ADAS Subroutine ssxb

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      SUBROUTINE SSXB( IBSEL  , IZIN   , IZ0IN  ,
     &                 ITVAL  , TVAL   , DVAL   ,
     &                 WLNGTH ,
     &                 SXBA   , LTRNG  , LDRNG  ,
     &                 TITLX  , IRCODE
     &               )
C-----------------------------------------------------------------------
C
C  ******************** FORTRAN77 SUBROUTINE: SSXB **********************
C
C  PURPOSE: TO EXTRACT AND INTERPOLATE  IONIZATIONS PER PHOTON FOR
C           EMITTING IONS.
C           USES THE SAME ROUTINES USED BY ADAS501, EXCEPT FOR:
C
C           'E1FILE' - WHICH OPENS THE REQUESTED FILE.
C           'E1CHKB' - WHICH CHECKS INPUT  VALUES  ARE  CONSISTENT  WITH
C                      THE SELECTED DATA-BLOCK 'IBSEL' AND   'IBSEL'  IS
C                      IN RANGE.
C
C            THE FIRST OF THESE FUNCTIONS IS CARRIED  OUT  IN  'ADAS501'
C            VIA ISPF PANELS USING THE ROUTINE 'E1SPF0'  -  ADAS501 DOES
C            NOT REQUIRE THE ROUTINE 'E1CHKB' AS THE USER CANNOT  SELECT
C            AN INVALID VALUE FOR 'IBSEL' OR 'IBSEL'/EMITTER COMBINATION
C
C
C  CALLING PROGRAM: GENERAL USE
C
C  SUBROUTINE:
C
C  INPUT : (I*4)   IBSEL   = INDEX OF DATA-BLOCK SELECTED FOR ANALYSIS
C  INPUT : (I*4)   IZIN    = ION CHARGE OF EMITTING ION
C  INPUT : (I*4)   IZ0IN   = NUCLEAR CHARGE OF EMITTING ION
C
C  INPUT : (I*4)   ITVAL   = NO. OF ELECTRON TEMPERATURE/DENSIY PAIRS
C  INPUT : (R*8)   TVAL()  = ELECTRON TEMPERATUIRES (UNITS: EV)
C                            DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C  INPUT : (R*8)   DVAL()  = ELECTRON DENSITIES (UNITS: CM-3)
C                            DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C
C  OUTPUT: (R*8)   WLNGTH  = SELECTED BLOCK WAVELENGTH (ANGSTROMS)
C
C  OUTPUT: (R*8)   SXBA()  = IONIZATIONS PER PHOTON.
C                            DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C  OUTPUT: (L*4)   LTRNG() =.TRUE.  => OUTPUT 'SXBA()'  VALUE WAS INTER-
C                                      POLATED  FOR  THE  USER  ENTERED
C                                      ELECTRON TEMPERATURE 'TVAL()'.
C                           .FALSE. => OUTPUT 'SXBA()'  VALUE WAS EXTRA-
C                                      POLATED  FOR  THE  USER  ENTERED
C                                      ELECTRON TEMPERATURE 'TVAL()'.
C                            DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C  OUTPUT: (L*4)   LDRNG() =.TRUE.  => OUTPUT 'SXBA()'  VALUE WAS INTER-
C                                      POLATED  FOR  THE  USER  ENTERED
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C                                       ELECTRON DENSITY 'DVAL()'.
C                             .FALSE. => OUTPUT 'SXBA()'  VALUE WAS EXTRA-
C                                       POLATED  FOR  THE  USER  ENTERED
C                                       ELECTRON DENSITY 'DVAL()'.
C                              DIMENSION: TEMPERATURE/DENSITY PAIR INDEX
C
C  OUTPUT: (C*80)  TITLX   = INFORMATION STRING (DSN ETC.)
C  OUTPUT: (I*4)   IRCODE  = RETURN CODE FROM SUBROUTINE:
C                              0 => NORMAL COMPLETION - NO ERROR DETECTED
C                              1 => DATA SET MEMBER FOR EMITTING ION WITH
C                                   CHARGE 'IZIN' & ION CHARGE 'IZ0IN' CAN
C                                   NOT BE FOUND/DOES NOT EXIST.
C                              2 => DISCREPANCY BETWEEN REQUESTED CHARGES
C                                   AND THOSE IN INPUT FILE.
C                              3 => THE SELECTED DATA-BLOCK 'IBSEL' IS OUT
C                                   OF RANGE OR DOES NOT EXIST.
C                              4 => INVALID VALUE FOR 'IZ0IN' ENTERED.
C                                   ('IZ0MIN' <= 'IZ0IN' <= 'IZ0MAX')
C                              5 => INVALID VALUE FOR 'IZIN' ENTERED.
