ADAS Subroutine rdwbes

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C
       subroutine rdwbes( ndinfo,
     &                    z0    , nlqs  , nshell , na    , la    ,
     &                    ea    , qda   , alfaa  ,
     &                    jsn   , jealfa, acc    , xmax  , h     ,
     &                    lam   , einc  , irept  , iext  ,iochk  ,
     &                    res   ,
     &                    ninfo , cinfoa
     &                  )
C-----------------------------------------------------------------------
C
C  ***************** fortran77 program: rdwbes.for *********************
C
C  Purpose:  Evaluates Born multipole integrals using distorted bound
C            waves.  The distorted waves are in a Jucys or Slater type
C            potential.
C
C
C  Subroutine:
C
C  Input : (i*4)  ndinfo   = maximum number of information strings
C  Input : (r*8)  z0       = nuclear charge (+ve)
C  Input : (i*4)  nlqs()   = 1000*n+100*l+iqfor each screening shell
C                            1st dim: screening shell index
C  Input : (i*4)  nshell   = number of screening shells
C  Input : (i*4)  na()     = initial (1) and final (2) state principal
C                            quantum numbers.
C  Input : (i*4)  la()     = initial (1) and final (2) orbital quantum
C                            numbers.
C  Input : (r*8)  ea()     = energies(ryd) of initial (1) and final (2)
C                            states - set <0 for bound states.
C  Input : (r*8)  qda()    = quantum defects for initial (1) and
C                            final (2) states.
C  Input : (r*8)  alfaa(,) = screening parameters
C                            1st dim: initial (1) and final (2) states
C                            2nd dim: screening shell index.
C  Input : (i*4)  jsn      = -1 => Jucys potential
C                          =  0 => Slater potential
C  Input : (i*4)  jealfa   =  0 => search for energies given potential
C                          =  1 => search for alfaa parameters for
C                                  potential given energies and quantum
C                                  defects.
C  Input : (r*8)  acc      = search accuracy setting
C  Input : (r*8)  xmax     = range for numerical wave function generation
C                            and storage
C  Input : (r*8)  h        = step interval for numerical wave function
C                            storage
C  Input : (i*4)  lam      = Born multipole
C  Input : (r*8)  einc     = incident electron energy(ryd)
C  Input : (i*4)  irept    = 0 =>full wave function determination
C                          = 1 => repeat with same wave functions as in
C                                 previous case with irept=0
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C  Input : (i*4)  iext     = 0 normal operation with internally generated
C                             wave functions
C                          = 1 use external wave functions supplied in
C                             function gext(x,n,l) with n and l
C                             specifying orbital.
C  Input : (i*4)  iochk    = 1 => Born multipole integral evaluated
C                          = 2 => Ochkur multipole integral evaluated
C
C  Output: (r*8)  res      = multipole integral (at.unit)
C  Output: (i*4)  ninfo    = number of information strings
C  Output  (c*90) cinfoa() = information strings
C                            1st dim: index number of strings
C
C
C  Routines:
C          routine    source   brief description
C          ------------------------------------------------------------
C          zeff       adas     effectrive charge (+ve)
C          effz3      adas     evaluates effective potential
C          gext       adas     access external radial wave functions
C          zser       adas     power series expansion of z(r)
C          bdcf7      adas     generate bound radial distorted wave fn.
C          fcf6       adas     generate free radial distorted wave fn.
C          rbesf      adas     evalluate bessel function
C          ass2       adas     asymptotic integral contribution
C          dnamp      adas     asymp. wave fn. amplitude Taylor coeffts
C          phase      adas     asymp. wave fn. phase Taylor coeffts
C          ass        adas     asymptotic integral contribution
C
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C           ja7.08
C           tel. 0141-548-4196
C
C  Date:   22/04/85
C
C  Update: HP Summers  16/06/95  alter definition of nlqs as
C                                1000*n+100*l+iq to avoid problem when
C                                number of equivalent electrons is 10
C  Update: HP Summers  21/05/04  restructure and add calculation
C                                information strings to parameter output
C-----------------------------------------------------------------------
C-----------------------------------------------------------------------
      CHARACTER*90        CINFOA(NDINFO)
      INTEGER             IEXT,        IOCHK,       IREPT,       JEALFA
      INTEGER             JSN,         LA(2),       LAM,         NA(2)
      INTEGER             NDINFO,      NINFO,       NLQS(10),    NSHELL
      REAL*8              ACC,         ALFAA(2,10), EA(2),       EINC
      REAL*8              H,           QDA(2),      RES,         XMAX
      REAL*8              Z0
```