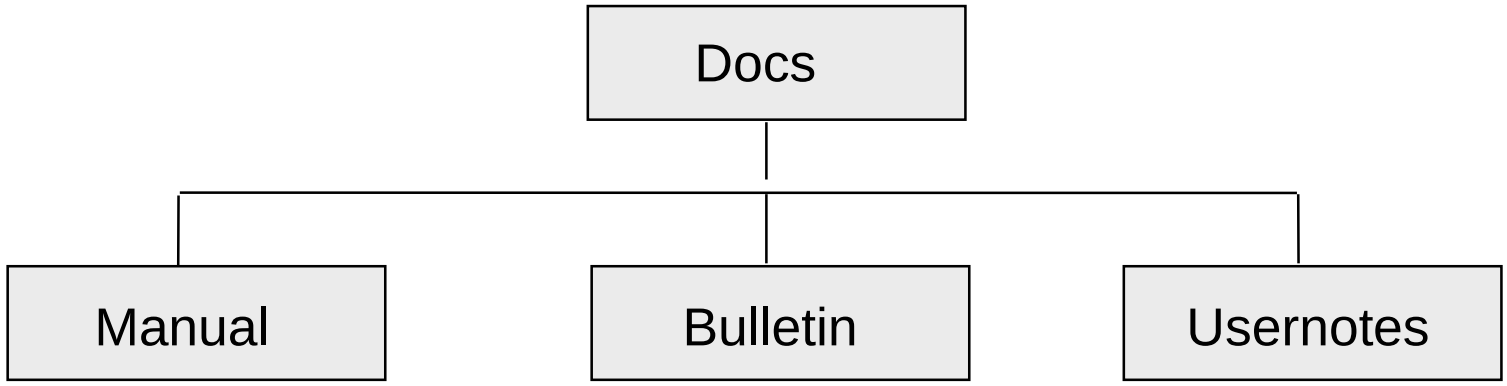
2. ADAS - a tutorial

- Starting up ADAS
  - » Finding the documentation
  - » Exploring the database content
  - » Initiating an on-line session
  - » On-line interrogation of the database

Documentation

- Documentation is accessible on the web

http://patiala.phys.strath.ac.uk/adas/

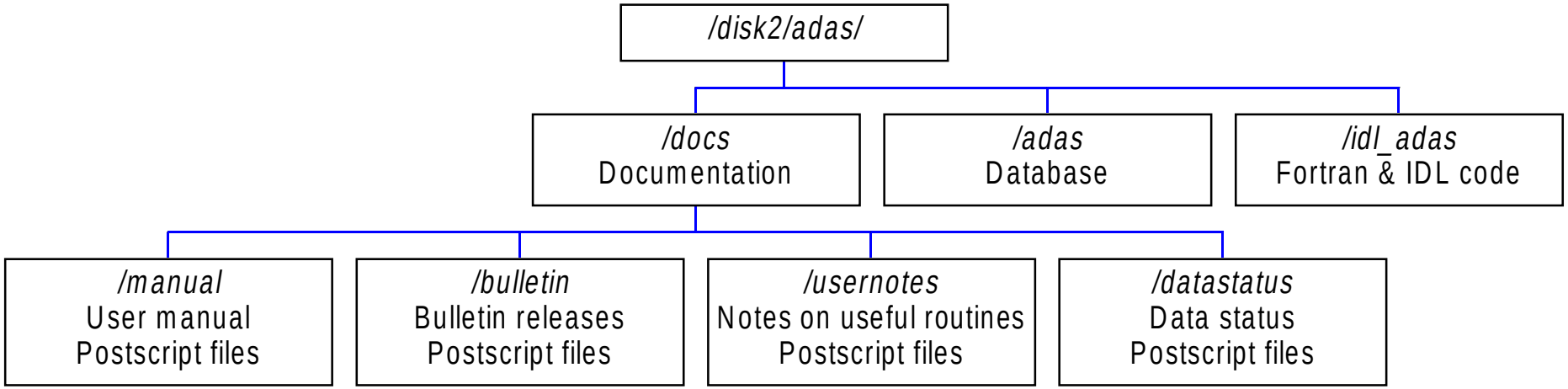


Documentation (contd.)

