

ADAS Subroutine dcpopo

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      SUBROUTINE DCPOPO( NDTEM , NDMET , NDLEV ,  
&                      MAXT   , NMET  , NORD  ,  
&                      DENSA  , IMETR , IORDR ,  
&                      LRSEL  , LHSEL  ,  
&                      RATIA  , RATHA  ,  
&                      STACK  , STVR   , STVH   ,  
&                      POPAR  
&                      )
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C  
C ***** FORTRAN77 SUBROUTINE: DCPOPO *****  
C  
C PURPOSE: TO CONSTRUCT ORDINARY/NON-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. OF INPUT TEMP/DENS PAIRS ( 1 ->'NDTEM' )  
C INPUT : (I*4) NMET = NUMBER OF METASTABLES LEVELS ( 1 ->'NDMET' )  
C INPUT : (I*4) NORD = NUMBER OF ORDINARY LEVELS ( 1 ->'NDLEV' )  
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 INPUT : (I*4) IORDR() =INDEX OF ORDINARY EXCITED LEVELS IN COMPLETE  
C                      LEVEL LIST.  
C                      (ARRAY SIZE = 'NDLEV' )  
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) STACK(,,) = ORDINARY EXCITED LEVEL POPULAT'N DEPENDENCE  
C                      ON METASTABLE LEVEL.  
C                      1st DIMENSION: ORDINARY LEVEL INDEX  
C                      2nd DIMENSION: METASTABLE INDEX  
C                      3rd DIMENSION: TEMPERATURE INDEX  
C INPUT : (R*8) STVR(,) = ORDINARY EXCITED LEVEL:  
C                      FREE-ELECTRON RECOMBINATION COEFFICIENTS
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C          (UNITS* CM**3/SEC-1)
C          1st DIMENSION: ORDINARY LEVEL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C INPUT : (R*8) STVH(,) = ORDINARY EXCITED LEVEL:
C          CHARGE-EXCHANGE RECOMBINATION COEFFICIENTS
C          (UNITS* CM**3/SEC-1)
C          1st DIMENSION: ORDINARY LEVEL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C
C I/O   : (R*8)  POPAR(,) = LEVEL POPULATIONS
C          1st DIMENSION: LEVEL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C          ON INPUT : CONTAINS POPULATIONS FOR
C                   METASTABLE LEVELS ONLY.
C          ON OUTPUT: CONTAINS POPULATIONS FOR
C                   ALL LEVELS.
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) IN      = DENSITY ARRAY INDEX
C          (I*4) IO      = ORDINARY LEVEL ARRAY INDEX
C          (I*4) IM      = METASTABLE LEVEL ARRAY INDEX
C
C
C ROUTINES: NONE
C
C AUTHOR:  HP SUMMERS
C          K1/1/57
C          JET EXT. 4941
C
C DATE:   27/06/91
C

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C VERSION 1.1  RICHARD MARTIN DATE: 27-10-97
C PUT UNDER SCCS CONTROL.
C NAME CHANGED FROM BHPOPO TO DCPOPO
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C
C-----

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INTEGER	IMETR (NDMET) ,	IORDR (NDLEV)
INTEGER	MAXT, NDLEV,	NDMET, NDTEM
INTEGER	NMET, NORD	
LOGICAL	LHSEL, LRSEL	
REAL*8	DENSA (NDTEM) ,	POPAR (NDLEV, NDTEM)
REAL*8	RATHA (NDTEM) ,	RATIA (NDTEM)
REAL*8	STACK (NDLEV, NDMET, NDTEM) ,	STVH (NDLEV, NDTEM)
REAL*8	STVR (NDLEV, NDTEM)	