ADF42: driver data-sets for ADAS810 and ADAS8#10 calculations

Provides driver datasets for ADAS810 envelope feature emissivity coefficient calculation. Note the drivers may also be used in offline production via the code ADAS8#10.

Utilising subroutines :

ADAS810 ADAS8#10

Data lines : (comprises fortran namelists followed by blank line separated vector data) *Format:*

Namelists

&FILES
DSN04, DSN18, DSN35, DSN15, DSN40, DSN11, DSN11F, DSN11E
&END

&ION
ELEMENT, Z0, Z1, IP
&END

&META
LNORM, NMET, IMETR(1), IMETR(2), IMETR(3), IMETR(4)
&END

&PROCESS
LIOSEL, LHSEL, LRSEL, LISEL, LNSEL, LPSEL, ZEFF
&END

&OUTPUT
LMETR, LBELOWIP, LTSCL, LDSCL, LBRDI, AMIN,
NUMTE, NUMTION, NUMTH, NUMDENS, NUMDION, NUMWVL
&END

C80	1a80
(TE(I),I=1,NTEMP)	4e10.3

C80	1a80
(DENS(I),I=1,NDENS)	4e10.3
C80	1a80
for I=1,NWVRG until blank line	
NPIXA(I),WVMINA(),WVMAXA()	i5,2e10.3
repeat	
C80	1a80

variable identification :

name	*meaning*
DSN04	ADF04 input file name
DSN11	ADF11 line power output file name
DSN11F	ADF11 filtered line power output file name
DSN11E	ADF11 energy-resolved line power output file name
DSN15	ADF15 *pec* output file name
DSN18	ADF18 projection file name
DSN35	ADF35 energy resolved filter file name
DSN40	ADF40 *feature pec* output file name
ELEMENT	element symbol
Z0	nuclear charge
Z1	ion charge + 1
IP	ionisation potential (cm-1)
LNORM	‘true ’ => normalise to stage population; ‘false’ => normalise to ground population
IMETR(i)	index of i^{th} designated metastable in level list

LIOSEL	‘true ’ => include ionisation from excited states; ‘false’ => do not include ionisation
LHSEL	‘true ’ => include CX from neutral hydrogen; ‘false’ => do not include CX
LRSEL	‘true ’ => include recombination to excited levels; ‘false’ => do not include recombination
LISEL	‘true ’ => include inner shell ionisation; ‘false’ => do not include inner shell ionisation
LNSEL	‘true ’ => include projection data; ‘false’ => do not include projection data
LPSEL	‘true ’ => include proton impact collisions; ‘false’ => do not include proton impact
ZEFF	effective ion charge
LMETR	‘true ’ => metastable resolved; ‘false’ => metastable unresolved
LBELOWIP	‘true ’ => only include transitions with energy levels below the ionisation potential in PLT; ‘false’ => include all transitions in the adf04 file
LTSCL	‘true ’ => scaled electron temps.; ‘false’ => unscaled electron temps.
LDSCL	‘true ’ => scaled electron densities; ‘false’ => unscaled electron densities.
LBRDI	‘true ’ => ion temp. broadening; ‘false’ => no broadening.
AMIN	minimum A-value for transition for inclusion in line emission lists and radiated power.
NUMTE	number of electron temperatures
NUMTION	number of ion temperatures
NUMTH	number of neutral hydrogen temperatures
NUMDENS	number of electron densities
NUMDION	number of ion densities
NUMWVL	number of wavelength regions
C80	blank line
TE()	electron temperatures (K) (if numte > 0) (Note may be scaled c.f.LTSCL)
TI()	ion temperatures (K) (if numti > 0) (Note may be scaled c.f.LTSCL)

TH()	neutral hydrogen temperatures (K) (if numth > 0) (Note may be scaled c.f.LTSCL)
DENS()	electron densities (cm-3) (if numdens > 0) (Note may be scaled c.f.LDSCL)
DENSI()	ion densities (cm-3) (if numdion > 0) (Note may be scaled c.f.LDSCL)
NPIXA()	number of pixels allocated to wavelength region
WVMINA()	minimum wavelength of interval (A)
WVMAXA()	maximum wavelength of interval (A)

Table B42a – sample file for C^{+2} (*adf42_test.dat*) available in central ADAS.

```
&FILES
  dsn04  = '/home/adas/adas/adf04/adas#6/mom97_ls#c2.dat',
  dsn18  = 'NULL',
  dsn35  = 'NULL',
  dsn15  = 'test_adf15_pec.dat',
  dsn40  = 'test_adf40_fpec.dat',
  dsn11  = 'test_adf11_plt.dat',
  dsn11f = 'test_adf11_plt_filter.dat'
&END

&ION
   element = 'C',
   z0      = 6,
   z1      = 3,
   ip      = 386241.0
&END

&META
  lnorm    = .true.
  nmet     = 1,
  imetr(1) = 1
&END

&PROCESS
  liosel = .FALSE.,
  lhsel  = .FALSE.,
  lrsel  = .FALSE.,
  lisel  = .FALSE.,
  lnsel  = .FALSE.,
  lpsel  = .FALSE.,
  zeff   = 3.0
```

```
&END

&OUTPUT
  lmetr   = .FALSE.,
  lbelowip= .FALSE.,
  ltscl   = .TRUE.,
  ldscl   = .FALSE.,
  lbrdi   = .FALSE.,
  amin    = 0.0,
  numte   = 5,
  numtion = 5,
  numth   = 0,
  numdens = 5,
  numdion = 0,
  numwvl  = 4
&END

1.800e+04 4.500e+04
9.000e+04 1.800e+05 4.500e+05

1.800e+04 4.500e+04
9.000e+04 1.800e+05 4.500e+05

1.000E+11 1.000E+12 1.000E+13 1.000E+14 1.000E+15

64 1.000e+00 1.50e+00
32 1.000e+01 1.00e+02
32 4.500e+02 8.00e+02
32 1.000e+00 1.00e+02
```