

```

1      FUNCTION RANF0( )
2      IMPLICIT DOUBLE PRECISION (A-H,O-Z)
3      COMMON /CC2/IRAN
4      IRAN=AND(IRAN*50392677,2147483647)
5 C      IRAN=IAND(IRAN*50392677,2147483647)
6      RANF0=IRAN/2147483777.0D0
7      RETURN
8      END
9 C-----
10     FUNCTION GAM(X)
11     IMPLICIT DOUBLE PRECISION (A-H,O-Z)
12     A=X
13     B=1D0
14     10 IF(A.LE.1D0) GOTO 20
15     A=A-1D0
16     B=A*B
17     GOTO 10
18     20 GAM=(1D0-A*(0.577191652-A*(0.988205891-
19     @   A*(0.897056937-A*(0.918206857-A*
20     @   (0.756704078-A*(0.482199394-A*
21     @   (0.193527818-A*0.035868343)))))))*B/A
22     RETURN
23     END
24 C-----
25     FUNCTION ERF(X)
26     IMPLICIT DOUBLE PRECISION (A-H,O-Z)
27     Y=1./(1.+0.3275911D0*X)
28     ERF=1.-Y*(0.254829592D0+Y*(-0.284496736D0+
29     @   Y*(1.421413741D0+Y*(-1.453152027D0+
30     @   Y*1.061405429D0))))*EXP(-X*X)
31     RETURN
32     END
33 C*****
34     PROGRAM JET01
35 C***** C2022
36     PARAMETER (MOL=1200000, NCELL=40000)
37     IMPLICIT DOUBLE PRECISION (A-H,O-Z)
38     COMMON /CC2/IRAN
39     REAL*4 P(3,MOL),PZ1(MOL),PZ2(MOL)
40     REAL*4 CTA(NCELL)
41     DIMENSION LCR(MOL),IP(MOL)
42     DIMENSION IC1(NCELL),IC2(NCELL)
43     DIMENSION SC(8,NCELL),SS(8),OP(50),ASC(8)
44     CHARACTER CHAF*3,FTT*4,FT2*8
45     DIMENSION PRI(4,500),U0(240)
46 C-----
47     IERR=0
48     IERR1=0
49     IERR2=0
50     RVRALL=1E-10

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```

51      RVRGT=0.
52      IRAN=584287
53      PI=3.14159265358979D0
54      SQPI=SQRT(PI)
55 C
56      TEMP=273.+15.
57      TEMPW=TEMP
58      PTOR=50.
59      PPAS=PTOR*101300./760.
60      ANUM=PPAS/(1.3807E-23*TEMP)
61      PRAT=50.
62      ORID=0.0025
63      EZA=ORID*0.5
64      EZA2=EZA*EZA
65 C-----
66      NIS=1
67      K100=5000
68      I9=100000
69      FTT='sjet'
70      KS=164
71      ES0=1.02
72      I2=40
73      KO=I2*6
74 C
75      AMC=0.5
76      ACT=8.0
77 C-----
78      TKN=EZA/I2
79      TKN05=TKN*0.5
80      TKN000=TKN/1000.0
81 C-----
82      AL1=(ES0-1.)/TKN
83      AL2=1./LOG(ES0)
84 C
85      WRITE(*,*) TKN,' =TKN'
86 C=====
87      DO 730 I=1,KO
88 C
89      C05=TKN*(I-1)
90      C25=TKN*I
91      CTT=(C25*C25-C05*C05)*PI
92 C
93      DO 720 J=1,KS
94      N=KS*(I-1)+J
95      T15=TKN*DBLE(ES0)**(J-1)
96      CTA(N)=CTT*T15
97      IF(I.EQ.3) THEN
98          CTA(N-KS*2)=CTA(N)+CTA(N-KS)+CTA(N-KS*2)
99      ELSEIF(I.GE.4) THEN
100         CTA(N-KS*2)=CTA(N)

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```

