

ADAS Subroutine dcpopm

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      SUBROUTINE DCPOPM( NDTEM , NDMET , NDLEV ,
&                      MAXT   , NMET   ,
&                      DENSA  , IMETR  ,
&                      LRSEL  , LHSEL  ,
&                      RATIA  , RATHA  ,
&                      STCKM  , STVRM  , STVHM  ,
&                      POPAR
&                      )
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C-----
C
C ***** FORTRAN77 SUBROUTINE: DCPOPM *****
C
C PURPOSE: TO CONSTRUCT METASTABLE LEVEL POPULATIONS.
C
C CALLING PROGRAM: XCOEF
C
C SUBROUTINE:
C
C INPUT : (I*4) NDTEM = MAXIMUM NUMBER OF TEMP/DENS PAIRS ALLOWED
C INPUT : (I*4) NDMET = MAXIMUM NUMBER OF METASTABLE LEVELS ALLOWED
C INPUT : (I*4) NDLEV = MAXIMUM NUMBER OF ENERGY LEVELS ALLOWED
C
C INPUT : (I*4) MAXT = NO. INPUT TEMP/DENSITY PAIRS ( 1 ->'NDTEM' )
C INPUT : (I*4) NMET = NUMBER OF METASTABLES LEVELS ( 1 ->'NDMET' )
C
C INPUT : (R*8) DENSA() = ELECTRON DENSITIES (UNITS: CM-3)
C INPUT : (I*4) IMETR() = INDEX OF METASTABLE IN COMPLETE LEVEL LIST
C                      (ARRAY SIZE = 'NDMET' )
C
C INPUT : (L*4) LRSEL = .TRUE. => FREE ELECTRON RECOMBINATION
C                      REQUESTED.
C                      = .FALSE. => FREE ELECTRON RECOMBINATION
C                      NOT REQUESTED.
C INPUT : (L*4) LHSEL = .TRUE. => CHARGE TRANSFER FROM NEUTRAL
C                      HYDROGEN REQUESTED.
C                      = .FALSE. => CHARGE TRANSFER FROM NEUTRAL
C                      HYDROGEN NOT REQUESTED.
C
C INPUT : (R*8) RATIA() = RATIO ( N(Z+1)/N(Z) STAGE ABUNDANCIES )
C INPUT : (R*8) RATHA() = RATIO (NEUTRAL H DENSITY/ELECTRON DENSITY)
C
C INPUT : (R*8) STCKM(, ) = METASTABLE POPULATIONS STACK:
C                      1st DIMENSION: METASTABLE INDEX
C                      2nd DIMENSION: TEMPERATURE INDEX
C INPUT : (R*8) STVRM(, ) = METASTABLE LEVEL:
C                      FREE-ELECTRON RECOMBINATION COEFFICIENTS
C                      (UNITS* CM**3/SEC-1)
C                      1st DIMENSION: METASTABLE INDEX
C                      2nd DIMENSION: TEMPERATURE INDEX
C INPUT : (R*8) STVHM(, ) = METASTABLE LEVEL:
C                      CHARGE-EXCHANGE RECOMBINATION COEFFICIENTS
C                      (UNITS* CM**3/SEC-1)
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C          1st DIMENSION: METASTABLE INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C
C OUTPUT:  (R*8)  POPAR(,) = LEVEL POPULATIONS
C          1st DIMENSION: LEVEL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C          (ON OUTPUT CONTAINS POPULATIONS FOR
C          METASTABLE LEVELS ONLY.)
C
C          (R*8) DCOEF      = DENSITY MULTIPLIED BY RELEVANT RATIOS FOR
C          CALCULATING RECOMBINATION CONTRIBUTIONS.
C
C          (I*4) IT        = TEMPERATURE ARRAY INDEX
C          (I*4) IM        = METASTABLE LEVEL ARRAY INDEX
C
C ROUTINES: NONE
C
C AUTHOR:  HP SUMMERS
C          K1/1/57
C          JET EXT. 4941
C
C DATE:    27/ 6/91
C
C VERSION: 1.1 RICHARD MARTIN DATE: 27-10-97
C PUT UNDER SCCS CONTROL.
C NAME CHANGED FROM BHPOPM TO DCPOPM
C
C-----
C
C-----
C
C          INTEGER          IMETR (NDMET) ,          MAXT ,          NDLEV
C          INTEGER          NDMET ,          NDTEM ,          NMET
C          LOGICAL          LHSEL ,          LRSEL
C          REAL*8           DENSA (NDTEM) ,          POPAR (NDLEV , NDTEM)
C          REAL*8           RATHA (NDTEM) ,          RATIA (NDTEM)
C          REAL*8           STCKM (NDMET , NDTEM) ,          STVHM (NDMET , NDTEM)
C          REAL*8           STVRM (NDMET , NDTEM)

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