+031. 0010E-031. 4588E+031. 6204E-041. 4733E+031. 2345E-041. 4879E+03
 8. 8549E-041. 5027E+038. 4737E-041. 5177E+038. 0887E-041. 5328E+037. 7298E-041. 5480E+03
 7. 4358E-041. 5634E+037. 1513E-041. 5789E+036. 8754E-041. 5946E+036. 6083E-041. 6104E+03
 6. 3417E-041. 6265E+036. 0729E-041. 6426E+035. 8017E-041. 6589E+035. 5384E-041. 6754E+03
 5. 2835E-041. 6921E+035. 1067E-041. 7089E+034. 9582E-041. 7259E+034. 8092E-041. 7430E+03
 4. 6589E-041. 7604E+034. 5135E-041. 7779E+034. 3734E-041. 7955E+034. 2353E-041. 8134E+03

1.0977E-041	0314E+033	9605E-041	8496E+033	8281E-041	8680E+033	6949E-041	8865E+03
2.5636E-041	9053E+033	4359E-041	9242E+033	3086E-041	9434E+033	1873E-041	9627E+03
3.0811E-041	9823E+032	9768E-042	0019E+032	8760E-042	0218E+032	7747E-042	0419E+03
4.6732E-042	0622E+032	5713E-042	0827E+032	4685E-042	1033E+032	3712E-042	1243E+03
5.2772E-042	1454E+032	1836E-042	1667E+032	1159E-042	1892E+032	0486E-042	2100E+03
6.9808E-042	2319E+031	9147E-042	2541E+031	8497E-042	2765E+031	7865E-042	2991E+03
7.7248E-042	3220E+031	6444E-042	3451E+031	6047E-042	3684E+031	5446E-042	3919E+03
8.4839E-042	4157E+031	4238E-042	4397E+031	3637E-042	4639E+031	3162E-042	4884E+03
9.2794E-042	5132E+031	2438E-042	5391E+031	2100E-042	5634E+031	1762E-042	5888E+03
1.1424E-042	6146E+031	1083E-042	6406E+031	0738E-042	6668E+031	0376E-042	6933E+03
1.0029E-042	7201E+039	6832E-052	7471E+039	3654E-052	7744E+039	0497E-052	8020E+03
2.7441E-052	0298E+038	4383E-052	8580E+038	1422E-052	8864E+037	8500E-052	9150E+03
7.3587E-052	9440E+037	2773E-052	9733E+037	0718E-053	0028E+036	8686E-053	0327E+03
6.6673E-053	0628E+036	4739E-053	0933E+036	2809E-053	1240E+036	0949E-053	1350E+03
5.9100E-053	1854E+035	7282E-053	2181E+035	5466E-053	2501E+035	3632E-053	2824E+03
5.1812E-053	3150E+035	0016E-053	3479E+034	8301E-053	3812E+034	6605E-053	4148E+03
4.4908E-053	4487E+034	3514E-053	4830E+034	2177E-053	5176E+034	0837E-053	5526E+03
3.9502E-053	5879E+033	8229E-053	6236E+033	7031E-053	6596E+033	5880E-053	6939E+03
3.4735E-053	7327E+033	3591E-053	7694E+033	2439E-053	8072E+033	1276E-053	8451E+03
2.9744E-053	8833E+032	8639E-053	9219E+032	7895E-053	9609E+032	7156E-054	0002E+03
2.6432E-054	0400E+032	5719E-054	0801E+032	5015E-054	1207E+032	4817E-054	1616E+03
2.4614E-054	2030E+032	2920E-054	2448E+032	2246E-054	2870E+032	1596E-054	3296E+03
2.0946E-054	3726E+032	0295E-054	4161E+031	9648E-054	4600E+031	9013E-054	5043E+03
1.8874E-054	5490E+031	7787E-054	5943E+031	7275E-054	6399E+031	6673E-054	6860E+03
1.6173E-054	7326E+031	5669E-054	7796E+031	5189E-054	8271E+031	4715E-054	8751E+03
1.4244E-054	9236E+031	3769E-054	9725E+031	3300E-055	0219E+031	2897E-055	0718E+03
1.2594E-055	1222E+031	2156E-055	1732E+031	1801E-055	2246E+031	1447E-055	2765E+03
1.1100E-055	3289E+031	0761E-055	3819E+031	0422E-055	4834E+031	0095E-055	4894E+03
9.7689E-065	5440E+039	4403E-065	5991E+039	1568E-065	6547E+038	8934E-065	7109E+03
8.6489E-065	7677E+038	3993E-065	8250E+038	1635E-065	8829E+037	9336E-065	9414E+03
7.7036E-066	0004E+037	4721E-066	0600E+036	9639E-066	1203E+036	7425E-066	1811E+03
6.5204E-066	2425E+036	2988E-066	3046E+036	0885E-066	3672E+035	9184E-066	4305E+03
5.7381E-066	4944E+035	5994E-066	5590E+035	4414E-066	6242E+035	2821E-066	5900E+03
5.1296E-066	7565E+034	9662E-066	8296E+034	8133E-066	8914E+034	6643E-066	9599E+03
4.5197E-067	0291E+034	3769E-067	0990E+034	2390E-067	1695E+034	0881E-067	2408E+03
3.9460E-067	3127E+033	8038E-067	3854E+033	6954E-067	4588E+033	6054E-067	5330E+03
3.5174E-067	6078E+033	4309E-067	6834E+033	3415E-067	7598E+033	2563E-067	8369E+03
3.1707E-067	9143E+033	0863E-067	9935E+033	0016E-068	0729E+032	9163E-068	1532E+03
2.8821E-068	2342E+032	7497E-068	3160E+032	6693E-068	3987E+032	5911E-068	4821E+03
2.5138E-068	5664E+032	4380E-068	6516E+032	3653E-068	7376E+032	2923E-068	8244E+03
2.2212E-068	9121E+032	1561E-069	0007E+032	0980E-069	0901E+032	0418E-069	1805E+03
1.9863E-069	2717E+031	9805E-069	3639E+031	8765E-069	4569E+031	7967E-069	5509E+03
1.7440E-069	6458E+031	6909E-069	7417E+031	6376E-069	8385E+031	5850E-069	9363E+03
1.5349E-061	0095E+041	4880E-061	0135E+041	4514E-061	0236E+041	4153E-061	0397E+04
1.3820E-061	0440E+041	3490E-061	0544E+041	3164E-061	0649E+041	2838E-061	0754E+04
1.2548E-061	0841E+041	2344E-061	0969E+041	2142E-061	1078E+041	1939E-061	1188E+04
1.0205E-061	1300E+049	8876E-071	1412E+049	5235E-071	1325E+049	2077E-071	1640E+04
8.9400E-071	1755E+048	7243E-071	1872E+048	5212E-071	1990E+048	3172E-071	2109E+04
8.1119E-071	2230E+047	9046E-071	2351E+047	7078E-071	2474E+047	5208E-071	2598E+04
7.3822E-071	2723E+047	1428E-071	2850E+046	8874E-071	2977E+046	7038E-071	3106E+04
6.5205E-071	3237E+046	3366E-071	3368E+046	1531E-071	3501E+045	9787E-071	3635E+04
5.5583E-071	3771E+045	3939E-071	3908E+045	2639E-071	4046E+045	1445E-071	4186E+04
5.0380E-071	4327E+044	9311E-071	4469E+044	8246E-071	4613E+044	4726E-071	4758E+04
4.3579E-071	4905E+044	2444E-071	5053E+044	1313E-071	5202E+044	0194E-071	5353E+04
3.9080E-071	5506E+043	7980E-071	5660E+043	6911E-071	5816E+043	5969E-071	5973E+04
3.4746E-071	6132E+043	3949E-071	6292E+043	3163E-071	6454E+043	2401E-071	6617E+04
3.0369E-071	6783E+042	9517E-071	6949E+042	8683E-071	7118E+042	7871E-071	7288E+04
2.7171E-071	7460E+042	6583E-071	7633E+042	6012E-071	7809E+042	5539E-071	7986E+04
2.5139E-071	8164E+042	4766E-071	8345E+042	4400E-071	8527E+042	2029E-071	8711E+04
2.1529E-071	8897E+042	1115E-071	9085E+042	0761E-071	9275E+042	0456E-071	9466E+04

2. 0622E-071 9640E+042 1293E-071 9835E+042 2023E-072 0053E+042 1894E-072 0252E+04
 1. 6134E-072 0453E+041 3880E-072 0654E+041 4473E-072 0862E+041 4182E-072 1069E+04
 1. 3942E-072 1278E+041 3917E-072 1490E+041 4116E-072 1704E+041 4397E-072 1919E+04
 1. 4286E-072 2137E+041 1708E-072 2357E+041 1601E-072 2579E+041 1596E-072 2804E+04
