The CCF concept, cifbuild and calview

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The XMM-Newton CCF and `cifbuild`

- The calibration of XMM-Newton instruments is partially independent from the development of its data analysis software, SAS

- XMM-Newton calibration data is contained in Current Calibration File (CCF)
  - CCF = the collection of **all** the XMM-Newton calibration files ever made public
  - Note: the calibration files are **updated continuously** ➔ **NO CCF version number**
    but individual calibration files versions

- Calibration Index File (CIF) necessary for data analysis, pointing to the relevant files, according to:
  - observation date
  - analysis date

- `cifbuild` operates on the calibration directory $SAS_CCFPATH
  - setenv SAS_CCFPATH <ccf_dir>

- Command: `cifbuild`
  - **It produces a FITS file ccf.cif in the working directory, using :**
    - **$SAS_ODF for observation Date and**
    - **'now' for analysis date, unless explicitly specified**

CIF is a FITS file

- **The CIF file is in FITS format (you may use any FITS tool to view or work on it, e.g. fv).**

- **Once the Calibration Index file has been produced:**

  setenv SAS_CCF ccf.cif

File Edit Tools

	TELESCOP 4A	SCOPE 6A	TYPEID 32A	ISSUE I	VALDATE 19A yyyy:dd:mmZhh:mm:ss
40	XMM	EPN	LINCOORD	9	1998-01-01T00:00:00
41	XMM	EPN	MODEPARAM	3	1999-01-01T00:00:00
42	XMM	EPN	PATTERNLIB	1	1998-01-01T00:00:00
43	XMM	EPN	QUANTUMEF	8	2000-01-01T00:00:00
44	XMM	EPN	REDIST	5	1998-01-01T00:00:00
45	XMM	EPN	TIMECORR	4	1998-01-01T00:00:00
46	XMM	OM	ASTROMET	8	1998-01-01T00:00:00
47	XMM	OM	BADPIX	2	1998-01-01T00:00:00
48	XMM	OM	COLORTRANS	5	1998-01-01T00:00:00
49	XMM	OM	DARKFRAME	3	1998-01-01T00:00:00
50	XMM	OM	DIFFUSEGALA	1	1998-01-01T00:00:00
51	XMM	OM	HKPARMINT	3	1999-01-01T00:00:00
52	XMM	OM	LARGESCALESENS	2	1998-01-01T00:00:00
53	XMM	OM	LINCOORD	1	1998-01-01T00:00:00
54	XMM	OM	PHOTTONAT	3	1998-01-01T00:00:00
55	XMM	OM	PIXTOPIXSENS	3	1998-01-01T00:00:00
56	XMM	OM	PSF1DRB	4	1998-01-01T00:00:00
57	XMM	OM	QUICKMAG	2	1998-01-01T00:00:00
58	XMM	OM	ZODIACAL	1	1998-01-01T00:00:00
59	XMM	RGS1	ADUCONV	5	2000-02-06T16:49:60
60	XMM	RGS1	BACKGROUND	1	1998-01-01T00:00:00
61	XMM	RGS1	BADPIX	5	2000-02-06T16:49:60
62	XMM	RGS1	CALSOURCEDATA	1	1998-01-01T00:00:00
63	XMM	RGS1	CLOCKPATTERNS	1	1998-01-01T00:00:00
64	XMM	RGS1	CROSSPSF	2	2000-01-01T00:00:00
65	XMM	RGS1	CTI	2	2000-02-06T16:49:60
66	XMM	RGS1	DARKFRAME	4	1998-01-01T00:00:00
67	XMM	RGS1	HKPARMINT	6	1999-01-01T00:00:00
68	XMM	RGS1	LINCOORD	7	1998-01-01T00:00:00
69	XMM	RGS1	LINESPREADFUNC	3	1999-01-01T00:00:00

cifbuild, valdate, evaldate

cifbuild uses single CCF keywords:

