

ADAS Subroutine ghnlv

SUBROUTINE GHNLV(Z0,Z1,ZEFF,N,L,N1,NL2,TEV,GAMA,GAMTOT)

C PURPOSE: EVALUATES APPROXIMATE EXCITATION RATE PARAMETERS, GAMMA,
C FROM N,L LEVELS OF HYDROGEN-LIKE AND LITHIUM-LIKE IONS TO HIGHER
C LEVELS N1,L1 USING CLASSICAL OVERLAPS.
C
C FOR TRANSITIONS FROM 1S,2S AND 2P APPROXIMATE FITTINGS ARE USED BASED
C ON SAMPSON DATA.
C FOR TRANSITIONS FROM HIGHER NL LEVELS UPWARDS A RESOLVED VARIANT
C OF PERCIVAL-RICHARDS IS USED, WITH NUMERICAL QUADRATURES.
C ***** H.P. SUMMERS, JET 15 JAN. 1985 *****
C INPUT
C Z0=NUCLEAR CHARGE
C Z1=ION CHARGE+1
C ZEFF=EFFECTIVE ION CHARGE (CF. SAMPSON ET AL.)
C N=LOWER PRINCIPAL QUANTUM NUMBER
C L=LOWER ANGULAR QUANTUM NUMBER
C N1=UPPER PRINCIPAL QUANTUM NUMBER
C NL2=MAXIMUM INCLUSIVE N FOR WHICH N WILL BE RESOLVED
C TEV=ELECTRON TEMPERATURE (EV)
C OUTPUT
C GAMA(I),I=1,N1 IS VECTOR OF RATE PARAMETERS WITH L1=I-1 AND
C L1 THE UPPER ANGULAR QUANTUM NUMBER
C GAMTOT = SUM OF GAMA(I),I=1,N1
C-----
C VERSION : 1.2
C MODIFIED: Martin O'Mullane
C DATE : 08-11-2004
C Alter nmax in gamaf() from 200 to 500.
C
C VERSION : 1.3
C DATE : 16-05-2007
C MODIFIED : Allan Whiteford
C Updated comments as part of subroutine documentation
C procedure.
C-----

IMPLICIT REAL*8 (A-H,O-Z)
INTEGER L, N, N1, NL2
REAL*8 GAMA(20), GAMTOT, TEV, Z0
REAL*8 Z1, ZEFF