Computational overview of ADAS

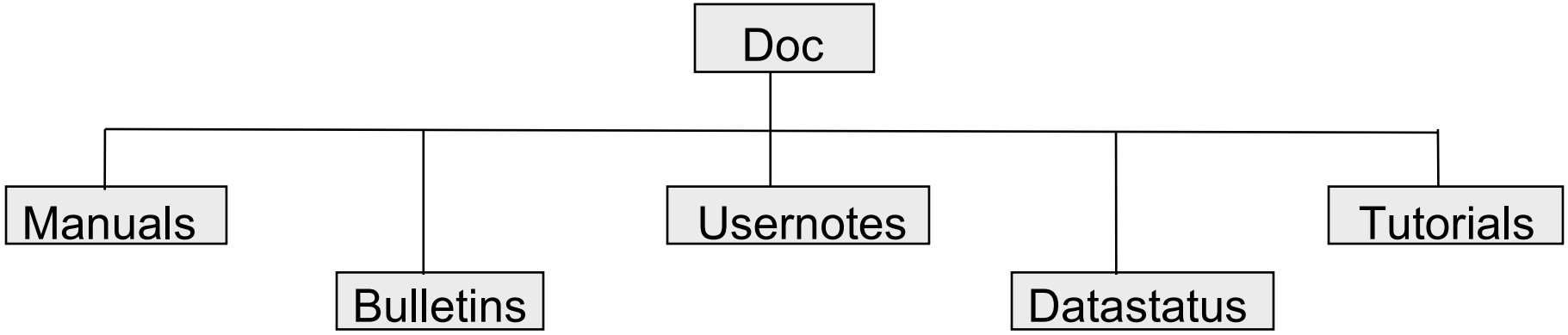
- Introduction
  - » Supported systems and language details
  - » Overall organization
- Initial setup of ADAS
  - » Establishing the local IDL/ADAS environment
  - » Standard user space organization and setup
- Some components of ADAS
  - » The code part of ADAS
  - » The database and adf numbers
  - » 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.

ADAS data disposition

- The data are organised by data format and maintained under CVS in
  - » */<path>/adas/adas* */adf01* */<sub-dir1>*
    /<sub-dir2>
    . . .
    /adf02 */<sub-dir1>*
    /<sub-dir2>
    . . .

- Sub-directory naming is not standardised but
  - » All final data sets have the extension '*.dat'*
  - » Year numbers are frequently used. In ADAS directories, year numbers mark the introduction of a method. It does not necessarily mean year of calculation.
  - » Preferred data is often distinguished by the name '*adas'.* Initials may be used to identify a particular data compiler.
  - » All data sets must have a final comment block identifying at minimum the producer, date and updates