- Full documentation is on a workstation at each ADAS Project site (RAL, MPAE etc.)
  - » Log on to a workstation running ADAS and IDL
  - » Bring up and move into a command tool
  - » *cd /.../adas* ; change directory to ADAS
  - » *ls* *;* list files and directories
  - » Directories include: */docs* */adas* */idl_adas*

<u>N.B. */.../* denotes the root path to ADAS</u>

Documentation (contd.)



Documentation (contd.)

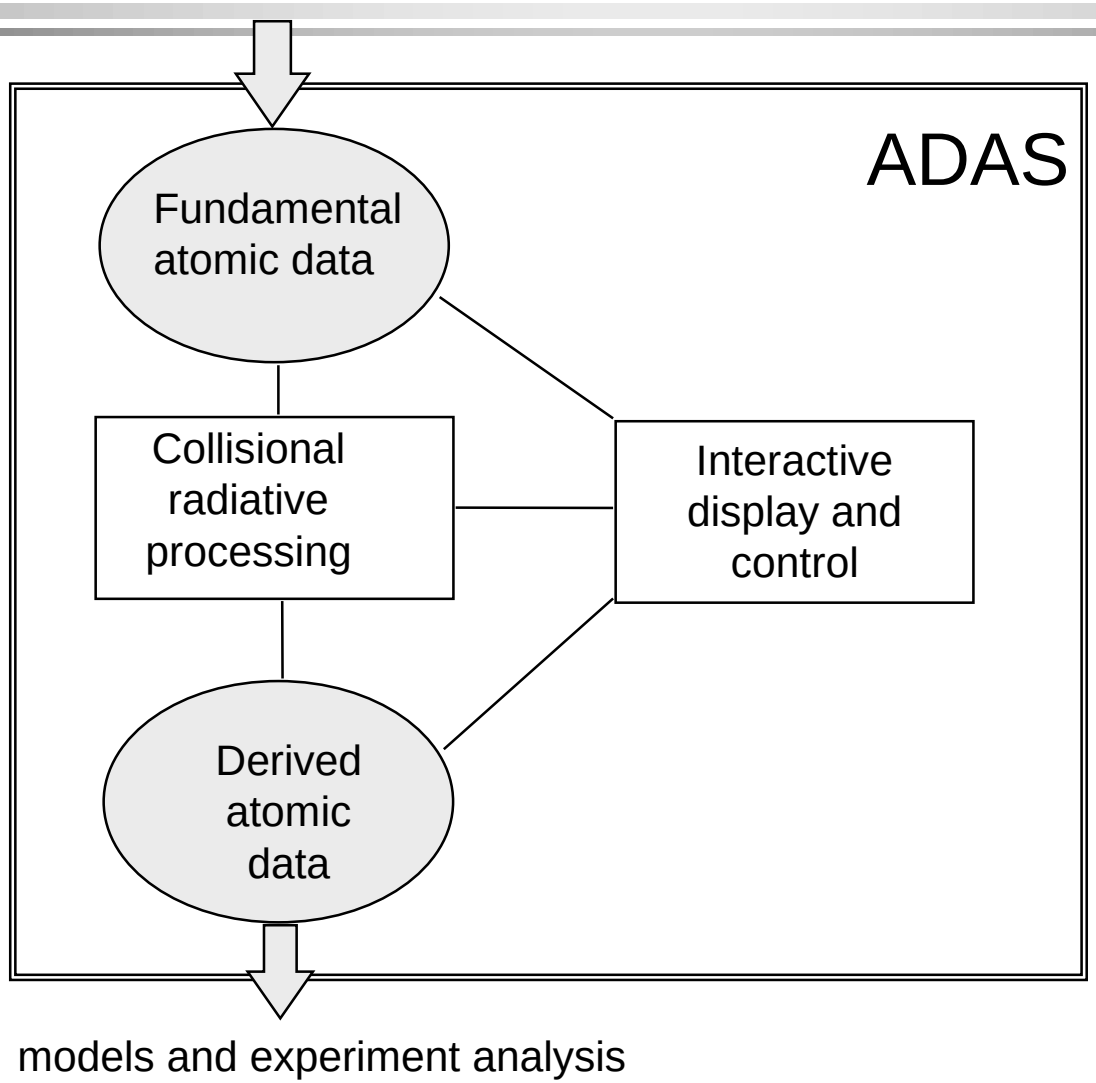
- Find the current list of bulletins
  - » *cd /.../adas/docs/bulletin*
  - » *ls* ; list bulletins
  - » Naming is as date of issue
    eg. *nov18-95.ps*
- According to your system, bring up a tool to view a postscript file
  - » Open
    /.../adas/docs/bulletin/nov18-95.ps

