esa ESAC SAS

The CCF concept, cifbuild and calview

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XMM-Newton calibration library

- 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**

The Calibration Index File : CIF

File Edit Tools

TELESCOP	SCOPE	TYPEID	ISSUE	VALDATE
4A	6A	32A	I	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

- 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
```

cifbuild & how it works

cifbuild uses single CCF keywords:

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

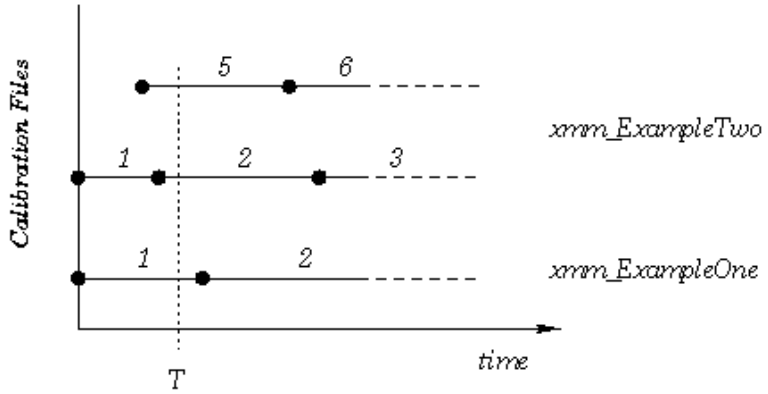

Figure 2: Current calibration file with two files: update. At the time T the current calibration file consists of *xmm_ExampleOne_0001.ccf* and *xmm_ExampleTwo_0005.ccf*

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.

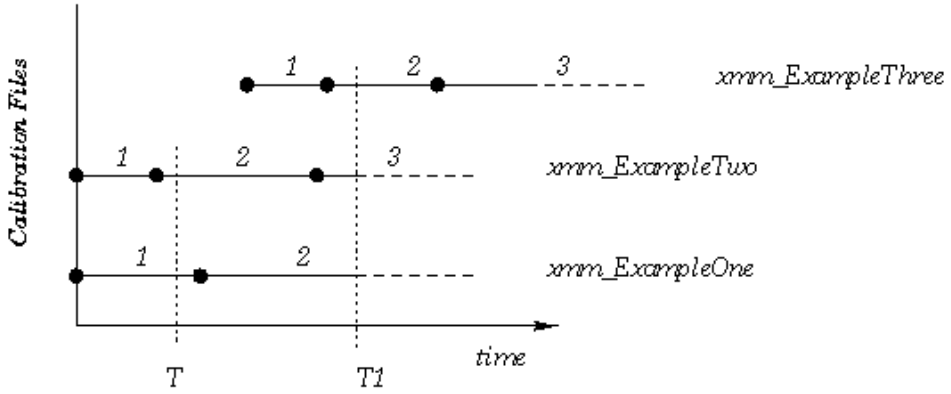

Figure 3: Current calibration file with three files. At the time $T1$ the current calibration file consists of *xmm_ExampleOne_0002.ccf* and *xmm_ExampleTwo_0009.ccf* and *xmm_ExampleThree_0002.ccf*

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CIF / CCF on the web !

- On the XMM-Newton calibration web pages [http://xmm.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)

- 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://xmm.vilspa.esa.es/external/xmm_sw_cal/calib/rel_notes/index.shtml

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Reduced CCF set (since Nov. 2006)

- 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 years ago).
- 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 from before January 2004, which have been **superseded**, are not present in this repository.
- The repository has as of June 2008 a volume of ~ 2 GB, while the reduced repository is about 725 MB.
- **`rsync -av xmm.esac.esa.int::XMM_RED_CCF`**

SAS calibration data access

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