101      ENDIF
102 720 CONTINUE
103 C
104 730 CONTINUE
105 C
106      NC=KS*(KO-2)
107      WRITE(*,'(A,5I10)') ' NC=== ',NC
108 C=====
109      CH=TKN*TKN*TKN*PI
110      BNUM=ANUM*CH
111      WEI=BNUM/AMC
112 C..... Argon
113      IVSS=0
114      OME=0.81
115      OMEX=OME-0.5
116      OMEY=(1.-2.*OME)+1.0
117      FW=GAM(2.5-OME)
118      IF(IVSS.NE.1) THEN
119          ALP=1.00
120      ELSE
121          ALP=1.40
122          RALP=1./ALP
123      ENDIF
124      AMOL=39.94
125      RGAS=8314.3/AMOL
126      RG2=2.*RGAS
127      AMAS=AMOL/6.02E26
128      BOL=AMAS*RGAS
129      BOL2=2.*BOL
130      AMR=AMAS*0.5
131      HNH=5./3.
132      VISC=2.2E-5
133      DIRM=SQRT(5.*(ALP+1.)*(ALP+2.)*SQRT(AMAS*
134 @      BOL*273./PI)/(4.*ALP*(5.-2.*OME)*
135 @      (7.-2.*OME)*VISC))
136      ACXS=PI*DIRM*DIRM
137      VM=SQRT(2.*RGAS*TEMP)
138      BETA=1./VM
139      AVA=2./SQPI*VM
140      VRM=SQRT(2.)*AVA
141      AMFP=1./(SQRT(2.)*PI*DIRM*DIRM*ANUM*(273./
142 @      TEMP)**(OME-0.5))
143      DEN0=PPAS/(RGAS*TEMP)
144      TAU=AMFP/AVA
145 C
146      RRKN=ORID/AMFP
147 C-----
148      WRITE(*,*) AMAS,DIRM,AMFP,RRKN
149 C
150      VMW=SQRT(RG2*TEMPW)

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```

151      BETAW=1./VMW
152 C-----
153      CMUL=3.0
154      VRMAX=CMUL*VRM
155 C
156      SIG=VRMAX**OMEY
157      SIG2=ACXS*(BOL2*273./AMR)**OMEX/FW
158      SMAX=SIG*SIG2
159 C=====
160      TEX=2./(HMH+1.)*TEMP
161      VTEX=SQRT(RG2*TEX)
162      BETB=1./VTEX
163      EXX=SQRT(HMH*RGAS*TEX)
164      DEN01=(2./(HMH+1.))**(1./(HMH-1.))
165      WRITE(*,*) ' TEX,          EXX,          DEN'
166      WRITE(*,'(3F15.8)') TEX,EXX,DEN01
167 C-----
168      UUM=(EXX+SQRT(EXX*EXX+4.*RGAS*TEX))*0.5
169      CON=-AMAS/(2.*BOL*TEX)
170      UU=UUM*EXP(CON*(UUM-EXX)*(UUM-EXX))
171 C...UU: Maximum value
172      EX=EXX/SQRT(RG2*TEX)
173      USA=EXP(-EX*EX)+SQPI*EX*(1+ERF(EX))
174      FIN0=(1./4.)*DEN01*ANUM*
175      @      SQRT(8.*RGAS*TEX/PI)*USA
176      DFIN0=(1./4.)*ANUM/PRAT*AVA
177      FINB=(1./4.)*ANUM*AVA
178 C
179      NMO=MOL
180 C
181      ES=TKN*(ES0**KS-1.)/(ES0-1.)
182      EO=TKN*KO
183 C
184      DTM=TAU*ACT
185 C
186      FIN=FIN0*EZA*EZA*PI/WEI*DTM
187      DFIN=DFIN0*EO*EO*PI/WEI*DTM
188      DFINS=DFIN*(EO*2.*PI*ES)/(EO*EO*PI)
189 C
190      FINBAS=FINB*EZA*EZA*PI/WEI*DTM
191      write(*,*) fin,dfin,dfins
192 C-----
193      NM=EO*EO*PI*ES*ANUM/PRAT/WEI
194      NMM=NM
195 C2022 -----
196      DO 18 M=1,8
197      18 SS(M)=0.