Bulletins

nov18-95 ADAS Bulletin

Two new programs are ready. They are the first of the ADAS series 4 ionisation and recombination processing codes. ADAS401, allows interrogation of condensed master files (adf10). These are datasets of recombination coefficients, ionisation coefficients, power coefficients etc. stored in isoelectronic sequence groups. ADAS405 is an equilibrium ionisation balance code capable of working with either unresolved (stage to stage) or resolved (metastables distinguished) iso-nuclear master file datasets (adf11). It is quite sophisticated allowing production and display of generalised contribution functions as well as the more usual fractional abundances and power functions. I hope its capabilities will prove helpful. These programs are the first of their type and have proved quite time consuming for Tim to convert. Meanwhile Alessandro has being working hard on a differential emission measure analysis code and environment - it has been set up also to become an ADAS utility. The code is quite complex and uses the integral inversion core by Alan Thomson. This code is presently under test at Strathclyde University and at Rutherford-Appleton Laboratory but without its final ADAS title and menu position decided. We can make arrangements for consortium members with special interest in this code to have preliminary access to it. It will probably be issued in ADAS release 1.5. A number of errors have been corrected and adjustments made in this release (1.4) including some in ADAS101, ADAS209 and ADAS506. Remember that it is safest to remove your defaults directory member for a corrected program and allow ADAS to recreate it. Admittedly, I usually forget and only realise I have not done so when a program unexpectedly jumps me back to the main menus.

Database


ADAS
Fundamental atomic data
Collisional radiative processing
Interactive display and control
Derived atomic data
models and experiment analysis

Database (contd.)

- The various classes of ADAS data have precisely specified organisation called ADAS data formats (eg. adf14)
  - » *cd /.../adas/adas* ; move to database
  - » *ls* ; list adf directories
- There are about 24 adf classes
  - » The spec. and a sample of each is in the manual (eg. */.../adas/manual/appxb-14.ps*)

Database (contd.)

- Key adf's for fusion & solar application
  - » adf04 : specific ion data
  - » adf07 : direct electron impact ionis. data
  - » adf11 : coll. rad ionis., recom. & power data
  - » adf12 : CX effective emission coefft. data
  - » adf13 : ionisation per photon data
  - » adf15 : photon emissivity coefft. data
  - » adf20 : G(Te) functions

Database (contd.)

- Looking at a specific ion file
  - » *cd /.../adas/adas/adf04*
  - » *ls*
- There are many specific ion file collections stored by isoelectronic sequence
  - » Hand-worked data are in */<seq>like* directories
  - » *cd lilike*
  - » *cat lilike_c3.dat | more*

