jul18-01   **ADAS Bulletin**

This is the second of our regular four monthly bug *ADAS code and data error & minor adjustment releases* and is associated with ADAS version 2.5.3.

Corrections to codes

C.1 Corrected omission of level information return from *read_adf08.pro* .

C.2 Some modules were missing in the *read_adf11.so* module. These have been added to the compilation script. A problem has been corrected with the variables IPRT and IGRD associated with *adf11* files. These variables were altered in the Fortran reading subroutine. They were reset to 1 from –1 which prejudiced their use at the IDL level to determine which branch of interpretation of the data set ('standard' or 'partial') to follow.

C.3 The population dependence structure returned from *run_adas208.pro* was incorrectly indexed. In correcting this, more checking has been included on allowed inputs. Also, metastable and level configuration information are now returned separately.

C.4 An IDL program to run ADAS308 from the command line, *run_adas308.pro*, has been added. Two IDL implementations of the Fortran codes were required and have been added to the */../adas/idl/adaslib* library , namely, *r8ah.pro* which calculates hydrogenic A-values which in turn calls *r8rd2b.pro*.

C.5 *libadas7xx* has been added. This was required immediatelt for easy access to the impact parameter subroutine for electron impact excitation. There are at the moment no other obvious routines fom either ADAS series 6 or 7 which should be included in scannable libraries.

C.6. An IDL *read_adf24* routine has been added. The *adf24* data format contains state selective charge transfer cross-section data.

C.7. An IDL *read_adf02* routine has been added. The a*df02* data format contains ion impact cross-section data stored by target element (H or He).

C.8. An indexing problem with read_adf04.pro has been corrected. Also options have been added to input a Burgess 'C-parameter' and to include limit points.

Extensions to codes

E.1 <u>ADAS601</u> Some new features have been added as follow:
   1. In the output file (*demap_output.dat*) deviation is now multiplied by the constant variance (*sigma*) to get the non-reduced value (modification dated 06-12-00 in *f01wout.pro*).
   2. The abundance analysis has been extended in that, after the DEM evaluation, the lines used for the integral inversion plus all the lines flagged 'a' in the first column of the intensity file are used to get the element abundance which gives the minimum deviation for these lines. Error bars are evaluated by searching the abundance range which produces deviation less than one (ie. predicted intensity within observational uncertainities).
   3. Error fix: removed redundant input '*mpre*' in the call to predict_intensity.
   4. Error fix: In *dem_plot.pro*, added ranges in the definitions of *xs* and *ys* to avoid memory of previous runs.
   5. Modified to support SCCS data control tags.
E.2 ADAS602
   1. Included support for CDS-NIS line profiles post loss.
   2. Fixed bug causing crash when using automatic cycling.

Corrections to data   Note all data is now under SCCS control.

D.1 The data sets */.../adf04/lilike.da*t and */.../adf04/lilike.dat%* have been removed. These contained aggregated *adf05* files which are already in the central *adf05* directory.

D.2 A new *adf04* file for electron impact excitation of Ne^{+4} , */.../adf04/clike/clike_dcg00#ne4.dat*, prepared by Don Griffin has been added.

D.3. The */.../adf03/atompars/atompars_vm#cr.dat* dataset has been used to prepare a new '89' *adf11* data collection for Cr, namely, */.../adf11/<aaa>89/<aaa>89_cr.dat*.

D.4. The *adf07* file of electron impact ionisation rate coefficients for helium has been updated, namely, */.../adf07/ionelec_szd#he.dat*.

D.5. Several inconsistencies have appeared in the *adf08* data sets for radiative recombination coefficients for oxygen ions. The b-like data did not match up with the level set in the associated adf04 file. The *rrc98##_o8ls.dat* file was not present as was the *rrc98#li_o5ls* file. To make everything consistent, */.../adf08/rrc96#b/rrc98#b_o3ls.dat* was removed, */.../adf08/rrc96#h/rrc98#h_o7ls.dat* was moved to */.../adf08/rrc98#h/*, */.../adf08/rrc96#h/rrc98#h_n6ls.dat* was moved to */.../adf08/rrc98#h/*, and */.../adf08/rrc98#li/rrc98#li_o5ls.txt* was removed.

D.6. The */.../adf10/prb96/* files have been reorganised a little. The files in this sub-directory should have the form pj#prb96_<el><met>0.dat with <el> the element and <met> the metastable index. The old style files have been removed.

D.7. The *adf25* drivers for oxygen were missing and the *adf18/a09_p204* cross-referencing files point to the incorrect *adf25* files. These errors have been corrected.

D.8. There is a problem with the O^{+1} *adf04* file. This seems to have been introduced by ADAS210 which is being checked. The A-values for certain transitions are much too large. A new *adf04/adas#8/cop98#8_ls#o1.dat* has been prepared and this ionisation stage of oxygen has been carried through the whole GCR procedure again. Note that the ADAS210 problem affects the intermediate coupling, 'IC', case so *cop98#8_ic#o1.dat* is removed for the time being. There is also a problem with the helium-like data set cop98#8_ls#o6.dat where several forbidden transitions had unphysical A-values, also one important transition was missing. This ionisation stage has been redone.

    The consequence of these corrections is that there are new *adf10*, *adf11*, *adf13* and *adf15* files. As the problems were caused by error rather than upgrade, the old files are replace rather than a new year number assigned.

D.9. The *adf04* files for helium-like argon and iron from Allan Whiteford's work are in */.../adf04/helike/helike_adw01#ar.dat* and */.../adf04/helike/helike_adw01#fe.dat*. Similar data sets but with slightly extended temperature ranges are in the two new directories */../adf04/adas#18/* and */../adf04/adas#26/*.

D.9. The dataset /../adf04/hlike/hlike_rh1989c.dat was missing its terminating –1's and has been corrected.

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