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	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

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

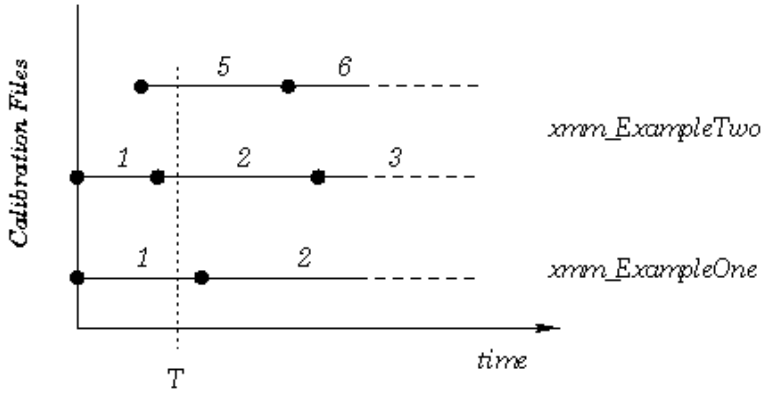


Figure 2: Current calibration file with two files: update. At the time T the current calibration file consists of *xmm_ExampleOne_0001.ccf* and *xmm_ExampleTwo_0005.ccf*

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.

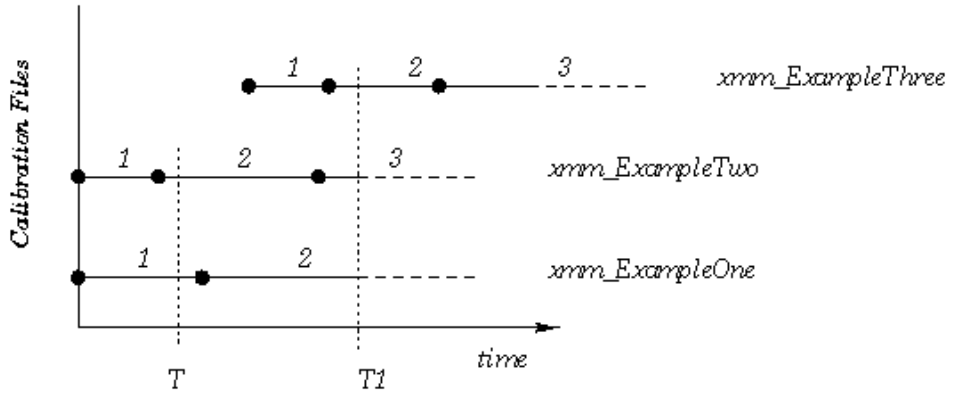


Figure 3: Current calibration file with three files. At the time $T1$ the current calibration file consists of *xmm_ExampleOne_0002.ccf* and *xmm_ExampleTwo_0009.ccf* and *xmm_ExampleThree_0002.ccf*