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

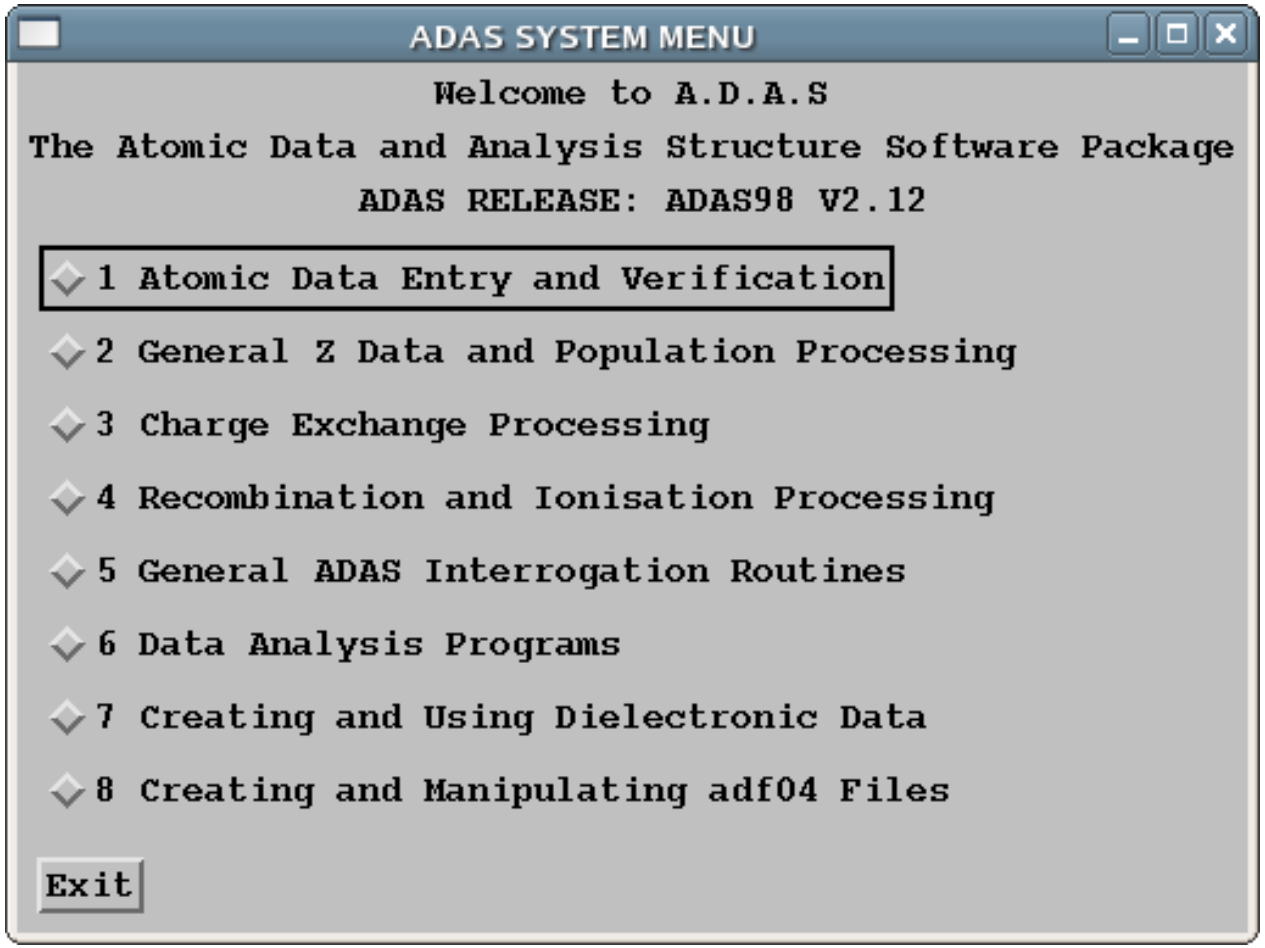
    /<path>/<UID>/adas/pass
- A start-up script is available to set pathways, environments and directories required by the ADAS user.
- It is helpful to maintain data sets in structures matching central ADAS as