 1. 0340E-072 3030E+041 0270E-072 3259E+041 0894E-072 3490E+041 1617E-072 3724E+04
 1. 2049E-072 3940E+047 3901E-082 4198E+047 4536E-082 4438E+047 3892E-082 4681E+04
 7. 4177E-082 4926E+047 4903E-082 5174E+047 3611E-082 5424E+047 8960E-082 3677E+04
 8. 3843E-082 5932E+048 4180E-082 6190E+045 5325E-082 6430E+045 7438E-082 6713E+04
 6. 0146E-082 6979E+046 2889E-082 7247E+048 0839E-082 7518E+041 0502E-072 7791E+04
 1. 2715E-072 8047E+041 2979E-072 8346E+042 4286E-092 8628E+042 4193E-092 8912E+04
 2. 4247E-092 9200E+042 4413E-092 9490E+042 5700E-092 9783E+042 7000E-093 0079E+04
 2. 7640E-093 0378E+042 0643E-093 0680E+042 1518E-093 0985E+042 2607E-093 1293E+04
 2. 3706E-093 1604E+043 0910E-093 1918E+044 0753E-093 2235E+044 9035E-093 2536E+04
 C LETFILE8 SOLAR MAXIMUM DIFFERENTIAL
 2. 8898E+041 6671E+001 3809E+041 6837E+006 7355E+031 7004E+004 7411E+031 7173E+00
 4. 0045E+031 7344E+003 3680E+031 7516E+002 8972E+031 7690E+001 0457E+041 7866E+00
 1. 0169E+031 8049E+009 0039E+021 8223E+008 5735E+021 8404E+008 1368E+021 8587E+00
 7. 6937E+021 8771E+007 2502E+021 8958E+006 8003E+021 9146E+006 3199E+021 9437E+00
 5. 2900E+021 9329E+005 3381E+021 9729E+004 8412E+021 9919E+004 5364E+022 0117E+00
 4. 2688E+022 0817E+003 9783E+022 0319E+008 6850E+022 0723E+003 3887E+022 0929E+00
 3. 2022E+022 1137E+003 0210E+022 1347E+002 8380E+022 1559E+002 6532E+022 1773E+00
 2. 4646E+022 1989E+002 2781E+022 2208E+002 0912E+022 2429E+001 9982E+022 2632E+00
 1. 9048E+022 2877E+001 8094E+022 3104E+001 7136E+022 3334E+001 6168E+022 3566E+00
 1. 5191E+022 3800E+001 4204E+022 4036E+001 3207E+022 4275E+001 2200E+022 4516E+00
 1. 1292E+022 4760E+001 0946E+022 5006E+001 0594E+022 5255E+001 0243E+022 5506E+00
 9. 8844E+012 5759E+009 5262E+012 6015E+009 1625E+012 6274E+008 7951E+012 6335E+00
 8. 4241E+012 6799E+008 0494E+012 7045E+007 6709E+012 7334E+007 2887E+012 7606E+00
 6. 9027E+012 7880E+006 5129E+012 8157E+006 1192E+012 8437E+005 7927E+012 8719E+00
 5. 5626E+012 9005E+005 3803E+012 9299E+005 0956E+012 9584E+004 8585E+012 9878E+00
 4. 6192E+013 0175E+004 3774E+013 0475E+004 1332E+013 0778E+003 8867E+013 1084E+00
 3. 6976E+013 1393E+003 3877E+013 1705E+003 2695E+013 2020E+003 1501E+013 2338E+00
 8. 0295E+013 2659E+002 9078E+013 2984E+002 7848E+013 3812E+002 6606E+013 3643E+00
 2. 5352E+013 3977E+002 4085E+013 4315E+002 2805E+013 4656E+002 1513E+013 5000E+00
 2. 0208E+013 5848E+001 8890E+013 5699E+001 7559E+013 6054E+001 6472E+013 6413E+00
 1. 6081E+013 6774E+001 5585E+013 7140E+001 5135E+013 7509E+001 4680E+013 7882E+00
 1. 4221E+013 8258E+001 3758E+013 8439E+001 3289E+013 9023E+001 2816E+013 9410E+00
 1. 2339E+013 9802E+001 1856E+014 0198E+001 1369E+014 0597E+001 0877E+014 1001E+00
 1. 0380E+014 1408E+009 8781E+004 1820E+009 3712E+004 2235E+008 8593E+004 2655E+00
 8. 3423E+004 3079E+007 8202E+004 3507E+007 3584E+004 3939E+007 1498E+004 4376E+00
 6. 9891E+004 4817E+006 7262E+004 5263E+006 5113E+004 5712E+006 2942E+004 6167E+00
 4. 0750E+004 4626E+005 8536E+004 7089E+005 6299E+004 7357E+005 4041E+004 8030E+00
 5. 1760E+004 8507E+004 9457E+004 8989E+004 7191E+004 9476E+004 4781E+004 9968E+00
 4. 2408E+005 0464E+004 0012E+005 0966E+003 8232E+003 1472E+003 6996E+003 1984E+00
 8. 5747E+005 2500E+003 4487E+005 3022E+003 3213E+003 3549E+003 1927E+003 4081E+00
 3. 0628E+005 4619E+002 9317E+005 5162E+002 7992E+005 5710E+002 6654E+005 6269E+00
 2. 5808E+005 6823E+002 3938E+005 7387E+002 2360E+005 7958E+002 1414E+005 8534E+00
 2. 0890E+005 9115E+002 0361E+005 9703E+001 9826E+006 0296E+001 9286E+006 0896E+00
 1. 8741E+006 1501E+001 8190E+006 2112E+001 7634E+006 2729E+001 7072E+006 3353E+00
 1. 6504E+006 3982E+001 3931E+006 4618E+001 5353E+006 5261E+001 4768E+006 5909E+00
 1. 4178E+006 6544E+002 7650E+006 7226E+001 1933E+006 7894E+008 5673E+016 8569E+00
 7. 1391E+016 9250E+006 1004E+016 9938E+005 3320E+017 0638E+001 4667E+027 1335E+00
 2. 6626E+017 2044E+008 4099E+017 2760E+002 3297E+017 3483E+002 2577E+017 4214E+00
 2. 1850E+017 4951E+002 1116E+017 5696E+002 0381E+017 6449E+001 9478E+017 7208E+00
 1. 8487E+017 7976E+001 7387E+017 8751E+001 6325E+017 9533E+001 5510E+018 0324E+00
 1. 4761E+018 1122E+001 4005E+018 1928E+001 3241E+018 2743E+001 2470E+018 3565E+00
 1. 1893E+018 4395E+001 1391E+018 5234E+001 0890E+018 6081E+001 0391E+018 6937E+00
 9. 8865E+008 7801E+009 3771E+008 8673E+008 8625E+008 9555E+008 5047E+009 0445E+00
 8. 1926E+009 1344E+007 8774E+009 2251E+007 5590E+009 3168E+007 2375E+009 4094E+00
 6. 9128E+009 5029E+006 5849E+009 5974E+006 2537E+009 6928E+005 9192E+009 7891E+00
 5. 5841E+009 8864E+005 4386E+009 9846E+005 3101E+001 0084E+015 1803E+001 0184E+01

3. 0491E+001. 0283E+014. 9167E+001. 0388E+014. 7830E+001. 0491E+014. 6480E+001. 0395E+01
 4. 3116E+001. 0700E+014. 3738E+001. 0807E+014. 2347E+001. 0914E+014. 0942E+001. 1028E+01
 3. 9523E+001. 1132E+013. 8090E+001. 1243E+013. 6642E+001. 1354E+013. 3230E+001. 1467E+01
 3. 4085E+001. 1581E+013. 2928E+001. 1696E+013. 1807E+001. 1813E+013. 0688E+001. 1930E+01
 2. 9558E+001. 2049E+012. 8416E+001. 2168E+012. 7263E+001. 2289E+012. 6099E+001. 2411E+01
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 2. 1554E+001. 3041E+012. 0856E+001. 3170E+012. 0151E+001. 3301E+011. 9439E+001. 3433E+01
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 1. 3200E+001. 4684E+011. 2898E+001. 4830E+011. 2593E+001. 4977E+011. 8011E+001. 5126E+01
 1. 4431E+001. 5276E+011. 3417E+001. 5428E+011. 2803E+001. 5581E+011. 2257E+001. 5736E+01
 1. 1732E+001. 5893E+011. 3122E+001. 6051E+011. 0573E+001. 6210E+011. 0186E+001. 6371E+01
 9. 8345E-011. 6594E+019. 4802E-011. 6698E+019. 1223E-011. 6864E+018. 7659E-011. 7032E+01
 8. 4118E-011. 7201E+018. 0496E-011. 7372E+017. 6816E-011. 7545E+017. 4806E-011. 7719E+01
 7. 2832E-011. 7895E+017. 0892E-011. 8073E+016. 8948E-011. 8253E+016. 6985E-011. 8434E+01
