

ADAS Subroutine bxrcom

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      SUBROUTINE BXRCOM( NDTEM , NDTRN , NDLEV ,
&                      NTIN   , TIN    , RCIN   ,
&                      NTOUT  , TOUT   ,
&                      ICNT   , ITRN   , ICLEV  ,
&                      RCOUT  , LTRNG
&                      )
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C
C ***** FORTRAN77 SUBROUTINE: BXRCOM *****
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 COMBINAT-
C           IONS OF TEMPERATURE AND CAPTURING LEVEL 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
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 RECOMBINASTION OF THE SELECTED
C                   TYPE
C                   USED TO SELECT APPROPRIATE RATE COEFFTS FOR
C                   RECOMBINATION TYPE.
C INPUT : (I*4) ICLEV() = CAPTURING LEVELS INDICES.
C                   DIMENSION: 'TRANSITION'/RECOMBINATION INDEX
C
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C OUTPUT: (R*8) RCOUT(,) = SPLINED RECOMBINATION RATE COEFFT. VALUES.
 C 1st DIMENSION: TEMPERATURE INDEX ('TOUT')
 C 2nd DIMENSION: CAPTURING LEVEL 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 = 8
 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) 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 RECOMBINATION RATE COEFTS)
 C DIMENSION: TEMPERATURE INDEX ('TOUT()')
 C
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 C

C ROUTINES:

ROUTINE	SOURCE	BRIEF DESCRIPTION
XXSPLE	ADAS	SPLINE SUBROUTINE (WITH EXTRAP. INFO)

C AUTHOR: PAUL E. BRIDEN (TESSELLA SUPPORT SERVICES PLC)
 C K1/0/81
 C JET EXT. 4569
 C

C DATE: 09/10/90

C UPDATE: 31/01/91 - PE BRIDEN - ADAS91 - INTRODUCED 'LTRNG'
 C - REPLACED XXSPLE WITH XXSPLE

C
C UPDATE: 11/12/91 - PE BRIDEN - ADAS91 -NLTEM INCREASED FROM 20 to 101
C
C UPDATE: 10/06/92 - PE BRIDEN - ADAS91 -CORRECT ERROR - CHANGED
C 'ICAP=ICLEV(IC)' TO
C 'ICAP=ICLEV(IRECMB)'
C
C UPDATE: 20/05/93 - PE BRIDEN - ADAS91 -NTDSN INCREASED FROM 8 to 14
C (REFLECTS CHANGES TO BXDATA)
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INTEGER	ICLEV (NDTRN) ,	ICNT	
INTEGER	ITRN (NDTRN) , NDLEV,	NDTEM,	NDTRN
INTEGER	NTIN, NTOUT		
LOGICAL	LTRNG (NDTEM)		
REAL*8	RCIN (NTDSN, NDTRN) ,	RCOUT (NDTEM, NDLEV)	
REAL*8	TIN (NTDSN) , TOUT (NDTEM)		