ADAS Subroutine d8data

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       SUBROUTINE D8DATA( IUNIT,   IZDIMD,  IGDIMD,
     +                    IZ0,     IZL,     IZU,
     +                    IZRA,    IZDA,    IZIA,    IZTA,    IZSA,
     +                    CRRCA,   NRRCA,   ISRRCA,
     +                    NZA,     KSIA,
     +                    N0RA,    V0RA,    PHFCRA,  EDSPRA,  SCLERA,
     +                    CDRCA,   NDRCA,   ISDRCA,
     +                    DEDA,    FDA,     GDA,     NNDA,    MSDA,
     +                    ITYPDA,  N0DA,    NCUTA,   V0DA,    PHFCDA,
     +                    CRFCDA,  EPSIJA,  FIJA,    EDSPDA,  SCLEDA,
     +                    CCIOA,   NCIOSA,  NCIORA,  ISCIOA,
     +                    PIOA,    AIOA,    BIOA,    CIOA,    NQIOA,
     +                    ZETAA,   EIONA,   CIA,
     +                    WGHTA,   ENERA,   CRA,
     +                    CPLTA,   NPLTA,   ISPLTA,
     +                    DEPTA,   FPTA,    GPTA,    NNPTA,   SPYLTA,
     +                    CPLSA,   NPLSA,   ISPLSA,  INFO,
     +                    DEPSA,   FPSA,    GPSA,    NNPSA,   SPYLSA,
     +                    LVALID
     +                  )
C
C-----------------------------------------------------------------------
C
C  ****************** FORTRAN77 SUBROUTINE: D8DATA *********************
C
C  PURPOSE:  TO FETCH DATA FROM INPUT ATOMPARS DATA SET OF TYPE ADF03.
C
C  CALLING PROGRAM: ADAS408
C
C
C
C  SUBROUTINE:
C
C  INPUT : (I*4)  IUNIT     = UNIT TO WHICH INPUT FILE IS ALLOCATED
C  INPUT : (I*4)  IZDIMD    = MAXIMUM NUMBER OF IONISATION STAGES
C  INPUT : (I*4)  IGDIMD    = MAXIMUM NUMBER OF GROUPS
C
C
C  THE OUTPUT ARRAYS ARE INDEXED
C            XXX()  = XXX(IZDIMD)         1ST DIMENSION ION STAGE
C
C            XXX(,) = XXX(IZDIMD,IGDIMD)  1ST DIMENSION ION STAGE
C                                         2ND DIMENSION GROUP
C
C
C
C  OUTPUT: (I*4)  IZ0       =  NUCLEAR CHARGE
C  OUTPUT: (I*4)  IZL       =  LOWEST INCLUDED ION
C  OUTPUT: (I*4)  IZU       =  HIGHEST INCLUDED ION
C
C  OUTPUT: (I*4)  IZRA()    =  RECOMBINING ION (RAD.  RECOM.)
C  OUTPUT: (I*4)  IZDA()    =  RECOMBINING ION (DIEL. RECOM.)
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C  OUTPUT: (I*4)  IZIA()     =  IONISING ION    (COLL. IONIS.)
C  OUTPUT: (I*4)  IZTA()     =  RADIATING ION   (TOTAL LINE POWER)
C  OUTPUT: (I*4)  IZSA()     =  RADIATING ION   (SPECIFIC LINE POWER)
C
C
C
C  OUTPUT: (C*5)  CRRCA()    =  RADIATIVE RECOM. CODE
C  OUTPUT: (I*4)  NRRCA()    =    - NOT USED -
C  OUTPUT: (I*4)  ISRRCA()   =    - NOT USED -
C
C  OUTPUT: (I*4)  NZA()      = LOWEST ACCESSIBLE SHELL FOR RAD. RECOM.
C  OUTPUT: (I*4)  KSIA()     = NUMBER OF ELECTRONS IN SHELL
C
C  OUTPUT: (I*4)  N0RA()     = LOWEST ACCESSIBLE PRINC. QUANTUM SHELL
C                              FOR RAD. RECOM.
