

ADAS Subroutine b8totl

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      SUBROUTINE B8TOTL( NDLEV  , NDMET  ,  
&                      NORD    , NMET   ,  
&                      IORDR   , IMETR  , ISTRN ,  
&                      DENSX   ,  
&                      STCKMX  , STACKX ,  
&                      PLA1    , PLBAX  ,  
&                      PLAX    , PLX    ,  
&                      PSAX    , PSX    ,  
&                      )
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C ***** FORTRAN77 SUBROUTINE: B8TOTL *****

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C PURPOSE: TO CALCULATE TOTAL/SPECIFIC LINE POWERS FOR METASTABLES
C AND TOTAL/SPECIFIC EQUILIBRIUM LINE POWERS.

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C DEVELOPMENT OF B6TOTL.

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C NOTE: A SPECIFIC LINE IS EVALUATED WHICH TERMINATES ON EACH
C METASTABLE. EACH IS RESOLVED INTO THE PART DRIVEN BY EACH
C METASTABLE. THE EQUILIBRIUM POWER IN EACH OF THESE LINES IS
C ALSO EVALUATED USING THE EQUILIBRIUM METASTABLE FRACTIONS.

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C CALLING PROGRAM: ADAS208

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C SUBROUTINE:

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C INPUT : (I*4) NDLEV = PARAMETER = MAX. NO. OF LEVELS ALLOWED

C INPUT : (I*4) NDMET = PARAMETER = MAX. NO. OF METASTABLES ALLOWED

C

C INPUT : (I*4) NORD = NUMBER OF ORD. LEVELS (1 <= NORD <= 'NDLEV')

C INPUT : (I*4) NMET = NUMBER OF METASTABLES (1 <= NMET <= 'NDMET')

C

C INPUT : (I*4) IORDR() = INDEX OF ORDINARY LEVELS IN COMPLETE LEVEL
C LIST (ARRAY SIZE = 'NDLEV')

C INPUT : (I*4) IMETR() = INDEX OF METASTABLE IN COMPLETE LEVEL LIST
C (ARRAY SIZE = 'NDMET')

C INPUT : (I*4) ISTRN() = SPECIFIC LINE POWER: SELECTED ELECTRON
C IMPACT TRANSITION INDEX. (FOR USE WITH
C 'IE1A()' , 'IE2A()' AND 'AA()' ARRAYS)
C WHICH GIVES LARGEST POWER TO METASTABLE
C DIMENSION: METASTABLE LINE COUNT INDEX

C INPUT : (R*8) DENSX = ELECTRON DENSITY (UNITS: CM-3)

C

C INPUT : (R*8) STCKMX() = METASTABLE POPULATIONS STACK
C AT FIXED TEMPERATURE AND DENSITY.

C DIMENSION: METASTABLE INDEX

C INPUT : (R*4) STACKX(,) = ORDINARY EXCITED LEVEL POPULAT'N DEPENDENCE
C ON METASTABLE LEVEL. AT FIXED TEMPERATURE
C AND DENSITY.

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C 1st DIMENSION: ORDINARY LEVEL INDEX

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C          2nd DIMENSION: METASTABLE INDEX
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C INPUT : (R*8)  PLA1 () = DIRECT LINE POWER LOSS FOR EACH LEVEL.
C                   (UNITS: ERGS SEC-1) (DIMENSION: LEVEL INDEX)
C INPUT : (R*8)  PLBAX () = HIGH N PROJECTED POWER BASED ON EXCITATIONS
C                   FROM A PARTICULAR METASTABLE TO LEVELS
C                   'IPROJ' UPWARDS. (UNITS: ERGS CM3 SEC-1)
C                   AT FIXED TEMPERATURE.
C                   DIMENSION: METASTABLE INDEX
C
C OUTPUT: (R*8)  PLAX    = TOTAL EQUILIBRIUM LINE POWER COEFFICIENTS.
C                   AT FIXED TEMPERATURE AND DENSITY.
C                   (UNITS: ERGS CM3 SEC-1)
C OUTPUT: (R*8)  PLX ()  = TOTAL LINE POWERS FOR METASTABLES. THIS IS
C                   THE SUM OF ALL EMISSIONS ORGINATING IN THE
C                   COLLISIONAL-RADIATIVE SENSE FROM THE
C                   METASTABLE. AT FIXED TEMPERATURE AND DENSITY
C                   (UNITS: ERGS SEC-1 )
C                   DIMENSION: METASTABLE INDEX
C
C OUTPUT: (R*8)  PSAX () = TOTAL EQUILIBRIUM LINE POWER COEFFICIENTS.
C                   AT FIXED TEMPERATURE AND DENSITY.
C                   (UNITS: ERGS CM3 SEC-1)
C                   DIMENSION: METASTABLE INDEX
C OUTPUT: (R*8)  PSX (, ) = TOTAL LINE POWERS FOR METASTABLES. THIS IS
C                   THE SUM OF ALL EMISSIONS ORGINATING IN THE
C                   COLLISIONAL-RADIATIVE SENSE FROM THE
C                   METASTABLE. AT FIXED TEMPERATURE AND DENSITY
C                   (UNITS: ERGS SEC-1 )
C                   1ST. DIMENSION: METASTABLE INDEX FOR LINE
C                   2ND. DIMENSION: METASTABLE INDEX OF DRIVER
C
C          (I*4) IM      = METASTABLE LEVEL ARRAY INDEX
C          (I*4) IS      = ORDINARY LEVEL ARRAY INDEX
C          (I*4) ISL     = SPECIFIC LINE POWER INDEX
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C
C ROUTINES: NONE
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C
C AUTHOR:  PAUL E. BRIDEN (TESSELLA SUPPORT SERVICES PLC)
C          K1/0/37
C          JET EXT. 5023
C
C DATE:    09/10/90
C
C UPDATE:  20/05/93-P BRIDEN: STACKX ARRAY CHANGED FROM REAL*8 -> REAL*4
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C UPDATE:  24/05/96  HP SUMMERS - EXTENSION FOR SPECIFIC LINE POWER
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C *****
C PUT UNDER S.C.C.S CONTROL:

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C
C VERSION: 1.1 DATE: 16/07/95
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C - FIRST PUT UNDER S.C.C.S

C
C VERSION: 1.2 DATE: 20/07/07
C MODIFIED: Allan Whiteford
C - Small modification to comments to allow for automatic
C documentation preparation.

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INTEGER	IMETR (NMET) ,	IORDR (NORD) ,	ISTRN (NDMET)	
INTEGER	NDLEV ,	NDMET ,	NMET ,	NORD
REAL*8	DENSX ,	PLA1 (NDLEV) ,	PLAX	
REAL*8	PLBAX (NDMET) ,		PLX (NDMET)	
REAL*8	PSAX (NDMET) ,	PSX (NDMET ,	NDMET)	
REAL	STACKX (NDLEV ,	NDMET)		
REAL*8	STCKMX (NDMET)			