

## ADAS Subroutine b8toth

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      SUBROUTINE B8TOTH( NDLEV   , NDMET   , NDTEM   , NDDEN   ,  
&                      NORD     , NMET    , NPL     ,  
&                      IORDR    , IMETR   ,  
&                      IT       , MAXT    , IN      , MAXD    ,  
&                      RATPIA   ,  
&                      STVHM    , STVH    ,  
&                      PLA1     ,  
&                      PHA      , PH  
&                      )
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C \*\*\*\*\* FORTRAN77 SUBROUTINE: B8TOTH \*\*\*\*\*

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C PURPOSE: TO CALCULATE TOTAL CHARGE EXCHANGE DRIVEN LINE POWER.

C

C NOTE: CODE EXECUTES FOR ONE TEMPERATURE AND DENSITY INDEX AT A TIME

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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 INPUT : (I\*4) NDTEM = PARAMETER = MAX. NO. OF TEMPERATURES ALLOWED

C INPUT : (I\*4) NDDEN = PARAMETER = MAX. NO. OF DENSITIES 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 INPUT : (I\*4) NPL = NUMBER OF PARENT METASTABLES (NPL <= 'NDMET')

C

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

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

C INPUT : (I\*4) IT = CURRENT TEMPERATURE INDEX

C INPUT : (I\*4) MAXT = NUMBER OF INPUT TEMPERATURES ( 1 -> 'NDTEM')

C INPUT : (I\*4) IN = CURRENT DENSITY INDEX

C INPUT : (I\*4) MAXD = NUMBER OF INPUT DENSITIES ( 1 -> 'NDDEN')

C INPUT : (R\*8) RATPIA(,) = RATIO ( N(Z+1)/N(Z) STAGE ABUNDANCIES )

C 1ST DIMENSION: DENS INDEX

C 2ND DIMENSION: PARENT INDEX

C

C INPUT : (R\*8) STVHM(,,,) = METASTABLE LEVEL:

C CHARGE-EXCHANGE RECOMBINATION POPUL. PART  
(UNITS\* CM\*\*3/SEC-1)

C 1st DIMENSION: METASTABLE INDEX

C 2nd DIMENSION: TEMPERATURE INDEX

C 3rd DIMENSION: DENSITY INDEX

C 4TH DIMENSION: PARENT INDEX

C INPUT : (R\*4) STVH(,,,) = ORDINARY EXCITED LEVEL:

C CHARGE-EXCHANGE RECOMBINATION POPUL. PART

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C          (UNITS* CM**3/SEC-1)
C          1st DIMENSION: ORDINARY LEVEL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C          3rd DIMENSION: DENSITY INDEX
C          4TH DIMENSION: PARENT INDEX
C INPUT : (R*8)  PLA1 () = DIRECT LINE POWER LOSS FOR EACH LEVEL.
C          (UNITS: ERGS SEC-1) (DIMENSION: LEVEL INDEX)
C
C OUTPUT: (R*8)  PH(,,) = TOTAL CX LINE POWER FOR PARENT. THIS IS
C          THE SUM OF ALL EMISSIONS ORIGINATING IN THE
C          COLLISIONAL-RADIATIVE SENSE FROM THE
C          PARENT.
C          => P(TOTAL)/N(IP)          (ERGS SEC-1)
C          1ST DIMENSION: PARENT METASTABL INDEX
C          2nd DIMENSION: TEMPERATURE INDEX
C          3rd DIMENSION: DENSITY INDEX
C OUTPUT: (R*8)  PHA(,) = EQUILIBRIUM CX POWER COEFFT.
C          => P(TOTAL)/(DENS*N(1)) (ERGS CM3 SEC-1)
C          1st DIMENSION: TEMPERATURE INDEX
C          2nd DIMENSION: DENSITY INDEX
C
C          (I*4) IM      = METASTABLE LEVEL ARRAY INDEX
C          (I*4) IS      = ORDINARY LEVEL ARRAY INDEX
C          (I*4) IP      = PARENT METASTABLE INDEX
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C
C
C ROUTINES: NONE
C
C
C AUTHOR:  H. P. SUMMERS, UNIVERSITY OF STRATHCLYDE
C          JA8.08
C          TEL. 0141-553-4196
C
C DATE:    24/05/96
C
C UPDATE:
C
C*****
C PUT UNDER S.C.C.S CONTROL:
C
C VERSION: 1.1 DATE: 15/07/96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C          - FIRST PUT UNDER S.C.C.S
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C          INTEGER          IMETR(NMET), IN,          IORDR(NORD), IT
C          INTEGER          MAXD,          MAXT,          NDDEN,          NDLEV
C          INTEGER          NDMET,          NDTEM,          NMET,          NORD
C          INTEGER          NPL

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REAL*8          PH (NDTEM, NDDEN, NDMET) ,      PHA (NDTEM, NDDEN)
REAL*8          PLA1 (NDLEV) ,  RATPIA (NDDEN, NDMET)
REAL            STVH (NDLEV, NDTEM, NDDEN, NDMET)
REAL*8          STVHM (NDMET, NDTEM, NDDEN, NDMET)
```