ADF15: photon emissivity coefficients

Provides photon emissivity coefficients. Formatting conventions and variable storage are given below.

Utilising subroutines :

ADAS405 ADAS406 ADAS409 ADAS503

Formatted files to ADF15 specification :

Database Status Data type = pec files Data root = /.../adas/adas/adf15/

Element	*Members*	*Prefix*	*Library*	*Resolution*	*Comments*	*Quality*
B	b0,b1,b2,b3,b4	llu,llr	pec93#b	LS	Dickson '93	moderate
Be	be0,be1,be2,be3	llu,llr,pju,pjr	pec93#be	LS	Dickson '93	good
C	c0,c1,c2,c3	llu,llr,pju,pjr	pec93#c	LS	Dickson '93	good
Cr	cr0	llu,llr	pec93#cr	LS	Summers & Badnell '95	good
He	he0	llu,llr,pju,pjr	pec93#he	LS	Dickson '93	good
Mo	mo0	llu,llr	pec93#mo	LS	Summers & Badnell '95	good
N	n4	llu,llr	pec93#n	LS	Summers '95	good
O	o1,o4,o5	llu,llr,pju,pjr	pec93#o	LS	Dickson '93	good
H	h0	pju,pjr	pec96#h	LS	GCR Project	high
He	he0,he1	pju,pjr	pec96#he	LS	GCR Project	high
Li	li0,li1, li2	pju,pjr	pec96#li	LS	GCR Project	high
Be	be0,be1,be2,be3	pju,pjr	pec96#be	LS	GCR Project	high
C	c0- c5	pju,pjr	pec96#c	LS	GCR Project	high
C	c0 ,c1 ,c2	vsu,vsr	pec96#c	LS	GCR Project (visible spectral range)	high
N	n0 –n6	pju,pjr	pec96#n	LS	GCR Project	high
O	o0 – 07	pju,pjr	pec96#o	LS	GCR Project	high
Ne	ne0 – ne9	pju,pjr	pec96#ne	LS	GCR Project	high
Si	si0 – si13	pju,pjr	pec96#si	LS	GCR Project	high

Notes:
1. Prefixes are as follow: 'llu' => low level, metastable unresolved; 'llr'=> low level, metastable resolved; 'pju'=> including projection matrices, metastable unresolved; 'pjr'=> including projection matrices, metastable resolved.
2. pec96 data for hydrogenic ions are calculated using an infinite n-shell dedicated hydrogenic ion code (ADAS310 - variant); all other data are calculated using ADAS208.
3. 1996 is now the year number used for the output from the GCR Project. They are available both in relation to resolved and unresolved metastables and are an update on O'Mullane & Summers, 1996

Data lines : *Format:*

NSEL, TEXT	i5,4x,'/',c35,'/'	
for ISEL= 1 to NSEL		
WLNG , NDENS , NTE , FILMEM, TYPE , INDM , ISEL	f9, 'A',2i4,2c8,i2,i5	NB. '/' & 'code=' delimited
(DENS(IN), IN=1,NDENS)	8e9.2	
(TE(IT), IT=1,NTE)	8e9.2	
for IN = 1 to NDENS		
(PEC(IN,IT), IT=1,NTE)	8e9.2	
repeat		
repeat		

variable identification :

name	*meaning*
NSEL	number of transitions available
TEXT	information
WLNG	wavelength of transition (Ang)
NDENS	number of densities
NTE	number of temperatures
FILMEM	source specific ion excitation file
TYPE	type of photon emissivity (excit, recomb, cx)
INDM	associated metastable index in source file
ISEL	transition index
DENS()	electron densities (cm-3)
TE()	electron temperatures (eV)
PEC(,)	finite density photon emissivity coefficients (cm3 s-1)
	1st parameter electron density index
	2nd parameter electron temperature index

