



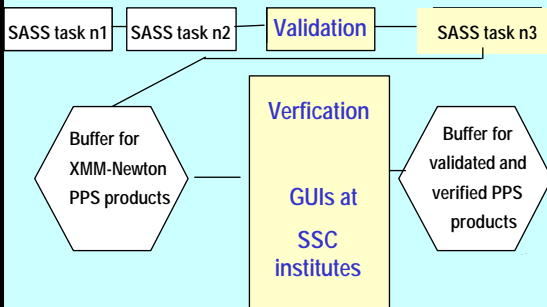
The Data Product Screening System

Validation and Verification of XMM-Newton PPS Products



The Data Product Screening System (DPSS) is an important component of the XMM-Newton Pipeline Processing System (PPS) inside the Survey Scientist Consortium (SSC). The DPSS is designed to ensure a high-level data quality of all XMM-Newton data products. The DPSS consist of automatic validation tasks followed by an visual inspection step (verification) employing a Graphical User Interface (GUI). The DPSS is regularly updated and distributed to all XMM-Newton SSC institutes.

The PPS –DPSS Interface



The DPSS is part of the PPS pipeline. The automatic validation step of the DPSS consists of 2 SAS tasks performing general health checks of the PPS products, which do not require human interaction. Before the data products are delivered to the observers, a visual screening is performed at each SSC institute. The visual data verification is based on a Graphical User Interface, combining the software modules tcl/tk and ftools.

Basic Verification Screening Steps

I. Overall Data Health

Visualize all EPIC, OM, RGS images
check observation mode (compare with template modes)
obvious failures

II. Source detection quality

Overlay of Box, ML source lists on all EPIC images
source flagging (false detections, centroid position, missed sources)
observation flagging (overall aspect problems)

Overlay OM source lists on OM sky images
no single source flagging
general detection quality

III. Visualize PDF, HTML, PNG files

Basic steps for the visual verification process. The front page GUI allows to visualize all EPIC pn, MOS and OM images and their associated source lists. Individual flags can be given to sources detected by the source detection algorithm. The GUI allows to visualize all PPS products (RGS, Cross-Correlation Products...) and to attach flag settings to each individual product.

The Graphical User Interface

The DPSS GUI front page – EPIC images and source list verification

The DPSS GUI front page designed to visualize and to verify the EPIC and OM source detection quality. Individual source flags can be attached to EPIC sources. In addition, observation flags can be given to individual XMM-Newton observations. Images and source lists can be set to 'invalid' whenever critical errors during the pipeline processing have occurred.

The DPSS Software System

FTOOLS

- FitsTcl → handle fits file structures
→ creates FitsFileObjects
- Itcl → create the GUI
- POW → display images

The DPSS Graphical User Interface is based on Ftools version 5.1. Ftools offers the unique possibility to create Graphical User Interfaces using Itcl. For the visualization of XMM-Newton images the software module POW as part of the Ftools software system is used. FitsTcl allows to handle the multi-header fits file structure of XMM-Newton PPS products.