

ADAS Subroutine rndegv

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SUBROUTINE RNDEGV(Z0,Z,ZEFF1,ZEFF2,NI,LI,LTI,EI,WI,NJ,LJ,LTJ,EJ,  
&WJ,IS,ISP,LP,N0,TEV,DENS,TPV,ZP,EMP,GAE,GAP)  
IMPLICIT REAL*8(A-H,O-Z)
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C-----  
C PURPOSE: CALCULATES TERM AVERAGED ELECTRON AND +VE ION COLLISIONAL  
C RATE PARAMETERS BETWEEN NEARLY DEGENERATE LEVELS.  
C  
C EXPLICIT ENERGY LEVEL CALCULATIONS ARE PERFORMED FOR H, HE AND LI-  
C LIKE SYSTEMS AND A SIMPLE SUM OF J RESOLVED COMPONENT RATE  
C PARAMETERS IS FORMED. FOR OTHER SYSTEMS THE INPUT ENERGIES ARE USED.  
C THE DRIVING PROGRAM REQUIRES THE STATEMENT  
C CALL GAMAF(200)  
C PRIOR TO CALLS TO RNDEGV  
C ***** H.P. SUMMERS, JET 18 FEB 1985 *****  
C ***** CORRECTIONS 22/5/85  
C INPUT  
C Z0=TARGET NUCLEAR CHARGE  
C Z=TARGET ION CHARGE  
C ZEFF1=TARGET EFFECTIVE CHARGE (FOR CORRELATION PART OF ENERGY)  
C ZEFF2=TARGET EFFECTIVE CHARGE (FOR RELATIVISITIC PART OF ENERGY)  
C NI=VALENCE ELECTRON PRINCIPAL QUANTUM NUMBER IN STATE I  
C LI=VALENCE ELECTRON ORBITAL QUANTUM NUMBER IN STATE I  
C LTI=TOTAL ORBITAL ANGULAR MOMENTUM IN STATE I  
C EI=BINDING ENERGY OF STATE I (RYD)  
C WI=STATISTICAL WEIGHT OF STATE I (FULL WEIGHTING INCLUDING SPIN)  
C NJ=VALENCE ELECTRON PRINCIPAL QUANTUM NUMBER IN STATE J  
C LJ=VALENCE ELECTRON ORBITAL QUANTUM NUMBER IN STATE J  
C LTJ=TOTAL ORBITAL ANGULAR MOMENTUM IN STATE J  
C EJ=BINDING ENERGY OF STATE J (RYD)  
C WJ=STATISTICAL WEIGHT OF STATE J  
C IS=(2*S+1) WHERE S IS TOTAL SPIN  
C ISP=(2*SP+1) WHERE SP IS PARENT SPIN  
C LP=PARENT ORBITAL ANGULAR MOMENTUM  
C N0=LOWEST PRINCIPAL QUANTUM NUMBER FOR ION (FOR LIFETIME)  
C TEV=TEMPERATURE(EV) (ELECTRON DISTRIBUTION)  
C DENS=ELECTRON DENSITY (CM-3)  
C TPV=TEMPERATURE(EV) (COLLIDING +VE ION DISTRIBUTION)  
C ZP=CHARGE OF COLLIDING +VE ION  
C EMP=REDUCED MASS FOR COLLIDING +VE ION (ELECTRON MASSES)  
C OUTPUT  
C GAE=GAMMA RATE PARAMETER FOR ELECTRON COLLISIONS  
C GAP=GAMMA RATE PARAMETER FOR +VE ION COLLISIONS  
C-----  
C VERSION : 1.1  
C DATE : 18-03-1999  
C MODIFIED : ???  
C  
C VERSION : 1.2  
C DATE : 05-10-2000  
C MODIFIED : ???  
C - Removed junk from columns > 72  
C
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C VERSION : 1.3
C DATE : 16-05-2007
C MODIFIED : Allan Whiteford
C - Updated comments as part of subroutine documentation
C procedure.
C

C-----
INTEGER IS, ISP, LI, LJ
INTEGER LP, LTI, LTJ, NO
INTEGER NI, NJ
REAL*8 DENS, EI, EJ, EMP
REAL*8 GAE, GAP, TEV, TPV
REAL*8 WI, WJ, Z, Z0
REAL*8 ZEFF1, ZEFF2, ZP