ADAS Subroutine rbesf

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C
       FUNCTION RBESF(LAM,Q,X)
       IMPLICIT REAL*8(A-H,O-Z)
C
C  PURPOSE: EVALUATES HALF INTEGER BESSEL FUNCTION
C
C  RBESF=(J(LAM,Q*X)-DELTA(LAM,0))/Q**2
C-----------------------------------------------------------------------
C
C  VERSION  : 1.1
C  DATE     : ?
C  MODIFIED : H P Summers
C              - Initial version.
C
C  VERSION  : 1.2
C  DATE     : 16-05-2007
C  MODIFIED : Allan Whiteford
C              - Remove listing information from colums 72+.
C              - Updated comments as part of subroutine documentation
C          procedure.
C-----------------------------------------------------------------------
       Z=Q*X
       XLAM=LAM
       IF(Z.LE.1.0D0)GO TO 25
       Z0=1.570796*XLAM
       SN=DSIN(Z-Z0)
       CS=DCOS(Z-Z0)
       T=1.0
       RBESF=T*SN
       I=0
       IC=1
    5  I=I+1
       XI=I
       T=T*(XLAM+XI)*(XLAM-XI+1.0)/(XI*2.0*Z)
       IF(DABS(T).LE.1.0D-7)GO TO 20
       GO TO (10,15),IC
   10  RBESF=RBESF+T*CS
       T=-T
       IC=2
       GO TO 5
   15  RBESF=RBESF+T*SN
       IC=1
       GO TO 5
   20  RBESF=RBESF/Z
       IF(LAM.LE.0)RBESF=RBESF-1.0D0
       RBESF=RBESF/(Q*Q)
   60  RETURN
   25  T=1.0
       IF(LAM.LE.0)GOTO 36
       DO 35 I=1,LAM
       XI=I
   35  T=T/(2.0*XI+1.0)
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```
      T=T*X*X
      IF(LAM.NE.2)T=T*Z**(LAM-2)
      I=0
      GO TO 37
36    T=-(X*X)/6.0D0
      I=1
37    RBESF=T
      Z2=0.5*Z*Z
40    I=I+1
      XI=I
      T=-T*Z2/(XI*(2.0*(XLAM+XI)+1.0))
      IF(DABS(T).LE.1.0D-7)GO TO 60
      RBESF=RBESF+T
      GO TO 40
     END
     INTEGER             LAM
     REAL*8              Q,           X
```