

ADAS Subroutine c6tbrc

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SUBROUTINE C6TBRC ( MXNSHL , MXJSHL , IZ1 , NBOT ,  
& NTOP , TEV , QTHRC , FTHRCJ  
& )
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C ***** FORTRAN77 SUBROUTINE: C6TBRC *****

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C PURPOSE: SETS UP A TABLE OF RADIATIVE RECOMBINATION RATE
C COEFFICIENTS FOR A BARE NUCLEUS, HELIUM-LIKE OR NEON-LIKE
C ION TO EXCITED NLJ LEVELS.

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C CALLING PROGRAM: ADAS306

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C INPUT : (I*4) MXNSHL = MAXIMUM VALUE OF PRINCIPAL QUANTUM NUMBER.

C INPUT : (I*4) MXJSHL = MAXIMUM NUMBER OF J SUB-SHELLS.

C INPUT : (I*4) IZ1 = ION CHARGE.

C INPUT : (I*4) NBOT = MINIMUM PRINCIPAL QUANTUM NUMBER.

C INPUT : (I*4) NTOP = MAXIMUM PRINCIPAL QUANTUM NUMBER.

C INPUT : (R*8) TEV = ELECTRON TEMPERATURE.

C UNITS: EV

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C OUTPUT: (R*8) QTHRC () = RECOMBINATION RATE COEFFICIENT TO LEVEL N.

C UNITS: CM³ SEC⁻¹

C DIMENSION: N-SHELL

C OUTPUT: (R*8) FTHRCJ (,) = FRACTION OF RECOMBINATION RATE OF LEVEL N
C TO STATE NLJ.

C 1ST DIMENSION: J-SHELL INDEX WHERE

C 1 GIVES J=L+0.5

C 2 GIVES J=L-0.5

C 2ND DIMENSION: REFERENCED BY I4IDFL () .

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C PARAM : (R*8) P1 = BOLTZMANN CONSTANT.

C UNITS: EV K⁻¹

C PARAM : (R*8) P2 =

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C (I*4) N = PRINCIPAL QUANTUM NUMBER OF BOUND ELECTRON.

C (I*4) L = ORBITAL QUANTUM NUMBER OF BOUND ELECTRON.

C (I*4) L1 = ORBITAL QUANTUM NUMBER OF FREE ELECTRON.

C (I*4) LP = TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM
C NUMBER OF PARENT STATE.

C (I*4) ISP = 2*SP+1 WHERE SP IS TOTAL SPIN OF PAREN STATE. T

C (I*4) LT = TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM
C NUMBER OF BOUND SYSTEM.

C (I*4) LT1 = TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM
C NUMBER OF FREE SYSTEM.

C (I*4) IS = 2*S+1 WHERE S IS TOTAL SPIN OF SYSTEM.

C (I*4) IRES = LEVEL OF RESOLUTION.

C = 1 :

C = 2 : ABOVE LT1 SUM.

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C = 3 : ABOVE LT SUM.
 C = 4 : ABOVE S SUM.
 C = 5 : UNRESOLVED GBF.
 C (I*4) I = LOOP INDEX.
 C (I*4) J = LOOP INDEX.
 C (I*4) IDL = TABLE INDEX.
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 C (R*8) Z1 = REAL VALUE = IZ1.
 C (R*8) TE = ELECTRON TEMPERATURE.
 C UNITS: K
 C (R*8) V = EFFECTIVE PRINCIPAL QUANTUM NUMBER OF BOUND
 C ELECTRON.
 C (R*8) FACT =
 C (R*8) SUM =
 C (R*8) XL = REAL VALUE = L.
 C (R*8) WL =
 C (R*8) T =
 C (R*8) PREC1 = RADIATIVE RECOMBINATION INTEGRAL.
 C (R*8) PION1 = PHOTOIONISATION INTEGRAL.
 C (R*8) PSTIM1 = STIMULATED RECOMBINATION INTEGRAL.
 C (R*8) PREC2 = RADIATIVE RECOMBINATION INTEGRAL.
 C (R*8) PION2 = PHOTOIONISATION INTEGRAL.
 C (R*8) PSTIM2 = STIMULATED RECOMBINATION INTEGRAL.

C PARAM : (R*8) P1 = BOLTZMANN CONSTANT.
 C UNITS: EV K-1

C PARAM : (R*8) P2 =

C ROUTINES:

ROUTINE	SOURCE	BRIEF DESCRIPTION
I4IDFL	ADAS	RETURNS UNIQUE INDEX GIVEN QUANTUM NUMBERS N AND L.
CXPHOT	ADAS	CALCULATES PHOTO INTEGRALS USING GIIH BOUND-FREE GAUNT-FACTORS.

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 C K1/0/81
 C JET EXT. 5183

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C UNIX-IDL PORT:

C AUTHOR: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)

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C VERSION: 1.1 DATE: 22-05-96

C MODIFIED: WILLIAM OSBORN

C - FIRST VERSION. IBM VERSION NOT CHANGED

C VERSION: 1.2 DATE: 29-05-96

C MODIFIED: WILLIAM OSBORN

C - REMOVED UNUSED VARIABLES

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INTEGER	IZ1,	MXJSHL,	MXNSHL,	NBOT
INTEGER	NTOP			
REAL*8	FTHRCJ (MXJSHL, (MXNSHL* (MXNSHL+1)) /2)			
REAL*8	QTHRC (MXNSHL),		TEV	