

ADAS Subroutine d8gpca

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SUBROUTINE D8GPCA (TEA      , IZ1      ,
&                ITYPE    , NO      , V0      ,
&                EIJ_in   , FIJ      , EDISPG  , SCALEG  ,
&                PHFRAC   , CORFAC   , NCUT_in , NG      ,
&                ALF      )

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C
C ***** FORTRAN77 SUBROUTINE: D8GPCA *****
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C PURPOSE : ROUTINE TO PROVIDE BURGESS GENERAL PROGRAM RESULTS
C           AT A GIVEN TEMPERATURES AND AT ZERO DENSITY.
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C           EQUAL THE GENERAL FORMULA RESULTS AS FAR AS POSSIBLE
C           BY MODIFICATION OF BETHE CORRECTIONS VIA A SINGLE
C           SCALING PARAMETER CORFAC.
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C           THE CORRECTION FACTORS USED IN THE GENERAL PROGRAM
C           ARE OBTAINED BY ADJUSTMENT OF STANDARD SETS FOR SPECIFIC
C           TYPES OF TRANSITION. THE ADJUSTMENT IS
C           (NEW COR(J))=EXP(-CORFAC/(L*DF+0.5))*(STANDARD COR(J))
C           THE STANDARD COR'S ARE AS FOLLOWS:
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C TYPE	C TRANSITION	C COR'S	C DF
C 1	C NI=1,NJ>=2,LJ=LI+1:	C 0.05,0.30,0.50,0.90	C 2.0
C 2	C NI=2,NJ=3,LJ=LI+1:	C 0.01,0.02,0.20,0.40,0.70,0.90	C 1.0
C 3	C NI=2,NJ=3,LJ=LI-1:	C 0.01,0.01,0.01,0.08,0.30,0.70	C 1.0
C 4	C NJ-NI=0, LJ=LI+1 :	C 0.30,0.35,0.40,0.45,0.70,0.90	C 0.5
C 5	C NJ-NI=0, LJ=LI-1 :	C 0.30,0.35,0.40,0.45,0.70,0.90	C 0.5
C 6	C NJ-NI>0, LJ=LI+1 :	C 0.01,0.02,0.20,0.40,0.70,0.90	C 1.0
C 7	C NJ-NI>0, LJ=LI-1 :	C 0.01,0.01,0.01,0.08,0.30,0.70	C 1.0

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C CALLING PROGRAM: ADAS408
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C SUBROUTINE:
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C INPUT : (I*4) IZ1      = RECOMBINING ION CHARGE
C
C           (I*4) ITYPE   = TYPE OF DIELECTRONIC TRANSITION
C           (I*4) NO      = LOWEST ACCESSIBLE PRINC. QUANTUM SHELL
C                           FOR DIEL. RE
C           (I*4) NCUT    = CUT-OFF PRINC. QUANTUM SHELL IN
C                           GENERAL PROGRAM
C           (I*4) NG      = CUT-OFF PRINC. QUANTUM SHELL FROM
C                           COLLISINAL IONISATION
C           (R*8) V0      = EFFECTIVE PRINC. QUANTUM NUMBER
C                           FOR LOWEST ACCESS
C           (R*8) PHFRAC  = PHASE SPACE OCCUPANCY AVAILABILITY
C                           FOR LOWEST SHELL
C           (R*8) CFAC    = ADJUSTMENT FOR BETHE CORRECTIONS
C                           IN GENERAL PROGRAM
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C          (R*8)  EIJ          = Z SCALED PARENT TRANSITION ENERGY (RYD)
C          (R*8)  FIJ          = OSCILLATOR STRENGTH FOR TRANSITION
C          (R*8)  EDSP         = ENERGY ADJUSTMENT IN BURGESS GENERAL
C                               FORMULA (RYD)
C          (R*8)  SCALE        = MULTIPLIER ON BURGESS GENERAL FORMULA
C
C          (R*8)  TEA          = TEMPERATURE OF CALCULATION (K)
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C
C
C OUTPUT: (R*8)  ALFO          = GENERAL PROGRAM DIELECTRONIC COEFFICIENTS
C          (R*8)  PHFRAC       = REVISED PHASE SPACE FACTOR
C          (R*8)  CORFAC       = REVISED BETHE CORRECTION SCALER
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C PROGRAM:
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C ROUTINES:
C          ROUTINE    SOURCE    DESCRIPTION
C          -----
C          GPDIEL     ADAS      ?
C          BF         ADAS      ?
C
C
C HISTORY : BASED ON GPCALC
C           H P SUMMERS    11-5-87
C
C AUTHOR: M O'MULLANE, UCC
C
C DATE:    28/07/94
C
C UNIX-IDL PORT:
C
C VERSION: 1.1                      DATE: 15-04-96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C           - FIRST CONVERTED
C
C VERSION: 1.2                      DATE: 23-05-96
C MODIFIED: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC)
C           REPLACED CFAC WITH CORFAC: ERROR. REMOVED ALF0 AND ALFDAT
C
C
C VERSION: 1.3                      DATE: 16-01-2004
C MODIFIED: Martin O'Mullane
C           - Added ncut_in and eij_in as input arguments because
C             ncut and eij are altered in this subroutine.
C           - Trap for AD1.eq.0 for shells above n=10.
C           - X was defined the same way for the for both parts.
C             Re-define it for n>10 using v1 rather than v.
C
C VERSION: 1.4                      DATE: 17-05-2007
C MODIFIED: Allan Whiteford
C           - Updated comments as part of subroutine documentation

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C procedure.

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INTEGER	ITYPE,	IZ1,	N0,	NCUT_IN
INTEGER	NG			
REAL*8	ALF,	CORFAC,	EDISPG,	EIJ_IN
REAL*8	FIJ,	PHFRAC,	SCALEG,	TEA
REAL*8	V0			