How to practice with SAS during the Workshop

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Contents

SAS

- SAS 13.0.0: xmmsas_20130501_1901-13.0.0
- Released May 8th, 2013.
- SAS public web page: http://xmm.esac.esa.int/sas/

External Software Tools

- Any installation of perl (e.g. OpenSuSE 12.3 includes perl 5.16.2 that works fine).
  - http://www.cpan.org/src/
- SAO ds9 7.2 + xpa 2.1.14.
  - http://hea-www.harvard.edu/RD/ds9/
- Grace 5.1.23 (xmgrace)
  - http://plasma-gate.weizmann.ac.il/Grace/
- Heasoft 6.13
  - http://heasarc.nasa.gov/lheasoft/
- wcstools 3.8.7
  - http://tdc-www.harvard.edu/wcstools/

Data to practice with

- A set of example observations (ODF) for selected objects. These are the same that are used for the Scientific Validation of the public release of SAS (~4 GB).

- Where to find these example ODFs ?
  - Linux Desktops: /SAS_Workshop/<objectname>/ODF
  - ftp: ftp://xmm.esac.esa.int/pub/sasdev/SAS_Workshop_Example_ODF

- You can download specific public ODF from XMM-Newton Science Archive (XSA) via a tool named 'getodf', available in ftp://xmm.esac.esa.int/pub/sasdev/GetOdf/
  - getodf –i ObsId (getodf –h to get help)

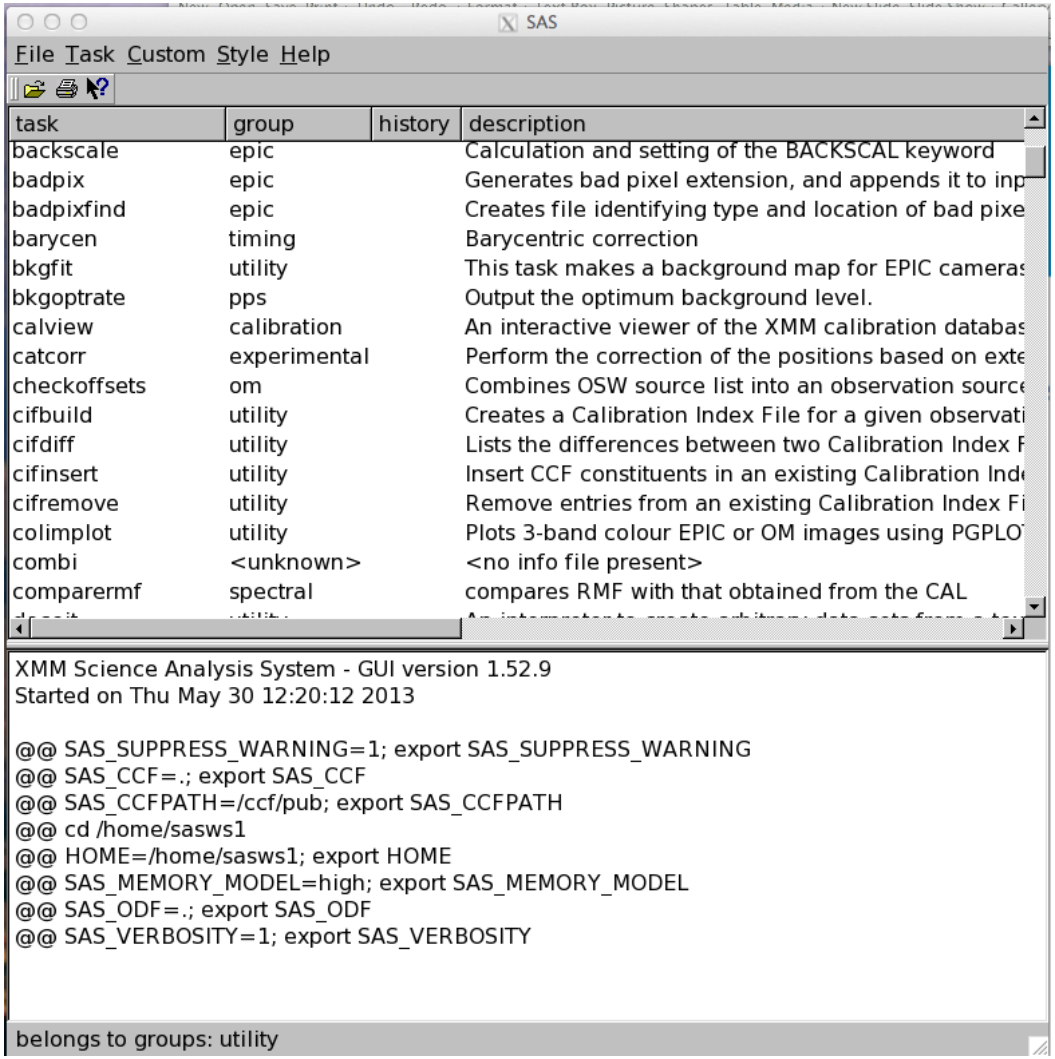
- You may use your own data, if you have any.