198      DO 19 L=1,NC
199      SC(1,L)=1E-10
200      DO 19 M=2,8

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201     19 SC(M,L)=0.
202     DO 191 M=1,KO
203     191 U0(M)=0.
204 C-----
205     WRITE(*,*) ' SIMULATE-->1 or  MANAGE-->2'
206     READ(*,*) KDO
207     IF(KDO.EQ.2) GOTO 3354
208 C-----
209     DO 222 J=1,NM
210     PZ1(J)=RANF0()*ES
211     PZ2(J)=EO*SQRT(RANF0())
212 C
213     B=SQRT(-LOG(RANF0()))/BETA
214     A=2.*PI*RANF0()
215     P(1,J)=B*SIN(A)
216     B=SQRT(-LOG(RANF0()))/BETA
217     A=2.*PI*RANF0()
218     P(2,J)=B*SIN(A)
219     B=SQRT(-LOG(RANF0()))/BETA
220     A=2.*PI*RANF0()
221     222 P(3,J)=B*SIN(A)
222 C-----
223 C
224     DO 100 J1=1,I9
225     IF((J1-1).EQ.(J1-1)/10*10) THEN
226     OV=RVRGT/RVRALL
227     WRITE(*,666) J1,NM,NMM,IERR,IERR1,IERR2,OV
228     666 FORMAT(I7,I8,'=NM 'I8,'=NMM ',3I7,F15.7)
229     ENDIF
230 C
231     WRITE(*,'(I7$)') J1
232     DO 24 I=1,NIS
233 C
234     WRITE(*,'(A$)') ' - M'
235     IN=-1
236     N=0
237 C----- MOTION START -----
238 C
239     502 N=N+1
240     X0=PZ1(N)
241     Y0=PZ2(N)
242     U=P(1,N)
243     V=P(2,N)
244     W=P(3,N)
245     IF (IN.LT.0) THEN
246     DTT=DTM
247     ELSE
248     DTT=DTM*RANF0()
249     ENDIF
250     X=X0+U*DTT

```

```

251 C
252     IF (X.LT.0.) THEN
253         DTE=-X0/U
254         S=Y0+V*DTE
255         S2=W*DTE
256         Y2=SQRT(S*S+S2*S2)
257         IF (Y2.LE.EZA) GOTO 504
258         IF(Y2.GE.E0) GOTO 514
259         V=(V*S+W*S2)/Y2
260         W=W*Y0/Y2
261         DTT=DTT-DTE
262 C
263         B=VMW*SQRT(-LOG(RANF0()))
264         A=2.*PI*RANF0()
265         U=VMW*SQRT(-LOG(RANF0()))
266         V=B*SIN(A)
267         W=B*COS(A)
268         X0=TKN000
269         Y0=Y2
270         X=X0+U*DTT
271     ENDIF
272     IF (X.GT.ES) GOTO 514
273     S=Y0+V*DTT
274     S2=W*DTT
275     Y=SQRT(S*S+S2*S2)
276     IF (Y.GE.E0) GOTO 514
277     V=(V*S+W*S2)/Y
278     W=W*Y0/Y
279     GOTO 525
280 C
281     504 SS(2)=SS(2)+1.
282         GOTO 544
283     514 SS(3)=SS(3)+1.
