

ADAS Subroutine sigia

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C
      SUBROUTINE SIGIA ( LSETX      , LPASS      ,
&                      ALPH        , ETH        , ILTYP      , IOPT      ,
&                      NENIN       , ENIN       , SGIN       ,
&                      LTHETA      , VREL      , XSEC
&                      )
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C
C *****
C ***** FORTRAN77 SUBROUTINE: SIGIA *****
C
C VERSION: 1.0 (ADAS91)
C
C PURPOSE:  INTERPOLATES CROSS-SECTION DATA FROM AN INPUT VECTOR OF
C           VALUES USING CUBIC SPLINES.
C
C EXTRAPOLATES FOR RELATIVE SPEEDS OUT OF DATA RANGE ACCORDING TO
C VARIOUS TYPES (ILTYP).  LOGARITHMIC INTERPOLATION MAY BE USED
C (LPASS).  SPEED ECONOMY IS POSSIBLE FOR REPEATS WITH THE SAME
C SPLINE KNOTS (LSETX).
C
C CALLING PROGRAM:  CXTHER
C
C NOTES:
C   (1) FOR  ILTYP.EQ.0, EXTRAPOLATION IS AS FOLLOWS:
C
C SUBROUTINE:
C
C INPUT : (L*4)   LSETX   = .TRUE. => SPLINE NOT SET FOR THESE KNOTS
C           .FLSE. => SPLINE NOT FOR THESE KNOTS
C INPUT : (L*4)   LPASS   = .TRUE. => DO NOT CONVERT INTO LOG10 FOR
C           ENERGIES AND X-SECTS. FOR SPLINE
C           .FLSE. => CONVERT INTO LOG10 FOR
C           ENERGIES AND X-SECTS. FOR SPLINE
C INPUT : (R*8)   ALPH    = HIGH ENERGY EXTRAPOLATION PARAMETER
C INPUT : (R*8)   ETH     = THRESHOLD ENERGY (RYD.)
C INPUT : (I*4)   ILTYP   = TYPE FOR LOW AND HIGH ENERGY CROSS-
C           -SECTION EXTRAPOLATION.
C INPUT : (I*4)   IOPT    = SPLINE END POINT CURVATURE/GRADIENT OPTION
C           1 => DDY1 = 0, DDYN = 0
C           4 => DY1 = 0 , DDYN = 0
C
C INPUT : (I*4)   NENIN   = NUMBER OF ENERGIES IN INPUT DATA SET
C INPUT : (R*8)   ENIN()  = ENERGIES (EV/AMU) IN INPUT DATA SET
C INPUT : (R*8)   SGIN()  = INPUT X-SECTIONS (CM2) FROM INPUT DATA SET
C           1ST.DIM: ENERGY INDEX
C INPUT : (I*4)   LTHETA  = NUMBER OF VALUES IN VREL VECTOR
C INPUT : (R*8)   VREL()  = RELATIVE SPEEDS FOR OUTPUT (CM S-1)
C
C OUTPUT: (R*8)   XSEC()  = OUTPUT CROSS-SECTION (CM2)
C
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