  /<path>/<UID>/adas/adf01/…/

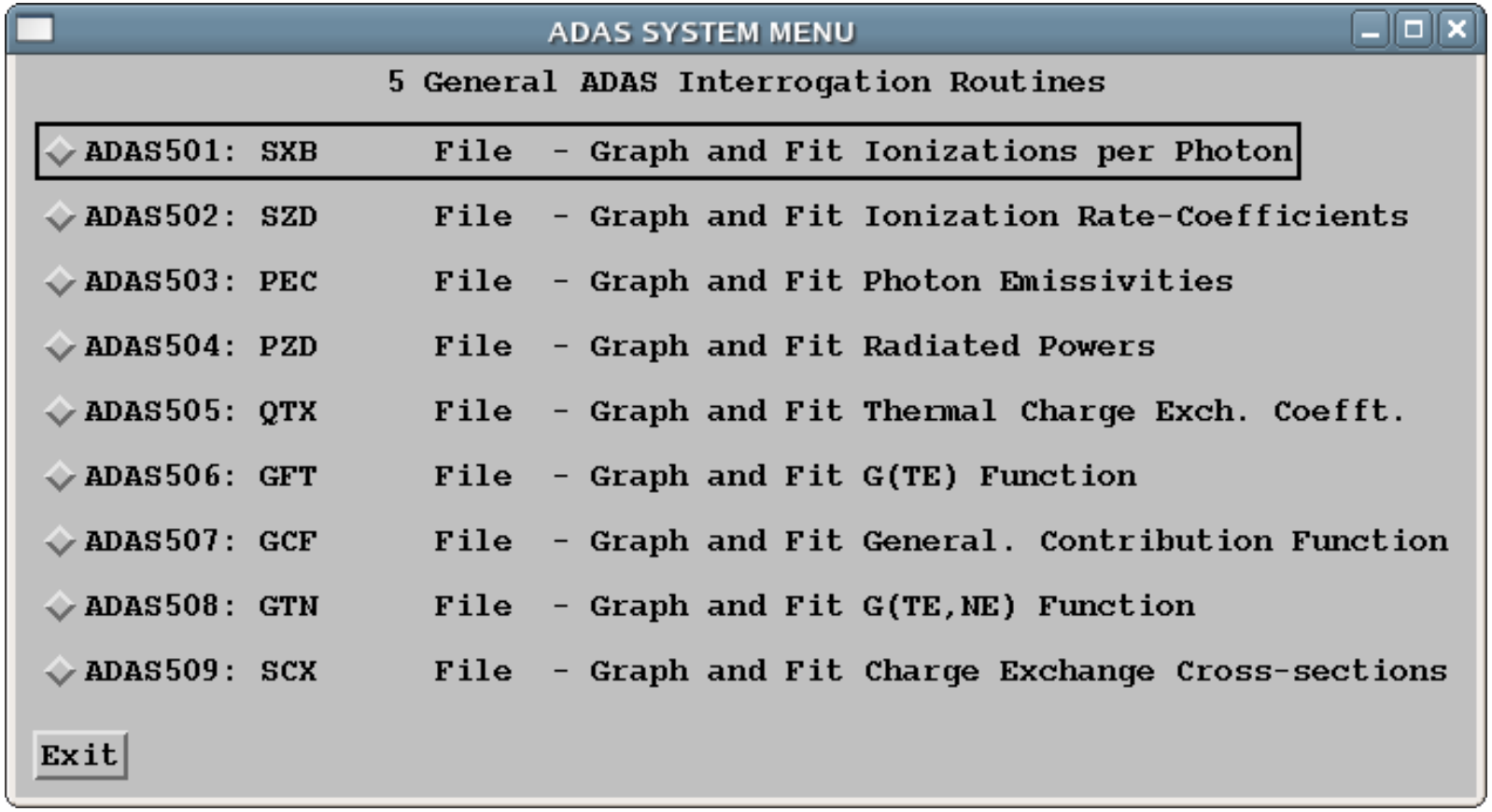
ADAS on-line

- 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



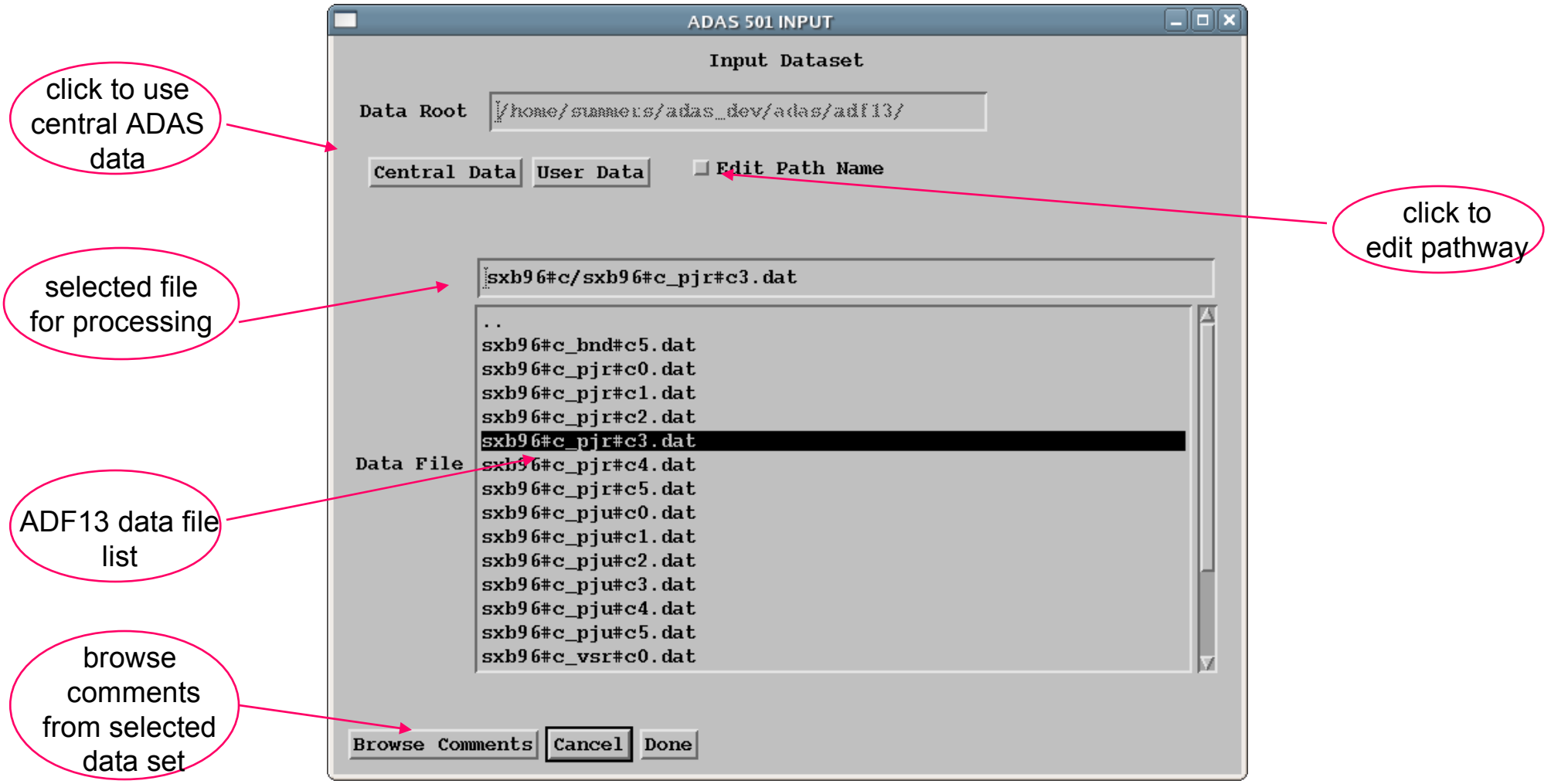
ADAS501 - a typical interrogation code

- Datasets of class ADF13 contain ionisation per photon ratios (SXB data) as a function of Te and Ne.
- 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 icon button along side *Cancel* allowing *Exit and Return to Menu*.

