Getting started with the SAS

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SAS facts

- Development started in ~ November 1997
- Altogether more than 30 scientists involved:
  - SSC + SOC + University of Columbia
- Versions 0 through 4 not public
- About 2–3 public versions/year
- Pipeline releases every ~ 6 weeks

Installation and set up

- Binary distributions of SAS 5.2.0 are available for Solaris, Linux, and Tru64
- Objectives:
  - make it easy to install
  - provide all libraries required, also external ones
- Once installed:
  - SAS_DIR = SAS_PATH = /xmm/sas
  - source $SAS_DIR/sas–set–up.[c]sh

How to get help

- With Netscape
  - sashelp
  - sashelp --doc=sometask
  - sometask --manpage
- With any other browser
  - browser $SAS_DIR/README.html
- On the web:
  - http://xmm.vilspa.esa.es/sas/
  - http://xmm.vilspa.esa.es/xmmhelp

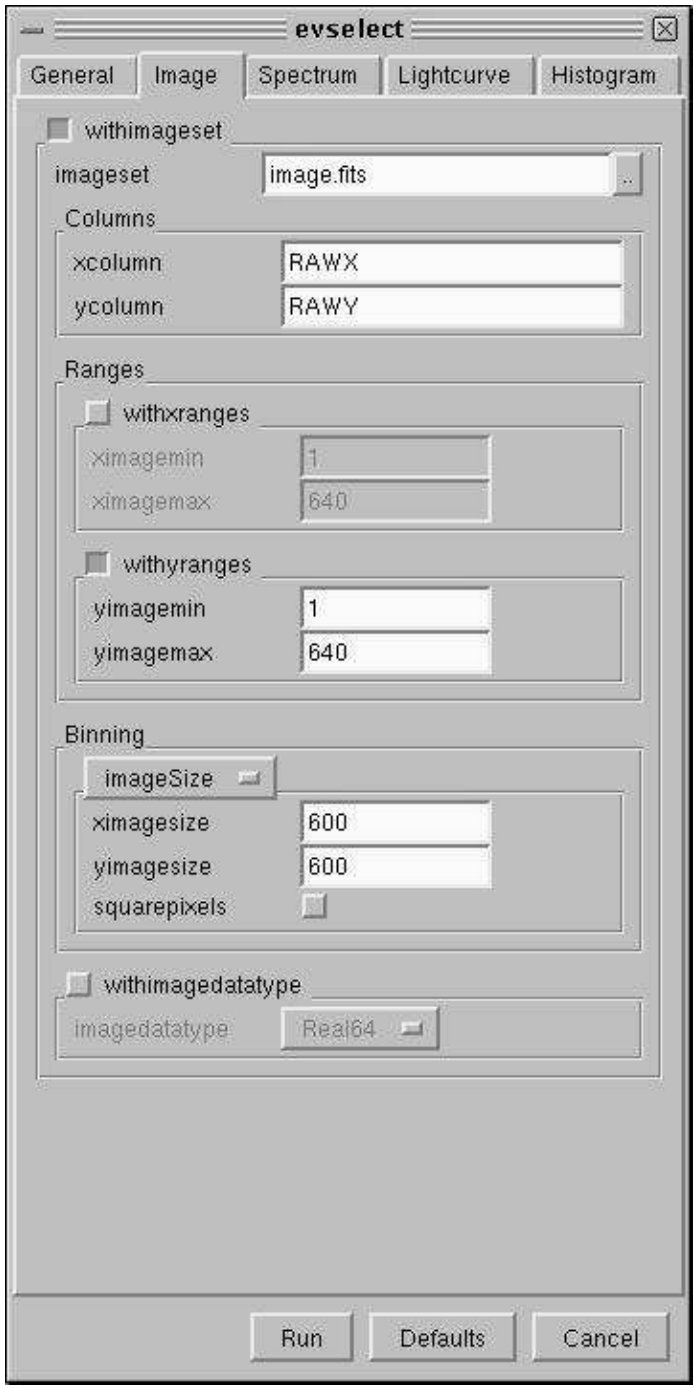
Environment variables

- SAS_DIR and SAS_PATH
- SAS_ODF: points to the active ODF, usually via the summary file generated by odfingest
- SAS_CCF: points to the current CIF, generated with cifbuild or downloaded from the web
- SAS_CCFPATH: points to where the CCF constituents are to be found
- SAS_MEMORY_MODEL: low or high
- SAS_VERBOSITY: 0 through 10 (use 3 to 6)

A command line GUI

- SAS tasks can have many parameters, at the beginning it may not be easy to find your way around them.
- Every well constructed SAS task supports the —dialog switch this causes a parameter dialog to pop up:

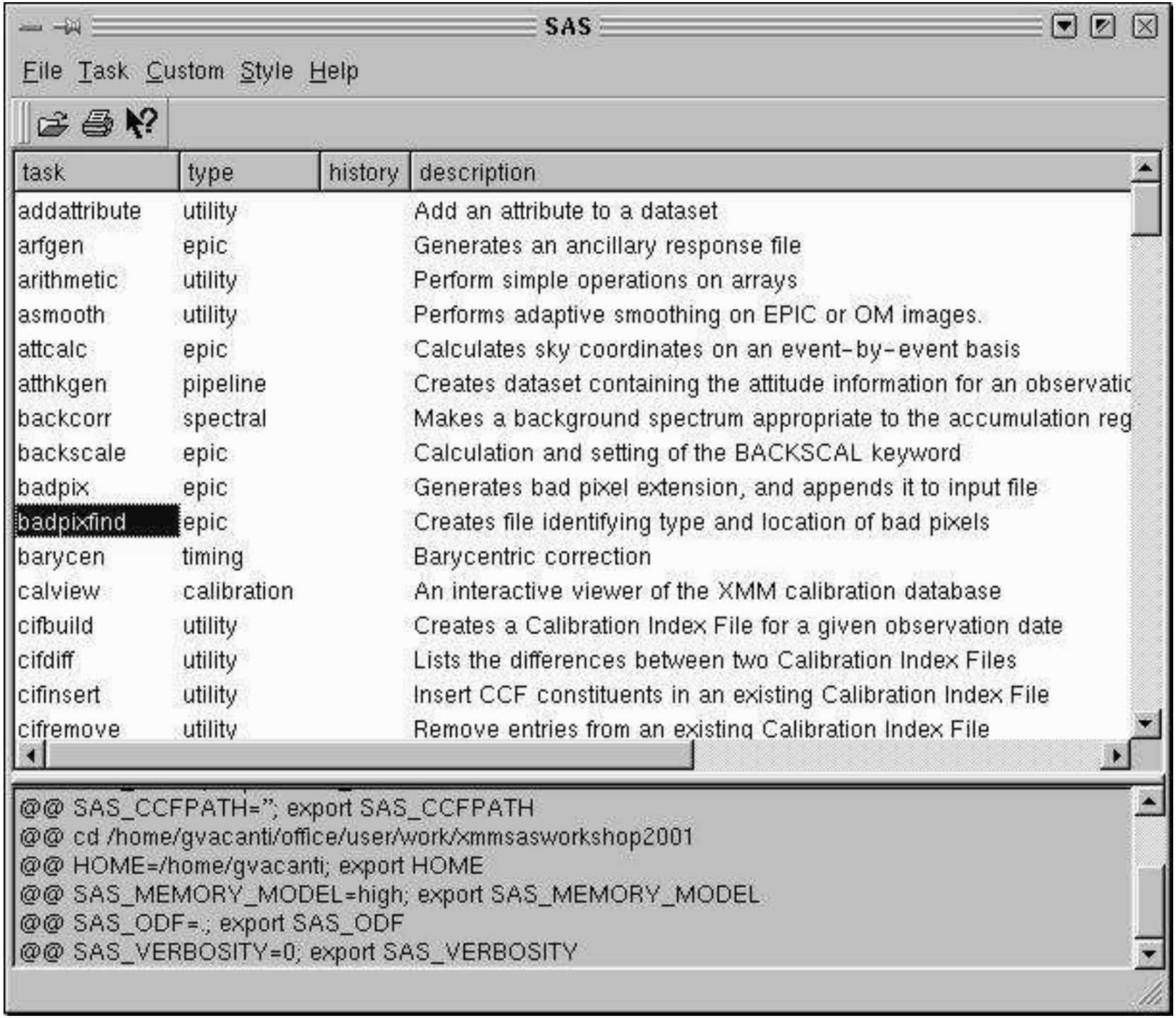
evselect — dialog


evselect
General
Image
Spectrum
Lightcurve
Histogram
withimageset
imageset
image.fits
Columns
xcolumn
RAWX
ycolumn
RAWY
Ranges
withxranges
ximagemin
1
ximagemax
640
withyranges
yimagemin
1
yimagemax
640
Binning
imageSize
ximagesize
600
yimagesize
600
squarepixels
withimagedatatype
imagedatatype
Real64
Run
Defaults
Cancel

The real GUI

- The SAS is distributed with a Graphical User Interface that helps the user navigate the many commands available, and set a few important environment variables.
- To start the SAS GUI just type

sas


SAS
File Task Custom Style Help
task type history description
addattribute utility Add an attribute to a dataset
arfgen epic Generates an ancillary response file
arithmetic utility Perform simple operations on arrays
asmooth utility Performs adaptive smoothing on EPIC or OM images.
attcalc epic Calculates sky coordinates on an event-by-event basis
atthkgen pipeline Creates dataset containing the attitude information for an observatic
backcorr spectral Makes a background spectrum appropriate to the accumulation reg
backscale epic Calculation and setting of the BACKSCAL keyword
badpix epic Generates bad pixel extension, and appends it to input file
badpixfind epic Creates file identifying type and location of bad pixels
barycen timing Barycentric correction
calview calibration An interactive viewer of the XMM calibration database
cifbuild utility Creates a Calibration Index File for a given observation date
cifdiff utility Lists the differences between two Calibration Index Files
