

ADAS Subroutine d6data

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      SUBROUTINE D6DATA( DSFLLA , LSELA , LEXSA , LDEFA , LPART ,
&                      IZ0    , IZ1MIN , IZ1MAX , NPART  ,
&                      NTDIM  , ITMAX  ,
&                      ISDIMD , IZDIMD , ITDIMD , IPDIMD , NPARTR,
&                      DTEV   , DDENS  ,
&                      DTEVD  , DDENSD , DRCOFD , ZDATA  ,
&                      DRCOFI ,
&                      ACDA   , LACDA  ,
&                      SCDA   , LSCDA  ,
&                      CCDA   , LCCDA  ,
&                      PRBA   , LPRBA  ,
&                      PRCA   , LPRCA  ,
&                      QCDA   , LQCDA  ,
&                      XCDA   , LXCDA  ,
&                      PLTA   , LPLTA  ,
&                      )
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C ***** FORTRAN77 SUBROUTINE: D6DATA *****

C

C PURPOSE : TO EXTRACT A COMPLETE SET OF COLLISIONAL DIELECTRONIC DATA
C FOR A TEMP/DENSITY MODEL
C FROM EITHER PARTIAL (METASTABLE/PARENT RESOLVED) OR STANDARD
C (UNRESOLVED) ISONUCLEAR MASTER FILES

C

C NOTE : THE SOURCE DATA IS CONTAINED AS SEQUENTIAL DATASETS
C WITH THE FOLLOWING NAMING CONVENTIONS:

C

- C (1) JETSHP.ACD<YR>#<EL>.<CODE>DATA
- C (2) JETSHP.SCD<YR>#<EL>.<CODE>DATA
- C (3) JETSHP.CCD<YR>#<EL>.<CODE>DATA
- C (4) JETSHP.PR<YR>#<EL>.<FILT>.<CODE>DATA
- C (5) JETSHP.PRC<YR>#<EL>.<FILT>.<CODE>DATA
- C (6) JETSHP.QCD<YR>#<EL>.<CODE>DATA
- C (7) JETSHP.XCD<YR>#<EL>.<CODE>DATA
- C (8) JETSHP.PLT<YR>#<EL>.<CODE>DATA

C

C WHERE, <YR> = TWO DIGIT YEAR NUMBER
C <EL> = ONE OR TWO CHARACTER ELEMENT SYMBOL
C <CODE> = R => PARTIAL DATA
C U => PARTIAL DATA
C OMITTED => STANDARD DATA
C <FILT> = SIX CHARACTER POWER FILTER CODE

C

C AND DATA OF CLASSES 6 AND 7 DO NOT EXIST FOR THE STANDARD CASE.

C

C

C INPUT : (C*120)DSFLLA() = MASTER FILE DATA SET NAMES
C INPUT : (L*4) LSELA() = .TRUE. => INPUT DATA SET TYPE FOR THIS
C INDEX SELECTED
C = .FALSE. => INPUT DATA SET FOR THIS INDEX