ADF04 sample

```
H + 0         1         1        109679.
    1   1S              (2)0( 0.5)              0.
    2   2S              (2)0( 0.5)          82259.
                                 -
   14   5F              (2)3( 6.5)         105292.
   15   5G              (2)4( 8.5)         105292.
   -1
 1.00    3       5.00+03 7.50+03 1.00+04 1.50+04 2.50+04 5.00+04 7.50+04 1.00+05
   2   1 8.23+00 2.50-01 2.52-01 2.56-01 2.62-01 2.74-01 2.92-01 3.08-01 3.20-01
   3   1 6.27+08 3.80-01 3.95-01 4.10-01 4.50-01 5.45-01 8.40-01 1.15+00 1.44+00
                                 -
  13   4 0.00+00 5.36+00 6.55+00 7.55+00 9.13+00 1.12+01 1.39+01 1.51+01 1.59+01
  14   4 0.00+00 4.08+00 5.00+00 5.70+00 6.62+00 7.49+00 8.00+00 7.97+00 7.83+00
  -1
  -1  -1
C-----------------------------------------------------------------------
C  This is a composite data set for low temperature use formed from
C        Kingston et al. (1989)    HLIKE.DATA(AEK89H)
C        Callaway et al. (1987)    HLIKE.DATA(CALL87H)
                                 -
C                                                H.P. Summers, Jan. 1991
C-----------------------------------------------------------------------
```

Initiating ADAS

- Create your own adas database directory if not already present
  - » *cd /.../<user>*
  - » *mkdir adas*
  - » *cd adas*
- Ensure you have defaults and pass directories else create them
  - » *mkdir defaults*
  - » *mkdir pass*

Initiating ADAS (contd.)

- Move to directory where you wish ADAS output text or graph files to be placed
  - » *cd /.../<user>/pass*
- Start ADAS
  - » *adas*
  - » *The primary ADAS program series selection menu is presented*

Initiating ADAS (contd.)

- To select an ADAS program for execution
  - » *click on button for required ADAS series: the sub-menu for the series appears*
  - » *click on the button for the required code to start the program running*

Initiating ADAS (contd.)

- There are six ADAS series
  - » adas1 Atomic data entry and verification
  - » adas2 Population processing
  - » adas3 Charge exchange processing
  - » adas4 Recombination and ionisation processing
  - » adas5 Supplementary programs
  - » adas6 Data analysis programs

On-line interrogation

- To graph and print an ionisation rate coefficient
  - » *select adas5 series*
  - » *click on button for ADAS502*
  - » *the file selection screen is presented for data class adf07*
  - » *click on file to select it: you can move up and down through directories and use central ADAS or your own data*

On-line interrogation (contd.)

