

ADAS Subroutine aphotdw

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SUBROUTINE APHOTDW(B,B1,V,N,L,L1,LP,ISP,LT,LT1,IS,PREC,PION,  
&PSTIM,IRESOL,ndgnt,gaunt,energy,ie)  
IMPLICIT REAL*8 (A-H,O-Z)
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C -----  
C  
C VERSION OF PHOTDW FOR USE BY ADASRRC WHICH USES AGIIDW  
C ***** H.P.SUMMERS, JET 30 JUNE 1992 *****  
C  
C PURPOSE: CALCULATE PHOTO INTEGRALS USING GIIDW BOUND-FREE  
C GAUNT-FACTORS  
C  
C SAME AS RECOM.FORT(PHOTO5) BUT CALLS GIIDW  
C ***** H.P.SUMMERS, JET 19 AUG. 1984*****  
C INPUT  
C B=1.5789D5*Z**2/(V**2*TE)  
C B1=1.5789D5*Z**2/(V**2*TR)  
C WHERE  
C TE=ELECTRON TEMPERATURE (K)  
C TR=RADIATION TEMPERATURE (K)  
C Z=BOUND STATE ION CHARGE +1  
C (THUS Z**2/V**2 IS THE IONISATION POTENTIAL (RYD))  
C V=EFFECTIVE PRINCIPAL QUANTUM NUMBER OF BOUND ELECTRON  
C N=PRINCIPAL QUANTUM NUMBER OF BOUND ELECTRON  
C L=ORBITAL QUANTUM NUMBER OF BOUND ELECTRON  
C L1=ORBITAL QUANTUM NUMBER OF FREE ELECTRON  
C ISP=2*SP+1 WHERE SP IS TOTAL SPIN OF PARENT STATE  
C LP=TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM NUMBER OF PARENT STATE  
C LT=TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM NUMBER OF BOUND SYSTEM  
C LT1=TOTAL ORBITAL ANGULAR MOMENTUM QUANTUM NUMBER OF FREE SYSTEM  
C IS=2*S+1 WHERE S IS TOTAL SPIN OF SYSTEM  
C ndgnt = max number of Gaunt factors allowed  
C OUTPUT  
C PREC=RADIATIVE RECOMBINATION INTEGRAL  
C PION=PHOTOIONISATION INTEGRAL  
C PSTIM=STIMULATED RECOMBINATION INTEGRAL  
C WHERE  
C IRESOL=1 FOR ((LP,SP)N L LT S, (LP,SP)L1 LT1 S)  
C =2 FOR ((LP,SP)N L LT S, (LP,SP)L1 S) =ABOVE LT1 SUM  
C =3 FOR ((LP,SP)N L S, (LP,SP)L1 S) = ABOVE LT SUM  
C =4 FOR ((LP,SP)N L, (LP,SP)L1) = ABOVE S SUM  
C =5 FOR NO L RESOLUTION USING GBF  
C gaunt() = Bound-free Gaunt factor at energy  
C energy() = v**2*e  
C where e = (free electron energy)/z**2 (ryd)  
C v = effective principal quantum number  
C of bound electron  
C ie = number of Gaunt/energy pairs  
C  
C  
C UNIX-IDL PORT:  
C  
C AUTHOR: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
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C
 C DATE: 4TH JULY 1996
 C
 C VERSION: 1.1 DATE: 04-07-96
 C MODIFIED: WILLIAM OSBORN
 C - FIRST VERSION.
 C
 C VERSION: 1.2 DATE: 19-12-01
 C MODIFIED: Martin O'MULLANE
 C - Removed junk from > column 72.
 C
 C VERSION: 1.3 DATE: 02-02-05
 C MODIFIED: Paul Bryans
 C - Returns Gaunt factor, associated vve and number
 C of Gaunt/vve pairs
 C
 C VERSION: 1.4 DATE: 16-05-07
 C MODIFIED: Allan Whiteford
 C - Modified comments as part of subroutine documentation
 C procedure.
 C

CC -----
 C

INTEGER	IE,	IRESOL,	IS,	ISP
INTEGER	L,	L1,	LP,	LT
INTEGER	LT1,	N,	NDGNT	
REAL*8	B,	B1,	ENERGY (NDGNT)	
REAL*8	GAUNT (NDGNT) ,		PION,	PREC
REAL*8	PSTIM,	V		