ADAS Subroutine a1data

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       SUBROUTINE A1DATA( DSFULL , INDXREF , TITLE , CAMETH , Z0    ,
     &                    Z      , ZEFF    , INDL  , INDU   , EI    ,
     &                    EJ     , WI      , WJ    , ACOEFF , S     ,
     &                    FIJ    , EIJ     , IXTYP , FXC2   , FXC3  ,
     &                    IXOPS  , IBPTS   , IFPTS , IDIFF  , ICT   ,
     &                    ITOUT  , XA , YA , APOMA , DIFOMA , TOA   ,
     &                    GOA    , APGOA   , EXCRA , DEXCRA , GBARFA,
     &                    ISTDIM , IREAD   , IZ    , IZ0    , GF    ,
     &                    BCVAL
     &                 )
C-----------------------------------------------------------------------
C
C  ********************* FORTRAN77 SUBROUTINE A1DATA ******************
C
C  PURPOSE: TO REFRESH A DATA INDEX FROM AN ADAS101 ARCHIVE. READS
C           IN THE INDEX CODE A-ADAS, B-BURGESS AND THE THE REST OF
C           THE DATA AS APPROPRIATE.
C
C  CALLING PROGRAM:
C            ADAS101.FOR
C
C  INPUT:
C            (C*80) DSFULL   - THE USERS' CHOSEN ARCHIVE FILE NAME.
C            (I*4)  INDXREF  - THE INDEX NUMBER TO REFRESH FROM.
C            (C*40) TITLE    - THE INFORMATION LINE IN THE ARCHIVE
C                              FILE.
C            (C*4)  CAMETH   - THE TAG TO DISTINGUISH BETWEEN THE
C                              TWO TYPES OF ANALYSIS.
C                              A - ADAS, B- BURGESS
C            (R*8)  GF       - THE WEIGHTED OSCILLATOR STRENGTH
C            (R*8)  BCVAL    - THE BURGESS SCALABLE PARAMETER C.
C            (I*4)  ISTDIM = THE MAXIMUM ARRAY DIMENSION
C            (I*4)  IREAD  = THE INPUT UNIT
C
C  OUTPUTS:
C            (R*8)  Z0     = NUCLEAR CHARGE OF ION
C            (R*8)  Z      = ION CHARGE
C            (R*8)  ZEFF   = ION CHARGE + 1
C            (I*4)  INDL   = LOWER LEVEL INDEX  (USER CHOICE)
C            (I*4)  INDU   = UPPER LEVEL INDEX  (USER CHOICE)
C            (R*8)  WI     = LOWER LEVEL STATISTICAL WEIGHT
C            (R*8)  WJ     = UPPER LEVEL STATISTICAL WEIGHT
C            (R*8)  EI     = LOWER LEVEL ENERGY (IN SELECTED UNITS)
C            (R*8)  EJ     = UPPER LEVEL ENERGY
C            (R*8)  ACOEFF = TRANSITION PROBABILITY (IN ABOVE FORM,
C                            DIPOLE CASE ONLY)
C            (I*4)  IXTYP  = 1  DIPOLE TRANSITION
C                          = 2  NON-DIPOLE TRANSITION
C                          = 3  SPIN CHANGE TRANSITION
C                          = 4  OTHER
C            (I*4)  IBPTS  = 0  BAD POINT OPTION OFF
C                          = 1  BAD POINT OPTION ON
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C            (I*4)  IFPTS  = 1  SELECT ONE POINT OPTIMISING
C                           = 2  SELECT TWO POINT OPTIMISING
C            (I*4)  IXOPS  = 0  OPTIMISING OFF
C                           = 1  OPTIMISING ON  (IF ALLOWED)
C            (I*4)  IDIFF  = 0  RATIO FITTING FOR DIPOLE X-SECT(ONLY
C                               WITH OPTIMISING)
C                           = 1  DIFFERENCE FITTING FOR DIPOLE X-SECT
C            (R*8)  S      = LINE STRENGTH
C            (R*8)  FIJ    = OSCILLATOR STRENGTH
C            (R*8)  EIJ    = TRANSITION ENERGY
C            (R*8)  FXC2   = SPLINING VARIABLE
C            (R*8)  FXC3   = SPLINING VARIABLE
C            (I*4)  ICT    = NUMBER OF X-SECTIONS
C            (I*4)  ITOUT  = NUMBER OF TEMPERATURES
C            (R*8)  XA     = ENERGY (PARAMETER X)
C            (R*8)  YA     = OMEGA (COLLISION STRENGTH)
C            (R*8)  APOMA  = APPROXIMATE OMEGA
C            (R*8)  DIFOMA = DIFFERENCE BETWEEN YA & APOMA
C            (R*8)  TOA    = TEMPERATURE SET
C            (R*8)  GOA    = GAMMA (EFFECTIVE COLLISION STRENGTHS)
C            (R*8)  APGOA  = APPROXIMATE GAMMA
C            (R*8)  EXCRA  = EXCITATION RATE COEFFICIENT
C            (R*8)  DEXCRA = DEEXCITATION RATE COEFFICIENT
C            (R*8)  GBARFA = G BAR FUNCTION
C            (I*4)  ISTDIM = THE MAXIMUM ARRAY DIMENSION
C            (I*4)  IREAD  = THE INPUT UNIT
C
C  ROUTINES: NONE
C
C  AUTHOR:   DAVID H.BROOKS (UNIV.OF STRATHCLYDE) EXT.4213/4205
C
C  VERSION 1.1                              DATE:     26/05/95
C  MODIFIED: DAVID H. BROOKS
C - FIRST RELEASE
C  VERSION 1.2                              DATE:     03/10/96
C  MODIFIED: WILLIAM OSBORN
C       - ADDED TRAP FOR WHEN THE REQUESTED ARCHIVE NUMBER IS NOT IN
C         THE FILE
C
C  DATE: 07/05/99 VERSION 1.3
C  MODIFIED: HUGH SUMMERS
C - CORRECTED CONFUSION ABOUT NCHAR AND NELEC
C
C-----------------------------------------------------------------------
      CHARACTER*4         CAMETH
      CHARACTER*80        DSFULL
      CHARACTER*40        TITLE
      INTEGER             IBPTS,       ICT,         IDIFF,       IFPTS
      INTEGER             INDL,        INDU,        INDXREF,     IREAD
      INTEGER             ISTDIM,      ITOUT,       IXOPS,       IXTYP
      INTEGER             IZ,          IZ0
      REAL*8              ACOEFF,      APGOA(ISTDIM)
      REAL*8              APOMA(ISTDIM),            BCVAL
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REAL*8          DEXCRA(ISTDIM),          DIFOMA(ISTDIM)
REAL*8          EI,          EIJ,        EJ
REAL*8          EXCRA(ISTDIM),           FIJ,         FXC2
REAL*8          FXC3,        GBARFA(ISTDIM),          GF
REAL*8          GOA(ISTDIM), S,          TOA(ISTDIM), WI
REAL*8          WJ,          XA(ISTDIM), YA(ISTDIM),  Z
REAL*8          Z0,          ZEFF
```