The *cif* on-line

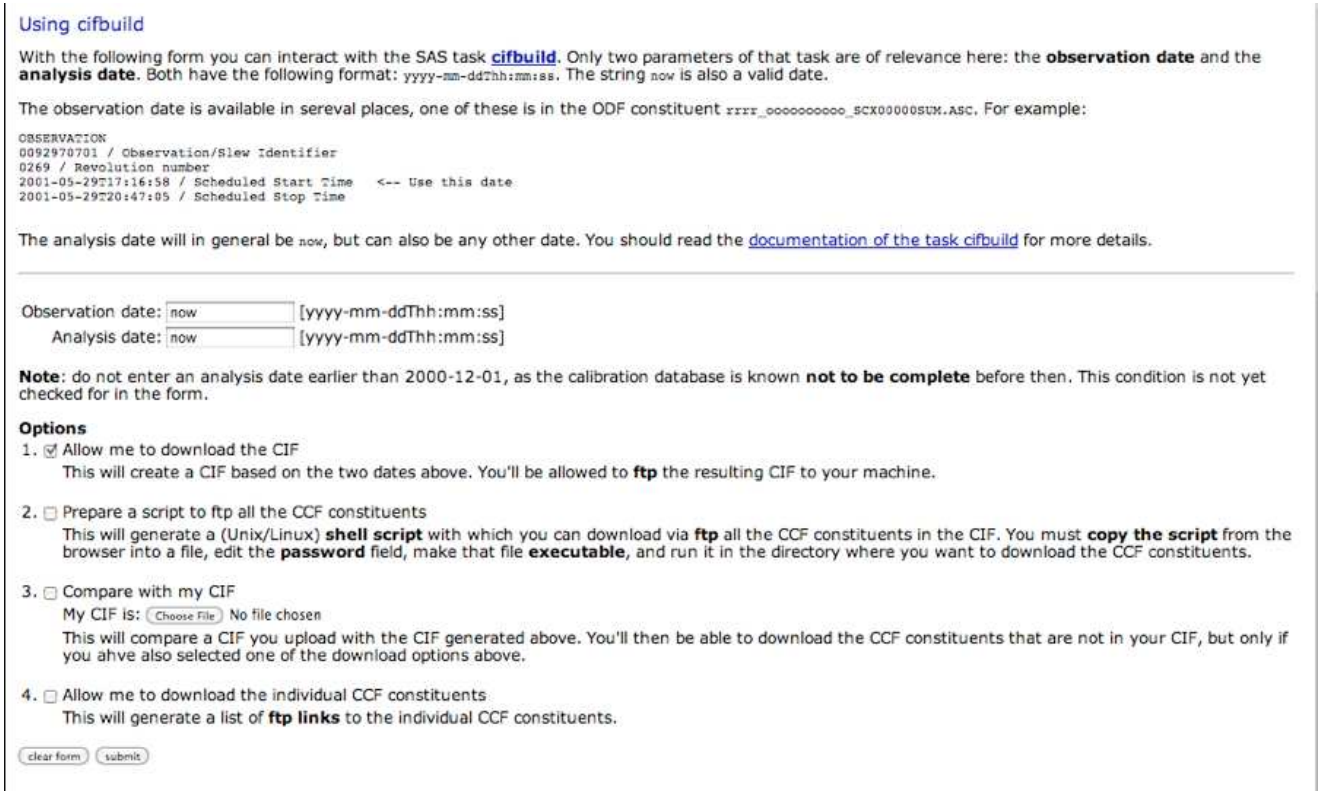
- On the XMM-Newton calibration web pages [http://xmm2.esac.esa.int/external/xmm_sw_cal/calib/cifbuild.shtml]:

✓ 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)



Using cifbuild

With the following form you can interact with the SAS task **cifbuild**. Only two parameters of that task are of relevance here: the **observation date** and the **analysis date**. Both have the following format: `yyyy-mm-ddThh:mm:ss`. The string `now` is also a valid date.

The observation date is available in sereval places, one of these is in the ODF constituent `rrrr_oooooooooo_SCX00000SUM.ASC`. For example:

```
OBSERVATION
0092970701 / Observation/Slew Identifier
0269 / Revolution number
2001-05-29T17:16:58 / Scheduled Start Time   <-- Use this date
2001-05-29T20:47:05 / Scheduled Stop Time
```

The analysis date will in general be `now`, but can also be any other date. You should read the documentation of the task cifbuild for more details.

Observation date: now [yyyy-mm-ddThh:mm:ss]
Analysis date: now [yyyy-mm-ddThh:mm:ss]

Note: do not enter an analysis date earlier than 2000-12-01, as the calibration database is known **not to be complete** before then. This condition is not yet checked for in the form.

