

1b. Computational overview of ADAS

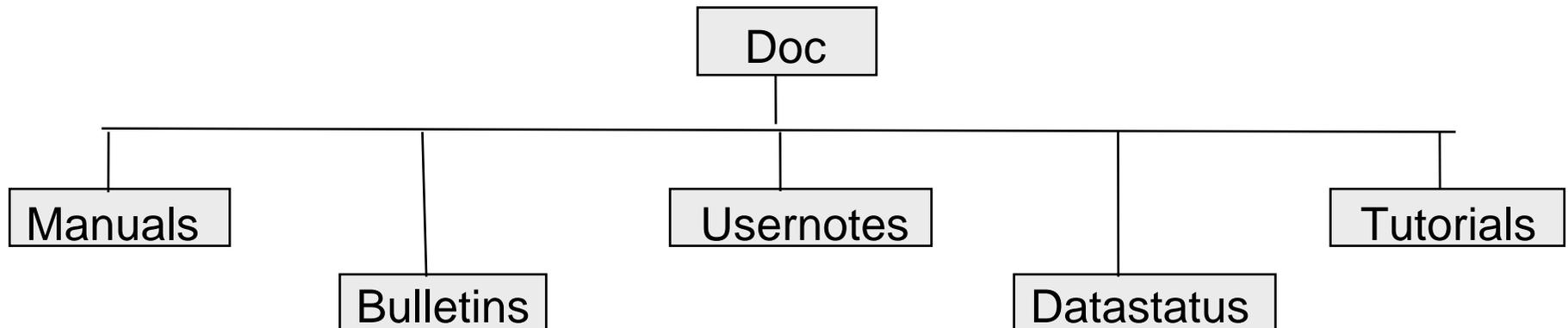
- Introduction
 - » Supported systems and language details
 - » Overall organization
- Initial setup of ADAS
 - » Establishing the local IDL/ADAS environment
 - » Standard user space organization and setup
- Some components of ADAS
 - » The code part of ADAS
 - » The database and adf numbers
 - » The documentation
- Learning to use ADAS online
 - » ADAS501
 - » using common widgets

ADAS

- The interactive user interface
 - » ADAS series
- The fundamental and derived databases
 - » ADAS data formats
- The application interface
 - » Large ADAS FORTRAN and IDL subroutine libraries
 - » Small C, MATLAB and PERL libraries
- Offline-ADAS
- Documentation

Documentation

- Documentation is accessible on the world-wide-web
 - » <http://www.adas.ac.uk>
 - » Also present on all local ADAS work-stations
 - » `/<path>/adas/doc/`
- The main user manual - ver 2.5.6 - is in
 - » `/<path>/adas/doc/manual/`



ADAS series

Interactive codes are grouped in series. Currently ~ 85 codes.

- Atomic data entry and verification
- Population processing
- Charge exchange processing
- Recombination, ionisation processing
- General interrogation programs
- Data analysis and spectral fitting
- Creating and using dielectronic data
- Structure and excitation calculations

ADAS code disposition

- The codes and sub-routines (>1000) are organised hierarchically and maintained under SCCS in

- » *<path>/adas/idl*
 - /adaslib*
 - /adas1xx* */adaslib*
 - /adas101*
 - ...*
 - /adas2xx* */adaslib*
 - /adas201*
 - ...*
- /fortran*
 - /adaslib*
 - /adas1xx* */adaslib*
 - /adas101*
 - ...*

- Source IDL code is open, but FORTRAN code is restricted. FORTRAN shared object module libraries are available to user codes.

- » *<path>/adas/lib /libadaslib.a*
 - /libadas1xx.a*
 - ...*

Database

- Fundamental and derived data. Currently ~ 6 Gbyte.
- The various classes of ADAS data have precisely specified organisation called ADAS data formats or 'ADFs' for short (eg. *ADF14*). There are ~ 56 different classes.
- Some key ADF's for fusion application
 - » *ADF04* : specific ion data
 - » *ADF11* : coll.-rad. ionis. & recom. coefficients.
 - » *ADF13* : ionisation per photon ratios
 - » *ADF15* : emissivity coefficients
 - » *ADF40* : envelope feature photon emiss. coefficients.

