

ADAS Subroutine lftime

```
SUBROUTINE LFTIME (ZEFF, N, L, NMIN, TAU)
IMPLICIT REAL*8 (A-H, O-Z)
```

```
C-----
C
C PURPOSE: EVALUATES RADIATIVE LIFETIME OF AN NL LEVEL OF A H-LIKE ION.
C
C ***** H.P. SUMMERS, JET      22 JAN 1985 *****
C *** CORRECTIONS 13/5/85
C *** CORRECTIONS 22/5/85
C INPUT
C   ZEFF=EFFECTIVE CHARGE FOR OUTER ELECTRON
C   N=PRINCIPAL QUANTUM NUMBER FOR OUTER ELECTRON
C   L=ORBITAL ANGULAR MOMENTUM QUANTUM NUMBER FOR OUTER ELECTRON
C   NMIN=LOWEST ACCESSIBLE PRINCIPAL QUANTUM NUMBER BY DIPOLE
C   TRANSITION
C OUTPUT
C   TAU=LIFETIME (SEC)
C
C VERSION   : 1.2
C DATE      : 16-05-2007
C MODIFIED  : Allan Whiteford
C           - Updated comments as part of subroutine documentation
C           procedure.
C-----
      IF (N-NMIN) 5, 5, 10
5     TAU=1.0D10
      RETURN
10    NMAX=N-1
      XN=N
      XL=L
      T1=2.67744D9*ZEFF**4/(2.0D0*XL+1.0D0)
      SUM=0.0D0
      DO 20 N1=NMIN, NMAX
      XN1=N1
      DE=1.0D0/XN1**2-1.0D0/XN**2
      DE3=DE**3
      L1=L+1
      XL1=L1
      IF (L1.GE.N1) GO TO 15
      SUM=SUM+XL1*T1*DE3*RD2BS (N1, L1, N, L)
15    L1=L-1
      XL1=L1
      IF (L1.LT.0.OR.L1.GE.N1) GO TO 20
      SUM=SUM+XL1*T1*DE3*RD2BS (N1, L1, N, L)
20    CONTINUE
      IF (SUM.LE.1.0D-10) GOTO 5
      TAU=1.0D0/SUM
      RETURN
END
INTEGER          L,          N,          NMIN
REAL*8           TAU,        ZEFF
```