 6. 5002E-011. 8617E+016. 2999E-011. 8802E+016. 1019E-011. 8989E+015. 9035E-011. 9178E+01
 5. 7032E-011. 9368E+015. 5009E-011. 9561E+015. 2966E-011. 9755E+015. 0903E-011. 9952E+01
 4. 8824E-012. 0150E+014. 6853E-012. 0350E+014. 5113E-012. 0552E+014. 3897E-012. 0737E+01
 4. 2670E-012. 0963E+014. 1430E-012. 1171E+014. 0178E-012. 1382E+013. 8913E-012. 1594E+01
 3. 7636E-012. 1809E+013. 6347E-012. 2026E+013. 5044E-012. 2245E+013. 3768E-012. 2466E+01
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 2. 7996E-012. 3604E+012. 7399E-012. 3889E+012. 6796E-012. 4076E+012. 6187E-012. 4315E+01
 2. 5571E-012. 4557E+012. 4950E-012. 4801E+012. 4322E-012. 5047E+012. 3704E-012. 5296E+01
 2. 3089E-012. 5548E+012. 2468E-012. 5802E+012. 1848E-012. 6058E+012. 1221E-012. 6317E+01
 2. 0588E-012. 6579E+014. 7275E-012. 6843E+012. 9572E-012. 7110E+012. 4660E-012. 7379E+01
 2. 2446E-012. 7651E+012. 1459E-012. 7926E+012. 0403E-012. 8204E+011. 9491E-012. 8484E+01
 2. 4010E-012. 8767E+011. 7150E-012. 9053E+011. 6571E-012. 9342E+011. 6046E-012. 9633E+01
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 1. 3696E-013. 1135E+011. 3295E-013. 1445E+011. 2891E-013. 1757E+011. 2490E-013. 2073E+01
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 1. 0539E-013. 3699E+011. 0157E-013. 4034E+019. 8147E-023. 4372E+019. 5835E-023. 4713E+01
 9. 3684E-023. 5058E+019. 1515E-023. 5407E+018. 9329E-023. 5759E+018. 7147E-023. 6114E+01
 8. 5039E-023. 6473E+018. 2911E-023. 6831E+018. 0761E-023. 7202E+017. 8590E-023. 7571E+01
 7. 6897E-023. 7945E+017. 4182E-023. 8322E+017. 1946E-023. 8703E+016. 9687E-023. 9087E+01
 6. 7491E-023. 9476E+016. 6206E-023. 9868E+016. 4978E-024. 0265E+016. 3737E-024. 0665E+01
 6. 2484E-024. 1069E+016. 1076E-024. 1477E+015. 8194E-014. 1889E+012. 8264E-014. 2306E+01
 1. 7518E-014. 2726E+011. 4318E-014. 3151E+011. 2820E-014. 3580E+011. 1538E-014. 4013E+01
 1. 0522E-014. 4450E+011. 9729E-014. 4892E+017. 5464E-024. 5388E+017. 1822E-024. 5789E+01
 6. 9620E-024. 6244E+016. 7413E-024. 6705E+016. 5522E-024. 7167E+016. 3939E-024. 7636E+01
 6. 2340E-024. 8110E+016. 0324E-024. 8588E+015. 8267E-024. 9071E+015. 6189E-024. 9558E+01
 5. 4166E-025. 0051E+015. 2485E-025. 0548E+015. 0797E-025. 1051E+014. 9223E-025. 1558E+01
 4. 7749E-025. 2071E+014. 6298E-025. 2588E+014. 5109E-025. 3111E+014. 3913E-025. 3639E+01
 4. 2706E-025. 4172E+014. 1486E-025. 4710E+014. 0255E-025. 5254E+013. 9011E-025. 5803E+01
 3. 7795E-025. 6357E+013. 6766E-025. 6918E+013. 5728E-025. 7488E+013. 4680E-025. 8055E+01
 3. 8638E-025. 8632E+013. 2683E-025. 9214E+013. 1738E-025. 9803E+011. 2861E+006. 0397E+01
 5. 0159E-016. 0997E+013. 0521E-016. 1604E+012. 3867E-016. 2216E+012. 0488E-016. 2834E+01
 1. 8020E-016. 3459E+011. 6166E-016. 4089E+014. 2274E-016. 4726E+019. 1111E-026. 5370E+01
 8. 5884E-026. 6019E+018. 3237E-026. 6675E+018. 0614E-026. 7338E+017. 8007E-026. 8007E+01
 7. 5442E-026. 8683E+017. 3032E-026. 9366E+016. 9668E-027. 0055E+016. 6276E-027. 0752E+01
 6. 2856E-027. 1455E+015. 9746E-027. 2165E+015. 7367E-027. 2882E+015. 4965E-027. 3606E+01
 5. 2540E-027. 4338E+015. 0090E-027. 5077E+014. 7786E-027. 5823E+014. 6030E-027. 6577E+01
 4. 4858E-027. 7388E+014. 2470E-027. 8106E+014. 0664E-027. 8882E+013. 8851E-027. 9666E+01
 3. 7116E-028. 0458E+013. 5585E-028. 1258E+013. 4452E-028. 2065E+011. 6844E-018. 2881E+01
 8. 7174E-028. 3705E+017. 0188E-028. 4537E+016. 3243E-028. 5377E+015. 6862E-028. 6225E+01
 5. 1814E-028. 7082E+018. 9429E-028. 7948E+013. 8246E-028. 8822E+013. 6193E-028. 9703E+01
 3. 5182E-029. 0596E+013. 4188E-029. 1497E+013. 3210E-029. 2406E+013. 2223E-029. 3324E+01
 3. 1229E-029. 4252E+013. 0095E-029. 5189E+012. 8909E-029. 6135E+012. 7710E-029. 7090E+01
 2. 6558E-029. 8055E+012. 5617E-029. 9030E+012. 4707E-021. 0001E+022. 3788E-021. 0101E+02
 2. 2859E-021. 0201E+022. 1922E-021. 0303E+022. 1156E-021. 0405E+022. 0422E-021. 0508E+02
 1. 9681E-021. 0613E+021. 8934E-021. 0718E+024. 0641E-011. 0825E+021. 7638E-011. 0932E+02

1 3048E-011 1041E+021 1380E-011 1151E+029 8396E-021 1262E+020 5779E-021 1374E+02
2 2123E-011 1487E+024 9683E-021 1601E+024 6204E-021 1716E+024 4785E-021 1832E+02
4 3332E-021 1950E+024 1905E-021 2069E+024 0453E-021 2189E+023 9083E-021 2310E+02
3 7325E-021 2432E+023 5427E-021 2556E+023 3510E-021 2681E+023 1574E-021 2807E+02
3 0205E-021 2934E+022 8839E-021 3062E+022 7541E-021 3192E+022 6279E-021 3329E+02
2 5003E-021 3456E+022 5004E-021 3590E+022 6188E-021 3725E+022 2936E-021 3861E+02
2 1480E-021 3999E+022 0344E-021 4138E+021 9234E-021 4278E+021 0184E-021 4420E+02
1 9504E-021 4564E+021 6513E-021 4708E+021 5889E-021 4855E+021 5282E-021 5002E+02
1 4669E-021 5151E+021 4050E-021 5302E+021 3424E-021 5454E+021 2795E-021 5608E+02
1 2178E-021 5763E+021 1616E-021 5919E+021 1316E-021 6077E+021 1015E-021 6237E+02
1 0719E-021 6399E+021 0419E-021 6562E+021 0116E-021 6726E+021 2524E-021 6892E+02
2 5614E-021 7040E+022 0738E-021 7230E+021 8608E-021 7401E+021 6832E-021 7574E+02
1 5349E-021 7749E+022 8177E-021 7925E+021 1203E-021 8103E+021 0585E-021 8283E+02
1 0221E-021 8465E+029 9031E-031 8648E+029 5826E-031 8834E+029 2593E-031 9021E+02
8 9348E-031 9210E+028 5766E-031 9401E+028 1973E-031 9594E+027 8142E-031 9788E+02
7 4273E-031 9985E+027 0912E-032 0184E+021 5582E-032 0384E+029 4089E-032 0387E+02
8 3460E-032 0792E+027 6885E-032 0998E+027 2170E-032 1207E+026 7888E-032 1418E+02
6 4744E-032 1631E+028 4556E-032 1846E+025 5121E-032 2063E+025 2792E-032 2282E+02
5 0543E-032 2503E+024 8562E-032 2727E+024 6604E-032 2953E+024 4630E-032 3181E+02
4 2848E-032 3411E+024 1425E-032 3644E+023 9987E-032 3879E+023 8535E-032 4116E+02
3 8917E-032 4356E+021 8001E-032 4598E+021 3768E-032 4843E+021 2203E-032 5090E+02
1 0756E-032 5339E+029 6546E-032 5591E+022 1812E-032 5845E+022 1742E-032 6102E+02
