ADAS Subroutine finish5

```
         SUBROUTINE FINISH5(NIP,INTD,IPRS,ILOW,IONIP,NIONIP,ILPRS,IVDISP,
     &       ZEFF,TS,W,CION,CPY,W1,ZIMPA,DNIMPA,NIMP,IUPS1,IUPS2,STITLE,
     &       NBENG,NTEMP,NDENS, lbndl, lproj)

        IMPLICIT REAL*8(A-H,O-Z)
C-----------------------------------------------------------------------
C
C       ********** FORTRAN 77 ROUTINE : FINISH5.F **********
C
C   PURPOSE : ASSEMBLES AND SOLVES THE COLLISIONAL RADIATIVE
C             FOR THE RELATIVE POPULATIONS, Bnl FACTORS AND THE
C             COLLISIONAL-RADIATIVE IONISATION AND RECOMBINATION
C             COEFFICIENTS.
C
C   INPUT :
C
C           ROUTINE SET TO READ STREAM 12 AS A TEMPORARY MEASURE
C
C   OUTPUT:
C
C
C   HISTORY : ROUTINE WAS ORIGINALLY WRITTEN BY H.P. SUMMERS
C
C
C   NOTE    :
C
C             IPOSNT .EQ. 1 EXTERNAL RADIATION FIELD IS .NE. 0.0
C             THE C-R MATRIX IS MODIFIED AND THE Bnl SOLUTION IS
C             OBTAINED. THE F2 COLUMN REPRESENTING THE RECOMBINATION
C             IS THEN EQUAL TO THE Bnl SOLUTION.
C
C             IPOSNT .EQ. 2 EXTERNAL RADIATION FIELD IS SET TO 0.0
C             PROVIDING THAT IR.EQ.2 AND JR.EQ.1. THE C-R MATRIX IS
C             MODIFIED AND THE Bnl SOLUTION IS OBTAINED. THE F1I
C             COLUMN REPRESENTING THE EXCITATION CONTRIBUTION FROM
C             THE FIRST METASTABLE IS EVALUATED BY MANIPULATING
C             THE F2 COLUMN, Bnl SOLUTION AND THE RELATIVE POPULATION
C             OF THE GROUND STATE.
C
C             IPOSNT .EQ.3 EXTERNAL RADIATION FIELD IS SET TO 0.0
C             PROVIDING THAT IR.EQ.2 AND JR.EQ.1. THE C-R MATRIX IS
C             MODIFIED AND THE Bnl SOLUTION IS OBTAINED. THE F1II
C             COLUMN REPRESENTING THE EXCITATION CONTRIBUTION FROM
C             THE SECOND METASTABLE IS EVALUATED BY MANIPULATING
C             THE F2 COLUMN, Bnl SOLUTION AND THE RELATIVE POPULATION
C             OF THE SECOND METASTABLE STATE.
C
C             IPOSNT .EQ.4 EXTERNAL RADIATION FIELD IS SET TO 0.0
C             PROVIDING THAT IR.EQ.2 AND JR.EQ.IMAX+1. THE C-R MATRIX
C             IS MODIFIED AND THE Bnl SOLUTION IS OBTAINED.THE F1III
C             COLUMN REPRESENTING THE EXCITATION CONTRIBUTION FROM
C             THE SECOND METASTABLE IS EVALUATED BY MANIPULATING
```

```
C             THE F2 COLUMN, Bnl SOLUTION AND THE RELATIVE POPULATION
C             OF THE SECOND METASTABLE STATE.
C
C
C
C   CONTACT : HARVEY ANDERSON
C             UNIVERSITY OF STRATHCLYDE
C             ANDERSON@PHYS.STRATH.AC.UK
C
C   DATE    : 4/3/98
C
C
C VERSION : 1.2
C DATE    : 21-10-99
C MODIFIED: RICHARD MARTIN
C            - CHANGED HEXADECIMAL CONSTANTS TO Z'FFF00000' FORM.
C
C VERSION : 1.3
C DATE    : 3-6-2000
C MODIFIED: Martin O'Mullane
C            - Removed call to errset.
C
C VERSION : 1.4
C DATE    : 18-11-2004
C MODIFIED: Martin O'Mullane
C            - Align with Harvey Anderson's last version.
C            - Add lbndl if adf26 files output is requested.
C            - The dsnps1 variable is replaced by iups2 in the
C              parameter list.
C            - Outputs projection matrices for Vienna codes
C              if lproj is set.
C
C-----------------------------------------------------------------------


      CHARACTER*80        STITLE
      INTEGER             ILOW,         ILPRS,        INTD,         IONIP
      INTEGER             IPRS,         IUPS1,        IUPS2,        IVDISP
      INTEGER             NBENG,        NDENS,        NIMP,         NIONIP
      INTEGER             NIP,          NTEMP
      LOGICAL             LBNDL,        LPROJ
      REAL*8              CION,         CPY,          DNIMPA(10),   TS
      REAL*8              W,            W1,           ZEFF
      REAL*8              ZIMPA(10)
```