- VALDATE as start of calibration validity period
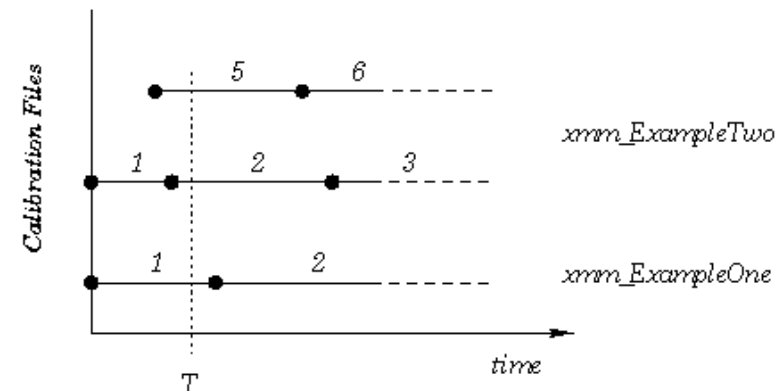- EVALDATE as end of validity period
- DATE as analysis validity period

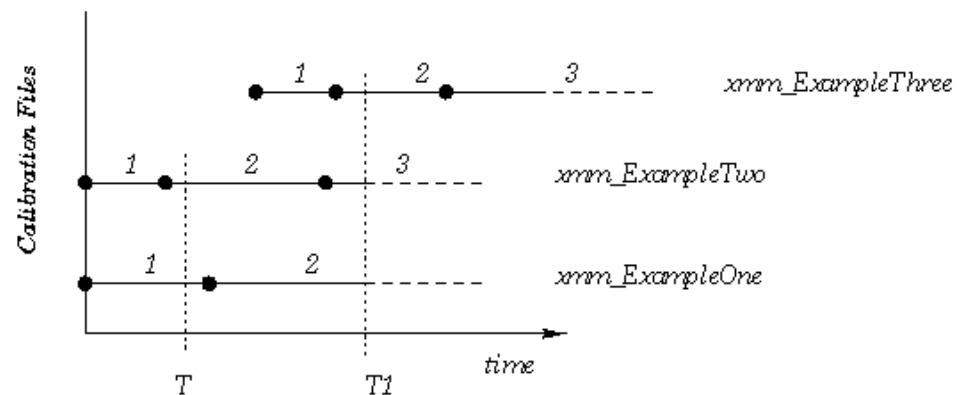

Figure 2: Current calibration file with two files: update. At the time T the current calibration file consists of xmm_ExampleOne_0001.ccf and xmm_ExampleTwo_0005.ccf

Rule: out of all the CCF calibration files take the highest issue with VALDATE lower AND EVALDATE higher than observation date AND DATE lower than analysis date.

Figure 3: Current calibration file with three files. At the time $T1$ the current calibration file consists of xmm_ExampleOne_0002.ccf and xmm_ExampleTwo_0003.ccf and xmm_ExampleThree_0002.ccf

The *cif* on-line

- On the XMM-Newton calibration web pages
  [http://xmm2.esac.esa.int/external/xmm_sw_cal/calib/cifbuild.shtml]:

  ✓ updated cif can be generated on-line and compared to the provided one

  ✓ required (missing) CCF constituents can also be downloaded

  ✓ Local CCF library can be mirrored from XMM web site.
    - Via the **rsync** or **mirror** commands (see doc web pages)

The *CCF* release notes

- CCF release note shall be consulted, at least periodically.
  - ✓ Subscribing to the CCF mailing list is also useful, to get the RNs and CCFs only when there is something new:

http://xmm2.esac.esa.int/external/xmm_sw_cal/calib/rel_notes/index.shtml

Keeping everything: Diogenes syndrom?

Wikipedia: **Diogenes syndrome**, also known as **senile squalor syndrome**, is a disorder characterized by extreme self-neglect, domestic squalor, social withdrawal, apathy, compulsive hoarding of rubbish, and lack of shame

- **All** the calibration files are **kept** in the **CCF repository** only to be able to **reproduce** calibration conditions met in the past (SAS can reduce data as it would have been done with the calibration knowledge of any past time).

- Many CCF files have been superseded by more accurate calibration and will never be used by a normal observer (eg. using the default "analysisdate=now").