Options

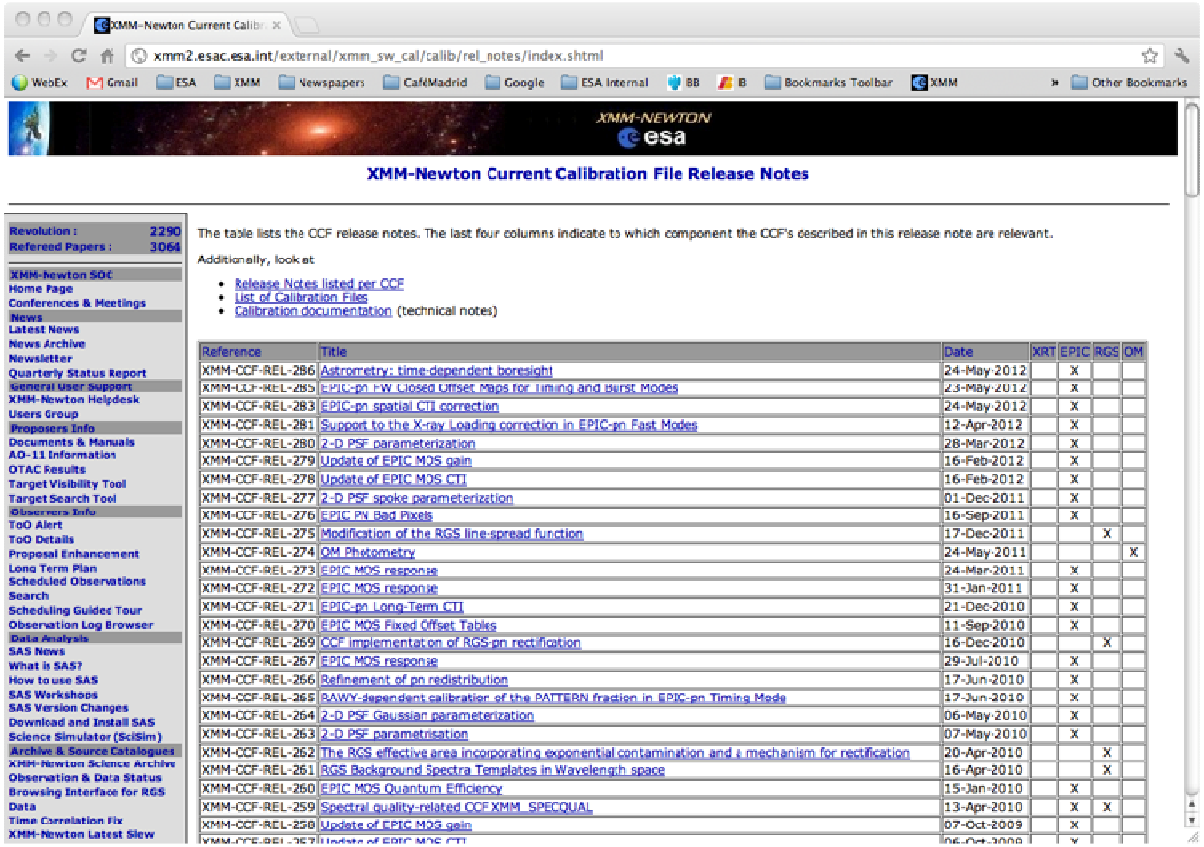
1. ☑ Allow me to download the CIF
   This will create a CIF based on the two dates above. You'll be allowed to **ftp** the resulting CIF to your machine.
2. ☐ Prepare a script to ftp all the CCF constituents
   This will generate a (Unix/Linux) **shell script** with which you can download via **ftp** all the CCF constituents in the CIF. You must **copy the script** from the browser into a file, edit the **password** field, make that file **executable**, and run it in the directory where you want to download the CCF constituents.
3. ☐ Compare with my CIF
   My CIF is: Choose File No file chosen
   This will compare a CIF you upload with the CIF generated above. You'll then be able to download the CCF constituents that are not in your CIF, but only if you ahve also selected one of the download options above.
4. ☐ Allow me to download the individual CCF constituents
   This will generate a list of **ftp links** to the individual CCF constituents.

clear form submit

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 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. A new reduced version (taking January 2008 as new date) is under preparation
- The repository has as of today a volume of ~ 2.8 GB, while the reduced repository is about 1.7 GB

All the important bits for you together

- CCF Library: All CCF ever made public
  - ftp: ftp://xmm.esac.esa.int/pub/ccf/constituents
  - rsync: rsync -a xmm.esac.esa.int::XMM_CCF
- Reduced CCF Library: (former - superseded after 1/2004)
  - 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

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