Example Observations

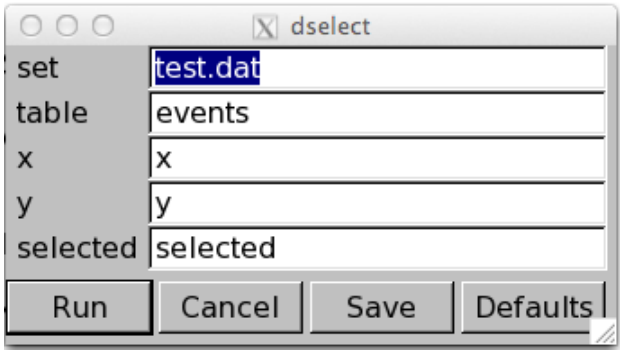
- AB-Dor: K-type Zero-Age-Main-Sequence star, RGS calibration target with lot of emission lines, ObsId = 0133120201.
- BPM 16274: White Dwarf, OM calibration target (many OM exposures in different modes and filters), ObsId=0125320701.
- G21.5-09: Crab-like SNR, all EPICs in Full Frame, suited for spectral fitting (both individual and combined), ObsId=0122700101.
- Lockman Hole: the popular observation field in all wavelengths. EPIC source searching, population, hardness ratios, ObsId=0123700101.
- Mkn 421: BL Lac, RGS effective area calibration target, very bright continuum with almost no lines, suited for RGS spectral fitting, ObsId=0099280201.
- PKS0558-304: bright quasar, different EPIC window modes, specially suited for EPIC spectral fitting, ObsId=0129360201.
- HD 13499: F-Type star, OM Calibration target (wavelength calibration of grism), ObsId=0125911301.
- Hz2: OM Calibration target (grism and UV flux), ObsId=0125910901.
- Timing: Data for timing analysis (PSRB1509), ObsId=0128120401.

GUI and command line

- Common SAS GUI (sas)



- Individual GUI (e.g. dselect –d)



- Command line

Identifying the SAS

- sasversion

```
sasversion:- XMM-Newton SAS release and build information:

SAS release: xmmsas_20130501_1901-13.0.0
Compiled on: Thu May  2 19:37:01 GMT 2013
Compiled by: sasbuild@sasbld02.net4.lan
Platform   : RHEL5.8 64

SAS-related environment variables that are set:

SAS_DIR = /sas/Linux/RHEL_5.8Client/64/sas13_0_0
SAS_PATH = /sas/Linux/RHEL_5.8Client/64/sas13_0_0
SAS_CCFPATH = /ccf/pub
```

Common task options

- Besides their specific parameters all SAS tasks have a common set of options.
- Command line format:
  - `<task> [options] --<param>=<value>`
- Common options:

`-a <dir1>[:<dir2>...]`	`--ccfpath <dir1>[:<dir2>...]`
`-c`	`--noclobber`
`-d`	`--dialog`
`-f <f1> [<f2> ...]`	`--ccffiles <f1> [<f2> ...]`
`-h`	`--help`
`-i <cifname>`	`--ccf <cifname>`
`-m`	`--manpage`
`-o <odfname>`	`--odf <odfname>`
`-p`	`--param`
`-t`	`--trace`
`-V <level>`	`--verbosity <level>`
`-v`	`--version`
`-w [code|n]`	`--warning [code|n]`

- http://xmm.esac.esa.int/sas/current/doc/taskmain/node2.html

Identify SAS Packages and Tasks

- SAS uses tasks. They are grouped into packages.
- A Package might include one or several tasks related to each other.
- A task is a single executable. It could be a real binary or an executable perl script.
- How to identify the version and package for a given task:

```
epproc --version
epproc (epicproc-2.1) [xmmsas_20130501_1901-13.0.0]
```

Help and Documentation

- sashelp command
  - SAS_BROWSER to change the browser (default firefox)
- sashelp –-doc=<task>
- <task> –-manpage (do not use –help; instead it will list information on parameters)
- SAS 13.0.0 On-line help (html): http://xmm.esac.esa.int/sas/current/doc/
- SAS 13.0.0 User's Guide (html): http://xmm.esac.esa.int/external/xmm_user_support/documentation/sas_usg/USG/

SAS Threads

- A SAS Thread is an example of a sequence of several SAS tasks which allow us to reduce specific XMM-Newton data.

- All threads are available in http://xmm.esac.esa.int/sas/current/documentation/threads/

Computers and CCFs

- Linux Desktops

Hostnames	Operating System	Accounts (Bash shell)
scil01 - scil10 (.net4.lan)	Red Hat Enterprise Linux (RHEL) 5.8 64-bit	u.: sasws1-sasws10 p.: saswks07

- Personal Laptops
  - SAS 13 installed
  - Required tools installed (perl, ds9, xmgrace, heasoft, wcstools)
  - CCF reduced set available.

- Reduced CCF set (~ 3.5 GB).
  - rsync: rsync –a xmm.esac.esa.int::XMM_RED_CCF .
  - ftp: ftp://xmm.esac.esa.int/pub/ccf/red_constituents