

ADAS Subroutine d1spln

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SUBROUTINE D1SPLN( ISWIT , LSWIT ,  
&                 NTDMAX ,  
&                 NDDEN , NDTIN , NDZ1V ,  
&                 ITDVAL ,  
&                 IDE    , ITE    , IZE    ,  
&                 DUSR   , TUSR   , IZ1    ,  
&                 DENSR  , TR     , ZIPT   ,  
&                 EIA    , AIPT   ,  
&                 LZRNG  , LDRNG  , LTRNG  ,  
&                 AOUT  
&                 )
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C-----  
C  
C ***** FORTRAN77 SUBROUTINE: D1SPLN *****  
C  
C PURPOSE: TO INTERPOLATE/EXTRAPOLATED DATA FROM MASTER CONDENSED FILE  
C           TO THE USER ENTERED TEMPERATURE/DENSITY PAIRS FOR THE SELEC-  
C           TED RECOMBINING ION CHARGE.  
C  
C CALLING PROGRAM: ADAS401  
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.PRB<YR>.DATA  
C           7. JETUID.PRC<YR>.DATA  
C           8. JETUID.PLT<YR>.DATA  
C           9. JETUID.PLS<YR>.DATA  
C           10. JETUID.MET<YR>.DATA  
C  
C           WHERE <YR> DENOTES TWO INTEGERS FOR THE YEAR SELECTED.  
C  
C           THE PARTICULAR TYPE OPENED (1-10) IS SELECTED BY 'ISWIT'  
C  
C  
C SUBROUTINE:  
C  
C INPUT : (I*4) ISWIT = DATA TYPE SELECTOR (SEE ABOVE) (1 -> 10)  
C INPUT : (L*4) LSWIT = .TRUE. => SET OF 'EIA' VALUES PRESENT IN  
C                               MASTER CONDENSED FILE.  
C                               .FALSE => SET OF 'EIA' VALUES NOT PRESENT  
C                               IN MASTER CONDENSED FILE.  
C  
C INPUT : (I*4) NTDMAX = USER ENTERED VALUES -  
C                               MAXIMUM NUMBER OF TEMPERATURE/DENSITY PAIRS
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C
C INPUT : (I*4)  NDDEN  = INPUT MASTER CONDENSED FILE -
C                   MAXIMUM NUMBER OF REDUCED DENSITIES
C INPUT : (I*4)  NDTIN  = INPUT MASTER CONDENSED FILE -
C                   MAXIMUM NUMBER OF REDUCED TEMPERATURES
C INPUT : (I*4)  NDZ1V  = INPUT MASTER CONDENSED FILE -
C                   MAXIMUM NUMBER OF CHARGE STATES
C
C INPUT : (I*4)  ITDVAL = USER ENTERED VALUES -
C                   NUMBER OF TEMPERATURE/DENSITY PAIRS ENTERED
C
C INPUT : (I*4)  IDE    = INPUT MASTER CONDENSED FILE -
C                   NUMBER OF REDUCED DENSITIES READ
C INPUT : (I*4)  ITE    = INPUT MASTER CONDENSED FILE -
C                   NUMBER OF REDUCED TEMPERATURES READ
C INPUT : (I*4)  IZE    = INPUT MASTER CONDENSED FILE -
C                   NUMBER OF CHARGE STATES READ
C
C INPUT : (R*8)  DUSR() = USER ENTERED VALUES -
C                   SET OF 'ITDVAL' ENTERED ELECTRON DENSITIES
C                   (UNITS: CM**-3)
C                   DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C INPUT : (R*8)  TUSR() = USER ENTERED VALUES -
C                   SET OF 'ITDVAL' ENTERED ELECTRON TEMPERATURES
C                   (UNITS: KELVIN)
C                   DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C INPUT : (I*4)  IZ1    = USER ENTERED VALUE -
C                   RECOMBINING ION CHARGE
C
C INPUT : (R*8)  DENSR() = INPUT MASTER CONDENSED FILE -
C                   SET OF 'IDE' REDUCED DENSITIES (CM-3/Z1**7)
C INPUT : (R*8)  TR()   = INPUT MASTER CONDENSED FILE -
C                   SET OF 'ITE' REDUCED TEMPERATURES (K/Z1**2)
C INPUT : (R*8)  ZIPT() = INPUT MASTER CONDENSED FILE -
C                   SET OF 'IZE' INPUT RECOMBINING ION CHARGES
C
C INPUT : (R*8)  EIA()  = INPUT MASTER CONDENSED FILE -
C                   IONISATION RATE COEFFTS. - (UNITS: RYDBERGS)
C                   DIMENSION: ION CHARGE
C INPUT : (R*8)  AIPT(,,) = INPUT MASTER CONDENSED FILE -
C                   RELEVANT COEFFICIENT/POWER DATA FOR 'ISWIT'.
C                   1ST DIMENSION: DENSITY INDEX      ('DENSR()')
C                   2ND DIMENSION: TEMPERATURE INDEX  ('TR()')
C                   3RD DIMENSION: CHARGE STATE INDEX ('ZIPT()')
C
C OUTPUT: (L*4)  LZRN(1) = .TRUE.  => 'AOUT()' VALUES FOR CHARGE-
C                   STATE 'IZ1' INTERPOLATED.
C                   = .FALSE. => 'AOUT()' VALUE FOR CHARGE-
C                   STATE 'IZ1' EXTRAPOLATED.
C OUTPUT: (L*4)  LDRN()  = .TRUE.  => 'AOUT()' VALUE FOR DENSITY
C                   INDEX INTERPOLATED.
C                   = .FALSE. => 'AOUT()' VALUE FOR DENSITY
C                   INDEX EXTRAPOLATED.

