

## ADAS Subroutine gpcall

SUBROUTINE GPCALL (MAXT, TEA, ALFDAT, ALFO, ALFGF, Z1, N0, V0, NI, LI, WI,  
&NJ, LJ, WJ, EIJ, F, EDISPG, SCALEG, PHFRAC, CORFAC, NCUT, ITYPE, IOPT,  
&IFSEL, IZ0)

IMPLICIT REAL\*8 (A-H, O-Z)

C-----  
C PURPOSE: PROVIDE BURGESS GENERAL FORMULA RESULTS AT A SERIES OF  
C TEMPERATURES, AND ALSO TO PRODUCE BURGESS GENERAL PROGRAM RESULTS  
C AT ZERO DENSITY AT THE SAME TEMPERATURES.  
C  
C THE LATTER ARE ADJUSTED TO EQUAL INPUT DATA AS FAR AS POSSIBLE BY  
C MODIFICATION OF BETHE CORRECTIONS VIA A SINGLE SCALING PARAMETER  
C CORFAC. THE ROUTINE FMIN IS USED TO OPTIMISE CORFAC.  
C  
C \*\*\*\*\* H.P. SUMMERS, JET 11 JUNE 1987 \*\*\*\*\*  
C \*\*\*\*\* H.P. SUMMERS, JET MOD.(1) 24 AUG 1989 \*\*\*\*\*  
C \*\*\*\*\* W.J. DICKSON, JET MOD.(2) 14 DEC 1989 \*\*\*\*\*  
C \*\*\*\*\* W.J. DICKSON, JET MOD.(3) 7 AUG 1990 \*\*\*\*\*  
C INPUT  
C MAXT=NUMBER OF TEMPERATURES  
C TEA(I)=ELECTRON TEMPERATURES (K)  
C Z1=RECOMBINING ION CHARGE  
C N0=LOWEST ACCESSIBLE N-SHELL BY RECOMBINATION  
C V0=EFFECTIVE PRINCIPAL QUANTUM NUMBER OF LOWEST ACCESSIBLE SHELL  
C NI=LOWER PRINCIPAL QUANTUM NUMBER OF PARENT TRANSITION  
C LI=LOWER ANGULAR QUANTUM NUMBER OF PARENT TRNASITION.  
C WI=LOWER PARENT STATE STATISTICAL WEIGHT.  
C NJ=UPPER PRINCIPAL QUANTUM NUMBER OF PARENT TRANSITION  
C LJ=UPPER ANGULAR QUANTUM NUMBER OF PARENT TRNASITION.  
C WJ=UPPER PARENT STATE STATISTICAL WEIGHT.  
C EIJ=PARENT TRANSITION ENERGY (RYD)  
C FIJ=ABSORPTION OSCILLATOR STRENGTH OF PARENT TRANSITION  
C EDISPG=UNIFORM ENERGY DISPLACEMENT FOR GENERAL FORMULA  
C SCALEG=UNIFORM SCALING OF GENERAL FORMULA  
C PHFRAC=INITIAL ESTIMATE OF PHASE SPACE FACTOR  
C CORFAC=INITIAL ESTIMATE OF BETHE CORRECTION SCALER  
C NCUT =HIGH N CUT-OFF (APPLICABLE TO METASTABLE INITIAL STATES)  
C OUTPUT  
C ALFO(I)=GENERAL PROGRAM DIELECTRONIC COEFFICIENTS (CM+3 SEC-1)  
C ALFGF(I)=GENERAL FORMULA DIELECTRONIC COEFFICIENTS  
C PHFRAC=REVISED PHASE SPACE FACTOR  
C CORFAC=REVISED BETHE CORRECTION SCALER  
C  
C UPDATE: 07/03/96 HP SUMMERS - INCREASED NRAT FROM 15 TO 100  
  
C UNIX-IDL PORT:  
C WILLIAM OSBORN, TESSELLA SUPPORT SERVICES PLC.  
C  
C DATE: 19TH APRIL 1996  
C  
C VERSION: 1.1 DATE: 19-04-96  
C MODIFIED: WILLIAM OSBORN  
C -NO CHANGES

C  
C VERSION: 1.2 DATE: 25-04-96  
C MODIFIED: WILLIAM OSBORN  
C -REPLACED CALLS TO E04ABF WITH FUNCTION FMIN FROM WWW.NETLIB

C  
C VERSION: 1.3 DATE: 09-08-96  
C MODIFIED: WILLIAM OSBORN  
C -REMOVED COMMA FROM WRITE STATEMENT (WRITING OF XV0)

C  
C VERSION: 1.4 DATE: 16-05-07  
C MODIFIED: Allan Whiteford  
C - Old IBM statement labels in columns 73-80 removed.  
C - Updated comments as part of subroutine documentation  
C procedure.

C-----  
INTEGER IFSEL, IOPT, ITYPE, IZ0  
INTEGER LI, LJ, MAXT, N0  
INTEGER NCUT, NI, NJ  
REAL\*8 ALFDAT (NRAT) , ALFGF (NRAT)  
REAL\*8 ALFO (NRAT) , CORFAC, EDISPG, EIJ  
REAL\*8 F, PHFRAC, SCALEG  
REAL\*8 TEA (NRAT) , V0, WI, WJ  
REAL\*8 Z1