

ADAS Subroutine dxrdnm

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C
      SUBROUTINE DXRDNM( DSNINC , LPART , IFAIL ,
&                      IZ0    , NPART , IPRTD , IGRDD , ICLASS ,
&                      IZ1    , ITMAX ,
&                      ISDIMD , IZDIMD , ITDIMD ,
&                      ISMAXD , IZMAXD , ITMAXD , IDMAXD , NPARTR,
&                      DTEV   , DDENS ,
&                      DTEVD  , DDENSD , DRCOFD , ZDATA ,
&                      DRCOFI
&                      )
C
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C
C ***** FORTRAN77 SUBROUTINE: DXRDNM *****
C
C PURPOSE : TO EXTRACT COLLISIONAL DIELECTRONIC DATA FROM
C           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           (9) JETSHP.PLS<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 PARTIAL CASE.
C
C INPUT  : (C*120) DSNINC   = ISONUCLEAR MASTER FILE NAME - VERIFIED
C                   AND READY FOR DYNAMIC ALLOCATION.
C INPUT  : (L*4)  LPART    = .TRUE.  => PARTIAL (RESOLVED) MASTER DATA
C                   . FALSE. => UNSRESOLVED MASTER DATA
C INPUT  : (I*4)  IZ0      = NUCLEAR CHARGE
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)  IPRTD    = REQUIRED PARENT INDEX
C INPUT  : (I*4)  IGRDD    = REQUIRED GROUND INDEX
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C INPUT  : (I*4)  ICLASS    = CLASS OF DATA ( 1 - 9 )
C INPUT  : (I*4)  IZ1       = REQUIRED ION CHARGE + 1
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  : (R*8)  DTEV()    = DLOG10(ELECTRON TEMPERATURES (EV))
C INPUT  : (R*8)  DDENS()   = DLOG10(ELECTRON DENSITIES (CM-3))
C
C OUTPUT : (I*4)  IFAIL     = 0    IF ROUTINE SUCCESSFUL - DATA FOR THE
C                               REQUESTED YEAR USED.
C                               = 1    IF ROUTINE OPEN STATEMENT FAILED
C                               = 2    IF FILE EXISTS BUT REQUIRED DATA
C                               BLOCK DOES NOT
C OUTPUT : (I*4)  ISMAXD    = NUMBER OF (CHARGE, PARENT, METASTABLE)
C                               BLOCKS IN SELECTED MASTER FILE
C OUTPUT : (I*4)  IZMAXD    = NUMBER OF ZDATA() VALUES IN SELECTED
C                               MASTER FILE
C OUTPUT : (I*4)  ITMAXD    = NUMBER OF DTEVD() VALUES IN SELECTED
C                               MASTER FILE
C OUTPUT : (I*4)  IDMAXD    = NUMBER OF DDENSD() VALUES IN SELECTED
C                               MASTER FILE
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
C PROGRAM: (C*80) DSNOLD    = FILE NAME USED IN PREVIOUS CALL
C           (C*80) CLINE    = GENERAL CHARACTER VARIABLE
C           (C*80) CTERM    = TERMINATOR LINE - '-' FILLED VARIABLE
C           (C*4)  CPATRN() = PATTERN USED TO DETECT DATA CLASS
C           (I*4)  IZOD     = NUCLEAR CHARGE READ FROM MASTER FILE
C           (I*4)  IZ1MIN   = MINIMUM CHARGE+1 READ FROM MASTER FILE
C           (I*4)  IZ1MAX   = MAXIMUM CHARGE+1 READ FROM MASTER FILE
C           (I*4)  IABT     = ABORT CODE
C           (I*4)  INDSEL   = LOCATION OF (CHARGE,PRNT,GRND)
C                               DATA BLOCK IN FILE

