ADAS Subroutine b8rcom

```
C
      SUBROUTINE B8RCOM( NDTEM  , NDTRN  , NDLEV  , NDMET   ,
     &                   NTIN   , TIN    , RCIN   ,
     &                   NTOUT  , TOUT   ,
     &                   ICNT   , ITRN   , ICLEV  , IC2LEV  ,
     &                   RCOUT  , LTRNG
     &                 )
C-----------------------------------------------------------------------
C
C  ****************** FORTRAN77 SUBROUTINE: B8RCOM *********************
C
C  PURPOSE: TO ESTABLISH RECOMBINATION RATE COEFFICIENTS  FOR  A SET  OF
C           TEMPERATURES GIVEN BY THE ARRAY 'TOUT()' USING CUBIC SPLINES
C           ON  A SET OF RATE  COEFFICIENTS  COVERING  THE  TEMPERATURES
C           GIVEN BY THE ARRAY 'TIN()'.
C
C           RECOMBINATION TYPE IS SELECTED VIA 'ICNT' & 'ITRN'
C
C           RATE COEFFICIENTS ARE GIVEN FOR A NUMBER OF CAPTURING LEVELS
C           AND THE ARRAY 'RCOUT(,,)' REPRESENTS  COEFFTS.  FOR COMB-
C           INATIONS OF TEMPERATURE, CAPTURING LEVEL INDEX AND PARENT
C           INDEX.
C
C           SPLINE IS CARRIED OUT USING LOG(RATE COEFFICIENT VALUES)
C
C  CALLING PROGRAM:  ADAS205/ADAS206
C
C  SUBROUTINE:
C
C  INPUT :  (I*4)  NDTEM   = MAXIMUM NUMBER OF TEMPERATURES ALLOWED
C  INPUT :  (I*4)  NDTRN   = MAXIMUM NUMBER OF RECOMBINATIONS ALLOWED
C  INPUT :  (I*4)  NDLEV   = MAXIMUM NUMBER OF ENERGY LEVELS ALLOWED
C  INPUT :  (I*4)  NDMET   = MAXIMUM NUMBER OF METASTABLES ALLOWED
C
C  INPUT :  (I*4)  NTIN    = NUMBER OF TEMPERATURES REPRESENTED IN THE
C                            INPUT DATA SET.
C  INPUT :  (R*8)  TIN()   = TEMPERATURES REPRESENTED IN INPUT DATA SET
C  INPUT :  (R*8)  RCIN(,) = RATE COEFF. REPRESENTED IN INPUT DATA SET
C                            1st DIMENSION: TEMPERATURE INDEX ('TIN')
C                            2nd DIMENSION: RECOMBINATION INDEX
C                                           (SEE: 'ITRN()')
C
C  INPUT :  (I*4)  NTOUT   = NUMBER OF ISPF SELECTED TEMPERATURES FOR
C                            OUTPUT.
C  INPUT :  (R*8)  TOUT()  = ISPF SELECTED TEMPERATURES FOR OUTPUT.
C
C  INPUT :  (I*4)  ICNT    = NUMBER OF SELECTED RECOMBINATIONS
C  INPUT :  (I*4)  ITRN()  = INDEX VALUES IN MAIN TRANSITION ARRAY WHICH
C                            REPRESENT RECOMBINATIONS  OF THE  SELECTED
C                            TYPE
C                            USED TO SELECT APPROPRIATE RATE COEFFTS FOR
C                            RECOMBINATION TYPE.
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C  INPUT :  (I*4)  ICLEV() = CAPTURING LEVELS INDICES.
C                           DIMENSION: 'TRANSITION'/RECOMBINATION INDEX
C  INPUT :  (I*4)  IC2LEV()= PARENT INDEX.
C                           DIMENSION: 'TRANSITION'/RECOMB/IONIS  INDEX
C
C  OUTPUT:  (R*8)  RCOUT(,,)= SPLINED RECOMBINATION RATE COEFFT. VALUES.
C                           1st DIMENSION: TEMPERATURE INDEX ('TOUT')
C                           2nd DIMENSION: CAPTURING LEVEL INDEX.