C                                   ( 0  <= 'IZIN' <= 99 )
C                              9 => ERROR ENCOUNTERED WHEN TRYING TO OPEN
C                                   INPUT DATA-SET.
C
C          (I*4)   NSTORE  = PARAMETER= MAXIMUM NUMBER  OF  DATA-BLOCKS
C                                       WHICH CAN BE READ FROM THE INPUT
C                                       DATA-SET.
C          (I*4)   NTDIM   = PARAMETER= MAXIMUM NUMBER OF ELECTRON TEMP-
C                                       ERATURES THAT CAN BE READ  FROM
C                                       AN INPUT DATA-SET DATA-BLOCK.
C          (I*4)   NDDIM   = PARAMETER= MAXIMUM NUMBER OF ELECTRON DENS-
C                                       ITIES  THAT  CAN  BE  READ  FROM
C                                       AN INPUT DATA-SET DATA-BLOCK.
C          (I*4)   IZ0MIN  = PARAMETER: MIN. ALLOWED VALUE FOR 'IZ0IN'
C          (I*4)   IZ0MAX  = PARAMETER: MAX. ALLOWED VALUE FOR 'IZ0IN'
C
C          (I*4)   IZ0LST  = LAST VALUE OF 'IZ0IN' FOR  WHICH  INPUT
C                            DATA WAS READ.
C          (I*4)   IZLAST  = LAST VALUE OF 'IZIN' FOR  WHICH  INPUT
C                            DATA WAS READ.
C          (I*4)   IUNIT   = UNIT TO WHICH INPUT DATA SET IS ALLOCATED
C          (I*4)   NBSEL   = TOTAL NUMBER OF DATA-BLOCKS READ FROM INPUT
C                            DATA SET.
C          (I*4)   IZ0     = INPUT FILE - EMITTING ION - NUCLEAR CHARGE
C          (I*4)   IZ      = INPUT FILE - EMITTING ION - CHARGE
C          (I*4)   IZ1     = INPUT FILE - EMITTING ION - CHARGE + 1
C          (I*4)   IPOS    = USED IN CONVERTING CWAVEL -> WLNGTH
C
C          (L*4)   LOPEN   = .TRUE.  => INPUT DATA SET OPEN.
C                            .FALSE. => INPUT DATA SET CLOSED.
C
C          (C*2)   ESYM    = INPUT FILE - EMITTING ION - ELEMENT SYMBOL
C          (C*3)   EXTIN   = CURRENT ADAS SOURCE DATA FILE EXTENSION
C          (C*3)   EXTLST  = ADAS SOURCE DATA FILE EXT. USED LAST TIME
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C                             DATA WAS READ.
CA          (C*80)  UIDIN   = CURRENT ADAS SOURCE DATA PATH
CA     (C*80)  UIDLST  = ADAS SOURCE DATA PATH USED LAST TIME
C                             DATA WAS READ.
C           (C*8)   GRPIN   = CURRENT ADAS SOURCE DATA GROUPNAME
C           (C*8)   GRPLST  = ADAS SOURCE DATA GROUPNAME USED LAST TIME
C                             DATA WAS READ.
CA          (C*80)  TYPIN   = OPTIONAL SUBDIRECTORY FOR FILE
CA          (C*80)  TYPLST  = OPTIONAL SUBDIRECTORY FOR FILE USED LAST TIME
C                             DATA WAS READ.
C           (C*11)  C11     = USED IN CONVERTING CWAVEL -> WLNGTH
C           (C*80)  DSNREQ  = NAME OF DATA FILE REQUESTED INCLUDING PATH
C                             (MAY OR MAY NOT EXIST)
C           (C*80)  DSNAME  = FULL NAME OF DATA FILE INTERROGATED
C
C           (I*4)   ISELA() = INPUT DATA FILE: DATA-BLOCK ENTRY INDICES.
C                             DIMENSION: DATA-BLOCK INDEX
C           (I*4)   ITA()   = INPUT DATA SET-NUMBER OF ELECTRON TEMPERA-
C                             TURES.
