ADF37: Non-Maxwellian distribution function files

Provides a specification of isotropic non-Maxwellian electron distributiuon functions suitable for use in conversion of collision strengths to rate coefficient. The format has two categories, namely, a purely numerical form and a superposition form. The latter is based hierarchically on basis distribution families.

Utilising subroutines :

ADAS809

Formatted files to ADF37 specification :

Database Status	Date = March 17, 2003	Data type =	Data root =/.../adas/adas/adf37/

unspecified

Type 1 data lines :	*Format:*
TITLE	1a80
ICATEG	i5
IEUNIT	i5
IFAMIL	i5
NMEMB	i5
For I=1 to NFAMIL	
FILNAM(I)	1a120
repeat	
FILOUT	1a120
For I=1 to NMEMB	

INDX(I), (CALGEB(I,J),J=1,NFAMIL),EALGEB(I) i5,5a25

repeat

variable identification :

name	*meaning*
title	header for file
iacteg	category of file (1 => superposition; 2=> numerical
ieunit	energy units of distribution function (1=> K ; 2 => eV
nfamil	number of distribution function families accessed
nmemb	number of members in the output family
filnam()	file names of input families
filout	file name of output family

Table B37c – example of a family superposition file.

```
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    1             ; format of file 1 => superposition; 2 => numerical
    1                      ; energy units 1 => K; 2=> eV
    2                      ; component families
   14             ; number of elements in output adf04 file family

family input
------------
    index   family file name                                    layer
    -----   ----------------                                    -----
     1     /home/adas/adas/adf37/pwl#1/e10as14.dat               1
     2     /home/adas/adas/adf37/lft#1/l03ls14.dat               1

adf04 output
------------
          /home/summers/adas/pass/a37-a04.dat

composition
------------
```

```
index   algebra 1            algebra 2             E-parm algebra
-----   ---------            ---------             --------------
  1     0.5*f1(1)            0.5*f2(14)            0.5*E1(1)+0.5*E2(14)
  2     0.5*f1(2)            0.5*f2(14)            0.5*E1(2)+0.5*E2(14)
  3     0.5*f1(3)            0.5*f2(14)            0.5*E1(3)+0.5*E2(14)
  4     0.5*f1(4)            0.5*f2(14)            0.5*E1(4)+0.5*E2(14)
  5     0.5*f1(5)            0.5*f2(14)            0.5*E1(5)+0.5*E2(14)
  6     0.5*f1(6)            0.5*f2(14)            0.5*E1(6)+0.5*E2(14)
  7     0.5*f1(7)            0.5*f2(14)            0.5*E1(7)+0.5*E2(14)
  8     0.5*f1(8)            0.5*f2(14)            0.5*E1(8)+0.5*E2(14)
  9     0.5*f1(9)            0.5*f2(14)            0.5*E1(9)+0.5*E2(14)
 10     0.5*f1(10)           0.5*f2(14)            0.5*E1(10)+0.5*E2(14)
 11     0.5*f1(11)           0.5*f2(14)            0.5*E1(11)+0.5*E2(14)
 12     0.5*f1(12)           0.5*f2(14)            0.5*E1(12)+0.5*E2(14)
 13     0.5*f1(13)           0.5*f2(14)            0.5*E1(13)+0.5*E2(14)
 14     0.5*f1(14)           0.5*f2(14)            0.5*E1(14)+0.5*E2(14)
c-----------------------------------------------------------------------
c  Description:     template of adf37 type 1 (superposition)
c  Author:          Hugh Summers
c  Date:            6 August 2002
c  Updates:
c-----------------------------------------------------------------------
```

Type 2 data lines : *Format:*

TITLE	1a80
ICATEG	i5
IEUNIT	i5
NENERG	i5
(EA(I),I=1,NENERG)	7d10.2
(FA(I),I=1,NENERG)	7d10.2

variable identification :

name	*meaning*
title	header for file
iacteg	category of file (1 => superposition; 2=> numerical

ieunit	energy units of distribution function (1=> K ; 2 => eV
nenerg	number of energy points for distribution function tabulation
ea()	energy points of tabulation
fa()`	distribution function tabulation

Table B37cd– example of a numerical file.

```
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    2               ; format of file 1 => superposition; 2 => numerical
    1               ; energy units 1 => K; 2=> eV
   52             ; number of tabulated values
  1.00e+00  2.00e+00  3.00e+00  4.00e+00  5.00e+00  6.00e+00  7.00e+00
  8.00e+00  9.00e+00  1.00e+01  1.20e+01  1.50e+01  2.00e+01  3.00e+01
  4.00e+01  5.00e+01  6.00e+01  7.00e+01  8.00e+01  1.00e+02  1.50e+02
  2.00e+02  3.00e+02  4.00e+02  5.00e+02  6.00e+02  7.00e+02  8.00e+02
  9.00e+02  1.00e+03  1.20e+03  1.50e+03  2.00e+03  3.00e+03  7.00e+03
  8.00e+04  1.00e+05  1.50e+05  2.00e+05  3.00e+05  4.00e+05  5.00e+05
  6.00e+05  7.00e+05  8.00e+05  9.00e+05  1.00e+06  1.20e+06  1.50e+06
  2.00e+06  3.00e+06  7.00e+06
  3.59e-02  4.05e-02  4.73e-02  5.45e-02  6.44e-02  8.31e-02  1.01e-01
  1.20e-01  1.45e-01  1.60e-01  1.71e-01  1.80e-01  1.83e-01  1.86e-01
  2.05e-02  2.88e-02  4.01e-02  4.56e-02  4.50e-02  3.49e-02  2.44e-02
  1.53e-02  7.34e-03  3.97e-03  2.09e-03  8.64e-04  4.38e-04  2.21e-04
  1.41e-02  2.41e-02  5.64e-02  1.15e-01  2.29e-01  5.03e-01  8.18e-01
  1.30e-02  1.38e-02  1.39e-02  1.28e-02  1.07e-02  7.27e-03  4.89e-03
  3.06e-03  1.50e-03  8.27e-04  4.41e-04  1.86e-04  9.48e-05  4.80e-05
  8.05e-03  9.31e-03  1.06e-02
c-----------------------------------------------------------------------
c  Description:     template of adf37 type 2 (numerical)
c  Author:          Hugh Summers
c  Date:            6 August 2002
c  Updates:
c-----------------------------------------------------------------------
```