5 7975E-032 6361E+025 6056E-032 6623E+025 4119E-032 6888E+025 2191E-032 7155E+02
5 0814E-032 7425E+024 8488E-032 7698E+024 6310E-032 7973E+024 4083E-032 8251E+02
1 0511E-032 8532E+026 2950E-032 8815E+025 4930E-032 9102E+025 0678E-032 9391E+02
4 7091E-032 9683E+024 3861E-032 9978E+026 0768E-033 0276E+023 6101E-033 0377E+02
3 4416E-033 0881E+023 3064E-033 1188E+023 1714E-033 1498E+023 0351E-033 1811E+02
2 9045E-033 2127E+022 7732E-033 2446E+022 6676E-033 2768E+022 5661E-033 3094E+02
1 8905E-033 3423E+021 0262E-033 3755E+027 9152E-033 4091E+026 9591E-033 4430E+02
6 1988E-033 4772E+025 5995E-033 5117E+021 2122E-033 5466E+023 5892E-033 5819E+02
3 3720E-033 6175E+023 2622E-033 6534E+023 1564E-033 6897E+023 0496E-033 7264E+02
2 9476E-033 7634E+022 8502E-033 8009E+023 5189E-033 8386E+023 0060E-033 8768E+02
2 7808E-033 9153E+022 6207E-033 9542E+022 4948E-033 9935E+022 3762E-034 0332E+02
2 6109E-034 0739E+022 0948E-034 1138E+021 9930E-034 1347E+021 9163E-034 1960E+02
1 8486E-034 2377E+021 7719E-034 2798E+021 6995E-034 3223E+024 2979E-034 3653E+02
2 8917E-034 4086E+022 3976E-034 4525E+022 2027E-034 4967E+022 0393E-034 5114E+02
1 9049E-034 5865E+022 9285E-034 6321E+021 5136E-034 6782E+021 4404E-034 7247E+02
1 3848E-034 7716E+021 3285E-034 8190E+021 2726E-034 8569E+022 7228E-034 9133E+02
1 8039E-034 9642E+021 5725E-035 0135E+021 4499E-035 0633E+021 3496E-035 1136E+02
1 2651E-035 1645E+021 5722E-035 2158E+021 0744E-035 2676E+021 0268E-035 3200E+02
9 8900E-045 3729E+029 5251E-045 4263E+024 8339E-035 4802E+022 5304E-035 5346E+02
1 7127E-035 5897E+021 4422E-035 6452E+021 3033E-035 7013E+021 1941E-035 7580E+02
1 1046E-035 8152E+021 6600E-035 8730E+028 7406E-045 9314E+028 3068E-045 9903E+02
7 9771E-046 0499E+023 1943E-036 1100E+021 6918E-036 1707E+021 2347E-036 2320E+02
1 0643E-036 2940E+029 7083E-046 3565E+028 9743E-046 4197E+028 3694E-046 4835E+02
1 1752E-036 5479E+026 8268E-046 6130E+026 5200E-046 6787E+026 2704E-046 7451E+02
3 4971E-036 8122E+021 8529E-036 8799E+021 4303E-036 9482E+021 2583E-037 0173E+02
1 1157E-037 0870E+021 0041E-037 1375E+022 0098E-037 2286E+026 7028E-047 3004E+02
6 2612E-047 3730E+026 0231E-047 4463E+021 1414E-037 5203E+028 2146E-047 5950E+02
7 2090E-047 6705E+026 6926E-047 7467E+026 2289E-047 8237E+025 8188E-047 9015E+02
7 2183E-047 9800E+024 8305E-048 0593E+024 5798E-048 1394E+024 3844E-048 2203E+02
1 9145E-038 3020E+021 1021E-038 3845E+028 6406E-040 4679E+027 6950E-048 5520E+02
6 9516E-048 6370E+026 3750E-048 7229E+021 0323E-038 8095E+024 7010E-048 8971E+02
4 8950E-048 9855E+021 1002E-039 0748E+027 2672E-049 1650E+026 1233E-049 2561E+02
5 6089E-049 3481E+025 2081E-049 4410E+024 8517E-049 5348E+026 5560E-049 6296E+02
3 8793E-049 7253E+022 5420E-039 8220E+021 1914E-039 9196E+028 3541E-041 0018E+03
6 9718E-041 0118E+036 1744E-041 0218E+035 6644E-041 0320E+035 1975E-041 0422E+03
8 5674E-041 0526E+033 8585E-041 0631E+031 0919E-031 0736E+037 1722E-041 0843E+03
5 9593E-041 0951E+035 3784E-041 1060E+034 9580E-041 1169E+034 5947E-041 1280E+03
6 7268E-041 1393E+031 3023E-021 1506E+036 0359E-031 1620E+033 3181E-031 1736E+03

2. 4443E-031. 1852E+032. 0491E-031. 1970E+031. 7889E-031. 2089E+031. 5825E-031. 2209E+03
 4. 1993E-031. 2331E+030. 6831E-041. 2453E+037. 6943E-041. 2377E+037. 3329E-041. 2702E+03
 7. 0225E-041. 2828E+034. 7247E-041. 2956E+036. 4922E-041. 3084E+036. 1460E-041. 3214E+03
 1. 1152E-031. 3346E+037. 7165E-041. 3478E+036. 2584E-041. 3612E+035. 5789E-041. 3748E+03
 3. 1897E-041. 3884E+034. 8483E-041. 4022E+034. 5324E-041. 4162E+035. 3872E-041. 4302E+03
 3. 7787E-041. 4444E+038. 6023E-041. 4582E+033. 4433E-041. 4733E+033. 2846E-041. 4879E+03
 3. 1264E-041. 5027E+032. 9669E-041. 5177E+032. 8050E-041. 5328E+032. 6604E-041. 5480E+03
 2. 5474E-041. 5634E+032. 4889E-041. 5789E+032. 3340E-041. 5946E+032. 2330E-041. 6104E+03
 2. 1319E-041. 6253E+032. 0301E-041. 6426E+031. 9272E-041. 6589E+031. 8264E-041. 6754E+03
 1. 7287E-041. 6921E+031. 6637E-041. 7089E+031. 6113E-041. 7239E+031. 5587E-041. 7430E+03
 1. 5056E-041. 7604E+031. 4540E-041. 7779E+031. 4045E-041. 7955E+031. 3562E-041. 8134E+03
 1. 3084E-041. 8314E+031. 2609E-041. 8496E+031. 2154E-041. 8680E+031. 1695E-041. 8865E+03
 1. 1299E-041. 9053E+031. 0786E-041. 9242E+031. 0333E-041. 9434E+031. 9053E-031. 9627E+03
 9. 5372E-051. 9822E+039. 2137E-052. 0019E+038. 8834E-052. 0218E+038. 5516E-052. 0419E+03
 8. 2187E-052. 0622E+037. 8848E-052. 0827E+037. 5477E-052. 1033E+037. 2277E-052. 1243E+03
 6. 9190E-052. 1454E+036. 6106E-052. 1667E+036. 4005E-052. 1882E+036. 1912E-052. 2100E+03
 5. 9804E-052. 2319E+035. 7711E-052. 2541E+035. 5631E-052. 2765E+035. 3632E-052. 2991E+03
 5. 1687E-052. 3220E+034. 9785E-052. 3451E+034. 7907E-052. 3684E+034. 6012E-052. 3919E+03
 4. 4100E-052. 4157E+034. 2185E-052. 4397E+034. 0265E-052. 4639E+033. 8790E-052. 4884E+03
 3. 7483E-052. 5132E+033. 6625E-052. 5381E+033. 5625E-052. 5634E+033. 4626E-052. 5888E+03
 3. 3625E-052. 6146E+033. 2614E-052. 6406E+033. 1594E-052. 6668E+033. 0529E-052. 6933E+03
 2. 9505E-052. 7201E+032. 8483E-052. 7471E+032. 7536E-052. 7744E+032. 6592E-052. 8020E+03
 2. 5679E-052. 8278E+032. 4765E-052. 8580E+032. 3871E-052. 8864E+032. 2986E-052. 9150E+03
 2. 2097E-052. 9440E+032. 1238E-052. 9738E+032. 0646E-053. 0028E+032. 0061E-053. 0327E+03
 1. 9482E-053. 0628E+031. 8926E-053. 0933E+031. 8369E-053. 1240E+031. 7821E-053. 1550E+03
 1. 7274E-053. 1864E+031. 6738E-053. 2181E+031. 6204E-053. 2501E+031. 5664E-053. 2824E+03
 1. 5129E-053. 3150E+031. 4603E-053. 3479E+031. 4100E-053. 3812E+031. 3602E-053. 4148E+03
 1. 3102E-053. 4487E+031. 2705E-053. 4890E+031. 2326E-053. 5176E+031. 1947E-053. 5526E+03
 1. 1567E-053. 5879E+031. 1199E-053. 6236E+031. 0856E-053. 6596E+031. 0518E-053. 6959E+03
 1. 0181E-053. 7327E+031. 8458E-053. 7698E+031. 5076E-053. 8072E+031. 1662E-053. 8451E+03