284     544 P(1,N)=P(1,NM)
285         P(2,N)=P(2,NM)
286         P(3,N)=P(3,NM)
287         PZ1(N)=PZ1(NM)
288         PZ2(N)=PZ2(NM)
289         N=N-1
290         NM=NM-1
291         GOTO 25
292 C
293     525 PZ1(N)=X
294         PZ2(N)=Y
295         P(1,N)=U
296         P(2,N)=V
297         P(3,N)=W
298 C
299     25 IF (N.LT.NM) GOTO 502
300     IF (IN.LT.0) GOTO 560

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```

301 C
302     IF (NM.GT.NMM) NMM=NM
303     GOTO 540
304 C
305 C----- FLOW IN NEW MOL. -----
306     560 CONTINUE
307     WRITE(*,'(A$)') 'F'
308 C
309     IN=FIN
310     B2=FIN-IN
311     IF (B2.GT.RANF0()) IN=IN+1
312     SS(5)=SS(5)+FINBAS
313     SS(1)=SS(1)+FIN
314     DO 1002 MI=1,IN
315     NM=NM+1
316     PZ1(NM)=0.
317     PZ2(NM)=EZA*SQRT(RANF0())*0.999999
318 C
319     B=SQRT(-LOG(RANF0()))/BETB
320     A=2.*PI*RANF0()
321     825 U=4.*VTEX*RANF0()
322     AA=U-EXX
323     UB=U*EXP(CON*AA*AA)/UU
324     IF (RANF0().GT.UB) GOTO 825
325     P(1,NM)=U
326     P(2,NM)=B*SIN(A)
327     1002 P(3,NM)=B*COS(A)
328 C
329     IF (NM.GT.NMO) THEN
330     WRITE(*,'(A)') ' ??? OVER MOL.(1) ???'
331     STOP
332     ENDIF
333 C----- FLOW IN NEW MOL FROM DOWNSTREAM. -----
334 C
335     WRITE(*,'(A$)') 'D'
336     IN=DFINS
337     B2=DFINS-IN
338     IF (B2.GT.RANF0()) IN=IN+1
339     SS(4)=SS(4)+DFINS
340     DO 2001 MI=1,IN
341     NM=NM+1
342     PZ1(NM)=ES*RANF0()
343     PZ2(NM)=EO
344 C
345     B=SQRT(-LOG(RANF0()))/BETA
346     A=2.*PI*RANF0()
347     P(1,NM)=B*SIN(A)
348     P(3,NM)=B*COS(A)
349     2001 P(2,NM)=-SQRT(-LOG(RANF0()))/BETA
350 C

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```

351     IF (NM.GT.NMO) THEN
352     WRITE(*,'(A)') ' ??? OVER MOL.(2) ???'
353     STOP
354     ENDIF
355 C
356     IN=DFIN
357     B2=DFIN-IN
358     IF (B2.GT.RANF0()) IN=IN+1
359     SS(4)=SS(4)+DFIN
360     DO 2002 MI=1,IN
361     NM=NM+1
362     PZ1(NM)=ES
363     PZ2(NM)=EO*SQRT(RANF0())
364 C2022
365     KU=PZ2(NM)/TKN-1.00001
366     IF(KU<1) KU=1
367     P(1,NM)=-SQRT(-LOG(RANF0()))/BETA+U0(KU)
368     B=SQRT(-LOG(RANF0()))/BETA
369     A=2.*PI*RANF0()
370     P(2,NM)=B*SIN(A)
371 2002 P(3,NM)=B*COS(A)
