

ADAS Subroutine d9spow

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      SUBROUTINE D9SPOW( LSELA  , LEXSA  , LDEFA  , LPART  , LEXSS  ,
&                      IZ0     , IZL    , IZH    , NPART  ,
&                      ISDIMD , IZDIMD , ITDIMD , IPDIMD , IMDIMD ,
&                      ACDA   , SCDA   , CCDA   , PRBA   ,
&                      PRCA   , QCDA   , XCDA   , PLTA   ,
&                      NMSUM  , IZIP   , IMIP   , IPIZM  ,
&                      NTDIM  , NDDIM  , ITMAX  , IDMAX  ,
&                      DENS   , DENSH  ,
&                      FPABUN , FSABUN ,
&                      PLTPEQ ,
&                      ACDSEQ , SCDSEQ , CCDSEQ , PRBSEQ ,
&                      PRCSEQ , PLTSEQ ,
&                      PRBEQ  , PRCEQ  , PLTEQ  , PRADA
&                      )
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C ***** FORTRAN77 SUBROUTINE: D9SPOW *****

C

C PURPOSE : TO ASSEMBLE RADIATED POWER FUNCTIONS USING FRACTIONAL
C METASTABLE ABUNDANCES.
C GENERATE STANDARD ISONUCLEAR MASTER DATA FROM PARTIAL DATA.
C 2D (TEMPERATURE, DENSITY) VERSION.

C

C NOTE : THE SOURCE ISONUCLEAR MASTER FILE DATA ARE OBTAINED BY A
C PRIOR CALL TO SUBROUTINE D9DATA FROM SEQUENTIAL FILES
C WITH THE FOLLOWING NAMING CONVENTIONS:

C

- (1) JETSHP.ACD<YR>#<EL>.<CODE>DATA
- (2) JETSHP.SCD<YR>#<EL>.<CODE>DATA
- (3) JETSHP.CCD<YR>#<EL>.<CODE>DATA
- (4) JETSHP.PRBC<YR>#<EL>.<FILT>.<CODE>DATA
- (5) JETSHP.PRC<YR>#<EL>.<FILT>.<CODE>DATA
- (6) JETSHP.QCD<YR>#<EL>.<CODE>DATA
- (7) JETSHP.XCD<YR>#<EL>.<CODE>DATA
- (8) JETSHP.PLT<YR>#<EL>.<CODE>DATA

C

WHERE, <YR> = TWO DIGIT YEAR NUMBER
C <EL> = ONE OR TWO CHARACTER ELEMENT SYMBOL
C <CODE> = R => PARTIAL DATA
C U => PARTIAL DATA
C OMITTED => STANDARD DATA
C <FILT> = SIX CHARACTER POWER FILTER CODE

C

AND DATA OF CLASSES 6 AND 7 DO NOT EXIST FOR THE PARTIAL CASE.

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C

C INPUT : (L*4) LSELA() = .TRUE. => INPUT DATA SET TYPE FOR THIS
C INDEX SELECTED
C = .FALSE. => INPUT DATA SET FOR THIS INDEX
C NOT SELECTED


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C
C INPUT : (R*8) QCDA(,,,) = INTERPOLATION OF QCD COEFFICIENT (CM3 S-1)
C
C 1ST DIM: TEMPERATURE INDEX
C
C 2ND DIM: DENSITY INDEX
C
C 3RD DIM: CHARGE STATE INDEX
C
C 4TH DIM: FIRST METASTABLE INDEX
C
C 5TH DIM: SECOND METASTABLE INDEX
C INPUT : (R*8) XCDA(,,,) = INTERPOLATION OF XCD COEFFICIENT (CM3 S-1)
C
C 1ST DIM: TEMPERATURE INDEX
C
C 2ND DIM: DENSITY INDEX
C
C 3RD DIM: CHARGE STATE INDEX
C
C 4TH DIM: FIRST PARENT METASTABLE INDEX
C
C 5TH DIM: SECOND PARENT METASTABLE INDEX
C INPUT : (R*8) PLTA(,,,) = INTERPOLATION OF PLT COEFFICIENT (W CM3 )
C
C 1ST DIM: TEMPERATURE INDEX
C
C 2ND DIM: DENSITY INDEX
C
C 3RD DIM: CHARGE STATE INDEX
C
C 4TH DIM: METASTABLE INDEX
C INPUT : (I*4) NMSUM = TOTAL NUMBER OF POPULATIONS
C
C INPUT : IZIP() = ION CHARGE +1 (IZ1) OF METASTABLE IN LIST
C INPUT : IMIP() = METASTABLE INDEX WITHIN CHARGE STATE IZ1
C OF METASTABLE INDEX FROM COMPLETE LIST
C INPUT : IPIZM(,) = METASTABLE INDEX IN COMPLETE LIST
C
C 1ST DIM: INDEX IZ1-IZL+1
C
C 2ND DIM: METASTABLE COUNT FOR STAGE (IGRD)
C INPUT : (I*4) NTDIM = MAXIMUM NUMBER OF DTEV/DDENS PAIRS
C INPUT : (I*4) ITMAX = NUMBER OF ( DTEV() , DDENS() ) PAIRS
C INPUT : (R*8) DENS() = ELECTRON DENSITIES (CM-3)
C INPUT : (R*8) DENSH() = HYDROGEN DENSITIES (CM-3)
C INPUT : (R*8) FPABUN(,,) = RESOLVED METASTABLE EQUILIBRIUM
C FRACTIONAL ABUNDANCES
C
C 1ST DIM: - TEMPERATURE INDEX
C
C 2ND DIM: - DENSITY INDEX
C
C 3RD DIM: - METASTABLE INDEX
C OUTPUT : (L*4) LEXSS() = .TRUE. => OUTPUT STANDARD MASTER DATA FOR
C THIS INDEX GENERATED
C
C = .FALSE. => OUTPUT STANDARD MASTER DATA FOR
C THIS INDEX NOT GENERATED
C OUTPUT : (R*8) FSABUN(,,) = STAGE EQUILIBRIUM FRACTIONAL ABUNDANCES
C
C 1ST DIM: - TEMPERATURE INDEX
C
C 2ND DIM: - DENSITY INDEX
C
C 3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8) PLTPEQ(,,) = METASTABLE PARTIAL EQUILIBRIUM RADIATED
C LINE POWER FUNCTIONS
C
C 1ST DIM: - TEMPERATURE INDEX
C
C 2ND DIM: - DENSITY INDEX
C
C 3RD DIM: - METASTABLE INDEX
C OUTPUT : (R*8) ACDSEQ(,,) = STANDARD (UNRESOLVED) ACD COEFFICIENT
C
C 1ST DIM: - TEMPERATURE INDEX
C
C 2ND DIM: - DENSITY INDEX
C
C 3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8) SCDSEQ(,,) = STANDARD (UNRESOLVED) SCD COEFFICIENT