 0. 7483E-063. 8833E+038. 4191E-063. 9219E+038. 2079E-063. 9609E+037. 9978E-064. 0002E+03
 7. 7929E-064. 0400E+037. 5918E-064. 0801E+037. 3910E-064. 1207E+037. 1919E-064. 1616E+03
 6. 9913E-064. 2030E+036. 7922E-064. 2448E+036. 5975E-064. 2870E+036. 4104E-064. 3296E+03
 6. 2290E-064. 3726E+036. 0356E-064. 4161E+035. 8488E-064. 4600E+035. 6628E-064. 5043E+03
 5. 4757E-064. 5490E+035. 3046E-064. 5943E+035. 1570E-064. 6399E+034. 9917E-064. 6860E+03
 4. 8480E-064. 7326E+034. 7029E-064. 7796E+034. 5636E-064. 8271E+034. 4252E-064. 8751E+03
 4. 2867E-064. 9236E+034. 1469E-064. 9725E+034. 0083E-065. 0219E+033. 8902E-065. 0718E+03
 3. 7817E-065. 1222E+033. 6734E-065. 1732E+033. 5686E-065. 2246E+033. 4647E-065. 2765E+03
 3. 3628E-065. 3289E+033. 2636E-065. 3819E+033. 1644E-065. 4354E+033. 0687E-065. 4894E+03
 2. 9732E-065. 5440E+032. 8767E-065. 5991E+032. 7944E-065. 6547E+032. 7189E-065. 7109E+03
 2. 6446E-065. 7677E+032. 5725E-065. 8250E+032. 5023E-065. 8829E+032. 4339E-065. 9414E+03
 2. 3653E-066. 0004E+032. 2966E-066. 0600E+032. 1732E-066. 1203E+032. 1065E-066. 1811E+03
 2. 0396E-066. 2425E+031. 9725E-066. 3046E+031. 9090E-066. 3672E+031. 8580E-066. 4305E+03
 1. 8100E-066. 4944E+031. 7623E-066. 3590E+031. 7148E-066. 6242E+031. 6670E-066. 6900E+03
 1. 6191E-066. 5655E+031. 5715E-066. 8236E+031. 5255E-066. 8914E+031. 4805E-066. 9599E+03
 1. 4861E-067. 0291E+031. 3922E-067. 0990E+031. 3480E-067. 1695E+031. 3034E-067. 2408E+03
 1. 2598E-067. 3127E+031. 2162E-067. 3854E+031. 1839E-067. 4588E+031. 1561E-067. 5330E+03
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 1. 0235E-067. 9148E+031. 9761E-077. 9935E+031. 7158E-078. 0729E+031. 4531E-078. 1532E+03
 9. 1919E-078. 2342E+038. 9368E-078. 3160E+038. 6882E-078. 3987E+038. 4471E-078. 4821E+03
 8. 2079E-078. 5664E+037. 9759E-078. 6516E+037. 7525E-078. 7376E+037. 5275E-078. 8244E+03
 7. 3046E-078. 9121E+037. 0967E-079. 0007E+036. 9102E-079. 0901E+036. 7287E-079. 1805E+03
 6. 5495E-079. 2717E+036. 3693E-079. 3639E+036. 1953E-079. 4569E+035. 9749E-079. 5509E+03
 5. 8047E-079. 6458E+035. 6329E-079. 7417E+035. 4600E-079. 8385E+035. 2873E-079. 9363E+03
 5. 1233E-071. 0035E+044. 9705E-071. 0135E+044. 8515E-071. 0236E+044. 7332E-071. 0337E+04
 4. 6194E-071. 0440E+044. 5066E-071. 0544E+044. 3955E-071. 0649E+044. 2839E-071. 0754E+04
 4. 1795E-071. 0861E+044. 0921E-071. 0969E+044. 0049E-071. 1078E+043. 9174E-071. 1188E+04
 3. 5641E-071. 1300E+043. 4564E-071. 1412E+043. 3399E-071. 1525E+043. 2328E-071. 1640E+04
 3. 1413E-071. 1755E+043. 0674E-071. 1872E+042. 9977E-071. 1990E+042. 9276E-071. 2109E+04
 2. 8570E-071. 2230E+042. 7857E-071. 2351E+042. 7170E-071. 2474E+042. 6512E-071. 2598E+04

2.5849E-071.2723E+042.5182E-071.2850E+042.4418E-071.2977E+042.3780E-071.3106E+041
 2.3143E-071.3237E+042.2303E-071.3368E+042.1863E-071.3501E+042.1248E-071.3635E+041
 2.0206E-071.3771E+041.9415E-071.3908E+041.9142E-071.4046E+041.8695E-071.4186E+041
 1.8273E-071.4327E+041.7848E-071.4469E+041.7424E-071.4613E+041.6597E-071.4758E+041
 1.6180E-071.4905E+041.5768E-071.5053E+041.5353E-071.5202E+041.4932E-071.5353E+041
 1.4549E-071.5506E+041.4151E-071.5660E+041.3764E-071.5816E+041.3421E-071.5973E+041
 1.3050E-071.6132E+041.2760E-071.6292E+041.2474E-071.6454E+041.2197E-071.6617E+041
 1.1419E-071.6783E+041.1099E-071.6949E+041.0794E-071.7118E+041.0496E-071.7288E+041
 1.0240E-071.7460E+041.0024E-071.7633E+049.8138E-081.7809E+049.6427E-081.7986E+041
 9.5007E-081.8164E+049.3691E-081.8345E+049.2400E-081.8527E+048.3083E-081.8711E+041
 8.1250E-081.8897E+047.9750E-081.9085E+047.8484E-081.9275E+047.7394E-081.9466E+041
 7.8141E-081.9660E+048.0867E-081.9855E+048.3812E-082.0053E+048.3423E-082.0252E+041
 6.0962E-082.0453E+046.0045E-082.0656E+045.4618E-082.0862E+045.3551E-082.1069E+041
 5.2681E-082.1278E+045.2644E-082.1490E+045.3484E-082.1704E+045.4623E-082.1919E+041
 4.4242E-082.2137E+044.4246E-082.2357E+044.3871E-082.2579E+044.3885E-082.2804E+041
 3.9074E-082.3030E+048.8834E-082.3259E+044.1261E-082.3490E+044.4071E-082.3724E+041
 4.5838E-082.3960E+042.8634E-082.4198E+042.8134E-082.4438E+042.7909E-082.4681E+041
 2.8035E-082.4926E+042.8326E-082.5174E+042.7822E-082.5424E+042.9880E-082.5677E+041
 1.1741E-082.5932E+043.1909E-082.6190E+042.0866E-082.6450E+042.1673E-082.6713E+041
 2.2705E-082.6979E+042.3749E-082.7247E+043.0558E-082.7518E+042.0013E-082.7791E+041
 4.8103E-082.8067E+044.9146E-082.8346E+049.0119E-102.8628E+048.9812E-102.8912E+041
 9.0122E-102.9200E+049.0704E-102.9490E+049.5590E-102.9783E+041.0052E-093.0079E+041
 1.0298E-093.0378E+047.6627E-103.0680E+047.9896E-103.0983E+048.3966E-103.1293E+041
 8.8076E-103.1604E+041.1490E-093.1918E+041.5134E-093.2235E+041.8247E-093.2556E+041
 LETFILE 7 90 PC WORST CASE(REV)
 0.000E 00 1.609E 00 0.000E 00 1.625E 00 0.000E 00 1.649E 00 9.841E 03 1.660E 00
 4.925E 04 1.678E 00 2.556E 04 1.695E 00 1.851E 04 1.713E 00 1.421E 04 1.731E 00
 1.324E 04 1.750E 00 1.103E 04 1.768E 00 2.428E 04 1.787E 00 6.042E 03 1.804E 00
 5.598E 03 1.825E 00 5.516E 03 1.845E 00 5.220E 03 1.864E 00 5.220E 03 1.884E 00
 4.760E 03 1.904E 00 4.551E 03 1.924E 00 4.551E 03 1.944E 00 3.813E 03 1.963E 00
 3.718E 03 1.986E 00 3.718E 03 2.007E 00 3.415E 03 2.028E 00 3.245E 03 2.049E 00
 3.245E 03 2.071E 00 3.106E 03 2.093E 00 2.462E 03 2.115E 00 2.462E 03 2.137E 00
 2.462E 03 2.160E 00 2.457E 03 2.183E 00 2.081E 03 2.206E 00 2.081E 03 2.229E 00
 2.081E 03 2.253E 00 2.081E 03 2.277E 00 1.855E 03 2.301E 00 1.710E 03 2.325E 00
 1.710E 03 2.350E 00 1.710E 03 2.375E 00 1.710E 03 2.400E 00 1.359E 03 2.426E 00
 1.321E 03 2.451E 00 1.321E 03 2.477E 00 1.321E 03 2.503E 00 1.321E 03 2.530E 00
 1.123E 03 2.557E 00 1.026E 03 2.584E 00 1.026E 03 2.611E 00 1.026E 03 2.639E 00
 1.026E 03 2.667E 00 1.026E 03 2.695E 00 1.008E 03 2.723E 00 1.008E 03 2.752E 00
