

ADAS Subroutine metrd

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      SUBROUTINE METRD (NUTMAX , NUDMAX , NUZMAX , NUMMAX ,  
&                      MAXT   , MAXD   , DSNIN  ,  
&                      IZL    , IZH    , IZO    ,  
&                      TEK    , DENSA  ,  
&                      METFRC ,  
&                      NGRD   ,  
&                      IST2   , IST5  )
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C

C ***** FORTRAN 77 SUBROUTINE METRD *****

C

C VERSION 1.0

C

C PURPOSE:

C TO FETCH DATA FROM ADF10 'MET' FILES AND SPLINE ONTO
C THE REQUESTED TEMPERATURE/DENSITY GRID.

C

C CALLING PROGRAM LH404RU

C

C SUBROUTINE:

C

C INPUT : (I*4) NUTMAX - OUTPUT ELEMENT MASTER FILE

C MAXIMUM NUMBER OF TEMPERATURES

C INPUT : (I*4) NUDMAX - OUTPUT ELEMENT MASTER FILE

C MAXIMUM NUMBER OF DENSITIES

C INPUT : (I*4) NUZMAX - OUTPUT ELEMENT MASTER FILE

C MAXIMUM NUMBER OF CHARGE STATES

C INPUT : (I*4) NUMMAX - OUTPUT ELEMENT MASTER FILE

C MAXIMUM NUMBER OF METASTABLES

C INPUT : (I*4) MAXT - OUTPUT ELEMENT MASTER FILE

C ACTUAL NUMBER OF TEMPERATURES

C INPUT : (I*4) MAXD - OUTPUT ELEMENT MASTER FILE

C ACTUAL NUMBER OF DENSITIES

C INPUT : (C*80) DSNIN(,) - NAMES OF MASTER CONDENSED FILES

C TO BE OPENED

C INPUT : (I*4) IZL - LOWEST ION CHARGE TO READ

C INPUT : (I*4) IZH - HIGHEST ION CHARGE TO READ

C ACTUALLY READ ONE MORE IF IZH<IZO

C INPUT : (I*4) IZO - NUCLEAR CHARGE TO READ

C INPUT : (R*8) DENSA()- OUTPUT ELEMENT MASTER FILE

C SET OF MAXD DENSITIES

C INPUT : (R*8) TEK() - OUTPUT ELEMENT MASTER FILE

C SET OF MAXT TEMPERATURES

C OUTPUT: (R*8) METFRC(,,,) - METASTABLE POPULATION FRACTIONS,

C SPLINED ONTO THE OUTPUT TEMPERATURES

C AND DENSITIES

C 1ST DIMENSION - DENSITY INDEX

C 2ND DIMENSION - TEMPERATURE INDEX

C 3RD DIMENSION - CHARGE STATE INDEX

C 4TH DIMENSION - METASTABLE INDEX

C INPUT : (I*4) NGRD() - NUMBER OF GROUND STATES OF THE FIRST

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C                               50 ISOELECTRONIC SEQUENCES
C INPUT : (I*4)  IST2   - UNIT NUMBER FOR OUTPUT INFORMATION
C                               AND ERROR MESSAGES
C INPUT : (I*4)  IST5   - UNIT NUMBER FOR READING MASTER CONDENSED
C                               FILE
C
C PARAMETER : (I*4)  NTDMAX - SIZE OF LOCAL WORKING SPACE
C                               (MUST BE GREATER THAN NUTMAX & NUDMAX)
C PARAMETER : (I*4)  NDZ1V - MASTER CONDENSED FILE
C                               MAXIMUM NUMBER OF CHARGE STATES
C PARAMETER : (I*4)  NDTIN - MASTER CONDENSED FILE
C                               MAXIMUM NUMBER OF TEMPERATURES
C PARAMETER : (I*4)  NDDEN - MASTER CONDENSED FILE
C                               MAXIMUM NUMBER OF DENSITIES
C PARAMETER : (I*4)  NDMET - MASTER CONDENSED FILE
C                               MAXIMUM NUMBER OF METASTABLES
C
C      : (R*8)  DENSR() - INPUT MASTER CONDENSED FILE
C                               SET OF IDE REDUCED DENSITIES
C      : (R*8)  TR() - INPUT MASTER CONDENSED FILE
C                               SET OF ITE REDUCED TEMPERATURES
C      : (R*8)  ZIPT() - INPUT MASTER CONDENSED FILE
C                               SET OF IZE RECOMBINING ION CHARGES
C      : (R*8)  AIPTM(,,) - INPUT MASTER CONDENSED FILE
C                               RATIO OF METASTABLE TO GROUND POP.
C                               1ST DIMENSION - DENSITY INDEX
C                               2ND DIMENSION - TEMPERATURE INDEX
C                               3RD DIMENSION - CHARGE STATE INDEX
C                               4TH DIMENSION - METASTABLE INDEX
C      : (R*8)  EIA() - INPUT MASTER CONDENSED FILE
C                               SET OF IONISATION POTENTIALS (CM-1)
C
C      : (R*8)  ATTY(,) - WORK SPACE FOR INTERPOLATION
C                               - STORES LOG10(INTERPOLATED VALUES)
C                               1ST DIMENSION - TEMPERATURE
C                               2ND DIMENSION - DENSITY
C      : (R*8)  ARRAY(,) - STORES LOG10(INTERPOLATED VALUES)
C                               1ST DIMENSION - TEMPERATURE
C                               2ND DIMENSION - DENSITY
C
C ROUTINES:
C -----
C      XXOPEN -
C      XXTERM -
C      XXIN80 - FETCH DATA FROM MASTER CONDENSED FILE
C      D4SPLN - INTERPOLATE CONDENSED MASTER FILE
C                               UPDATED VERSION OF DISPLN
C
C-----
C AUTHOR:  LORNE D. HORTON
C          ROOM K1/1/58, JET JOINT UNDERTAKING
C
C DATE:  21ST FEBRUARY 1996

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C UNIX-IDL PORT:
C
C VERSION: 1.1 DATE: 11-11-96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C   - FIRST CONVERTED
C
C VERSION: 1.2 DATE: 20-11-96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C   - REMOVED DIAGNOSTIC WRITE STATEMENTS
C
C VERSION: 1.3 DATE: 20-10-97
C MODIFIED: LORNE HORTON
C   - REMOVED WHITE SPACE FROM DATA FILENAME.
C-----
C

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CHARACTER*80	DSNIN(50,10)			
INTEGER	IST2,	IST5,	IZ0,	IZH
INTEGER	IZL,	MAXD,	MAXT	
INTEGER	NGRD(50),	NUDMAX,	NUMMAX,	NUTMAX
INTEGER	NUZMAX			
REAL*8	DENSA(NUDMAX)			
REAL*8	METFRC(NUDMAX, NUTMAX, NUZMAX, NUMMAX)			
REAL*8	TEK(NUTMAX)			