C  OUTPUT: (I*4)  V0RA()     = EFFECTIVE PRINCIPAL QUANTUM NUMBER
C                              FOR SHELL
C  OUTPUT: (R*8)  PHFCRA()   = PHASE SPACE OCCUPANCY AVAILABILITY
C                              FOR SHELL
C  OUTPUT: (R*8)  EDSPRA()   = ENERGY ADJUSTMENT IN LOWEST SHELL
C                              RATE COEFFICIENT
C  OUTPUT: (R*8)  SCLERA()   = MULTIPLIER FOR LOWEST SHELL
C                              RATE COEFFICIENT
C
C
C
C  OUTPUT: (C*5)  CDRCA()    =  DIELECTRONIC RECOM. CODE
C  OUTPUT: (I*4)  NDRCA()    =  NUMBER OF TRANSITIONS FOLLOWING
C  OUTPUT: (I*4)  ISDRCA()   =    - NOT USED -
C
C  OUTPUT: (R*8)  DEDA(,)    = TRANSITION ENERGY (EV)
C  OUTPUT: (R*8)  FDA(,)     = OSCILLATOR STRENGTH
C  OUTPUT: (R*8)  GDA(,)     = GAUNT FACTOR
C  OUTPUT: (I*4)  NNDA(,)    = DELTA N FOR TRANSITION
C  OUTPUT: (I*4)  MSDA(,)    = MERTZ SWITCH (0=OFF, 1=ON)
C
C  OUTPUT: (I*4)  ITYPDA(,) = TYPE OF DIELECTRONIC TRANSITION
C  OUTPUT: (I*4)  N0DA(,)    = LOWEST ACCESSIBLE PRINC. QUANTUM SHELL
C                              FOR DIEL. RE
C  OUTPUT: (I*4)  NCUTA(,)   = CUT-OFF PRINC. QUANTUM SHELL IN
C                              GENERAL PROGRAM
C  OUTPUT: (I*4)  V0DA(,)    = EFFECTIVE PRINC. QUANTUM NUMBER
C                              FOR LOWEST ACCESS
C  OUTPUT: (R*8)  PHFCDA(,) = PHASE SPACE OCCUPANCY AVAILABILITY
C                              FOR LOWEST SHELL
C  OUTPUT: (R*8)  CRFCDA(,) = ADJUSTMENT FOR BETHE CORRECTIONS
C                              IN GENERAL PROGRAM
C  OUTPUT: (R*8)  EPSIJA(,) = Z-SCALED PARENT TRANSITION ENERGY (RYD)
C  OUTPUT: (R*8)  FIJA(,)    = OSCILLATOR STRENGTH FOR TRANSITION
C  OUTPUT: (R*8)  EDSPDA(,) = ENERGY ADJUSTMENT IN BURGESS GENERAL
C                              FORMULA (RYD)
C  OUTPUT: (R*8)  SCLEDA(,) = MULTIPLIER ON BURGESS GENERAL FORMULA
C
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C
C
C  OUTPUT: (C*5)  CCIOA()    =  COLLISIONAL IONIS. CODE
C  OUTPUT: (I*4)  NCIOSA()   =  NUMBER OF SHELL  VALUES FOLLOWING
C  OUTPUT: (I*4)  NCIORA()   =  NUMBER OF RESON. VALUES FOLLOWING
C  OUTPUT: (I*4)  ISCIOA()   =    - NOT USED -
C
C  OUTPUT: (R*8)  PIOA(,)    = SHELL IONISATION POTENTIAL (EV)
C  OUTPUT: (R*8)  AIOA(,)    = LOTZ PARAMETER
C  OUTPUT: (R*8)  BIOA(,)    = LOTZ PARAMETER
C  OUTPUT: (R*8)  CIOA(,)    = LOTZ PARAMETER
C  OUTPUT: (I*4)  NQIOA(,)   = EQUIVALENT ELECTRONS IN SHELL
C
C  OUTPUT: (R*8)  ZETAA(,)   = NUMBER OF EQUIVALENT ELECTRONS FOR SHELL