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C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C          3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8)  CCDSEQ(,,) = STANDARD (UNRESOLVED) CCD COEFFICIENT
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C          3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8)  PRBSEQ(,,) = STANDARD (UNRESOLVED) SCD COEFFICIENT
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C          3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8)  PRCSEQ(,,) = STANDARD (UNRESOLVED) CCD COEFFICIENT
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C          3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8)  PLTSEQ(,,) = STANDARD (UNRESOLVED) CCD COEFFICIENT
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C          3RD DIM: - CHARGE STATE INDEX (IZ1-IZL+1)
C OUTPUT : (R*8)  PRBEQ(,)   = TOTAL EQUILIBRIUM RADIATED RECOM-BREMS
C          POWER FUNCTION
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C OUTPUT : (R*8)  PRCEQ(,)   = TOTAL EQUILIBRIUM CX RADIATED RECOM POWER
C          FUNCTION NORMALISED TO ELECTRON
C          DENSITY
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C OUTPUT : (R*8)  PLTEQ(,)   = TOTAL EQUILIBRIUM RADIATED LINE POWER
C          FUNCTION
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C OUTPUT : (R*8)  PRADA(,)   = TOTAL EQUILIBRIUM RADIATED POWER FUNCTION
C          1ST DIM: - TEMPERATURE INDEX
C          2ND DIM: - DENSITY INDEX
C
C PROGRAM: (I*4)  IT          = GENERAL INDEX FOR TEMPERATURE
C          (I*4)  ID          = GENERAL INDEX FOR DENSITY
C          (I*4)  IZ          = GENERAL INDEX FOR CHARGE
C          (I*4)  IP          = GENERAL INDEX FOR CHARGE
C          (I*4)  IZ1        = GENERAL INDEX FOR CHARGE+1
C          (I*4)  ICL        = GENERAL INDEX FOR CLASS
C          (I*4)  IPP        = GENERAL PARENT INDEX
C          (I*4)  IPG        = GENERAL GROUND INDEX
C          (I*4)  IZREF      = GENERAL CHARGE STAE POINTER INDEX
C          (I*4)  IPRT       = GENERAL INDEX FOR PARENT METASTABLE
C          (I*4)  IGRD       = GENERAL INDEX FOR METASTABLE
C
C
C ROUTINES:
C          ROUTINE      SOURCE      BRIEF DESCRIPTION
C          -----
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C
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C
C DATE : 11 December 1995
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C
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C - PUT UNDER SCCS CONTROL
C

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INTEGER IDMAX, IMDIM, IMIP (IMDIM)
INTEGER IPDIM, IPIZM (IZDIM, IPDIM), ISDIM
INTEGER ITDIM, ITMAX, IZ0, IZDIM
INTEGER IZH, IZIP (IMDIM), IZL
INTEGER NDDIM, NMSUM, NPART (IZDIM)
INTEGER NTDIM
LOGICAL LDEFA (8), LEXSA (8), LEXSS (8), LPART
LOGICAL LSELA (8)
REAL*8 ACDA (NTDIM, NDDIM, IZDIM, IPDIM, IPDIM)
REAL*8 ACDSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 CCDA (NTDIM, NDDIM, IZDIM, IPDIM, IPDIM)
REAL*8 CCDSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 DENS (NDDIM), DENSH (NDDIM)
REAL*8 FPABUN (NTDIM, NDDIM, IMDIM)
REAL*8 FSABUN (NTDIM, NDDIM, IZDIM)
REAL*8 PLTA (NTDIM, NDDIM, IZDIM, IPDIM)
REAL*8 PLTEQ (NTDIM, NDDIM)
REAL*8 PLTPEQ (NTDIM, NDDIM, IMDIM)
REAL*8 PLTSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 PRADA (NTDIM, NDDIM)
REAL*8 PRBA (NTDIM, NDDIM, IZDIM, IPDIM)
REAL*8 PRBEQ (NTDIM, NDDIM)
REAL*8 PRBSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 PRCA (NTDIM, NDDIM, IZDIM, IPDIM)
REAL*8 PRCEQ (NTDIM, NDDIM)
REAL*8 PRCSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 QCDA (NTDIM, NDDIM, IZDIM, IPDIM, IPDIM)
REAL*8 SCDA (NTDIM, NDDIM, IZDIM, IPDIM, IPDIM)
REAL*8 SCDSEQ (NTDIM, NDDIM, IZDIM)
REAL*8 XCDA (NTDIM, NDDIM, IZDIM, IPDIM, IPDIM)