

ADAS Subroutine cnv404a

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SUBROUTINE CNV404A(ITYPE , ISWIT ,  
&                NUTMAX , NUDMAX , NUZMAX , NUMMAX ,  
&                MAXT   , MAXD   ,  
&                IZL    , IZH    , IZ0    ,  
&                TEK    , DENSA   ,  
&                NGRD   ,  
&                IST2   , IST5    , IWRITE , DATE ,  
&                DSNIN  , OPEN17)
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C

C ***** FORTRAN 77 SUBROUTINE BND404A *****

C

C VERSION 1.0

C

C PURPOSE:

C

C TO FETCH DATA FROM RESOLVED ADF10 FILES, SPLINE THEM
C ONTO THE REQUESTED TEMPERATURE/DENSITY GRID, AND
C WRITE THE RESULT TO ADF11 FILES.

C

C CALLING ROUTINE / PROGRAM : LH404RR / ADAS404

C

C DATA:

C

C THE SOURCE DATA IS CONTAINED AS MEMBERS OF PARTITIONED
C DATA SETS AS FOLLOWS:

C

- C 1. JETUID.ACD<YR>.DATA
- C 2. JETUID.SCD<YR>.DATA
- C 3. JETUID.CCD<YR>.DATA
- C 4. JETUID.PRB<YR>.DATA
- C 5. JETUID.PRC<YR>.DATA
- C 6. JETUID.QCD<YR>.DATA
- C 7. JETUID.XCD<YR>.DATA

C

C WHERE <YR> DENOTES TWO INTEGERS FOR THE YEAR SELECTED.

C

C SUBROUTINE:

C

C INPUT : (I*4) ITYPE - TYPE OF ADF10 DATA BEING READ (SEE ABOVE)

C

C INPUT : (I*4) ISWIT - SWITCH FOR INTERPOLATION TYPE

C

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

C MAXIMUM NUMBER OF TEMPERATURES

C

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

C MAXIMUM NUMBER OF DENSITIES

C

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

C MAXIMUM NUMBER OF CHARGE STATES

C

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

C MAXIMUM NUMBER OF METASTABLES

C

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

C ACTUAL NUMBER OF TEMPERATURES

C

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

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C                                     ACTUAL NUMBER OF DENSITIES
C INPUT : (I*4)  IZL   - LOWEST ION CHARGE TO READ
C INPUT : (I*4)  IZH   - HIGHEST ION CHARGE TO READ
C INPUT : (I*4)  IZ0   - 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 INPUT : (I*4)  NGRD() - NUMBER OF GROUND STATES OF THE FIRST
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 INPUT : (I*4)  IWRITE - UNIT NUMBER FOR WRITING ADF11 DATA
C INPUT : (C*8)  DATE   - CURRENT DATE
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
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)  AIPT(,,) - INPUT MASTER CONDENSED FILE
C                                     RELEVANT RATE COEFFICIENTS
C                                     1ST DIMENSION - DENSITY INDEX
C                                     2ND DIMENSION - TEMPERATURE INDEX
C                                     3RD DIMENSION - CHARGE STATE 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      XXIN17  -  FETCH DATA FROM MASTER CONDENSED FILE

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C D4SPLN - INTERPOLATE CONDENSED MASTER FILE
C UPDATED VERSION OF D1SPLN
C

C-----
C AUTHOR: LORNE D. HORTON
C ROOM K1/1/58, JET JOINT UNDERTAKING
C

C DATE: 5TH AUGUST 1996
C-----

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 VERSION: 1.2 DATE: 20-10-97
C MODIFIED: LORNE HORTON (JET)
C - INCREASED SPACE FOR FILE NAME DIAGNOSTICS
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 WRITING
C DIFFERENT INFORMATION ON THE HEADER LINE OF THE
C ADF11 FILE.
C

C VERSION: 1.4 DATE: 13-10-99
C MODIFIED: MARTIN O'MULLANE
C - DO NOT WRITE QCD AND XCD BLOCKS WHICH ARE ALL ZERO.
C

C VERSION : 1.5
C DATE : 04-01-2007
C MODIFIED: Martin O'Mullane
C - When converting from ergs to Joules check for zero value
C before subtracting (it's a log!) 7. In this case set
C value of element to -74.0.
C

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C
C CHARACTER*8 DATE
C CHARACTER*80 DSNIN(50,10)
C INTEGER IST2, IST5, ISWIT, ITYPE
C INTEGER IWRITE, IZ0, IZH, IZL
C INTEGER MAXD, MAXT, NGRD(50), NUDMAX
C INTEGER NUMMAX, NUTMAX, NUZMAX
C LOGICAL OPEN17
C REAL*8 DENSA (NUDMAX), TEK (NUTMAX)