

ADAS Subroutine dbspln

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      SUBROUTINE DBSPLN( NTDIM , NDTIN ,  
&                      ITA    , ITVAL ,  
&                      TFILE  , TEVA  ,  
&                      QDRIN  , QDROUT ,  
&                      LTRNG  
&                      )
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C  
C ***** FORTRAN77 SUBROUTINE: DBSPLN *****  
C  
C PURPOSE:  
C     1) PERFORMS CUBIC SPLINE ON LOG(TEMPERATURE) VERSUS LOG(QDRIN)  
C        INPUT DATA. ('TFILE' VERSUS 'QDRIN' , ITA DATA PAIRS)  
C  
C     2) INTERPOLATES 'ITVAL' QDRIN 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 'ITVAL' QDRIN VALUES USING ABOVE SPLINES AT  
C        TEMPERATURES EQUI-DISTANCE ON RANGE OF LOG(TEMPERATURES)  
C        STORED IN INPUT 'TFILE' ARRAY.  
C  
C CALLING PROGRAM: ADAS411  
C  
C  
C SUBROUTINE:  
C  
C INPUT : (I*4)  NTDIM   = MAX. NO. OF TEMPERATURES ALLOWED IN  
C                DATA SET  
C INPUT : (I*4)  NDTIN   = MAX. NO. OF USER TEMPERATURES ALLOWED  
C INPUT : (I*4)  ITA     = INPUT DATA FILE: NUMBER OF DR/TEMPERATURE  
C                PAIRS READ FOR THE TRANSITION BEING ASSESSED  
C INPUT : (I*4)  ITVAL   = NUMBER OF SPLINE INTERPOLATED QDRIN/TEMP.  
C                REQUIRED FOR GRAPHICAL DISPLAY.  
C  
C INPUT : (I*4)  TFILE() = INPUT DATA FILE: TEMPERATURES  
C INPUT : (I*4)  TEVA()  = ISPF PANEL ENTERED TEMPERATURES  
C  
C INPUT : (R*8)  QDRIN() = INPUT DATA FILE: SELECTED TRANSITION -  
C                QDRIN VALUES AT 'TFILE()'.  
C OUTPUT: (I*4)  QDROUT() = SPLINE INTERPOLATED QDRIN VALUES AT 'TEVA()'  
C                (EXTRAPOLATED VALUES = 0.0).  
C  
C OUTPUT: (L*4)  LTRNG() = .TRUE.  => OUTPUT SPLINE VALUE WAS  
C                INTERPOLATED FOR 'DLOG(TEVA())'.  
C                .FALSE. => OUTPUT SPLINE VALUE WAS  
C                EXTRAPOLATED FOR 'DLOG(TEVA())'.  
C                (NOTE: 'YOUT()=0' AS 'IOPT < 0').  
C  
C     (I*4)  NIN       = PARAMETER = MAX. NO. OF INPUT TEMP/QDRIN  
C                PAIRS MUST BE >= 'ITA'
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C          (I*4)  NOUT      = PARAMETER = MAX. NO. OF 'OUTPUT TEMP/QDRIN
C                               PAIRS MUST BE >= 'ITVAL' & 'ITVAL'
C
C          (I*4)  IARR      = ARRAY SUBSCRIPT USED FOR TEMP/QDRIN PAIRS
C          (I*4)  IOPT      = DEFINES THE BOUNDARY DERIVATIVES FOR THE
C                               SPLINE ROUTFILEE 'XXSPLE', SEE 'XXSPLE'.
C                               (VALID VALUES = <0, 0, 1, 2, 3, 4)
C
C          (L*4)  LSETX     = .TRUE.  => SET UP SPLINE PARAMETERS RELATFILEG
C                               TO 'XIN' AXIS.
C                               .FALSE. => DO NOT SET UP SPLINE PARAMETERS
C                               RELATFILEG 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( 'TFILE()' )
C          (R*8)  YIN()     = LOG( 'QDRIN()' )
C          (R*8)  XOUT()    = LOG(TEMPERATURES AT WHICH SPLINES REQUIRED)
C          (R*8)  YOUT()    = LOG(OUTPUT SPLINE INTERPOLATED QDRIN VALUES)
C          (R*8)  DF()      = SPLINE INTERPOLATED DERIVATIVES

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C NOTE:

C ROUTFILEES:

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

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 C MODIFIED: RICHARD MARTIN
 C - PUT UNDER SCCS CONTROL

INTEGER	ITA,	ITVAL,	NDTIN,	NTDIM
LOGICAL	LTRNG (NDTIN)			
REAL*8	QDRIN (NTDIM),		QDROUT (NDTIN)	
REAL*8	TEVA (NDTIN),	TFILE (NTDIM)		