372 C
373     IF (NM.GT.NMO) THEN
374     WRITE(*,'(A)') ' ??? OVER MOL.(3) ???'
375     STOP
376     ENDIF
377     GOTO 502
378 C -----IDENT-----
379 540 WRITE(*,'(A$)') 'I'
380 C
381     DO 135 N=1,NM
382 C
383     IF(PZ1(N).LT.0.) THEN
384     PZ1(N)=1.E-10
385     IERR=IERR+1
386     ENDIF
387     IF(PZ2(N).LT.0.) THEN
388     PZ2(N)=1.E-10
389     IERR1=IERR1+1
390     ENDIF
391 C
392     A=LOG(AL1*PZ1(N)+1.)*AL2
393     II=A+0.999999D0
394     IF(II.EQ.0) II=1
395 C
396     JJ=DBLE(PZ2(N))/TKN+0.999999D0
397     IF(JJ.LE.3) THEN
398     JJ=1
399     ELSE
400     JJ=JJ-2

```



```

401         ENDIF
402 C
403         IP(N)=KS*(JJ-1)+II
404         IF(IP(N).GT.NC) THEN
405             IP(N)=NC
406             IERR2=IERR2+1
407         ENDIF
408 C
409     135 CONTINUE
410 C
411 C-----INDEX-----
412     WRITE(*,'(A$)') 'X'
413 C
414         DO 27 N=1,NC
415     27 IC1(N)=0
416         DO 28 M=1,NM
417             N=IP(M)
418     28 IC1(N)=IC1(N)+1
419             K=0
420         DO 29 N=1,NC
421             IC2(N)=K
422             K=K+IC1(N)
423     29 IC1(N)=0
424         DO 30 M=1,NM
425             N=IP(M)
426             IC1(N)=IC1(N)+1
427             K=IC2(N)+IC1(N)
428     30 LCR(K)=M
429 C
430 C----- COLLISION -----
431     WRITE(*,'(A$)') 'C'
432 C
433     DO 3241 N=1,NC
434 C
435         IF(IC1(N).LT.2) GOTO 3241
436         AUT=IC1(N)*(IC1(N)-1.0)*WEI*SMAX/(2.*CTA(N))
437         CN=AUT*DTM
438         ICN=INT(CN)
439         COCN=CN-ICN
440         IF(RANF0().LT.COCN) ICN=ICN+1
441 C
442         DO 367 IH=1,ICN
443 C
444             K=DBLE(RANF0())*IC1(N)+IC2(N)+0.9999999D0
445 C
446             IF(K.EQ.IC2(N)) K=K+1
447             L=LCR(K)
448 C
449             K2=DBLE(RANF0())*(IC1(N)-1)+IC2(N)+
450 @     0.9999999D0

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```