C                           3RD DIMENSION: PARENT INDEX.
C
C  OUTPUT:  (L*4)  LTRNG() = .TRUE. => TEMPERATURE VALUES WITHIN RANGE
C                                      READ FROM INPUT COPASE DATA SET.
C                          = .FALSE.=>TEMPERATURE VALUE NOT WITHIN RANGE
C                                     READ FROM INPUT COPASE DATA SET.
C                           1st DIMENSION: TEMPERATURE INDEX.
C
C
C           (I*4)  NTDSN   = PARAMETER = MAXIMUM NUMBER OF TEMPERATURES
C                                        ALLOWED IN INPUT DATA SET = 14
C           (I*4)  NLTEM   = PARAMETER = MUST BE >= 'NDTEM'
C
C           (I*4)  IOPT    = SPLINE END CONDITIONS/EXTRAPOLATION CONTROL
C                           SWITCH - SEE 'XXSPLE'
C                           I.E. DEFINES THE BOUNDARY DERIVATIVES.
C                           (VALID VALUES = 0, 1, 2, 3, 4)
C           (I*4)  IRECMB  = APPROPRIATE RECOMBINATN INDEX FOR 'RCIN(,)'
C           (I*4)  ICAP    = CAPTURING LEVEL INDEX BEING ASSESSED.
C           (I*4)  IC      = RECOMBINATION ARRAY INDEX
C           (I*4)  IP      = PARENT INDEX
C           (I*4)  IT      = TEMPERATURE ARRAY INDEX
C
C           (R*8)  DYIN()  = INTERPOLATED DERIVATIVES
C                           DIMENSION: TEMPERATURE INDEX ('TIN()')
C
C           (L*4)  LSETX   = .TRUE.  => X-AXES ('TIN()' VALUES) NEED TO
C                                       SET IN 'XXSPLE'.
C                           .FALSE. => X-AXES ('TIN()' VALUES) HAVE
C                                       BEEN SET IN 'XXSPLE'.
C                           (NOTE: 'LSETX' IS RESET BY 'XXSPLE')
C
C           (R*8)  LRCIN() = LOG ( 'RCIN(,)' ) FOR GIVEN CAPTURING LEVEL
C                           DIMENSION: TEMPERATURE INDEX ('TIN()')
C           (R*8)  LRCOUT()= LOG ( SPLINED RECOMB.IONIS  RATE COEFTS )
C                           DIMENSION: TEMPERATURE INDEX ('TOUT()' )
C
C
C ROUTINES:
C          ROUTINE    SOURCE    BRIEF DESCRIPTION
C          ------------------------------------------------------------
C          XXSPLE     ADAS      SPLINE SUBROUTINE (WITH EXTRAP. INFO)
C
C
C AUTHOR:  HP SUMMERS (UPGRADE OF BXRCOM BY PE BRIDEN)
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C          K1/1/57
C          JET EXT. 4941
C
C DATE:    11/06/92
C
C UPDATE:  12/07/93  HPS - MODIFICATIONS TO MAKE CONSISTENT WITH
C                          LATEST VERSION OF B8DATA
C
C***********************************************************************
C UNIX-IDL PORT:
C
C AUTHOR: DAVID H BROOKS, UNIVERSITY OF STRATHCLYDE
C
C DATE: UNKNOWN
C
C***********************************************************************
C PUT UNDER SCCS CONTROL:
C
C VERSION: 1.1 DATE: 10/05/96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C     - FIRST PUT UNDER SCCS
C
C-----------------------------------------------------------------------
C
C-----------------------------------------------------------------------
      INTEGER             IC2LEV(NDTRN),             ICLEV(NDTRN)
      INTEGER             ICNT,         ITRN(NDTRN), NDLEV,        NDMET
      INTEGER             NDTEM,        NDTRN,       NTIN,         NTOUT
      LOGICAL             LTRNG(NDTEM)
      REAL*8              RCIN(NTDSN,NDTRN)
      REAL*8              RCOUT(NDTEM,NDLEV,NDMET), TIN(NTDSN)
      REAL*8              TOUT(NDTEM)
```