ADAS501 input

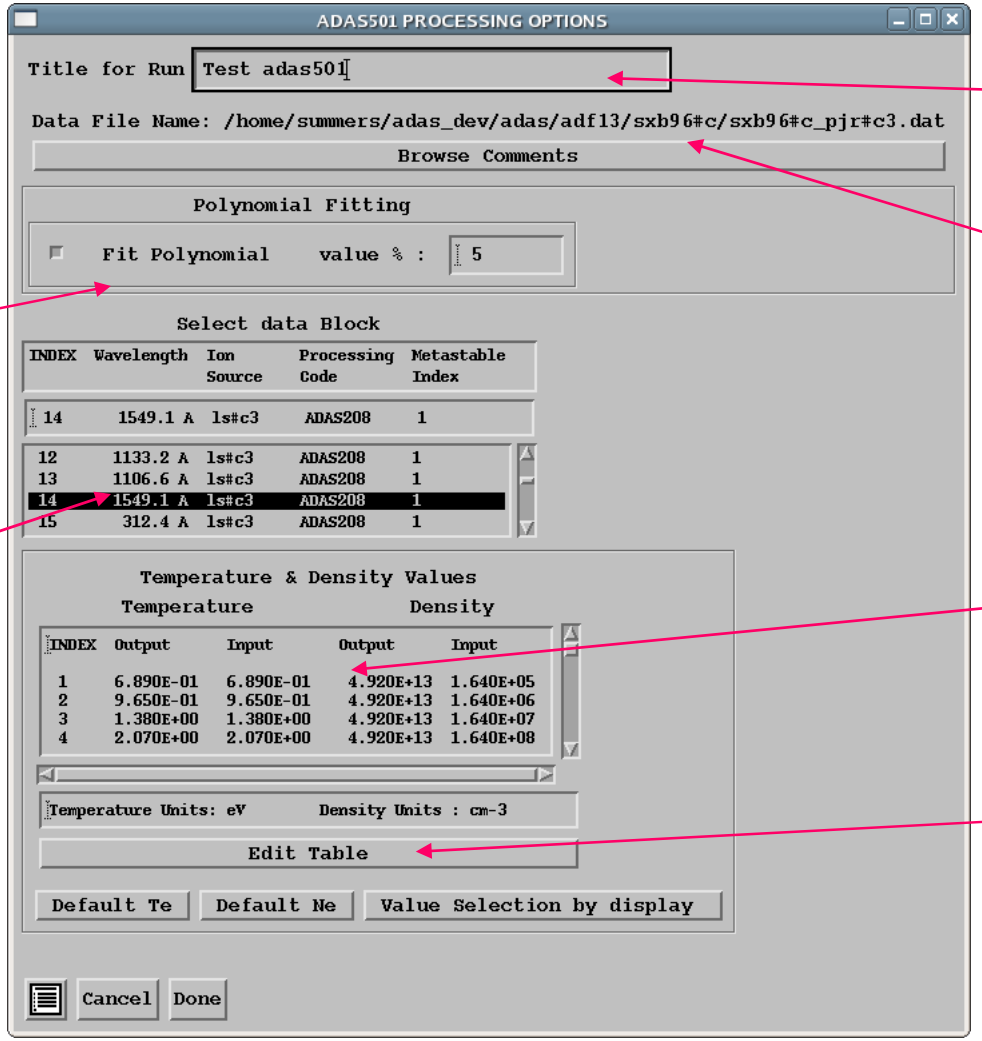


ADAS501 (contd.)

