

ADAS Subroutine c6prsl

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      SUBROUTINE C6PRSL ( MXNSHL , MXJSHL , MXPRSL , IZ0      ,
&                        IZ1      , NPLINE , NPU      , NPL      ,
&                        NUMAX   , WHIGH  , WLOW   , EM      ,
&                        QEX     , TOTPOP , TOTEMI , AVRGWL ,
&                        QEFF    , TBLPOP , TBLEMI , TBLWLN
&                        )
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C
C ***** FORTRAN77 SUBROUTINE: C6PRSL *****
C
C PURPOSE:  FILLS TABLES FOR REQUESTED PREDICTIONS OF SPECTRUM LINES.
C
C CALLING PROGRAM: C6EMIS
C
C INPUT : (I*4)  MXNSHL   = MAXIMUM NUMBER OF N SHELLS.
C INPUT : (I*4)  MXJSHL   = MAXIMUM NUMBER OF J SUB-SHELLS.
C INPUT : (I*4)  MXPRSL   = MAXIMUM NUMBER OF SPECTRUM LINES TO
C                        PREDICT.
C INPUT : (R*8)  IZ0      = NUCLEAR CHARGE.
C INPUT : (R*8)  IZ1      = ION CHARGE.
C INPUT : (I*4)  NPLINE   = NUMBER OF SPECTRUM LINES TO PREDICT.
C INPUT : (I*4)  NPU()    = LIST OF UPPER PRINCIPAL QUANTUM NUMBERS
C                        OF SPECTRUM LINES TO PREDICT.
C                        DIMENSION: PREDICTED LINE INDEX.
C INPUT : (I*4)  NPL()    = LIST OF LOWER PRINCIPAL QUANTUM NUMBERS
C                        OF SPECTRUM LINES TO PREDICT.
C                        DIMENSION: PREDICTED LINE INDEX.
C INPUT : (I*4)  NUMAX    = MAXIMUM UPPER PRINCIPAL QUANTUM NUMBER
C                        FOR OBSERVED SPECTRUM LINES.
C INPUT : (R*8)  WHIGH(, ) =
C                        1ST DIMENSION: J SHELL INDEX.
C                        2ND DIMENSION: REFERENCED BY L+1.
C INPUT : (R*8)  WLOW(, , ) =
C                        1ST DIMENSION: J SHELL INDEX.
C                        2ND DIMENSION: REFERENCED BY I4IDFL(N,L) .
C                        3RD DIMENSION: REFERENCED BY L+1.
C INPUT : (R*8)  EM       = EMISSION MEASURE.
C INPUT : (R*8)  QEX()    =
C                        DIMENSION: MXNSHL.
C
C OUTPUT: (R*8)  TOTPOP() = TOTAL COLLISION POP. FOR PREDICTED
C                        SPECTRUM LINE.
C                        UNITS: CM-2
C                        DIMENSION: PREDICTED LINE INDEX.
C OUTPUT: (R*8)  TOTEMI() = TOTAL COLLISION EMISSIVITIES FOR
C                        PREDICTED
C                        SPECTRUM LINE.
C                        UNITS: PH CM-2 SEC-1
C                        DIMENSION: PREDICTED LINE INDEX.
C OUTPUT: (R*8)  AVRGWL() = AVERAGE AIR WAVELENGTH FOR PREDICTED
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C SPECTRUM LINE.
C UNITS: A
C DIMENSION: PREDICTED LINE INDEX.
C OUTPUT: (R*8) QEFF() = EFF. RATE COEFFICIENT FOR PREDICTED
C SPECTRUM LINE.
C UNITS:
C DIMENSION: PREDICTED LINE INDEX.
C OUTPUT: (R*8) TBLPOP(,,) = TABLE OF COLLISION POP. FOR PREDICTED
C SPECTRUM LINE.
C UNITS: CM-2
C 1ST DIMENSION: J->J' TRANSITION INDEX.
C 2ND DIMENSION: REFERENCED BY I4IDLI().
C OUTPUT: (R*8) TBLEMI(,,) = TABLE OF COLLISION EMISSIVITIES FOR
C PREDICTED SPECTRUM LINE.
C UNITS: PH CM-2 SEC-1
C 1ST DIMENSION: J->J' TRANSITION INDEX.
C 2ND DIMENSION: REFERENCED BY I4IDLI().
C 3RD DIMENSION: PREDICTED LINE INDEX.
C OUTPUT: (R*8) TBLWLN(,,) = TABLE OF WAVELENGTHS FOR PREDICTED
C SPECTRUM LINE.
C UNITS: A
C 1ST DIMENSION: J->J' TRANSITION INDEX.
C 2ND DIMENSION: REFERENCED BY I4IDLI().
C 3RD DIMENSION: PREDICTED LINE INDEX.
C
C PARAM : (I*4) C1 = PRECISION AIR WAVELENGTH PARAM.
C PARAM : (I*4) C2 = PRECISION AIR WAVELENGTH PARAM.
C PARAM : (I*4) C3 = PRECISION AIR WAVELENGTH PARAM.
C PARAM : (I*4) C4 = PRECISION AIR WAVELENGTH PARAM.
C PARAM : (I*4) C5 = PRECISION AIR WAVELENGTH PARAM.
C PARAM : (I*4) RZ = PRECISION AIR WAVELENGTH PARAM.
C
C (I*4) IN = LOOP INDEX FOR SPECTRUM LINES.
C (I*4) N = PRINCIPAL QUANTUM NUMBER OF INITIAL
C STATE.
C (I*4) L = LOOP INDEX FOR ORBITAL QUANTUM NUMBER OF
C (I*4) J = LOOP INDEX FOR J QUANTUM NUMBER OF
C INITIAL STATE.
C (I*4) N1 = PRINCIPAL QUANTUM NUMBER OF FINAL STATE.
C (I*4) L1 = LOOP INDEX FOR ORBITAL QUANTUM NUMBER OF
C FINAL STATE.
C (I*4) J1 = LOOP INDEX FOR J QUANTUM NUMBER OF
C FINAL STATE.
C (I*4) NP = LOOP INDEX FOR PRINCIPAL QUANTUM NUMBER.
C (I*4) IDL = TABLE INDEX.
C (I*4) ID = TABLE INDEX.
C
C (R*8) Z1 = REAL VALUE = IZ1.
C (R*8) ZEFF1 = EFFECTIVE ION CHARGE.
C (R*8) ZEFF2 = EFFECTIVE ION CHARGE.
C (R*8) ZEFF3 = EFFECTIVE ION CHARGE.
C (R*8) SUM1 = SUM OF COL. POP. FOR PREDICTED LINE.
C UNITS: CM-2