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C          DIMENSION: DENSITY INDEX
C OUTPUT: (L*4)  LTRNG() = .TRUE.  => 'AOUT()' VALUE FOR TEMPERATURE
C                   INDEX INTERPOLATED.
C                   = .FALSE. => 'AOUT()' VALUE FOR TEMPERATURE
C                   INDEX EXTRAPOLATED.
C          DIMENSION: TEMPERATURE INDEX
C
C OUTPUT: (R*8)  AOUT() = EXTRAPOLATED/INTERPOLATED DATA FOR EACH
C                   USER ENTERED TEMPERATURE/DENSITY PAIR.
C                   DIMENSION: TEMPERATURE/DENSITY PAIR INDEX.
C
C          (I*4)  NUDIM = PARAMETER = MUST BE GREATER THAN OR EQUAL TO
C                   'NTDMAX'.
C
C          (I*4)  NDMAX1 = 'NDDEN'
C          (I*4)  NTMAX1 = 'NDTIN'
C          (I*4)  NZMAX1 = 'NDZ1V'
C          (I*4)  NDMAX2 = 'NUDIM'
C          (I*4)  NTMAX2 = 'NUDIM'
C          (I*4)  ITD   = GENERAL USE ARRAY SUBSCRIPT INDEX
C
C          (R*8)  ATTY(,) = WORKING SPACE FOR 3-WAY SPLINE ITERPOLATION
C                   ( STORES LOG10(INTERPOLATED VALUES) )
C                   1ST DIMENSION: TEMPERATURE
C                   2ND DIMENSION: DENSITY
C
C NOTE:
C
C ROUTINES:
C          ROUTINE      SOURCE      BRIEF DESCRIPTION
C          -----
C          DXSPL1      ADAS          1ST PART OF 3-WAY SPLINE OF INPUT DATA
C          DXSPL2      ADAS          2ND PART OF 3-WAY SPLINE OF INPUT DATA
C          DXSPL3      ADAS          3RD PART OF 3-WAY SPLINE OF INPUT DATA
C
C AUTHOR:  PAUL E. BRIDEN (TESSELLA SUPPORT SERVICES PLC)
C          K1/0/37
C          JET EXT. 2516
C
C DATE:    17/06/91
C
C UNIX PORT:
C
C VERSION: 1.1          DATE: 06-09-95
C MODIFIED: TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C          - FIRST RELEASE
C
C VERSION: 1.2          DATE: 15-04-96
C MODIFIED: TIM HAMMOND/PAUL BRIDEN
C          - CORRECT BUG: SET NDMAX2 AND NTMAX2 TO NUDIM AND NOT
C          NTDMAX.
C
C-----

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C

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INTEGER	IDE,	ISWIT,	ITDVAL,	ITE
INTEGER	IZ1,	IZE,	NDDEN,	NDTIN
INTEGER	NDZ1V,	NTDMAX		
LOGICAL	LDRNG (NTDMAX) ,		LSWIT	
LOGICAL	LTRNG (NTDMAX) ,		LZRNNG (1)	
REAL*8	AIPT (NDDEN, NDTIN, NDZ1V) ,		AOUT (NTDMAX)	
REAL*8	DENSR (NDDEN) ,		DUSR (NTDMAX)	
REAL*8	EIA (50) ,	TR (NDTIN) ,	TUSR (NTDMAX)	
REAL*8	ZIPT (NDZ1V)			