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C      (I*4)  IZDAT      = CURRENT DATA BLOCK ION CHARGE +1
C      (I*4)  ISEL      = GENERAL INDEX
C      (I*4)  I          = GENERAL INDEX
C      (I*4)  IT         = GENERAL INDEX
C      (I*4)  ID         = GENERAL INDEX
C      (I*4)  IZCHK     = INDEX TO VERIFY DATA Z1 SET COMPLETE
C      (I*4)  IPRTR()   = PARENT INDICES IN DATA SET
C      (I*4)  IGRDR()   = GROUND INDICES IN DATA SET
C      (I*4)  LCK       = MUST BE GREATER THAN 'ITMAXD' & 'IDMAXD'
C                        & 'ITMAX' - ARRAY SIZE FOR SPLINE CALCS.
C      (R*8)  A()       = GENERAL ARRAY
C      (R*8)  DRCOF0(,,) = INTERPOLATION OF DRCOFD(,,) W.R.T DTEV()
C      (L*8)  LEXIST    = TRUE --- FILE TO OPEN EXISTS ELSE NOT
C      (I*4)  L1        = PARAMETER = 1
C      (I*4)  IOPT     = DEFINES THE BOUNDARY DERIVATIVES FOR THE
C                        SPLINE ROUTINE 'XXSPLN', SEE 'XXSPLN'.
C      (L*4)  LSETX    = .TRUE. => SET UP SPLINE PARAMETERS RELATING
C                        TO X-AXIS.
C                        .FALSE. => DO NOT SET UP SPLINE PARAMETERS
C                        RELATING TO X-AXIS.
C                        (I.E. THEY WERE SET IN A PREVIOUS
C                        CALL )
C                        (VALUE SET TO .FALSE. BY 'XXSPLN')
C      (R*8)  DY()     = SPLINE INTERPOLATED DERIVATIVES

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C ROUTINES:

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C      ROUTINE      SOURCE      BRIEF DESCRIPTION
C      -----
C      I4UNIT       ADAS        FETCH UNIT NUMBER FOR OUTPUT OF MESSAGES
C      I4FCTN       ADAS        CONVERT STRING TO INTEGER FORM

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(R*8 ADAS FUNCTION - 'R8FUN1' (X -> X))

C AUTHOR : H. P. SUMMERS, JET
C K1/1/57
C JET EXT. 4941

C DATE : 24/04/94

C UPDATE : 21/07/94 - HPS - BYPASS CHECK ON CHARGE STATE COMPLETENESS
C FOR XCD AND QCD FILES

C UNIX-IDL PORT:

C VERSION: 1.1 DATE: 08-11-95
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C - FIRST RELEASE

C VERSION: 1.2 DATE: 22-11-95
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C - CHANGED TEST FOR ION LIMITS SLIGHTLY FROM
C IZ1MIN.GE.IZ1MAX TO IZ1MIN.GT.IZ1MAX TO ALLOW

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C          RUNS FOR HYDROGEN TO PROCEED.
C
C VERSION: 1.3 DATE: 13-10-99
C MODIFIED: Martin O'Mullane
C - PRB definition has been changed and they are now
C          summed over the parents. This necessitates accessing
C          the data more like PLT/PRC/PLS than the others.
C          - DSNOLD made same size as DSNINC
C
C VERSION: 1.4 DATE: 02-01-2001
C MODIFIED: Martin O'Mullane
C - Error in logic reading number of metastables in
C          resolved datasets - change IZ1MAX+IZ1MAX-2.GT.16
C          to IZ1MAX+IZ1MIN-2.GT.16
C
C VERSION: 1.4 DATE: 24-07-2001
C MODIFIED: Richard Martin
C Added check for whitespace (line 323), so that it can cope
C with SCCS data.
C
C VERSION: 1.5 DATE: 22-12-2008
C MODIFIED: Allan Whiteford
C SAVED IZ1MAX, IGRDR, IPRTR in addition to the
C          previously saved variables.
C
C-----

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CHARACTER*120	DSNINC			
INTEGER	ICLASS,	IDMAXD,	IFAIL,	IGRDD
INTEGER	IPRTD,	ISDIMD,	ISMAXD,	ITDIMD
INTEGER	ITMAX,	ITMAXD,	IZ0,	IZ1
INTEGER	IZDIMD,	IZMAXD,	NPART (IZDIMD)	
INTEGER	NPARTR (IZDIMD)			
LOGICAL	LPART			
REAL*8	DDENS (ITMAX),		DDENS (ITDIMD)	
REAL*8	DRCOFD (ISDIMD, ITDIMD, ITDIMD)			
REAL*8	DRCOFI (ITMAX),		DTEV (ITMAX)	
REAL*8	DTEVD (ITDIMD),		ZDATA (ISDIMD)	