 1.008E 03 2.781E 00 1.008E 03 2.811E 00 9.313E 02 2.841E 00 6.288E 02 2.871E 00
 6.288E 02 2.901E 00 6.288E 02 2.932E 00 6.288E 02 2.963E 00 6.288E 02 2.994E 00
 6.288E 02 3.024E 00 5.137E 02 3.058E 00 5.069E 02 3.090E 00 5.069E 02 3.123E 00
 5.069E 02 3.156E 00 5.069E 02 3.190E 00 5.069E 02 3.223E 00 3.980E 02 3.257E 00
 3.651E 02 3.292E 00 3.651E 02 3.327E 00 3.651E 02 3.362E 00 3.651E 02 3.398E 00
 3.651E 02 3.438E 00 3.599E 02 3.470E 00 2.807E 02 3.507E 00 2.807E 02 3.544E 00
 2.807E 02 3.581E 00 2.807E 02 3.619E 00 2.807E 02 3.657E 00 2.807E 02 3.696E 00
 2.475E 02 3.735E 00 1.879E 02 3.775E 00 1.879E 02 3.815E 00 1.879E 02 3.855E 00
 1.879E 02 3.896E 00 1.879E 02 3.937E 00 1.879E 02 3.979E 00 1.879E 02 4.021E 00
 1.730E 02 4.064E 00 1.691E 02 4.107E 00 1.691E 02 4.150E 00 1.691E 02 4.194E 00
 1.691E 02 4.239E 00 1.691E 02 4.284E 00 1.346E 02 4.329E 00 1.016E 02 4.375E 00
 1.016E 02 4.421E 00 1.016E 02 4.468E 00 1.016E 02 4.515E 00 1.016E 02 4.563E 00
 1.016E 02 4.611E 00 1.016E 02 4.660E 00 8.593E 01 4.709E 00 8.172E 01 4.759E 00
 8.172E 01 4.810E 00 8.172E 01 4.861E 00 8.172E 01 4.912E 00 8.172E 01 4.964E 00
 8.172E 01 5.017E 00 5.849E 01 5.070E 00 5.226E 01 5.123E 00 5.226E 01 5.178E 00
 5.226E 01 5.232E 00 5.226E 01 5.288E 00 5.226E 01 5.344E 00 5.226E 01 5.400E 00
 5.226E 01 5.458E 00 4.147E 01 5.515E 00 3.997E 01 5.574E 00 3.997E 01 5.633E 00
 3.997E 01 5.692E 00 3.997E 01 5.753E 00 3.997E 01 5.814E 00 3.997E 01 5.875E 00
 3.567E 01 5.937E 00 2.721E 01 6.000E 00 2.721E 01 6.064E 00 2.721E 01 6.128E 00
 2.721E 01 6.193E 00 2.721E 01 6.258E 00 2.721E 01 6.325E 00 2.721E 01 6.392E 00
 2.721E 01 6.459E 00 2.452E 01 6.528E 00 2.449E 01 6.597E 00 5.121E 02 6.667E 00
 4.698E 02 6.737E 00 3.658E 02 6.809E 00 2.607E 02 6.881E 00 2.308E 02 6.953E 00

2.213E	02	7.027E	00	3.771E	02	7.101E	00	1.386E	02	7.177E	00	1.234E	02	7.253E	00
1.223E	02	7.330E	00	1.213E	02	7.407E	00	1.203E	02	7.485E	00	1.203E	02	7.563E	00
1.114E	02	7.643E	00	1.110E	02	7.726E	00	1.088E	02	7.808E	00	9.920E	01	7.890E	00
9.920E	01	7.974E	00	9.920E	01	8.058E	00	9.436E	01	8.144E	00	9.407E	01	8.230E	00
9.446E	01	8.317E	00	8.830E	01	8.403E	00	8.098E	01	8.494E	00	8.098E	01	8.584E	00
8.098E	01	8.675E	00	7.931E	01	8.767E	00	7.570E	01	8.859E	00	7.570E	01	8.953E	00
7.570E	01	9.048E	00	7.983E	01	9.144E	00	7.591E	01	9.241E	00	7.532E	01	9.339E	00
7.532E	01	9.437E	00	7.532E	01	9.537E	00	7.366E	01	9.638E	00	6.731E	01	9.740E	00
6.731E	01	9.843E	00	6.763E	01	9.948E	00	6.769E	01	1.005E	01	6.769E	01	1.016E	01
6.147E	01	1.027E	01	6.130E	01	1.038E	01	6.130E	01	1.049E	01	6.130E	01	1.060E	01
6.130E	01	1.071E	01	6.200E	01	1.082E	01	7.218E	01	1.094E	01	7.367E	01	1.105E	01
7.367E	01	1.117E	01	7.367E	01	1.129E	01	6.795E	01	1.141E	01	6.207E	01	1.153E	01
6.207E	01	1.165E	01	6.153E	01	1.177E	01	5.838E	01	1.190E	01	5.838E	01	1.202E	01
5.767E	01	1.215E	01	5.545E	01	1.228E	01	5.545E	01	1.241E	01	5.545E	01	1.254E	01
5.545E	01	1.267E	01	5.545E	01	1.281E	01	5.511E	01	1.294E	01	5.747E	01	1.308E	01
6.302E	01	1.322E	01	6.302E	01	1.336E	01	6.302E	01	1.350E	01	6.302E	01	1.364E	01
4.302E	01	1.379E	01	6.195E	01	1.393E	01	6.025E	01	1.408E	01	6.185E	01	1.423E	01
6.248E	01	1.438E	01	6.248E	01	1.453E	01	6.248E	01	1.469E	01	6.248E	01	1.484E	01
6.079E	01	1.500E	01	5.947E	01	1.516E	01	5.926E	01	1.532E	01	6.124E	01	1.548E	01
6.280E	01	1.565E	01	6.278E	01	1.581E	01	6.305E	01	1.598E	01	6.259E	01	1.615E	01
6.242E	01	1.632E	01	6.242E	01	1.649E	01	6.242E	01	1.667E	01	6.020E	01	1.684E	01
5.841E	01	1.702E	01	5.839E	01	1.720E	01	5.538E	01	1.738E	01	5.476E	01	1.757E	01
5.474E	01	1.775E	01	5.474E	01	1.794E	01	5.474E	01	1.813E	01	5.473E	01	1.832E	01
6.092E	01	1.852E	01	6.569E	01	1.871E	01	6.490E	01	1.891E	01	6.489E	01	1.911E	01
6.489E	01	1.932E	01	6.489E	01	1.952E	01	6.489E	01	1.973E	01	6.488E	01	1.993E	01
5.384E	01	2.015E	01	5.203E	01	2.036E	01	5.203E	01	2.057E	01	5.201E	01	2.079E	01
5.201E	01	2.101E	01	5.201E	01	2.123E	01	5.201E	01	2.146E	01	5.201E	01	2.169E	01
5.184E	01	2.192E	01	5.576E	01	2.215E	01	5.961E	01	2.238E	01	5.961E	01	2.262E	01
5.961E	01	2.286E	01	5.960E	01	2.310E	01	5.960E	01	2.335E	01	5.960E	01	2.359E	01
5.892E	01	2.384E	01	5.893E	01	2.410E	01	5.914E	01	2.435E	01	5.915E	01	2.461E	01
5.915E	01	2.487E	01	5.915E	01	2.513E	01	5.915E	01	2.540E	01	5.915E	01	2.567E	01
5.903E	01	2.594E	01	5.596E	01	2.621E	01	5.481E	01	2.649E	01	5.513E	01	2.677E	01
5.507E	01	2.706E	01	5.501E	01	2.734E	01	5.495E	01	2.763E	01	5.493E	01	2.792E	01
5.442E	01	2.822E	01	5.437E	01	2.852E	01	5.404E	01	2.882E	01	5.403E	01	2.913E	01
5.402E	01	2.943E	01	5.402E	01	2.974E	01	5.402E	01	3.006E	01	5.402E	01	3.038E	01
5.363E	01	3.070E	01	5.330E	01	3.103E	01	4.973E	01	3.135E	01	4.972E	01	3.169E	01
4.972E	01	3.202E	01	4.972E	01	3.236E	01	4.972E	01	3.270E	01	4.972E	01	3.305E	01
4.959E	01	3.340E	01	4.947E	01	3.375E	01	4.279E	01	3.411E	01	4.188E	01	3.447E	01
4.183E	01	3.484E	01	4.183E	01	3.520E	01	4.183E	01	3.558E	01	4.183E	01	3.595E	01
4.182E	01	3.634E	01	4.172E	01	3.672E	01	4.172E	01	3.711E	01	4.369E	01	3.750E	01
4.387E	01	3.790E	01	4.387E	01	3.830E	01	4.387E	01	3.870E	01	4.386E	01	3.911E	01
4.381E	01	3.953E	01	4.364E	01	3.995E	01	4.311E	01	4.037E	01	3.720E	01	4.080E	01
3.720E	01	4.123E	01	3.735E	01	4.167E	01	3.797E	01	4.211E	01	3.761E	01	4.255E	01
3.730E	01	4.300E	01	3.743E	01	4.346E	01	3.742E	01	4.392E	01	3.741E	01	4.439E	01
3.243E	01	4.486E	01	3.221E	01	4.533E	01	3.220E	01	4.581E	01	3.219E	01	4.630E	01
3.219E	01	4.678E	01	3.212E	01	4.728E	01	3.201E	01	4.778E	01	3.059E	01	4.829E	01
2.824E	01	4.880E	01	2.824E	01	4.931E	01	2.824E	01	4.984E	01	2.824E	01	5.036E	01
2.824E	01	5.090E	01	2.824E	01	5.144E	01	2.824E	01	5.198E	01	2.718E	01	5.253E	01
2.394E	01	5.309E	01	2.394E	01	5.363E	01	2.394E	01	5.422E	01	2.394E	01	5.479E	01
2.393E	01	5.537E	01	2.393E	01	5.596E	01	2.393E	01	5.655E	01	2.361E	01	5.715E	01