C (R*8) SUM2 = SUM OF COL. EMIS. FOR PREDICTED LINE.
 C UNITS: PH CM-2 SEC-1
 C (R*8) SUM3 = SUM OF WAVELENGTHS FOR PREDICTED LINE.
 C UNITS: A
 C (R*8) EU0 = BINDING ENERGY
 C UNITS: RYD
 C (R*8) T1 = COL. POP. FOR PREDICTED SPECTRUM LINE.
 C UNITS: CM-2
 C (R*8) T2 = COL. EMIS. FOR PREDICTED SPECTRUM LINE.
 C UNITS: PH CM-2 SEC-1
 C (R*8) DELTA =
 C (R*8) SIG2 =
 C (R*8) RF =
 C (R*8) WAVAIR = WAVELENGTH FOR PREDICTED SPECTRUM LINE.
 C UNITS: A
 C
 C (R*8) EL () = BINDING ENERGY.
 C UNITS: RYD
 C DIMENSION: J SHELL INDEX WHERE:
 C 1 => L+0.5
 C 2 => L-0.5
 C (R*8) EUJ () = INITIAL STATE J RESOLVED ENERGY.
 C DIMENSION: J SHELL INDEX WHERE:
 C 1 => L+0.5
 C 2 => L-0.5
 C (R*8) AA () = LJ RESOLVED A-VALUE.
 C DIMENSION: TRANSITION INDEX WHERE:
 C 1 => L+0.5 --> L'+0.5
 C 2 => L+0.5 --> L'-0.5
 C 3 => L-0.5 --> L'+0.5
 C 4 => L-0.5 --> L'-0.5
 C
 C (R*8) ELJ (,) = FINAL STATE J RESOLVED ENERGY.
 C 1ST DIMENSION: L SHELL INDEX WHERE:
 C 1 => L'=L+1
 C 2 => L'=L-1
 C 2ND DIMENSION: J SHELL INDEX WHERE:
 C 1 => J'=L'+0.5
 C 2 => J'=L'-0.5

C ROUTINES:

ROUTINE	SOURCE	BRIEF DESCRIPTION
I4UNIT	ADAS	RETURNS UNIT NO. FOR OUTPUT OF MESSAGES.
I4IDFL	ADAS	RETURNS UNIQUE INDEX GIVEN QUANTUM NUMBERS N AND L.
I4IDLI	ADAS	RETURNS INDEX FOR PREDICTED SPECTRUM LINE TABLES.
R8ZETA	ADAS	
C6AJTB	ADAS	RETURNS LJ RESOLVED A-VALUES.

C NOTES:

C 1) THE J->J' TRANSITION INDEX IS AS FOLLOWS:

