

ADAS Subroutine h9spln

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SUBROUTINE H9SPLN( NDTRN      , NDTEM      ,
&                  NDTIN      ,
&                  NV          , MAXT      , NPSPL      ,
&                  IETRN      , ICNTE     , DTYPE     ,
&                  ISTRN      , ICNTS     ,
&                  USCEF      , TOA       , TOSA       ,
&                  SCOM       ,
&                  GAMMA      , GAMOSA    ,
&                  LTRNG      , ITRN
&                  )
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C
C ***** FORTRAN77 SUBROUTINE: H9SPLN *****
C
C PURPOSE:
C   1) PERFORMS CUBIC SPLINE ON LOG(TEMPERATURE) VERSUS LOG(GAMMA)
C      INPUT DATA. ('SCEF' VERSUS 'GAMMA' , NV DATA PAIRS)
C
C   2) INTERPOLATES 'MAXT' GAMMA VALUES USING ABOVE SPLINES AT
C      TEMPERATURES READ IN FROM ISPF PANELS FOR TABULAR OUTPUT.
C      (ANY TEMPERATURE VALUES WHICH REQUIRED EXTRAPOLATION TO
C      TAKE PLACE ARE SET TO ZERO).
C
C   3) INTERPOLATES 'NPSPL' GAMMA VALUES USING ABOVE SPLINES AT
C      TEMPERATURES EQUI-DISTANCE ON RANGE OF LOG(TEMPERATURES)
C      STORED IN INPUT 'SCEF' ARRAY.
C
C CALLING PROGRAM: ADAS809
C
C SUBROUTINE:
C
C INPUT : (I*4)  NV          = INPUT DATA FILE: NUMBER OF GAMMA/TEMPERATURE
C                   PAIRS READ FOR THE TRANSITION BEING ASSESSED
C INPUT : (I*4)  MAXT       = NUMBER OF ISPF ENTERED TEMPERATURE VALUES AT
C                   WHICH INTERPOLATED GAMMA VALUES ARE REQUIRED
C                   FOR TABULAR OUTPUT.
C INPUT : (I*4)  NPSPL      = NUMBER OF SPLINE INTERPOLATED GAMMA/TEMP.
C                   REQUIRED FOR GRAPHICAL DISPLAY.
C
C INPUT : (I*4)  SCEF()     = INPUT DATA FILE: TEMPERATURES (KELVIN)
C INPUT : (I*4)  TOA()     = ISPF PANEL ENTERED TEMPERATURES (KELVIN)
C OUTPUT: (I*4)  TOSA()    = 'NPSPL' TEMPERATURES FOR GRAPHICAL OUTPUT
C                   (KELVIN).
C
C INPUT : (R*8)  GAMMA()   = INPUT DATA FILE: SELECTED TRANSITION -
C                   GAMMA VALUES AT 'SCEF()'.
C OUTPUT: (R*8)  GAMOSA()  = SPLINE INTERPOLATED GAMMA VALUES AT 'TOSA()'
C
C OUTPUT: (L*4)  LTRNG()   = .TRUE. => OUTPUT SPLINE VALUE WAS
C                   INTERPOLATED FOR 'DLOG(TOA())'.
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C          .FALSE. => OUTPUT SPLINE VALUE WAS
C          EXTRAPOLATED FOR 'DLOG(TOA())'.
C          (NOTE: 'YOUT()=0' AS 'IOPT < 0').
C
C          (I*4) NIN      = PARAMETER = MAX. NO. OF INPUT TEMP/GAMMA
C          PAIRS MUST BE >= 'NV'
C          (I*4) NOUT     = PARAMETER = MAX. NO. OF 'OUTPUT TEMP/GAMMA
C          PAIRS MUST BE >= 'MAXT' & 'NPSPL'
C
C          (I*4) IARR     = ARRAY SUBSCRIPT USED FOR TEMP/GAMMA PAIRS
C          (I*4) IOPT     = DEFINES THE BOUNDARY DERIVATIVES FOR THE
C          SPLINE ROUTINE 'XXSPLE', SEE 'XXSPLE'.
C          (VALID VALUES = <0, 0, 1, 2, 3, 4)
C
C          (R*8) TSTEP    = THE SIZE OF STEP BETWEEN 'XOUT()' VALUES FOR
C          GRAPHICAL OUTPUT TEMP/GAMMA PAIRS TO BE
C          CALCULATED USING SPLINES.
C
C          (L*4) LSETX    = .TRUE.  => SET UP SPLINE PARAMETERS RELATING
C          TO 'XIN' AXIS.
C          .FALSE. => DO NOT SET UP SPLINE PARAMETERS
C          RELATING TO 'XIN' AXIS.
C          (I.E. THEY WERE SET IN A PREVIOUS
C          CALL )
C          (VALUE SET TO .FALSE. BY 'XXSPLE')
C
C          (R*8) XIN()    = LOG( 'SCEF()' )
C          (R*8) YIN()    = LOG( 'GAMMA()' )
C          (R*8) XOUT()   = LOG(TEMPERATURES AT WHICH SPLINES REQUIRED)
C          (R*8) YOUT()   = LOG(OUTPUT SPLINE INTERPOLATED GAMMA VALUES)
C          (R*8) DF()     = SPLINE INTERPOLATED DERIVATIVES
C
C          (L*4) LDUMP()  = .TRUE.  => OUTPUT SPLINE VALUE INTRPOLATED
C          FOR 'YOUT()'.
C          .FALSE. => OUTPUT SPLINE VALUE EXTRAPOLATED
C          FOR 'YOUT()'.
C          (NOTE: USED AS A DUMMY ARGUMENT.
C          ALL VALUES WILL BE TRUE.)

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C NOTE:

C ROUTINES:

ROUTINE	SOURCE	BRIEF DESCRIPTION
XXSPLE	ADAS	SPLINE SUBROUTINE (EXTENDED DIAGNOSTICS)
R8FUN1	ADAS	REAL*8 FUNCTION: (X -> X)

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C

C

INTEGER	DTYPE,	ICNTE,	ICNTS
INTEGER	IETRN (NDTRN) ,		ISTRN (NDTRN)
INTEGER	ITRN,	MAXT,	NDTEM, NDTIN
INTEGER	NDTRN,	NPSPL,	NV
LOGICAL	LTRNG (NOUT)		
REAL*8	GAMMA (NDTEM) ,		GAMOSA (NPSPL)
REAL*8	SCOM (NDTEM, NDTRN) ,		TOA (NDTIN)
REAL*8	TOSA (NPSPL) ,	USCEF (NDTEM)	