cifinsert utility Insert CCF constituents in an existing Calibration Index File
cifremove utility Remove entries from an existing Calibration Index File
@@ SAS_CCFPATH=''; export SAS_CCFPATH
@@ cd /home/gvacanti/office/user/work/xmmsasworkshop2001
@@ HOME=/home/gvacanti; export HOME
@@ SAS_MEMORY_MODEL=high; export SAS_MEMORY_MODEL
@@ SAS_ODF=.; export SAS_ODF
@@ SAS_VERBOSITY=0; export SAS_VERBOSITY

Current Calibration File

- The XMM calibration d/b is comprised of
  - The SAS Calibration Access Layer (algorithms)
  - Current Calibration File constituents (coefficients)
- Every SAS task accesses the calibration d/b via the Calibration Access Layer.
- The CAL has access to the CCF (via the CCF Index File)
- http://xmm.vilspa.esa.es/calibration/

cifbuild

- Given a collection of CCF constituents, the observation date and the analysis date, cifbuild returns the list of applicable constituents.
- cifbuild can be run via a web interface, and the appropriate constituents downloaded. Always up to date.
- On the web you can compare your local CIF with the latest one and download only the CCF constituents that you don't have.

Important change to come

- The next public release of the SAS will make versions of cifbuild before 4.0 obsolete and incorrect.
- Solutions:
  - Update your local version
  - Use the web pages to generate the CIF

odfingest

- odfingest creates a summary of the observation: exposures, instrument modes, filters ...
- The environment variable SAS_ODF should then be set to point to one such summary before an observation can be processed.