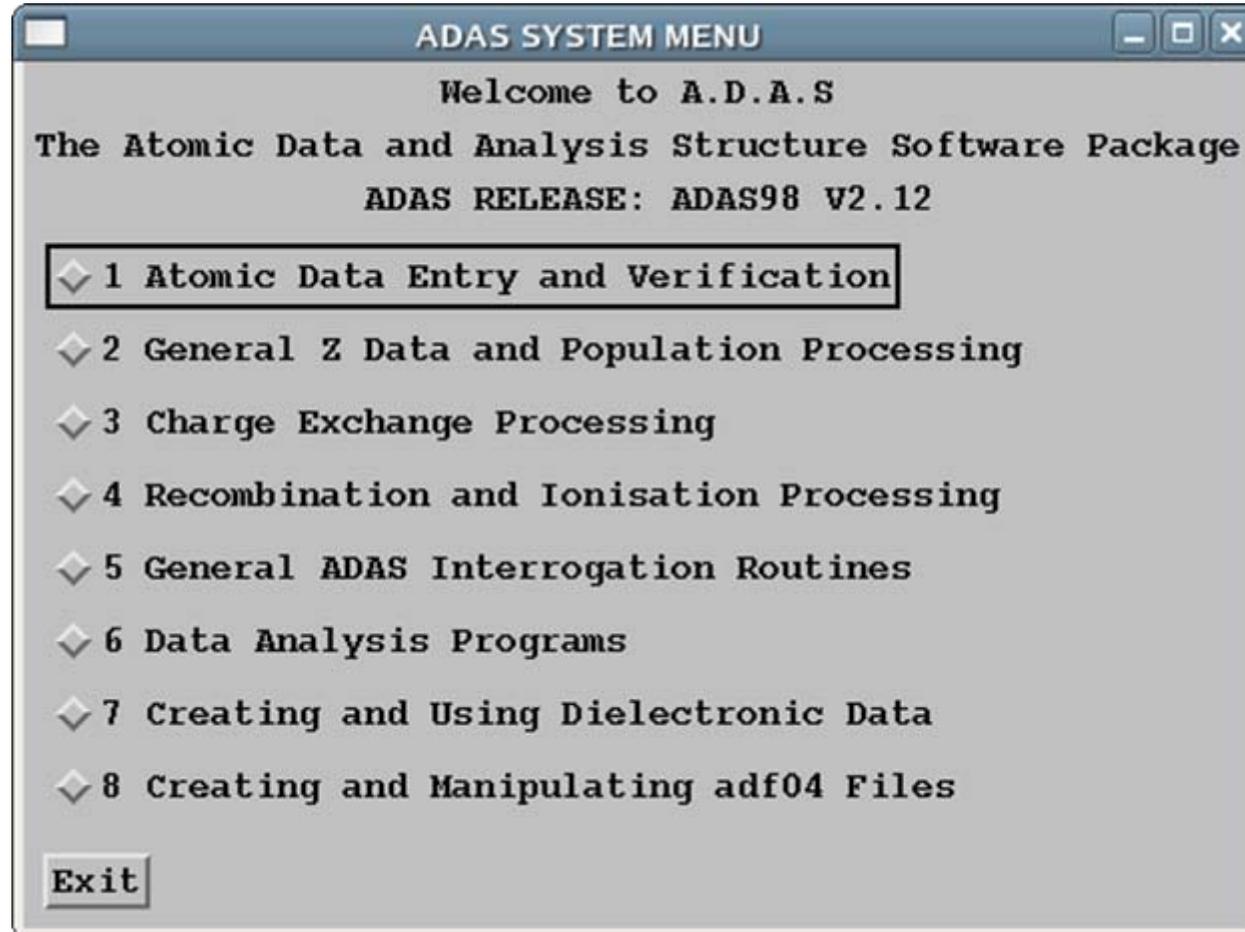
The interactive ADAS user

- An ADAS user requires a UID on a work- station with access to the ADAS and IDL servers.
- ADAS expects a number of directories to be present in the user file space, including
 - » The 'defaults' directory which remembers the settings and values from the previous use of each code
 /<path>/<UID>/adas/defaults
 - » The 'pass' directory to which ADAS created data sets are routed
 /<path>/<UID>/adas/pass
- A start-up script is available to set pathways, environments and directories required by the ADAS user.
- It is helpful to maintain data sets in structures matching central ADAS as
 /<path>/<UID>/adas/adf01/.../

