calview

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Abstract

An interactive viewer of the XMM calibration database.

1 Instruments/Modes

Instrument	Mode
all	all

2 Use

pipeline processing	no
interactive analysis	yes

3 Description

The XMM calibration database is comprised of ≈ 100 calibration datasets (the current calibration file, or CCF [1]), and a number of calibration algorithms and access functions (the calibration access layer, or **cal**). Many of the datasets in the CCF contain parameters that are meaningful only in conjunction with the calibration algorithms provided in the calibration access layer.

The fundamental philosophy of the XMM calibration database is that the only manner to access the calibration data, either in raw form (the contents of the datasets themselves) or in the interpreted form (the output of the algorithms) is through the functional interface provided by the calibration access layer.

While this approach has numerous advantages from the point of view of the task development process, it also means that the effect of a given calibration quantity can only be visualized by writing a small program to set the CAL state, and then call one of the calibration functions with the appropriate input parameters.

The purpose of **calview** is to reduce the user's programming effort in this sense to nil. To achieve this, and at the same time not require updating whenever a new calibration function is added to the **cal**, **calview** interacts with the **cal** through the interfaces provided by the calibration state server, and the calibration view server. The former is described in detail in **cal**. Here the two servers are described briefly insofar as they are used by **calview**.

The calibration state server allows one to set any of the calibration state parameters. These are: instrument, ccd, node, filter and mode identifiers, ccd and camera temperatures, on-chip binning factor, date, accuracy level, and randomization. The top part of the **calview** widget pane (figure 1) can be used to edit the calibration state. When a variable does not apply the corresponding widget is grayed out.

The behavior of the **cal** is also affected by the CCF in use. Through the pull down menu labelled "CCF" (figure 1) one can direct the **cal** to use a particular set of calibration datasets. It is possible to point the **cal** to a CCF directory, to a CCF index file (see **cifbuild** for information on how to generate one), or add individual CCF components to an existing list. It is also possible to list all of the CCF constituents in use, whether they were provided via the CIF or inserted at run time.

calview is also affected by the environment variables and command line options available to all SAS tasks that make use of the **cal**. Refer to the **cal** documentation for details.

The calibration view server affects **calview** in two areas.

It allows the user to edit a number of state variables that affect the display of the calibration output. The following variables can be set: energy, position in the field of view, spectral order. These variables function as input data to the calibration algorithms. For instance, for a given instrument and CCD the user can select the energy for which the CCD redistribution should be calculated.

Through the calibration view server, **calview** inquires which "viewables" are available given the current calibration state. The list of available viewables is available in the pull down menu labelled "View" (figure 2). **calview** has no a priori knowledge of what calibration data can be viewed. Viewables can have sub-viewables. These are specialized views of a given calibration quantity.

After a viewable is displayed, the list of CCF constituents accessed is displayed.

4 Parameters

This section documents the parameters recognized by this task (if any).

Parameter	Mand	Type	Default	Constraints

none needed by this task

5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

none issued by this task

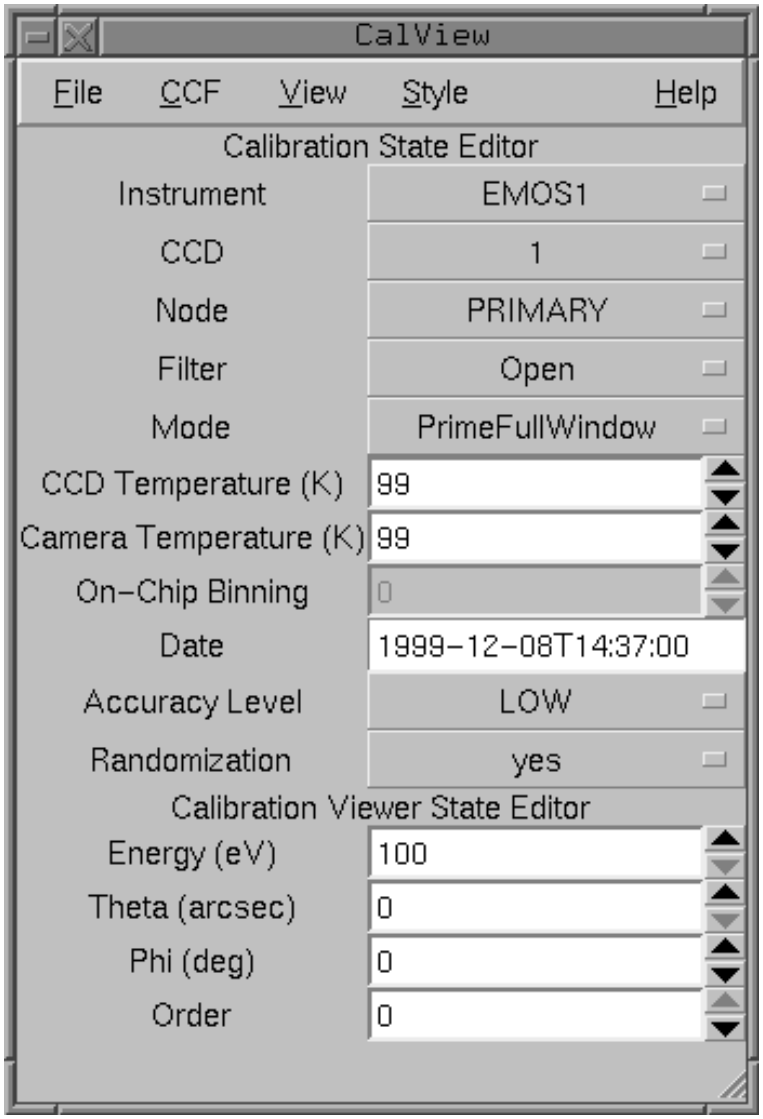

Figure 1: The **calview** user interface.

Figure 2: An example of the "View" pull down menu. Viewables with sub-viewables can be further expanded.

6 Input Files

1. The main input dataset, set through `SAS_CCF`, is a Calibration Index File. See **cifbuild** for more information on how to create such a file.
2. Any CCF dataset complying with the interface defined by the **cal**.

7 Output Files

None. The user can save the displayed data to disk for analysis with a custom tool.

8 Algorithm

There is no algorithm proper. **calview** interrogates the calibration state server and the calibration view server, and it displays the results in a number of widgets and pull down menus. Each time the value of one of the state variables is changed, **calview** loops through all the widgets and menus to bring them in line with the new state.

9 Comments

- Not all the calibration viewer variables are meaningful to all viewables. At the moment there is no way to know which variable affects which viewable, although it is fairly easy to guess.
- The calibration view server may fail to initialize if the Calibration Index File does not contain all of the required datasets. At the moment the only way of knowing if all the required datasets are available is to try and run **calview**.

  The Calibration Index File and the CCF that the users receive with their data is complete and can be used with **calview**.

References

[1] ESA. Interface control document for the XMM current calibration file. Technical Report XMM-GEN-ICD-0005, ESA/SSD, Dec 2001. Issue 4.0.