2.075E	01	5.775E	01	2.075E	01	5.837E	01	2.075E	01	5.898E	01	2.075E	01	5.961E	01
2.223E	01	6.024E	01	2.193E	01	6.088E	01	2.167E	01	6.152E	01	2.113E	01	6.217E	01
1.992E	01	6.283E	01	1.989E	01	6.350E	01	2.031E	01	6.417E	01	1.967E	01	6.483E	01
1.962E	01	6.553E	01	1.962E	01	6.623E	01	1.951E	01	6.693E	01	1.958E	01	6.764E	01
1.358E	01	6.835E	01	1.354E	01	6.908E	01	1.356E	01	6.981E	01	1.355E	01	7.055E	01
1.352E	01	7.130E	01	1.351E	01	7.205E	01	1.351E	01	7.281E	01	1.248E	01	7.359E	01
1.147E	01	7.436E	01	1.147E	01	7.515E	01	1.144E	01	7.595E	01	1.142E	01	7.675E	01
1.142E	01	7.756E	01	1.142E	01	7.839E	01	1.142E	01	7.922E	01	1.100E	01	8.005E	01
1.054E	01	8.090E	01	1.055E	01	8.176E	01	1.093E	01	8.262E	01	1.070E	01	8.350E	01
1.066E	01	8.438E	01	1.062E	01	8.527E	01	9.407E	00	8.618E	01	7.633E	00	8.709E	01

7.674E	00	8.801E	01	7.585E	00	8.894E	01	7.582E	00	8.989E	01	7.581E	00	9.084E	01
7.579E	00	9.180E	01	7.563E	00	9.277E	01	6.853E	00	9.375E	01	6.130E	00	9.475E	01
6.134E	00	9.575E	01	6.131E	00	9.676E	01	6.132E	00	9.779E	01	6.134E	00	9.882E	01
6.184E	00	9.987E	01	6.133E	00	1.009E	02	5.295E	00	1.020E	02	5.060E	00	1.031E	02
5.037E	00	1.042E	02	5.037E	00	1.053E	02	5.037E	00	1.064E	02	5.964E	00	1.075E	02
5.599E	00	1.086E	02	4.929E	00	1.098E	02	4.200E	00	1.110E	02	4.171E	00	1.121E	02
4.139E	00	1.133E	02	4.355E	00	1.145E	02	4.032E	00	1.157E	02	4.013E	00	1.170E	02
4.002E	00	1.182E	02	3.279E	00	1.194E	02	3.265E	00	1.207E	02	3.250E	00	1.220E	02
3.236E	00	1.233E	02	3.236E	00	1.246E	02	3.220E	00	1.259E	02	3.205E	00	1.272E	02
3.097E	00	1.286E	02	3.047E	00	1.300E	02	3.041E	00	1.313E	02	3.030E	00	1.327E	02
3.023E	00	1.341E	02	3.007E	00	1.355E	02	2.990E	00	1.370E	02	2.014E	00	1.384E	02
2.010E	00	1.399E	02	2.000E	00	1.414E	02	1.997E	00	1.429E	02	1.994E	00	1.444E	02
1.997E	00	1.459E	02	1.957E	00	1.475E	02	1.861E	00	1.490E	02	1.859E	00	1.506E	02
1.859E	00	1.522E	02	1.859E	00	1.538E	02	1.853E	00	1.554E	02	1.789E	00	1.571E	02
1.542E	00	1.587E	02	1.537E	00	1.604E	02	1.537E	00	1.621E	02	1.533E	00	1.638E	02
1.527E	00	1.656E	02	1.591E	00	1.673E	02	1.529E	00	1.691E	02	1.170E	00	1.709E	02
1.152E	00	1.727E	02	1.145E	00	1.745E	02	1.144E	00	1.764E	02	1.138E	00	1.782E	02
1.159E	00	1.801E	02	9.403E-01	1.820E	02	9.025E-01	1.840E	02	9.003E-01	1.859E	02	9.003E-01	1.859E	02
9.001E-01	1.879E	02	8.946E-01	1.899E	02	8.930E-01	1.919E	02	8.198E-01	1.939E	02	8.198E-01	1.939E	02	8.198E-01
7.690E-01	1.960E	02	7.651E-01	1.980E	02	7.637E-01	2.001E	02	7.716E-01	2.023E	02	7.716E-01	2.023E	02	7.716E-01
7.752E-01	2.044E	02	6.582E-01	2.066E	02	6.126E-01	2.087E	02	6.073E-01	2.110E	02	6.073E-01	2.110E	02	6.073E-01
6.049E-01	2.132E	02	6.010E-01	2.155E	02	6.042E-01	2.177E	02	5.160E-01	2.200E	02	5.160E-01	2.200E	02	5.160E-01
4.960E-01	2.224E	02	4.911E-01	2.247E	02	4.884E-01	2.271E	02	4.882E-01	2.295E	02	4.882E-01	2.295E	02	4.882E-01
4.860E-01	2.319E	02	3.874E-01	2.344E	02	3.871E-01	2.369E	02	3.862E-01	2.394E	02	3.862E-01	2.394E	02	3.862E-01
4.655E-01	2.419E	02	4.310E-01	2.445E	02	4.167E-01	2.471E	02	3.552E-01	2.497E	02	3.552E-01	2.497E	02	3.552E-01
3.582E-01	2.529E	02	3.494E-01	2.550E	02	3.682E-01	2.577E	02	3.387E-01	2.604E	02	3.387E-01	2.604E	02	3.387E-01
3.062E-01	2.632E	02	2.671E-01	2.660E	02	2.668E-01	2.688E	02	2.666E-01	2.716E	02	2.666E-01	2.716E	02	2.666E-01
2.662E-01	2.745E	02	2.630E-01	2.774E	02	2.639E-01	2.803E	02	2.637E-01	2.833E	02	2.637E-01	2.833E	02	2.637E-01
2.323E-01	2.843E	02	2.293E-01	2.893E	02	2.257E-01	2.924E	02	2.128E-01	2.955E	02	2.128E-01	2.955E	02	2.128E-01
1.760E-01	2.986E	02	1.777E-01	3.018E	02	1.709E-01	3.050E	02	1.700E-01	3.082E	02	1.700E-01	3.082E	02	1.700E-01
1.698E-01	3.115E	02	1.676E-01	3.148E	02	1.620E-01	3.181E	02	1.619E-01	3.215E	02	1.619E-01	3.215E	02	1.619E-01
1.600E-01	3.249E	02	1.584E-01	3.283E	02	1.900E-01	3.318E	02	1.524E-01	3.353E	02	1.524E-01	3.353E	02	1.524E-01
1.465E-01	3.389E	02	1.368E-01	3.425E	02	1.354E-01	3.461E	02	1.337E-01	3.497E	02	1.337E-01	3.497E	02	1.337E-01
1.295E-01	3.534E	02	1.119E-01	3.572E	02	1.107E-01	3.610E	02	1.107E-01	3.648E	02	1.107E-01	3.648E	02	1.107E-01
1.102E-01	3.687E	02	9.364E-02	3.725E	02	8.868E-02	3.765E	02	8.984E-02	3.805E	02	8.984E-02	3.805E	02	8.984E-02
8.811E-02	3.845E	02	8.730E-02	3.886E	02	8.505E-02	3.927E	02	8.208E-02	3.968E	02	8.208E-02	3.968E	02	8.208E-02
8.190E-02	4.011E	02	8.151E-02	4.053E	02	8.057E-02	4.096E	02	7.181E-02	4.139E	02	7.181E-02	4.139E	02	7.181E-02
6.518E-02	4.189E	02	6.494E-02	4.227E	02	6.453E-02	4.272E	02	6.928E-02	4.317E	02	6.928E-02	4.317E	02	6.928E-02
6.758E-02	4.343E	02	6.476E-02	4.409E	02	6.347E-02	4.456E	02	6.253E-02	4.503E	02	6.253E-02	4.503E	02	6.253E-02
6.042E-02	4.551E	02	6.013E-02	4.599E	02	5.738E-02	4.648E	02	5.689E-02	4.697E	02	5.689E-02	4.697E	02	5.689E-02
5.442E-02	4.747E	02	5.313E-02	4.797E	02	5.272E-02	4.848E	02	5.708E-02	4.899E	02	5.708E-02	4.899E	02	5.708E-02
5.678E-02	4.951E	02	5.620E-02	5.003E	02	5.633E-02	5.056E	02	5.606E-02	5.110E	02	5.606E-02	5.110E	02	5.606E-02
2.991E-02	5.164E	02	1.256E-02	5.219E	02	1.148E-02	5.274E	02	1.132E-02	5.330E	02	1.132E-02	5.330E	02	1.132E-02
1.113E-02	5.386E	02	1.048E-02	5.443E	02	1.690E-02	5.501E	02	1.304E-02	5.559E	02	1.304E-02	5.559E	02	1.304E-02
1.198E-02	5.618E	02	1.050E-02	5.677E	02	1.030E-02	5.738E	02	9.975E-03	5.798E	02	9.975E-03	5.798E	02	9.975E-03
1.076E-02	5.860E	02	9.092E-03	5.922E	02	8.736E-03	5.984E	02	8.393E-03	6.048E	02	8.393E-03	6.048E	02	8.393E-03
1.195E-02	6.112E	02	1.047E-02	6.177E	02	9.715E-03	6.242E	02	8.529E-03	6.308E	02	8.529E-03	6.308E	02	8.529E-03
7.920E-03	6.375E	02	7.412E-03	6.442E	02	7.823E-03	6.510E	02	6.822E-03	6.579E	02	6.822E-03	6.579E	02	6.822E-03
6.629E-03	6.649E	02	6.570E-03	6.719E	02	1.523E-02	6.791E	02	1.049E-02	6.863E	02	1.049E-02	6.863E	02	1.049E-02