» *click on done button to advance to 'processing options' screen*

» *select ionisation coefficient required by clicking in selection list window*

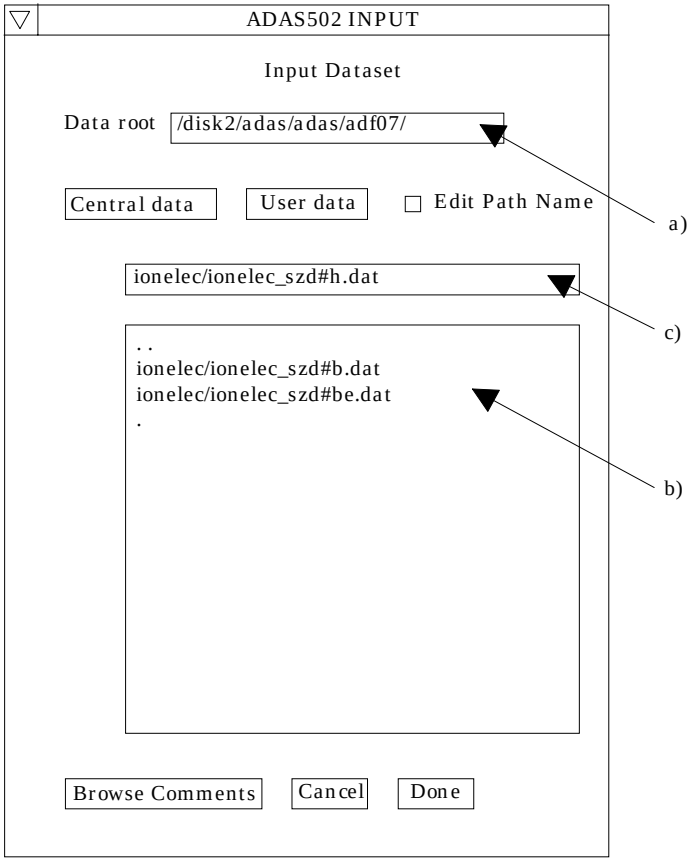
» *enter temperatures etc of choice*

