ADAS Subroutine c6tbfm

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      SUBROUTINE C6TBFM( MXNSHL , MXJSHL , IZ0    , IZ1    ,
     &                   AMSSNO , NBOT   , NTOP   , BMAG   ,
     &                   TIEV   , TBLF   , TBFMP  , TBFM   ,
     &                   TBFMM
     &                 )
C
C
C-----------------------------------------------------------------------
C
C  ****************** FORTRAN77 SUBROUTINE: C6TBFM *********************
C
C  PURPOSE:  FILLS TABLES OF  MAGNETIC FIELD DEPENDENT MIXING RATE
C            COEFFICIENTS BETWEEN NEARLY DEGENERATE LEVELS FOR
C            HYDROGEN-LIKE, LITHIUM-LIKE AND SODIUM-LIKE IONS.
C
C            RATES ARE CALCULATED FOR THE SEPARATE NLJ->NL+1J',
C            NLJ->NLJ' AND NLJ->NL-1J' TRANSITIONS.
C
C  CALLING PROGRAM: ADAS306
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)  IZ0     = TARGET NUCLEAR CHARGE.
C  INPUT : (I*4)  IZ1     = ION CHARGE.
C  INPUT : (R*8)  AMSSNO  = ATOMIC MASS NO.
C  INPUT : (I*4)  NBOT    = MINIMUM PRINCIPAL QUANTUM NUMBER.
C  INPUT : (I*4)  NTOP    = MAXIMUM PRINCIPAL QUANTUM NUMBER.
C  INPUT : (R*8)  BMAG    = MAGNETIC INDUCTION.
C                           UNITS: TESLA
C  INPUT : (R*8)  TIEV    = TEMPERATURE (ION DISTRIBUTION).
C                           UNITS: EV
C  INPUT : (R*8)  TBLF()  = TABLE OF RADIATIVE LIFETIMES.
C                           UNITS: SECS
C                           DIMENSION: REFERENCED BY FUNC I4IDFL(N,L).
C
C  OUTPUT: (R*8)  TBFMP(,)= RATE COEFFT. FOR NLJ->NL+1J'.
C                           1ST DIMENSION: J->J' TRANSITION INDEX.
C                           2ND DIMENSION: REFERENCED BY I4IDFL(N,L).
C  OUTPUT: (R*8)  TBFM(,) = RATE COEFFT. FOR NLJ->NL+1J'.
C                           1ST DIMENSION: J->J' TRANSITION INDEX.
C                           2ND DIMENSION: REFERENCED BY I4IDFL(N,L).
C  OUTPUT: (R*8)  TBFMM(,)= RATE COEFFT. FOR NLJ->NLJ' FOR STATE I.
C                           1ST DIMENSION: J->J' TRANSITION INDEX.
C                           2ND DIMENSION: REFERENCED BY I4IDFL(N,L).
C
C  PARAM : (I*4)  MXJ     = 'MXJSHL'.
C
C          (I*4)  NI      = VALENCE ELECTRON PRINCIPAL QUANTUM NUMBER
C                           IN STATE I.
C          (I*4)  NJ      = VALENCE ELECTRON PRINCIPAL QUANTUM NUMBER
C                           IN STATE J.
C          (I*4)  LI      = VALENCE ELECTRON ORBITAL QUANTUM NUMBER IN
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C                           STATE I.
C          (I*4)  LJ      = VALENCE ELECTRON ORBITAL QUANTUM NUMBER IN
C                           STATE J.
C          (I*4)  IDLI    = TABLE INDEX.
C          (I*4)  IDLJ    = TABLE INDEX.
C          (I*4)  I       = LOOP INDEX.
C          (I*4)  J       = LOOP INDEX.
C
C          (R*8)  FMP()   = RATE COEFFT. FOR NLJ->NL+1J'.
C                           DIMENSION: J->J' TRANSITION INDEX.
C          (R*8)  FMM()   = RATE COEFFT. FOR NLJ->NL+1J'.
C                           DIMENSION: J->J' TRANSITION INDEX.
C          (R*8)  FMI()   = RATE COEFFT. FOR NLJ->NLJ' FOR STATE I.
C                           DIMENSION: J->J' TRANSITION INDEX.
C          (R*8)  FMJ()   = RATE COEFFT. FOR NLJ->NLJ' FOR STATE J.
C                           DIMENSION: J->J' TRANSITION INDEX.
C
C NOTES:
C       1) THE J->J' TRANSITION INDEX IS AS FOLLOWS:
C              1 : J=L+0.5 -> J'=L'+0.5
C              2 : J=L+0.5 -> J'=L'-0.5
C              3 : J=L-0.5 -> J'=L'+0.5
C              4 : J=L-0.5 -> J'=L'-0.5
C
C       2) BEFORE CALLING C6TBQM THE LIFETIME TABLE MUST BE FILLED
C          WITH A CALL TO C6TBLF.
C
C ROUTINES:
C          ROUTINE    SOURCE    BRIEF DESCRIPTION
C          ------------------------------------------------------------
C          I4UNIT     ADAS      RETURNS UNIT NO. FOR OUTPUT OF MESSAGES.
C          I4IDFL     ADAS      RETURNS UNIQUE INDEX GIVEN QUANTUM
C                               NUMBERS N AND L.
C          CXMRDG     ADAS      CALCULATES MIXING RATE COEFFICIENTS
C                               BETWEEN NEARLY DEGENERATE LEVELS OF
C                               H-, LI- OR NA-LIKE IONS.
C
C AUTHOR:  JONATHAN NASH (TESSELLA SUPPORT SERVICES PLC)
C          K1/0/81
C          JET EXT. 5183
C
C DATE:    04/11/93
C
C UNIX-IDL PORT:
C
C AUTHOR:  WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C
C DATE:    22ND MAY 1996
C
C VERSION: 1.1                          DATE: 22-05-96
C MODIFIED: WILLIAM OSBORN
C               - FIRST VERSION. IBM VERSION NOT CHANGED
C
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C VERSION: 1.2                          DATE: 17-05-07
C MODIFIED: Allan Whiteford
C               - Updated comments as part of subroutine documentation
C                 procedure.
C-----------------------------------------------------------------------
C
C-----------------------------------------------------------------------
      INTEGER             IZ0,          IZ1,          MXJSHL,      MXNSHL
      INTEGER             NBOT,         NTOP
      REAL*8              AMSSNO,       BMAG
      REAL*8              TBFM(2*MXJSHL,(MXNSHL*(MXNSHL+1))/2)
      REAL*8              TBFMM(2*MXJSHL,(MXNSHL*(MXNSHL+1))/2)
      REAL*8              TBFMP(2*MXJSHL,(MXNSHL*(MXNSHL+1))/2)
      REAL*8              TBLF((MXNSHL*(MXNSHL+1))/2),           TIEV
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