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C                                     NOT SELECTED
C INPUT  : (L*4)  LEXSA()  = .TRUE.  => INPUT DATA SET TYPE FOR THIS
C                                     SELECTED INDEX EXISTS
C                                     = .FALSE. => INPUT DATA SET DOES NOT EXIST
C                                     FOR THIS SELECTED INDEX
C INPUT  : (L*4)  LDEFA()  = .TRUE.  => INPUT DATA SET TYPE FOR THIS
C                                     DEFAULT YEAR INDEX EXISTS
C                                     = .FALSE. => INPUT DATA SET DOES NOT EXIST
C                                     FOR THIS DEFAULT YEAR INDEX
C INPUT  : (L*4)  LPART    = .TRUE.  => PARTIAL DATA SELECTED
C                                     = .FALSE. => STANDARD DATA SELECTED
C INPUT  : (I*4)  IZO      = NUCLEAR CHARGE
C INPUT  : (I*4)  IZ1MIN   = MINIMUM ION CHARGE+1 IN MASTER DATA FILES
C INPUT  : (I*4)  IZ1MAX   = MAXIMUM ION CHARGE+1 IN MASTER DATA FILES
C INPUT  : (I*4)  NPART()  = METASTABLE PARTITION. I.E. NUMBER OF
C                                     METASTABLES FROM CHARGE STATE IZ1MIN-1 TO
C                                     IZ1MAX ON INPUT
C INPUT  : (I*4)  NTDIM    = MAXIMUM NUMBER OF DTEV/DDENS PAIRS
C INPUT  : (I*4)  ITMAX    = NUMBER OF ( DTEV() , DDENS() ) PAIRS
C INPUT  : (I*4)  ISDIMD   = MAXIMUM NUMBER OF (CHARGE, PARENT, GROUND)
C                                     BLOCKS IN ISONUCLEAR MASTER FILES
C INPUT  : (I*4)  IZDIMD   = MAXIMUM NUMBER OF CHARGE STATES
C                                     IN ISONUCLEAR MASTER FILES
C INPUT  : (I*4)  ITDIMD   = MAXIMUM NUMBER OF TEMP OR DENS VALUES IN
C                                     ISOELECTRONIC MASTER FILES
C INPUT  : (I*4)  IPDIMD   = MAXIMUM NUMBER OF METASTABLES FOR EACH
C                                     IONISATION STAGE
C INPUT  : (R*8)  DTEV()   = DLOG10(ELECTRON TEMPERATURES (EV))
C INPUT  : (R*8)  DDENS()  = DLOG10(ELECTRON DENSITIES (CM-3))
C
C OUTPUT : (I*4)  NPARTR() = METASTABLE PARTITION. I.E. NUMBER OF
C                                     METASTABLES FROM CHARGE STATE IZ1MIN-1 TO
C                                     IZ1MAX FOUND IN MASTER FILE
C OUTPUT : (R*8)  DTEVD()  = DLOG10(DATA ELECTRON TEMPERATURES (EV))
C                                     IN SELECTED MASTER FILE
C OUTPUT : (R*8)  DDENSD() = DLOG10(DATA ELECTRON DENSITIES (CM-3))
C                                     IN SELECTED MASTER FILE
C OUTPUT : (R*8)  DRCOFD(,,) = DLOG10(DATA RATE COEFFICIENTS (CM-3/S))
C                                     IN SELECTED MASTER FILE
C                                     1ST DIM: (CHARGE,META,GRD) BLOCK INDEX
C                                     2ND DIM: TEMPERATURE INDEX
C                                     3RD DIM: DENSITY INDEX
C OUTPUT : (R*8)  ZDATA()  = CHARGE + 1 FOR IONS IN SELECTED MASTER
C                                     FILE
C                                     1ST DIM: (CHARGE,META,GRD) BLOCK INDEX
C OUTPUT : (R*8)  DRCOFI() = INTERPOLATION OF DRCOFD(,,) FOR
C                                     DTEV() & DDENS()
C OUTPUT : (R*8)  ACDA(,,,) = INTERPOLATION OF ACD COEFFICIENT (CM3 S-1)
C                                     1ST DIM: TEMPERATURE INDEX
C                                     2ND DIM: CHARGE STATE INDEX
C                                     3RD DIM: RECOMBINING METASTABLE INDEX
C                                     4TH DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (L*4)  LACDA(,,) = .TRUE.  => ACD COEFFICIENT AVAILABLE

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C          .FALSE. => ACD COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: RECOMBINING METASTABLE INDEX
C          3RD DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (R*8)  SCDA( , , , ) = INTERPOLATION OF SCD COEFFICIENT (CM3 S-1)
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: RECOMBINING METASTABLE INDEX
C          4TH DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (L*4)  LSCDA( , , ) = .TRUE.  => SCD COEFFICIENT AVAILABLE
C          .FALSE. => SCD COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: RECOMBINING METASTABLE INDEX
C          3RD DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (R*8)  CCDA( , , , ) = INTERPOLATION OF CCD COEFFICIENT (CM3 S-1)
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: RECOMBINING METASTABLE INDEX
C          4TH DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (L*4)  LCCDA( , , ) = .TRUE.  => CCD COEFFICIENT AVAILABLE
C          .FALSE. => CCD COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: RECOMBINING METASTABLE INDEX
C          3RD DIM: RECOMBINED METASTABLE INDEX
C OUTPUT : (R*8)  PRBA( , , ) = INTERPOLATION OF PRB COEFFICIENT (W CM3 )
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: RECOMBINING METASTABLE INDEX
C OUTPUT : (L*4)  LCCDA( , ) = .TRUE.  => PRB COEFFICIENT AVAILABLE
C          .FALSE. => PRB COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: RECOMBINING METASTABLE INDEX
C OUTPUT : (R*8)  PRCA( , , ) = INTERPOLATION OF PRC COEFFICIENT (W CM3 )
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: RECOMBINING METASTABLE INDEX
C OUTPUT : (L*4)  LPRCA( , ) = .TRUE.  => PRC COEFFICIENT AVAILABLE
C          .FALSE. => PRC COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: RECOMBINING METASTABLE INDEX
C OUTPUT : (R*8)  QCDA( , , , ) = INTERPOLATION OF QCD COEFFICIENT (CM3 S-1)
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: FIRST METASTABLE INDEX
C          4TH DIM: SECOND METASTABLE INDEX
C OUTPUT : (L*4)  LQCDA( , , ) = .TRUE.  => QCD COEFFICIENT AVAILABLE
C          .FALSE. => QDC COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: FIRST METASTABLE INDEX
C          3RD DIM: SECOND METASTABLE INDEX
C OUTPUT : (R*8)  XCDA( , , , ) = INTERPOLATION OF XCD COEFFICIENT (CM3 S-1)
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX

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C          3RD DIM: FIRST PARENT METASTABLE INDEX
C          4TH DIM: SECOND PARENT METASTABLE INDEX
C OUTPUT : (L*4)  LXCDA(,,) = .TRUE.  => XCD COEFFICIENT AVAILABLE
C          .FALSE. => XCD COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM: FIRST PARENT METASTABLE INDEX
C          3RD DIM: SECOND PARENT METASTABLE INDEX
C OUTPUT : (R*8)  PLTA(,,) = INTERPOLATION OF PLT COEFFICIENT (W CM3 )
C          1ST DIM: TEMPERATURE INDEX
C          2ND DIM: CHARGE STATE INDEX
C          3RD DIM: METASTABLE INDEX
C OUTPUT : (L*4)  LPLTA(,) = .TRUE.  => PLT COEFFICIENT AVAILABLE
C          .FALSE. => PLT COEFFICIENT NOT AVAILABLE
C          1ST DIM: CHARGE STATE INDEX
C          2ND DIM:  METASTABLE INDEX
C
C PROGRAM: (I*4)  IT          = GENERAL INDEX FOR TEMPERATURE
C          (I*4)  IZ          = GENERAL INDEX FOR CHARGE
C          (I*4)  IZ1        = GENERAL INDEX FOR CHARGE+1
C          (I*4)  IPRT       = GENERAL INDEX FOR PARENT METASTABLE
C          (I*4)  JPRT       = GENERAL INDEX FOR PARENT METASTABLE
C          (I*4)  IGRD       = GENERAL INDEX FOR METASTABLE
C          (I*4)  JGRD       = GENERAL INDEX FOR METASTABLE
C
C
C ROUTINES:
C          ROUTINE      SOURCE      BRIEF DESCRIPTION
C          -----
C
C AUTHOR : H. P. SUMMERS, JET
C          K1/1/57
C          JET EXT. 4941
C
C DATE   : 25/04/94
C
C UPDATE :
C
C UNIX-IDL PORT:
C
C AUTHOR:  WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C
C DATE:    07/06/96
C
C VERSION: 1.1          DATE:07/06/96
C MODIFIED: WILLIAM OSBORN
C          - FIRST VERSION
C VERSION: 1.2          DATE:27/06/96
C MODIFIED: WILLIAM OSBORN
C          - REMOVED UNUSED VARIABLES
C VERSION: 1.3          DATE:27/06/96
C MODIFIED: WILLIAM OSBORN
C          - CHANGED 'DO 2 IT = 1,ITDIMD'

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C          TO 'DO 2 IT = 1,NTDIM'
C SO AS NOT TO GO OUTSIDE ARRAY BOUNDS
C   - CHANGED DECISIONS TO 'IF ((LEXSA(I).OR.LDEFA(I)).AND.LSELA(I))'
C     SEE D5DATA FOR MORE INFO.
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CHARACTER*120      DSFLLA(8)
INTEGER            IPDIMD,      ISDIMD,      ITDIMD,      ITMAX
INTEGER            IZ0,         IZ1MAX,      IZ1MIN,      IZDIMD
INTEGER            NPART (IZDIMD) ,          NPARTR (IZDIMD)
INTEGER            NTDIM
LOGICAL            LACDA (IZDIMD, IPDIMD, IPDIMD)
LOGICAL            LCCDA (IZDIMD, IPDIMD, IPDIMD)
LOGICAL            LDEFA (8) ,      LEXSA (8) ,      LPART
LOGICAL            LPLTA (IZDIMD, IPDIMD) ,      LPRBA (IZDIMD, IPDIMD)
LOGICAL            LPRCA (IZDIMD, IPDIMD)
LOGICAL            LQCD (IZDIMD, IPDIMD, IPDIMD)
LOGICAL            LSCDA (IZDIMD, IPDIMD, IPDIMD)
LOGICAL            LSELA (8) ,      LXCDA (IZDIMD, IPDIMD, IPDIMD)
REAL*8             ACDA (NTDIM, IZDIMD, IPDIMD, IPDIMD)
REAL*8             CCDA (NTDIM, IZDIMD, IPDIMD, IPDIMD)
REAL*8             DDENS (ITMAX) ,          DDENSD (ITDIMD)
REAL*8             DRCOFD (ISDIMD, ITDIMD, ITDIMD)
REAL*8             DRCOFI (ITMAX) ,          DTEV (ITMAX)
REAL*8             DTEVD (ITDIMD)
REAL*8             PLTA (NTDIM, IZDIMD, IPDIMD)
REAL*8             PRBA (NTDIM, IZDIMD, IPDIMD)
REAL*8             PRCA (NTDIM, IZDIMD, IPDIMD)
REAL*8             QCDA (NTDIM, IZDIMD, IPDIMD, IPDIMD)
REAL*8             SCDA (NTDIM, IZDIMD, IPDIMD, IPDIMD)
REAL*8             XCDA (NTDIM, IZDIMD, IPDIMD, IPDIMD)
REAL*8             ZDATA (ISDIMD)

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