The first few steps (1)

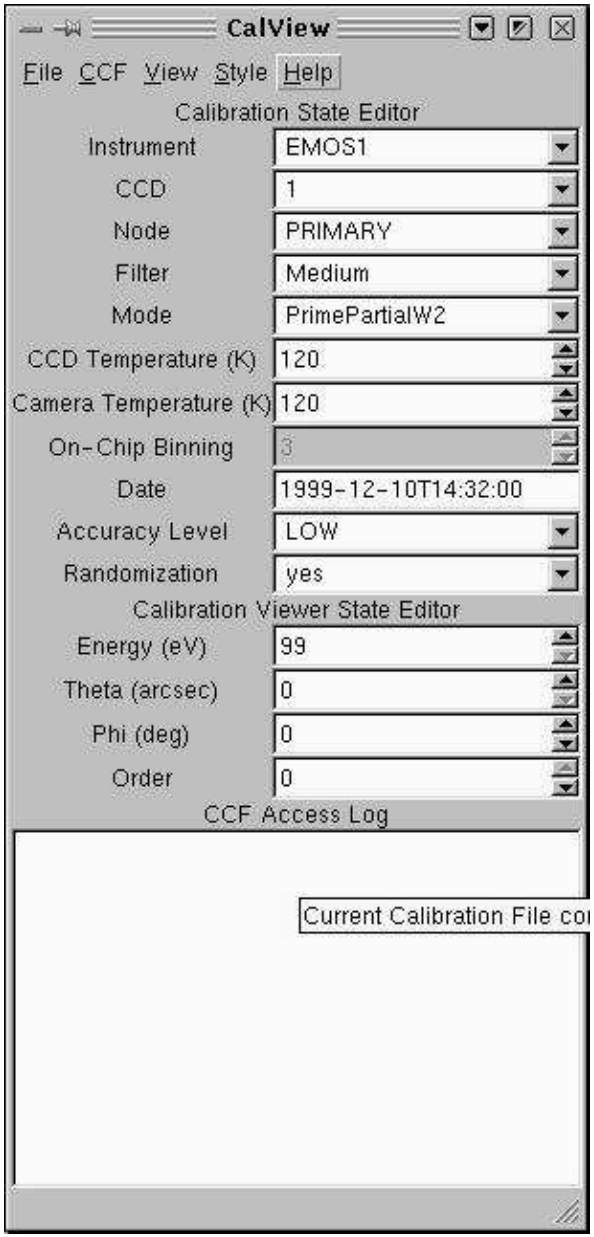
- The ODF is located in /data/odf
- Create a CIF for it:
  - via the web
    - store the CIF in ccf.cif
    - store the CCF constituents in /data/ccf
  - via cifbuild and local collection of CCF constituents
    - set SAS_CCFPATH to be /data/ccf
    - set SAS_ODF to be /data/odf
    - run cifbuild: you have ccf.cif

The first few steps (2)

- Set SAS_CCF to be ccf.cif
- Run odfingest
  - this creates a summary file with a name like RRRR_OOOOOOOOOO_SCX00000SUM.SAS
- set SAS_ODF to be the summary file
- start the SAS GUI

What is the calibration doing?

- You want to know what the combined effect of the CCF and the CAL is.
- You have set SAS_CCF and SAS_CCFPATH
- Turn to the task calview


CalView
File CCF View Style Help
Calibration State Editor
Instrument EMOS1
CCD 1
Node PRIMARY
Filter Medium
Mode PrimePartialW2
CCD Temperature (K) 120
Camera Temperature (K) 120
On-Chip Binning 3
Date 1999-12-10T14:32:00
Accuracy Level LOW
Randomization yes
Calibration Viewer State Editor
Energy (eV) 99
Theta (arcsec) 0
Phi (deg) 0
Order 0
CCF Access Log
Current Calibration File co