451      IF(K2.EQ.IC2(N)) K2=K2+1
452      IF(K.EQ.K2) K2=IC1(N)+IC2(N)
453      M=LCR(K2)
454 C
455      VRC1=P(1,L)-P(1,M)
456      VRC2=P(2,L)-P(2,M)
457      VRC3=P(3,L)-P(3,M)
458 C
459      VR=SQRT(VRC1*VRC1+VRC2*VRC2+VRC3*VRC3)
460 C
461      RVRALL=RVRALL+1.
462      IF(VR.GT.VRMAX) RVRGT=RVRGT+1.
463      B=VR**OMEY/SIG
464      A=RANF0()
465      IF(A.GE.B) GOTO 367
466 C
467      IF(IVSS.NE.1) THEN
468          B=2.*RANF0()-1.
469          A=SQRT(1.-B*B)
470          VRC1=B*VR
471          B=2.*PI*RANF0()
472          VRC2=A*COS(B)*VR
473          VRC3=A*SIN(B)*VR
474      ELSE
475          B=2.*(RANF0())**RALP)-1.
476          A=SQRT(1.-B*B)
477          C=2.*PI*RANF0()
478          CO=COS(C)
479          SI=SIN(C)
480          D=SQRT(VRC2*VRC2+VRC3*VRC3)
481          IF(D.GT.1.E-6) THEN
482              V1T=B*VRC1+A*SI*D
483              V2T=B*VRC2+A*(VR*VRC3*CO-VRC1*VRC2*SI)/D
484              VRC3=B*VRC3-A*(VR*VRC2*CO+VRC1*VRC3*SI)/D
485              VRC1=V1T
486              VRC2=V2T
487          ELSE
488              V1T=B*VRC1
489              VRC2=A*CO*VRC1
490              VRC3=A*SI*VRC1
491              VRC1=V1T
492          ENDIF
493      ENDIF
494 C
495      SC(8,N)=SC(8,N)+1.
496 C
497      VCCM=0.5*(P(1,L)+P(1,M))
498      P(1,L)=VCCM+VRC1*0.5
499      P(1,M)=VCCM-VRC1*0.5
500      VCCM=0.5*(P(2,L)+P(2,M))

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```

501      P(2,L)=VCCM+VRC2*0.5
502      P(2,M)=VCCM-VRC2*0.5
503      VCCM=0.5*(P(3,L)+P(3,M))
504      P(3,L)=VCCM+VRC3*0.5
505      P(3,M)=VCCM-VRC3*0.5
506 C
507 367 CONTINUE
508 C
509 3241 CONTINUE
510 C
511 24 CONTINUE
512 C-----
513 C
514      DO 23 M=1,NM
515 C
516      N=IP(M)
517      SC(1,N)=SC(1,N)+1.
518      SC(2,N)=SC(2,N)+P(1,M)
519      SC(3,N)=SC(3,N)+P(2,M)
520      SC(4,N)=SC(4,N)+P(3,M)
521      SC(5,N)=SC(5,N)+P(1,M)*P(1,M)
522      SC(6,N)=SC(6,N)+P(2,M)*P(2,M)
523      SC(7,N)=SC(7,N)+P(3,M)*P(3,M)
524 C
525 23 CONTINUE
526 C
527      WRITE(*,'(A,2I9)') ' E ',NM,NMM
528 C
529      II22=J1/K100
530      IF(J1.EQ.II22*K100) THEN
531      KEIZOK=II22
532          LC1=MOD(KEIZOK,10)+48
533          LC2=MOD(KEIZOK/10,10)+48
534          IF(KEIZOK.LT.100) THEN
535          CHAF=CHAR(LC2)//CHAR(LC1)
536          ELSE
537          LC3=MOD(KEIZOK/100,10)+48
538          CHAF=CHAR(LC3)//CHAR(LC2)//CHAR(LC1)
539          ENDIF
540          FT2=FTT//'c'//CHAF
541 C2022-----
542      OPEN(3,FILE=FT2,STATUS='UNKNOWN')
543      WRITE(3,'(I8)') NC
544      DO 451 N=1,NC
545      WRITE(3,466) (SC(L,N),L=1,7)
546 466 FORMAT(12E15.7)
547      N3=MOD(N-1,KS)+1
548      IF(N3==KS) THEN
549      N2=(N-1)/KS+1
550      U0(N2)=(SC(2,N-2)/SC(1,N-2)+

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551      @      SC(2,N-1)/SC(1,N-1)+SC(2,N)/SC(1,N))/3
552      ENDIF
553  451 CONTINUE
554      CLOSE(3)
555 C-----
556      A=NIS*DTM*K100/WEI
557      DO 140 M=4,8
558  140 OP(M)=SS(M-3)/A
559      OP(11)=A
560      OP(12)=(OP(6)-OP(7))/OP(8)
561      OP(13)=(OP(4)-OP(5))/OP(8)
562 C
563      DO 42 N=1,2
564  42 PRI(N,KEIZOK)=OP(N+11)
565 C
566      J0=KEIZOK
567      OPEN(9,FILE=FTT//'4',STATUS='UNKNOWN')
568      DO 43 N=1,2
569      WRITE(9,'(I8,F12.7)') 1,PRI(N,1)
570      DO 402 K=1,J0-1
571      I2=J0-K
572 c
573      S=0
574      DO 404 K1=K,J0
575  404 S=S+PRI(N,K1)
576      S=S/(I2+1)
577 c
578      WRITE(9,'(I8,F12.7,I10,F12.7)')
579      @      K+1,PRI(N,K+1),I2+1,S
580  402 CONTINUE
581      write(9,*) ' -----'
582 C
583  43 CONTINUE
584      CLOSE(9)
585 C
586      DO 118 M=1,8
587  118 SS(M)=0.