- 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



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

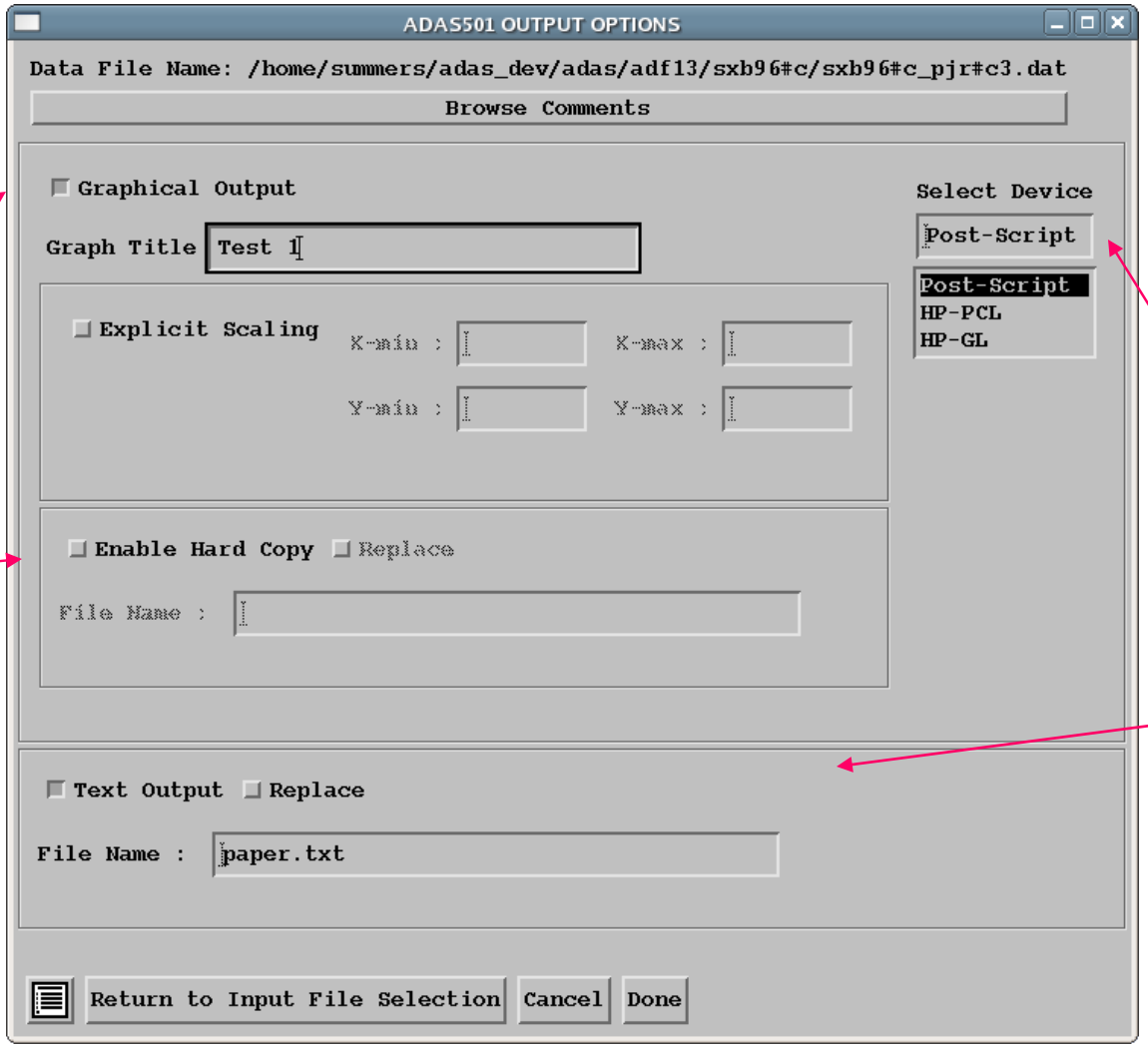
edit table

set default output values

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