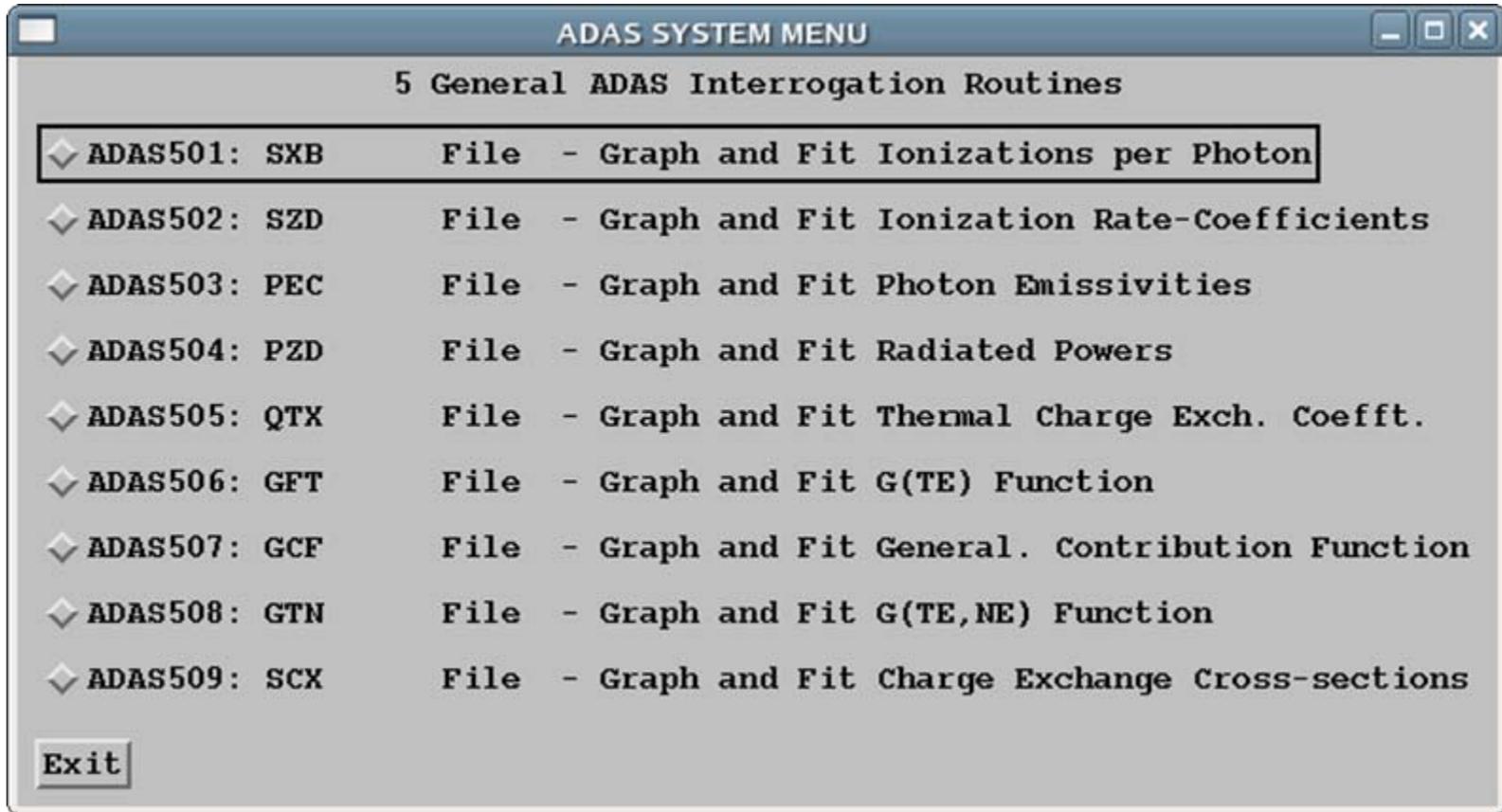
ADAS on-line

- Move to your *'/pass'* directory.
- Initiate ADAS on a unix workstation or a linux personal computer by typing *'adas'*.
- An interactive session begins starting with program selection from menus
- Each program interacts with the user via a variety of screens, normally including *'input'*, *'processing'* and *'output'* screens.

ADAS main menu



ADAS series 5 menu



ADAS501 - a typical interrogation code

- Datasets of class ADF13 contain ionisation per photon ratios (SXB data) as a function of T_e and N_e .
- The code ADAS501 interrogates ADF13 data sets at a temperature/density model of your choice.
- ADAS501 has a standard sequential three screen structure, namely *file selection*, *processing options* & *output options* screens

ADAS501 (contd.)

- File selection
 - » The path to central ADAS data of the correct class (*ADF13*) is selected by button press.
 - » A display screen shows available files which are selected by clicking on them.
 - » Files have the *.dat* extension otherwise they are directories.
 - » *Done* means go to next screen, *Cancel* means return to the previous screen.
 - » On many screens there is a small ikon button along side *Cancel* allowing *Exit and Return to Menu*.

ADAS501 input