» *click on done button to advance to 'output options' screen*

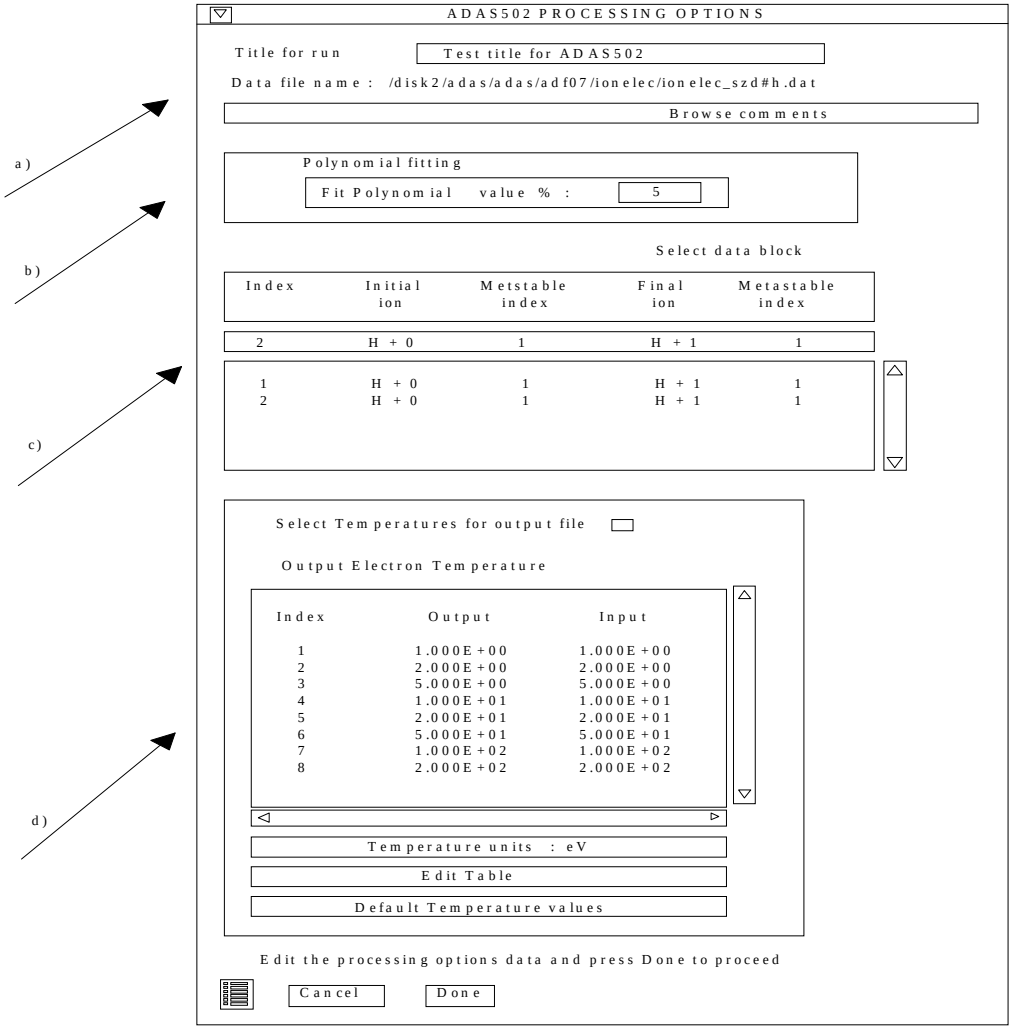
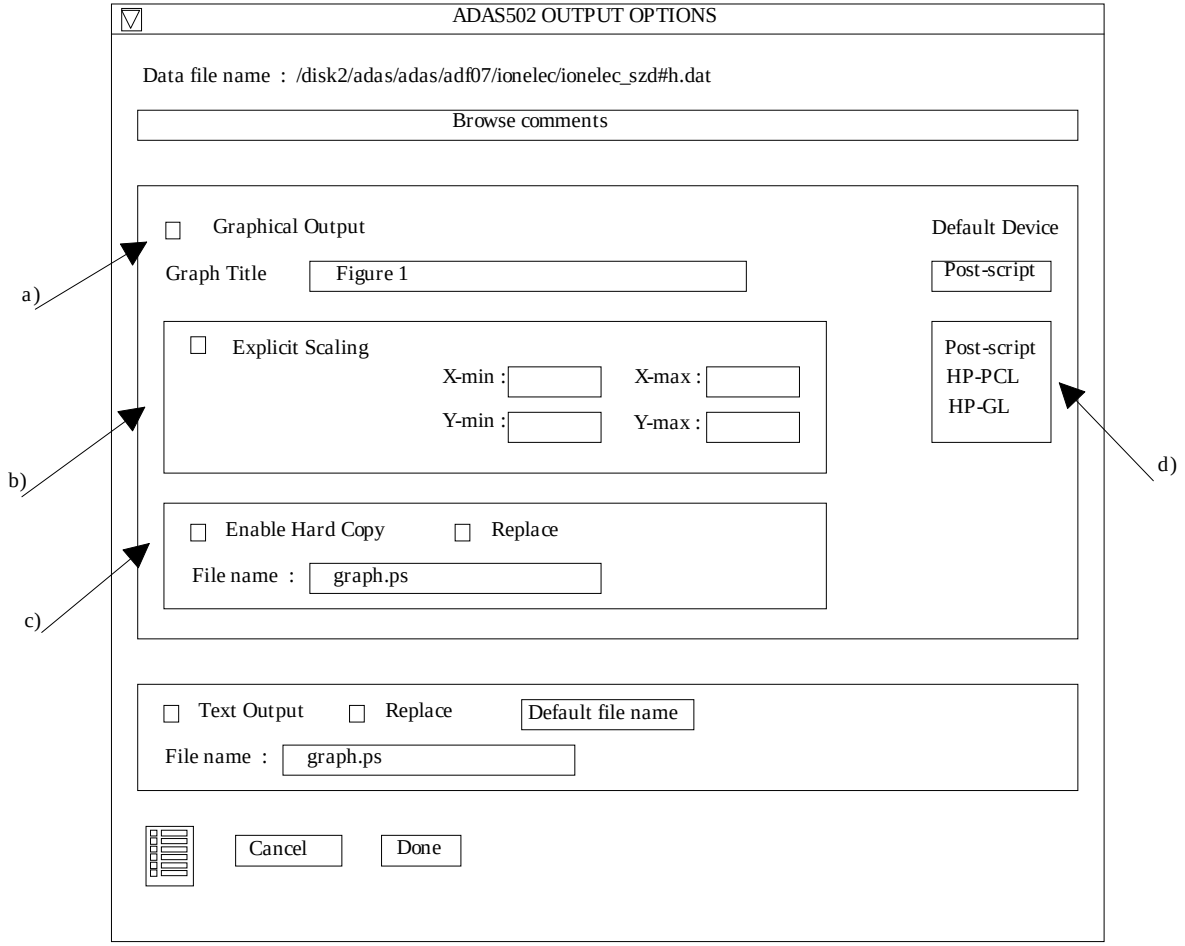
» *click to select graphical display*

» *click on done button to display graph*

ADAS502 Input



ADAS502 Processing



ADAS502 Output