C  OUTPUT: (R*8)  EIONA(,)   = IONISATION ENERGY FOR SHELL (RYD)
C  OUTPUT: (R*8)  CIA(,)     = MULTIPLIER FOR BURGESS-CHIDICHIMO RATE
C                              FOR SHELL
C  OUTPUT: (R*8)  WGHTA(,)   = WEIGHTING FACTOR FOR EXCITATION TO
C                              RESONANCE
C  OUTPUT: (R*8)  ENERA(,)   = EXCITATION ENERGY FOR TRANSITION
C                              TO RESONANCE (RYD)
C  OUTPUT: (R*8)  CRA(,)     = MULTIPLIER ON EXCITATION RATE EXPRESSSION
C
C
C
C  OUTPUT: (C*5)  CPLTA()    =  TOTAL LINE POWER CODE
C  OUTPUT: (I*4)  NPLTA()    =  NUMBER OF TRANSITIONS FOLLOWING
C  OUTPUT: (I*4)  ISPLTA()   =    - NOT USED -
C
C  OUTPUT: (R*8)  DEPTA(,)   = TRANSITION ENERGY (EV)
C  OUTPUT: (R*8)  FPTA(,)    = OSCILLATOR STRENGTH
C  OUTPUT: (R*8)  GPTA(,)    = GAUNT FACTOR
C  OUTPUT: (I*4)  NNPTA(,)   = DELTA N FOR TRANSITION
C
C  OUTPUT: (R*8)  SPYLTA(,)  = MULTIPLIER OF VAN REGEMORTER P
C                              FACTOR IN TOTAL POWER
C
C
C
C  OUTPUT: (C*5)  CPLSA()    = SPECIFIC LINE POWER CODE
C  OUTPUT: (I*4)  NPLSA()    =   - NOT USED -
C  OUTPUT: (I*4)  ISPLSA()   =   - NOT USED -
C  OUTPUT: (C*8)  INFO()     = WAVELENGTH OF SPECIFIC LINE FOR
C                              NAMING PURPOSES
C
C  OUTPUT: (R*8)  DEPSA(,)   = TRANSITION ENERGY (EV)
C  OUTPUT: (R*8)  FPSA(,)    = OSCILLATOR STRENGTH
C  OUTPUT: (R*8)  GPSA(,)    = GAUNT FACTOR
C  OUTPUT: (I*4)  NNPSA(,)   = DELTA N FOR TRANSITION
C
C  OUTPUT: (R*8)  SPYLSA(,)  = MULTIPLIER OF VAN REGEMORTER P FACTOR
C                              IN SPECIFIC LINE POWER
C
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C
C
C  OUTPUT: (L*4)  LVALID  = .TRUE. DATA SET READ AND APPEARS VALID
C                         = .FALSE. ERROR DETECTED IN READING DATA SET
C
C
C
C  PROGRAM:
C          (C*50) ERRMSG()= ERROR MESSAGE STRING
C          (I*4)  IDUM    = PROGRAM USE
C
C
C  ROUTINES:
C          ROUTINE   SOURCE   DESCRIPTION
C          ------------------------------------------------------
C          I4UNIT    ADAS     FETCH UNIT NUMBER FOR MESSAGE OUTPUT
C
C
C  AUTHOR:  H. P. SUMMERS, JET
C          K1/1/57
C          JET EXT. 4941
C
C  DATE:    10/05/94
C
C  UPDATE:
C
C UNIX-IDL PORT:
C
C VERSION: 1.1                          DATE: 04-04-96
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C               - PUT UNDER S.C.C.S. CONTROL
C
C VERSION: 1.2 DATE: 07-04-97
C MODIFIED: RICHARD MARTIN
C ADDED THE LINE WRITE(I4UNIT(-1),*)STRG1
C
C VERSION: 1.3 DATE: 24-02-98
C MODIFIED: M OMULLANE