provide graphical output

allow graphical hard copy

graphical output file coding

tabular output of results

ADAS501 Graph

graph of results

advanced options

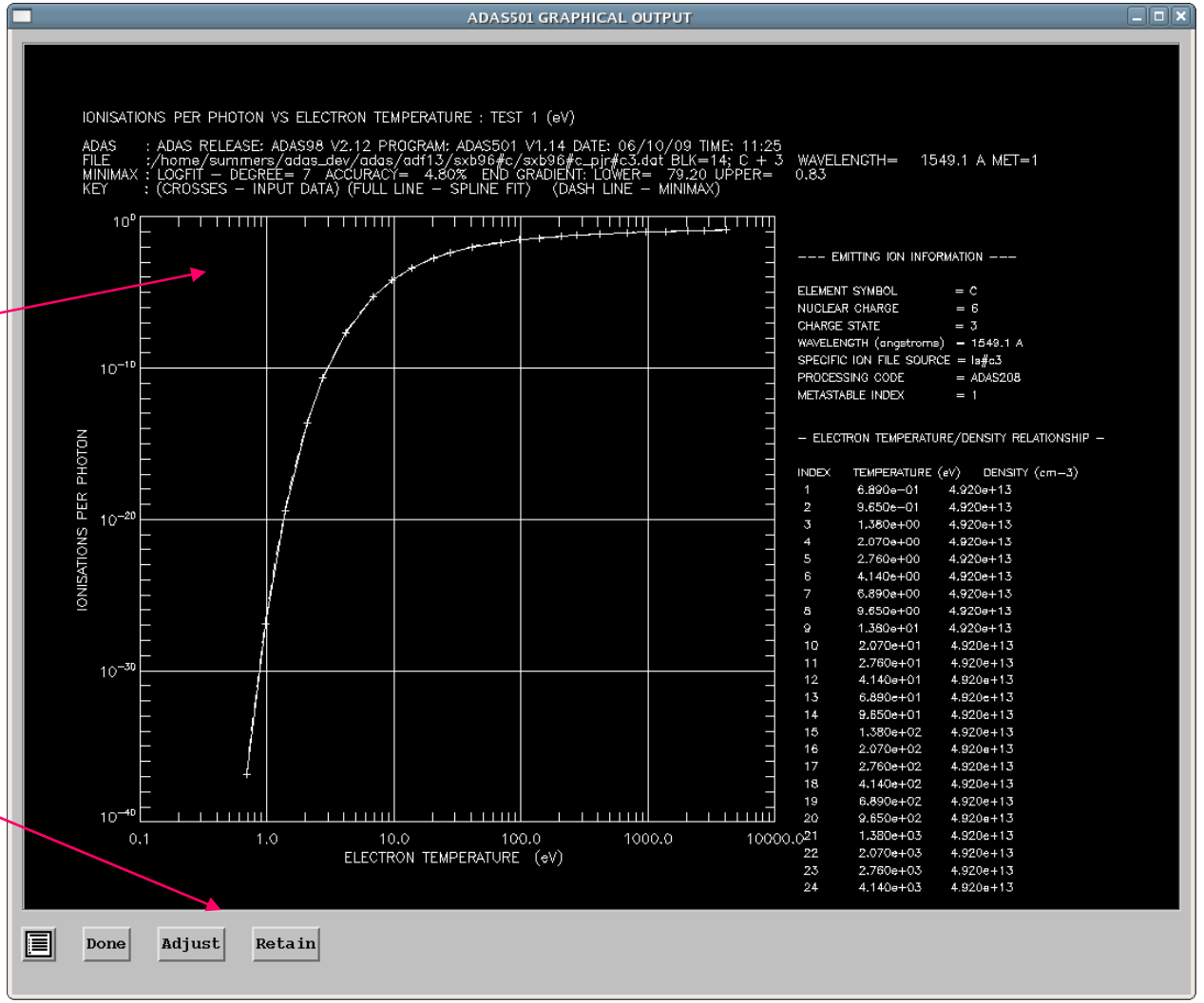
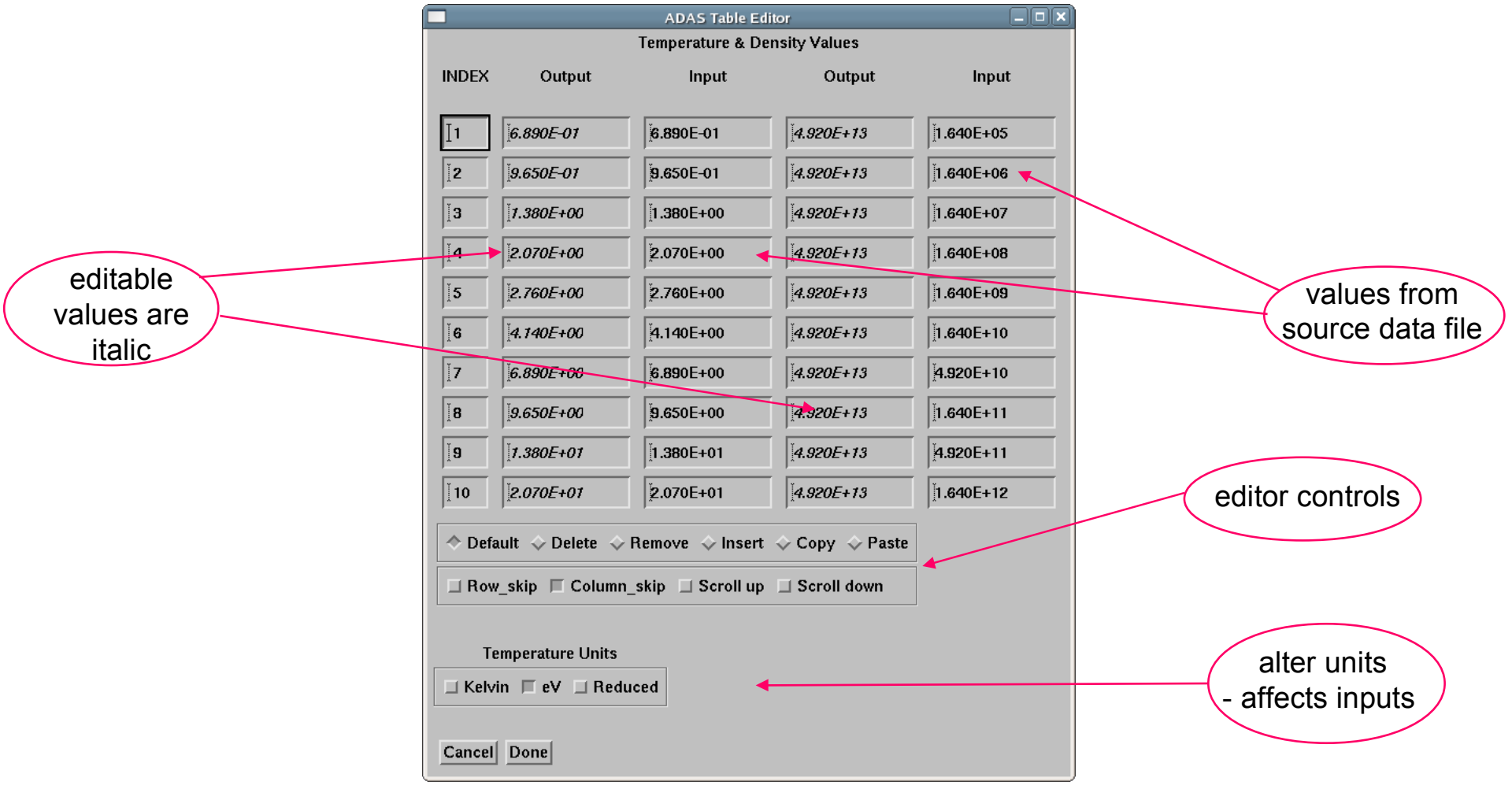



Table editor