The screenshot shows the 'ADAS 501 INPUT' dialog box. The title bar reads 'ADAS 501 INPUT'. The main title is 'Input Dataset'. The 'Data Root' field contains the path '/home/stanner/s/adas_dev/adas/adf13/'. Below this are three buttons: 'Central Data', 'User Data', and 'Edit Path Name' (which has an unchecked checkbox next to it). A text field below the buttons contains the selected file path '/sxb96#c/sxb96#c_pjr#c3.dat'. Below the text field is a list of files, with 'sxb96#c_pjr#c3.dat' highlighted. At the bottom are three buttons: 'Browse Comments', 'Cancel', and 'Done'. Five red ovals with arrows point to specific elements: 'click to use central ADAS data' points to the 'Central Data' button; 'selected file for processing' points to the text field; 'ADF13 data file list' points to the file list; 'browse comments from selected data set' points to the 'Browse Comments' button; and 'click to edit pathway' points to the 'Edit Path Name' button.

click to use central ADAS data

selected file for processing

ADF13 data file list

browse comments from selected data set

click to edit pathway

ADAS 501 INPUT

Input Dataset

Data Root: /home/stanner/s/adas_dev/adas/adf13/

Central Data User Data Edit Path Name

/sxb96#c/sxb96#c_pjr#c3.dat

..

sxb96#c_bnd#c5.dat

sxb96#c_pjr#c0.dat

sxb96#c_pjr#c1.dat

sxb96#c_pjr#c2.dat

sxb96#c_pjr#c3.dat

sxb96#c_pjr#c4.dat

sxb96#c_pjr#c5.dat

sxb96#c_pju#c0.dat

sxb96#c_pju#c1.dat

sxb96#c_pju#c2.dat

sxb96#c_pju#c3.dat

sxb96#c_pju#c4.dat

sxb96#c_pju#c5.dat

sxb96#c_vsr#c0.dat

Data File

Browse Comments Cancel Done

ADAS501 (contd.)