9.075E-03	6.935E	02	8.079E-03	7.009E	02	7.820E-03	7.089E	02	7.411E-03	7.158E	02	7.411E-03	7.158E	02	7.411E-03
8.978E-03	7.233E	02	6.109E-03	7.310E	02	5.375E-03	7.388E	02	7.040E-03	7.466E	02	7.040E-03	7.466E	02	7.040E-03
6.248E-03	7.545E	02	5.801E-03	7.625E	02	5.330E-03	7.705E	02	5.166E-03	7.787E	02	5.166E-03	7.787E	02	5.166E-03
5.095E-03	7.869E	02	5.075E-03	7.953E	02	4.540E-03	8.037E	02	4.493E-03	8.122E	02	4.493E-03	8.122E	02	4.493E-03
6.354E-03	8.208E	02	8.090E-03	8.295E	02	6.494E-03	8.383E	02	5.659E-03	8.472E	02	5.659E-03	8.472E	02	5.659E-03
4.878E-03	8.561E	02	4.644E-03	8.632E	02	4.383E-03	8.743E	02	5.008E-03	8.836E	02	5.008E-03	8.836E	02	5.008E-03
3.865E-03	8.930E	02	5.830E-03	9.024E	02	4.889E-03	9.120E	02	4.538E-03	9.216E	02	4.538E-03	9.216E	02	4.538E-03
4.024E-03	9.314E	02	3.746E-03	9.412E	02	3.664E-03	9.512E	02	3.947E-03	9.613E	02	3.947E-03	9.613E	02	3.947E-03
3.317E-03	9.715E	02	6.692E-03	9.817E	02	5.317E-03	9.921E	02	4.602E-03	1.003E	03	4.602E-03	1.003E	03	4.602E-03
3.876E-03	1.013E	03	3.745E-03	1.024E	03	3.528E-03	1.035E	03	3.981E-03	1.046E	03	3.981E-03	1.046E	03	3.981E-03
3.021E-03	1.057E	03	5.612E-03	1.068E	03	4.138E-03	1.079E	03	3.660E-03	1.091E	03	3.660E-03	1.091E	03	3.660E-03

3.274E-03	1.102E-03	9.158E-03	1.114E-03	9.003E-03	1.126E-03	3.290E-03	1.148E-03
1.945E-02	1.150E-03	1.534E-02	1.162E-03	1.200E-02	1.174E-03	8.392E-03	1.187E-03
7.586E-03	1.199E-03	7.185E-03	1.212E-03	1.176E-02	1.225E-03	4.757E-03	1.238E-03
4.181E-03	1.251E-03	4.078E-03	1.264E-03	3.818E-03	1.278E-03	6.988E-03	1.291E-03
3.595E-03	1.305E-03	3.381E-03	1.319E-03	3.921E-03	1.332E-03	3.690E-03	1.347E-03
3.289E-03	1.361E-03	3.098E-03	1.375E-03	3.001E-03	1.390E-03	2.745E-03	1.405E-03
2.867E-03	1.419E-03	2.531E-03	1.434E-03	2.248E-03	1.450E-03	2.163E-03	1.465E-03
2.149E-03	1.480E-03	2.084E-03	1.496E-03	1.969E-03	1.512E-03	1.878E-03	1.528E-03
1.977E-03	1.544E-03	1.813E-03	1.561E-03	1.647E-03	1.577E-03	1.539E-03	1.594E-03
1.532E-03	1.611E-03	1.484E-03	1.628E-03	1.463E-03	1.645E-03	1.311E-03	1.662E-03
1.222E-03	1.680E-03	1.205E-03	1.698E-03	1.173E-03	1.716E-03	1.166E-03	1.734E-03
1.085E-03	1.752E-03	1.024E-03	1.771E-03	1.006E-03	1.789E-03	9.704E-04	1.808E-03
9.484E-04	1.828E-03	9.299E-04	1.847E-03	9.252E-04	1.866E-03	9.163E-04	1.886E-03
9.005E-04	1.906E-03	8.726E-04	1.926E-03	8.231E-04	1.947E-03	6.970E-04	1.967E-03
6.831E-04	1.988E-03	6.720E-04	2.009E-03	6.564E-04	2.031E-03	6.371E-04	2.052E-03
6.269E-04	2.074E-03	5.813E-04	2.096E-03	5.655E-04	2.118E-03	5.498E-04	2.140E-03
5.444E-04	2.163E-03	5.341E-04	2.186E-03	5.204E-04	2.209E-03	4.638E-04	2.232E-03
4.558E-04	2.256E-03	4.375E-04	2.280E-03	4.281E-04	2.304E-03	4.222E-04	2.329E-03
4.168E-04	2.353E-03	3.927E-04	2.378E-03	3.701E-04	2.403E-03	3.642E-04	2.429E-03
3.565E-04	2.454E-03	3.525E-04	2.480E-03	3.378E-04	2.507E-03	3.304E-04	2.533E-03
2.916E-04	2.560E-03	2.859E-04	2.587E-03	2.836E-04	2.615E-03	2.792E-04	2.642E-03
2.698E-04	2.670E-03	2.641E-04	2.698E-03	2.520E-04	2.727E-03	2.472E-04	2.756E-03
2.435E-04	2.785E-03	2.366E-04	2.815E-03	2.293E-04	2.844E-03	2.262E-04	2.874E-03
2.290E-04	2.905E-03	2.000E-04	2.936E-03	1.789E-04	2.967E-03	1.771E-04	2.998E-03
1.749E-04	3.030E-03	1.738E-04	3.062E-03	1.724E-04	3.094E-03	1.694E-04	3.127E-03
1.581E-04	3.160E-03	1.465E-04	3.194E-03	1.461E-04	3.228E-03	1.450E-04	3.262E-03
1.436E-04	3.296E-03	1.413E-04	3.331E-03	1.370E-04	3.366E-03	1.282E-04	3.402E-03
1.135E-04	3.438E-03	1.128E-04	3.474E-03	1.119E-04	3.511E-03	1.109E-04	3.548E-03
1.106E-04	3.586E-03	1.081E-04	3.624E-03	1.040E-04	3.662E-03	9.728E-05	3.701E-03
9.090E-05	3.740E-03	9.038E-05	3.780E-03	8.975E-05	3.820E-03	8.648E-05	3.860E-03
8.586E-05	3.901E-03	8.340E-05	3.943E-03	7.748E-05	3.984E-03	7.172E-05	4.026E-03
7.273E-05	4.069E-03	6.816E-05	4.112E-03	6.704E-05	4.156E-03	6.647E-05	4.200E-03
6.635E-05	4.244E-03	6.435E-05	4.289E-03	6.073E-05	4.335E-03	5.902E-05	4.380E-03
5.757E-05	4.427E-03	5.702E-05	4.474E-03	5.694E-05	4.521E-03	5.635E-05	4.569E-03
5.341E-05	4.617E-03	4.972E-05	4.666E-03	4.658E-05	4.716E-03	4.548E-05	4.765E-03
4.475E-05	4.816E-03	4.465E-05	4.867E-03	4.418E-05	4.918E-03	4.414E-05	4.971E-03
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3.404E-05	5.239E-03	3.383E-05	5.295E-03	3.341E-05	5.351E-03	3.184E-05	5.407E-03
3.046E-05	5.465E-03	2.835E-05	5.523E-03	2.782E-05	5.581E-03	2.760E-05	5.640E-03
2.720E-05	5.700E-03	2.664E-05	5.760E-03	2.646E-05	5.821E-03	2.608E-05	5.883E-03
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1.028E-05	7.984E-03	9.960E-06	8.069E-03	9.774E-06	8.154E-03	9.658E-06	8.241E-03
9.581E-06	8.328E-03	9.542E-06	8.416E-03	9.330E-06	8.505E-03	9.153E-06	8.595E-03
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2.774E-06	1.324E-04	2.697E-06	1.338E-04	2.572E-06	1.352E-04	2.593E-06	1.366E-04

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1.120E-06	1.778E	04	1.039E-06	1.797E	04	1.025E-06	1.816E	04	9.979E-07	1.835E	04
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8.101E-07	1.934E	04	8.011E-07	1.955E	04	8.059E-07	1.975E	04	8.243E-07	1.996E	04
8.283E-07	2.017E	04	6.906E-07	2.039E	04	6.908E-07	2.060E	04	6.882E-07	2.082E	04
6.881E-07	2.104E	04	7.025E-07	2.126E	04	6.942E-07	2.149E	04	5.885E-07	2.172E	04
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2.925E-07	2.597E	04	3.026E-07	2.625E	04	3.171E-07	2.653E	04	3.634E-07	2.681E	04
3.809E-07	2.709E	04	2.845E-07	2.738E	04	3.296E-07	2.767E	04	4.283E-07	2.796E	04
6.997E-07	2.826E	04	1.137E-08	2.856E	04	1.205E-08	2.886E	04	1.272E-08	2.916E	04
1.542E-08	2.947E	04	1.200E-08	2.978E	04	1.343E-08	3.010E	04	1.754E-08	3.042E	04
3.081E-08	3.074E	04	0.000E 00	3.107E	04	0.000E 00	3.140E	04	0.000E 00	3.173E	04
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0.000E 00	5.783E	04	0.000E 00	5.844E	04	0.000E 00	5.906E	04	0.000E 00	5.969E	04

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