588      DO 119 L=1,NC
589      SC(1,L)=1E-10
590      DO 119 M=2,8
591  119 SC(M,L)=0.
592 C
593      ENDIF
594 C
595  100 CONTINUE
596 C
597      STOP
598 C=====
599  3354 WRITE(*,*) ' ***** DATA MANAGEMENT *****'
600      WRITE(*,*) ' INPUT X LIMIT..... 10 ?'

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```

601      READ(*,*) XLIM
602      WRITE(*,*) ' INPUT START No. '
603      READ(*,*) KDO1
604      WRITE(*,*) ' INPUT LAST No. '
605      READ(*,*) KDO2
606 C
607      KKD=KDO2-KDO1+1
608      DO 3355 I=KDO1,KDO2
609      WRITE(*,*) I
610 C
611          LC1=MOD(I,10)+48
612          LC2=MOD(I/10,10)+48
613          IF(I.LT.100) THEN
614              CHAF=CHAR(LC2)//CHAR(LC1)
615          ELSE
616              LC3=MOD(I/100,10)+48
617              CHAF=CHAR(LC3)//CHAR(LC2)//CHAR(LC1)
618          ENDIF
619          FT2=FTT//'c'//CHAF
620 C
621      OPEN(3,FILE=FT2,STATUS='UNKNOWN')
622      READ(3,'(I8)') NC
623      DO 4513 N=1,NC
624      READ(3,466) (ASC(L),L=1,7)
625      DO 4514 L=1,7
626 4514 SC(L,N)=SC(L,N)+ASC(L)
627 4513 CONTINUE
628      CLOSE(3)
629 C
630 3355 CONTINUE
631 C
632      DO 301 N=1,NC
633      DO 301 L=1,7
634 301 SC(L,N)=SC(L,N)/KKD
635 C
636      N=0
637      OPEN(8,FILE='OUTD',STATUS='UNKNOWN')
638      DO 302 I=1,KO-2
639      IF(I.EQ.1) THEN
640          C2=TKN*1.5
641      ELSE
642          C2=TKN*(I+1.5)
643      ENDIF
644      DO 303 J=1,KS
645      N=N+1
646      C15=TKN*(DBLE(ES0)**(J-1)-1.)/(ES0-1.)
647      T15=TKN*DBLE(ES0)**(J-1)*0.5
648      C1=C15+T15
649      XZ=C1/(2.*EZA)
650      YZ=C2/(2.*EZA)

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651      IF(XZ.GT.XLIM) GOTO 303
652      OP(1)=SC(1,N)
653      OP(2)=OP(1)/(AMC*K100)
654      OP(3)=OP(2)*CH/CTA(N)
655      OP(4)=SC(2,N)/OP(1)
656      OP(5)=SC(3,N)/OP(1)
657      OP(6)=SC(4,N)/OP(1)
658      OP(7)=(SC(5,N)/OP(1)-OP(4)*OP(4))/RGAS
659      OP(8)=(SC(6,N)/OP(1)-OP(5)*OP(5))/RGAS
660      OP(9)=(SC(7,N)/OP(1)-OP(6)*OP(6))/RGAS
661      OP(10)=(OP(7)+OP(8)+OP(9))/3.
662      OP(11)=(OP(8)+OP(9))/2.
663      OP(12)=SQRT((OP(4)*OP(4)+OP(5)*OP(5)+
664      @      OP(6)*OP(6))/(HMH*RGAS*OP(10)))
665      WRITE(8,93) XZ,YZ,OP(3),OP(4)/VM,OP(5)/VM,
666      @      OP(10)/TEMP,OP(7)/TEMP,OP(11)/TEMP,OP(12)
667      93 FORMAT(10E15.7)
668      303 CONTINUE
669      WRITE(8,'(1X)')
670      302 CONTINUE
671      CLOSE(8)
672 C
673      WRITE(*,*) '      E N D '
674      STOP
675 C
676      END
677

```