C CHANGED 'E6DATA' TO 'D8DATA' IN FORMAT STATEMENTS 2001 & 2009
C
C-----------------------------------------------------------------------
C     GENERAL VARIABLES
C
      CHARACTER*5         CCIOA(IZDIMD),            CDRCA(IZDIMD)
      CHARACTER*5         CPLSA(IZDIMD),            CPLTA(IZDIMD)
      CHARACTER*5         CRRCA(IZDIMD)
      CHARACTER*8         INFO(IZDIMD)
      INTEGER             IGDIMD,      ISCIOA(IZDIMD)
      INTEGER             ISDRCA(IZDIMD),           ISPLSA(IZDIMD)
      INTEGER             ISPLTA(IZDIMD),           ISRRCA(IZDIMD)
      INTEGER             ITYPDA(IZDIMD,IGDIMD),    IUNIT,       IZ0
      INTEGER             IZDA(IZDIMD),             IZDIMD
      INTEGER             IZIA(IZDIMD),             IZL
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INTEGER           IZRA(IZDIMD),            IZSA(IZDIMD)
INTEGER           IZTA(IZDIMD),            IZU
INTEGER           KSIA(IZDIMD),            MSDA(IZDIMD,IGDIMD)
INTEGER           N0DA(IZDIMD,IGDIMD),     N0RA(IZDIMD)
INTEGER           NCIORA(IZDIMD),          NCIOSA(IZDIMD)
INTEGER           NCUTA(IZDIMD,IGDIMD),    NDRCA(IZDIMD)
INTEGER           NNDA(IZDIMD,IGDIMD),     NNPSA(IZDIMD,IGDIMD)
INTEGER           NNPTA(IZDIMD,IGDIMD),    NPLSA(IZDIMD)
INTEGER           NPLTA(IZDIMD),           NQIOA(IZDIMD,IGDIMD)
INTEGER           NRRCA(IZDIMD),           NZA(IZDIMD)
INTEGER           V0RA(IZDIMD)
LOGICAL           LVALID
REAL*8            AIOA(IZDIMD,IGDIMD),     BIOA(IZDIMD,IGDIMD)
REAL*8            CIA(IZDIMD,IGDIMD),      CIOA(IZDIMD,IGDIMD)
REAL*8            CRA(IZDIMD,IGDIMD)
REAL*8            CRFCDA(IZDIMD,IGDIMD),   DEDA(IZDIMD,IGDIMD)
REAL*8            DEPSA(IZDIMD,IGDIMD),    DEPTA(IZDIMD,IGDIMD)
REAL*8            EDSPDA(IZDIMD,IGDIMD),   EDSPRA(IZDIMD)
REAL*8            EIONA(IZDIMD,IGDIMD),    ENERA(IZDIMD,IGDIMD)
REAL*8            EPSIJA(IZDIMD,IGDIMD),   FDA(IZDIMD,IGDIMD)
REAL*8            FIJA(IZDIMD,IGDIMD),     FPSA(IZDIMD,IGDIMD)
REAL*8            FPTA(IZDIMD,IGDIMD),     GDA(IZDIMD,IGDIMD)
REAL*8            GPSA(IZDIMD,IGDIMD),     GPTA(IZDIMD,IGDIMD)
REAL*8            PHFCDA(IZDIMD,IGDIMD),   PHFCRA(IZDIMD)
REAL*8            PIOA(IZDIMD,IGDIMD)
REAL*8            SCLEDA(IZDIMD,IGDIMD),   SCLERA(IZDIMD)
REAL*8            SPYLSA(IZDIMD,IGDIMD)
REAL*8            SPYLTA(IZDIMD,IGDIMD),   V0DA(IZDIMD,IGDIMD)
REAL*8            WGHTA(IZDIMD,IGDIMD),    ZETAA(IZDIMD,IGDIMD)
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