Example

```
   45    /HE+ 0 PHOTON EMISSIVITY COEFFICIENTS/
   584.4 A  24  24 /FILMEM =         /TYPE = EXCIT    /INDM = 1/ISEL =    1
 1.00E+01 1.00E+02 1.00E+03 1.00E+04 1.00E+05 1.00E+06 3.00E+06 1.00E+07
 3.00E+07 1.00E+08 3.00E+08 1.00E+09 3.00E+09 1.00E+10 3.00E+10 1.00E+11
 3.00E+11 1.00E+12 3.00E+12 1.00E+13 3.00E+13 1.00E+14 3.00E+14 1.00E+15
 4.31E-02 6.03E-02 8.62E-02 1.29E-01 1.72E-01 2.59E-01 4.31E-01 6.03E-01
 8.62E-01 1.29E+00 1.72E+00 2.59E+00 4.31E+00 6.03E+00 8.62E+00 1.29E+01
 1.72E+01 2.59E+01 4.31E+01 6.03E+01 8.62E+01 1.29E+02 1.72E+02 2.59E+02
 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 2.82E-30 3.22E-24
 1.08E-19 3.52E-16 2.00E-14 1.15E-12 3.02E-11 1.27E-10 3.90E-10 9.81E-10
 1.60E-09 2.69E-09 4.19E-09 5.12E-09 5.95E-09 6.66E-09 7.00E-09 7.20E-09
 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 2.82E-30 3.22E-24
 1.08E-19 3.52E-16 2.00E-14 1.15E-12 3.02E-11 1.27E-10 3.90E-10 9.81E-10
 1.60E-09 2.69E-09 4.19E-09 5.12E-09 5.95E-09 6.66E-09 7.00E-09 7.20E-09
 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 2.82E-30 3.22E-24
 1.08E-19 3.52E-16 2.00E-14 1.15E-12 3.02E-11 1.27E-10 3.90E-10 9.81E-10
 1.60E-09 2.69E-09 4.19E-09 5.12E-09 5.95E-09 6.66E-09 7.00E-09 7.20E-09
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        .
        .
        .

 1.07E-19 3.29E-16 1.79E-14 9.69E-13 2.43E-11 1.01E-10 3.05E-10 7.65E-10
 1.25E-09 2.13E-09 3.38E-09 4.19E-09 4.95E-09 5.65E-09 6.01E-09 6.29E-09
 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.00E-74 1.59E-44 2.59E-30 2.93E-24
 9.49E-20 2.86E-16 1.52E-14 7.95E-13 1.90E-11 7.69E-11 2.29E-10 5.64E-10
 9.19E-10 1.56E-09 2.51E-09 3.14E-09 3.76E-09 4.36E-09 4.71E-09 5.03E-09
4923.2 A  24  24 /FILMEM =         /TYPE = RECOM    /INDM =+1/ISEL =   45
 1.00E+01 1.00E+02 1.00E+03 1.00E+04 1.00E+05 1.00E+06 3.00E+06 1.00E+07
 3.00E+07 1.00E+08 3.00E+08 1.00E+09 3.00E+09 1.00E+10 3.00E+10 1.00E+11
 3.00E+11 1.00E+12 3.00E+12 1.00E+13 3.00E+13 1.00E+14 3.00E+14 1.00E+15
 4.31E-02 6.03E-02 8.62E-02 1.29E-01 1.72E-01 2.59E-01 4.31E-01 6.03E-01
 8.62E-01 1.29E+00 1.72E+00 2.59E+00 4.31E+00 6.03E+00 8.62E+00 1.29E+01
 1.72E+01 2.59E+01 4.31E+01 6.03E+01 8.62E+01 1.29E+02 1.72E+02 2.59E+02
 7.95E-14 5.90E-14 5.27E-14 7.86E-14 1.12E-13 1.56E-13 1.68E-13 1.47E-13
 1.14E-13 7.83E-14 5.73E-14 3.51E-14 1.86E-14 1.32E-14 1.19E-14 1.58E-14
 1.98E-14 2.24E-14 1.87E-14 1.44E-14 1.01E-14 5.66E-15 3.66E-15 1.98E-15
 7.99E-14 5.90E-14 4.99E-14 6.50E-14 8.67E-14 1.15E-13 1.22E-13 1.06E-13
 8.22E-14 5.64E-14 4.12E-14 2.50E-14 1.33E-14 9.83E-15 9.83E-15 1.46E-14
        .
        .
        .
        .

 2.21E-16 1.86E-16 1.41E-16 1.09E-16 7.69E-17 4.69E-17 3.22E-17 1.91E-17
 1.67E-09 3.72E-10 7.14E-11 1.11E-11 3.24E-12 7.19E-13 1.47E-13 5.89E-14
 2.46E-14 1.01E-14 5.70E-15 2.68E-15 1.11E-15 6.38E-16 3.69E-16 2.14E-16
 1.55E-16 1.06E-16 6.72E-17 4.84E-17 3.27E-17 1.95E-17 1.33E-17 7.80E-18
C-----------------------------------------------------------------------
C
C  PHOTON EMISSIVITY COEFFICIENTS:
C
C  SOURCE SPECIFIC ION   FILE:/home/mog/adas/adf04/helike/helike_kvi97#he0.dat
C  SOURCE IONIS. COEFFT. FILE:/u/adas/adas/adf07/szd93#he/szd93#he_he0.dat
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```
C  META. ION. COEFF. SELECTOR:  1(1,1)
C                              2(2,1)
C  POPULATION PROCESSING CODE:  ADAS208
C
C  ISEL  WAVELENGTH      TRANSITION            TYPE    METASTABLE  IMET NMET  IP
C  ----  ----------  ------------------------  -----  ------------ ---- ----  --
C   1.      584.4     5(1)1( 1.0)- 1(1)0(  .0)  EXCIT   1(1)0(  .0)   1     2
C   2.      537.0    11(1)1( 1.0)- 1(1)0(  .0)  EXCIT   1(1)0(  .0)   1     2
C   3.      522.2    19(1)1( 1.0)- 1(1)0(  .0)  EXCIT   1(1)0(  .0)   1     2
C   4.     5017.1    11(1)1( 1.0)- 3(1)0(  .0)  EXCIT   1(1)0(  .0)   1     2
C   5.     3965.7    19(1)1( 1.0)- 3(1)0(  .0)  EXCIT   1(1)0(  .0)   1     2

                          .       .       .

C  38.     7067.6     6(3)0( 1.0)- 4(3)1( 4.0)  RECOM  SEE                    +1
C  39.     5877.5     9(3)2( 7.0)- 4(3)1( 4.0)  RECOM  SEE                    +1
C  40.     4714.8    12(3)0( 1.0)- 4(3)1( 4.0)  RECOM  SEE                    +1
C  41.     4472.9    15(3)2( 7.0)- 4(3)1( 4.0)  RECOM  SEE                    +1
C  42.     7283.3     7(1)0(  .0)- 5(1)1( 1.0)  RECOM  SEE                    +1
C  43.     6680.0    10(1)2( 2.0)- 5(1)1( 1.0)  RECOM  SEE                    +1
C  44.     5049.0    13(1)0(  .0)- 5(1)1( 1.0)  RECOM  SEE                    +1
C  45.     4923.2    16(1)2( 2.0)- 5(1)1( 1.0)  RECOM  SEE                    +1
C
C   NOTES:  PROCESSED 19.11.97
C
C-------------------------------------------------------------------------------
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