C                             DIMENSION: DATA-BLOCK INDEX
C           (I*4)   IDA()   = INPUT DATA SET-NUMBER OF ELECTRON DENSITIES
C                             DIMENSION: DATA-BLOCK INDEX
C
C           (R*8)   TETA(,) = INPUT DATA SET -
C                             ELECTRON TEMPERATURES (UNITS: eV)
C                             1st DIMENSION: ELECTRON TEMPERATURE INDEX
C                             2nd DIMENSION: DATA-BLOCK INDEX
C           (R*8)   TEDA(,) = INPUT DATA SET -
C                             ELECTRON DENSITIES    (UNITS: cm-3)
C                             1st DIMENSION: ELECTRON DENSITY     INDEX
C                             2nd DIMENSION: DATA-BLOCK INDEX
C           (R*8)   SXB(,,)   =INPUT DATA SET -
C                              FULL SET OF IONIZATIONS PER PHOTON
C                              1st DIMENSION: ELECTRON TEMPERATURE INDEX
C                              2nd DIMENSION: ELECTRON DENSITY     INDEX
C                              3rd DIMENSION: DATA-BLOCK INDEX
C
C           (C*10)  CWAVEL() = INPUT FILE - WAVELENGTH (ANGSTROMS)
C                              DIMENSION: DATA-BLOCK INDEX
C           (C*8)   CFILE()  = INPUT FILE - SPECIFIC ION FILE SOURCE
C                              DIMENSION: DATA-BLOCK INDEX
C           (C*8)   CPCODE() = INPUT FILE - SPECIFIC ION PROCESSING CODE
C                              DIMENSION: DATA-BLOCK INDEX
C           (C*2)   CINDM()  = INPUT FILE - METASTABLE INDEX
C                              DIMENSION: DATA-BLOCK INDEX
C
C ROUTINES:
C           ROUTINE    SOURCE    BRIEF DESCRIPTION
C           ------------------------------------------------------------
C           E1FILE     ADAS      OPEN DATA SET FOR SELECTED EMITTER
C           E1DATA     ADAS      FETCH INPUT DATA FROM SELECTED DATA SET
C           E1CHKB     ADAS      CHECK VALIDITY OF ION AND 'IBSEL'
C           E1SPLN     ADAS      INTERPOLATE DATA WITH TWO WAY SPLINES
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C          E1TITL     ADAS      CREATE DESCRIPTIVE TITLE FOR OUTPUT
C          XXUID      ADAS      FETCHES/SETS ADAS SOURCE DATA USER ID
C          XXSSXB     ADAS      FETCHES/SETS ADAS SOURCE DATA FILE NAME+
C
C AUTHOR:  PAUL E. BRIDEN (TESSELLA SUPPORT SERVICES PLC)
C          K1/0/37
C          JET EXT. 5023
C
C DATE:    30/04/91
C
C UPDATE:  05/12/91 - PE BRIDEN: 'NSTORE' INCREASED FROM 10 TO 100
C
C UPDATE:  28/02/92 - PE BRIDEN: 'NSTORE' INCREASED FROM 100 TO 150
C
C UPDATE:  10/03/93 - PE BRIDEN: INTRODUCED CALL TO XXUID TO ESTABLISH
C                                IF USERID OF INPUT DATASET CHANGES
C                                BETWEEN CALLS.
C                                SAVE NAME OF LAST READ DATASET.
C                                (ADDED VARIABLES UIDIN,UIDLST,DSNREQ)
C
C UPDATE:   2/09/93 - HPS      : INTRODUCED CALL TO XXSSXB TO ESTABLISH
C                                IF USRGRP, USRTYP AND USREXT OF INPUT
C                                DATA SET CHANGES BETWEEN CALLS.
C                                SAVE NAME OF LAST READ DATASET.
C                                (ADDED VARIABLES GRPIN,GRPLST,TYPIN,
C                                 TYPLST, EXTIN, EXTLST)
C UPDATE:   31/10/03 - LALIT JALOTA
C CHANGED STRING DIMENSIONS TO 80
C
C VERSION: 1.1                          DATE: 25-05-95
C MODIFIED:  TIM HAMMOND (TESSELLA SUPPORT SERVICES PLC)
C               - PUT UNDER S.C.C.S. CONTROL
C
C VERSION: 1.2                          DATE: 22-04-96
C MODIFIED:  TIM HAMMOND
C               - INCREASED PARAMETERS: NSTORE 150 -> 250
C                                       NTDIM   20 ->  35
c                                       NDDIM   20 ->  26
C               - MODIFIED CONVERSION OF CWAVEL->WLNGTH
C                 (ADDED VARIABLES C11 AND IPOS)
c
C VERSION: 1.3                          DATE: 17-01-2001
C MODIFIED:  Martin O'Mullane
C               - Removed spurious 2 in 1st column of a comment.
C
C-----------------------------------------------------------------------
C-----------------------------------------------------------------------
C
C-----------------------------------------------------------------------
      CHARACTER*80        TITLX
      INTEGER             IBSEL,       IRCODE,      ITVAL,       IZ0IN
      INTEGER             IZIN
      LOGICAL             LDRNG(ITVAL),            LTRNG(ITVAL)
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```
      REAL*8             DVAL(ITVAL), SXBA(ITVAL), TVAL(ITVAL), WLNGTH
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