- Processing options
 - » First select the spectrum line required.
 - » Then the choice of temperature and density pairs must be entered.
 - » The 'Table Editor' widget is activated by button press to allow this.
 - » Using the editor takes a little practice.
 - » An advanced graphical method for Te/Ne pair selection may be used

ADAS501 Processing

The screenshot shows the 'ADAS501 PROCESSING OPTIONS' dialog box. It contains several sections: 'Title for Run' with a text field containing 'Test adas501'; 'Data File Name' with a text field containing a file path; 'Browse Comments' button; 'Polynomial Fitting' section with a checked 'Fit Polynomial' checkbox and a 'value %' field set to '5'; 'Select data Block' section with a table of data blocks; 'Temperature & Density Values' section with a table of values and 'Temperature Units: eV' and 'Density Units: cm-3' fields; 'Edit Table' button; and 'Default Te', 'Default Ne', and 'Value Selection by display' buttons. At the bottom are 'Cancel' and 'Done' buttons. Red arrows point from external text boxes to various elements in the dialog.

INDEX	Wavelength	Ion Source	Processing Code	Metastable Index
14	1549.1 A	1s+c3	ADAS208	1
12	1133.2 A	1s+c3	ADAS208	1
13	1106.6 A	1s+c3	ADAS208	1
14	1549.1 A	1s+c3	ADAS208	1
15	312.4 A	1s+c3	ADAS208	1

INDEX	Temperature		Density	
	Output	Input	Output	Input
1	6.890E-01	6.890E-01	4.920E+13	1.640E+05
2	9.650E-01	9.650E-01	4.920E+13	1.640E+06
3	1.380E+00	1.380E+00	4.920E+13	1.640E+07
4	2.070E+00	2.070E+00	4.920E+13	1.640E+08

your title to appear on graphs & tables

selected data set

make polynomial fit to data

select line for analysis

enter Te/Ne pairs for output

set default output values

edit table

ADAS501 (contd.)

- Output options
 - » Graphical display is of SXB as a function of temperature at temp/density pairs.
 - » Graphical hard copy and a listing summary of the extracted and fitted data are available.
 - » Automatic or explicit scaling may be chosen.
 - » The displayed graph can be adjusted and/or retained by further controls.
 - » Retain and Adjust require a little practice.

ADAS501 Output

ADAS501 OUTPUT OPTIONS

Data File Name: /home/summers/adas_dev/adas/adf13/sxb96#c/sxb96#c_pjr#c3.dat

Browse Comments

Graphical Output

Graph Title:

Select Device

Explicit Scaling

X-min: X-max:

Y-min: Y-max:

Enable Hard Copy Replace

File Name:

Text Output Replace

File Name:

provide graphical output

allow graphical hard copy

graphical output file coding

tabular output of results

ADAS501 Graph

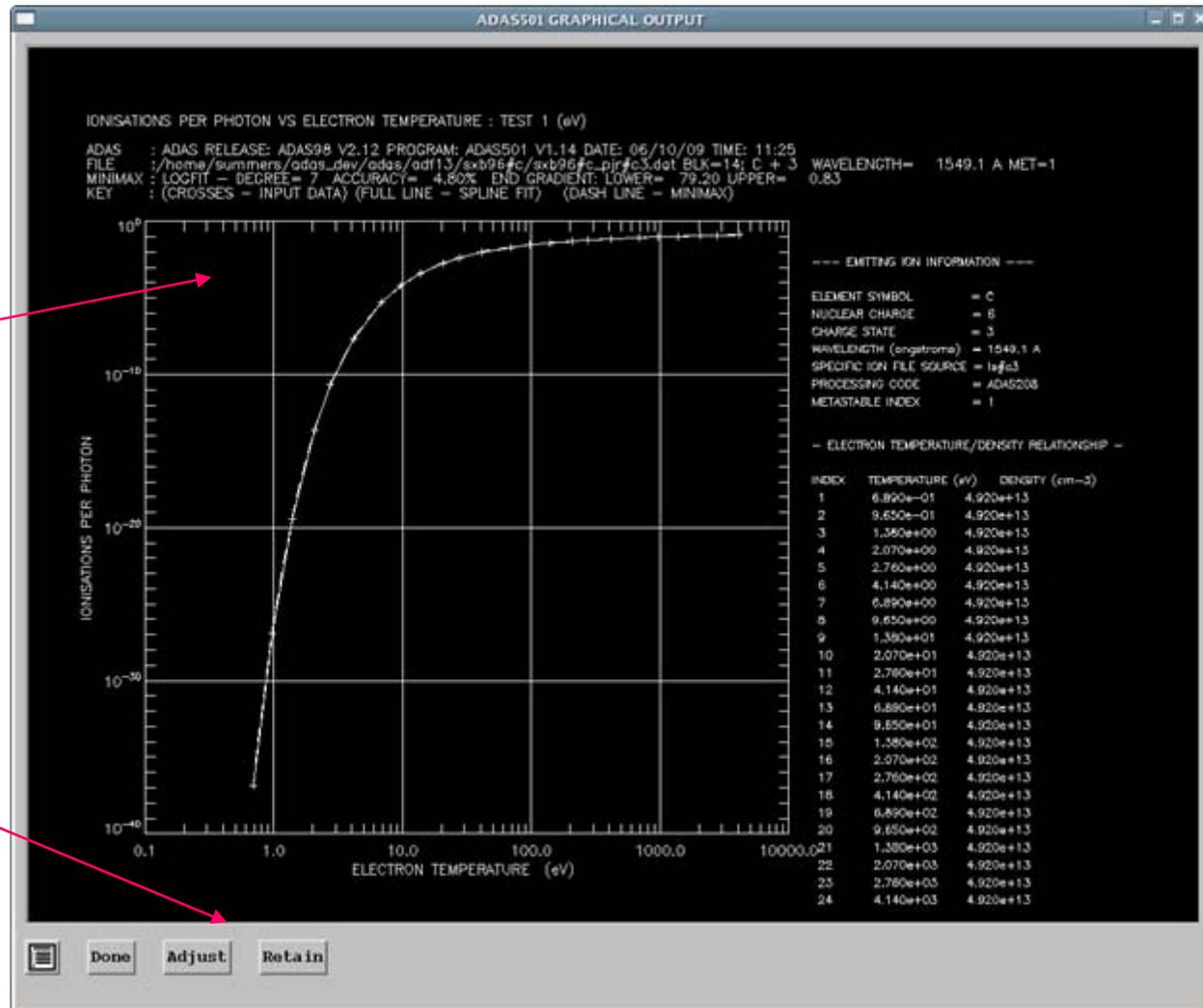


Table editor

The screenshot shows the ADAS Table Editor window with the following table:

INDEX	Output	Input	Output	Input
1	<i>6.890E-01</i>	6.890E-01	4.920E+13	1.640E+05
2	<i>9.650E-01</i>	9.650E-01	4.920E+13	1.640E+06
3	<i>1.380E+00</i>	1.380E+00	4.920E+13	1.640E+07
4	<i>2.070E+00</i>	2.070E+00	4.920E+13	1.640E+08
5	<i>2.760E+00</i>	2.760E+00	4.920E+13	1.640E+09
6	<i>4.140E+00</i>	4.140E+00	4.920E+13	1.640E+10
7	<i>6.890E+00</i>	6.890E+00	4.920E+13	4.920E+10
8	<i>9.650E+00</i>	9.650E+00	4.920E+13	1.640E+11
9	<i>1.380E+01</i>	1.380E+01	4.920E+13	4.920E+11
10	<i>2.070E+01</i>	2.070E+01	4.920E+13	1.640E+12

Annotations in the image include:

- A callout pointing to the italicized values in the 'Output' column: "editable values are italic".
- A callout pointing to the 'Input' column values: "values from source data file".
- A callout pointing to the control buttons: "editor controls".
- A callout pointing to the 'Temperature Units' section: "alter units - affects inputs".

editable values are italic

values from source data file

editor controls

alter units - affects inputs