- We have produced a reduced repository for all those observers, who do not want to mirror the entire repository but only the **relevant part** for an up-to-date data reduction.

- All the calibration files, which have been **superseded**, are not present in this repository.

- The repository has as of today 1360 files with a volume of ~ 5.8 GB, while the reduced repository is composed of 490 files with a volume of about 1.2 GB

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All the important bits for you together

- CCF Library: All CCFs ever made public
  - ftp: ftp://xmm.esac.esa.int/pub/ccf/constituents
  - rsync: rsync -a xmm.esac.esa.int::XMM_CCF

- Reduced CCF Library: (for a valid analysis today)
  - ftp: ftp://xmm.esac.esa.int/pub/ccf/red_constituents
  - rsync: rsync -a xmm.esac.esa.int::XMM_RED_CCF

- CCF on the net:
  - http://xmm2/esac/esa/int/external/xmm_sw_cal/calib/cifbuild/

- CCF Release Notes: justifying calibration files releases
  - http://xmm2/esac/esa/int/external/xmm_sw_cal/calib/rel_notes/

- CCF Web page: main CCF page
  - http://xmm2/esac/esa/int/external/xmm_sw_cal/calib/ccf.shtml
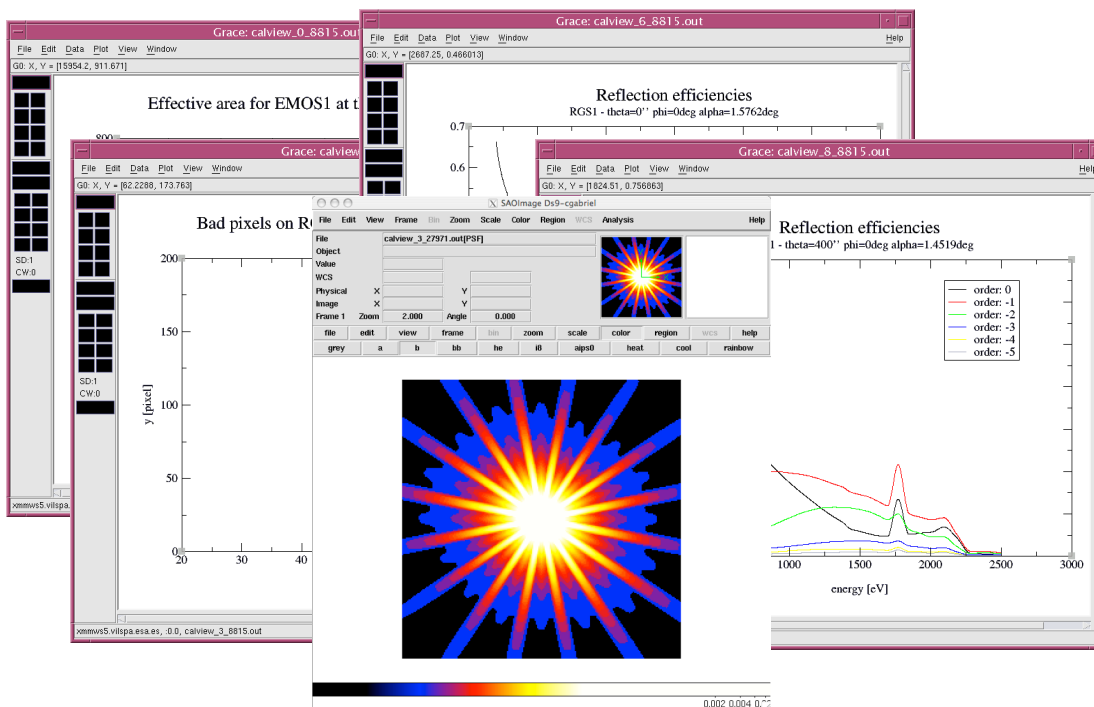
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`calview`: plotting CCF data and more

XMM-Newton Calibration DB: Calibration Access Layer CAL
(calibration algorithms & access functions) + CCF

calview: SAS task to access the calibration data

- using $SAS_CCF to define which calibration files should be using
- using $SAS_CCFPATH to locate the files

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