XMM-Newton CCF Release Note

XMM-CCF-REL-20

OM Detector Response

R. Much

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1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
OM_LARGESCALESENS_0002	2000-01-01T00:00:00	FILTER-U		No
		FILTER-B		No
		FILTER-V		No
		FILTER-UVW1		No
		FILTER-UVM2		No
		FILTER-UVW2		No
		FILTER-WHITE		No
		FILTER-MAGNI		No
		FILTER-GRISM1		No
		FILTER-GRISM2		No
OM_DARKFRAME_0003	2000-01-01T00:00:00	DARKFRAME		Yes
OM_PIXTOPIXSENS_0003	2000-01-01T00:00:00	PIXTOPIXSENS		No
		LEDTEMPLATTE		No

2 Changes

First release

The file *om_largescalesens* describes the largescale flatfield response of the combination detector plus filter. It was not possible to generate a sky flatfield: while the local straylight features can be handled by omitting the relevant areas in an OM image, the global straylight feature did show up as a large disk in the final, summed sky flat. At this stage it was decided to set the largescale flatfield to unit, with the underlaying assumption that the initial detector response is flat. This means that for the moment any flatfield correction will only be done relative to the early inorbit flatfield measurements.

The file *om_darkframe* describes the dark count rate of the detector. The analysis is based 11 dark ENG4 dataset summing up to a total exposure time of 44 ksec excluding darks during Zeta Pupis and Capella observations. The dark count rate is rather stable with time. The mean OM dark count rate is 2.56e-4 c/s/subpixel. However there is a variation in dark count rate across the detector of ± 9% showing mainly up as radial dependence, being highest in an annulus of about 8' radius and lowest in the center. Despite using a blocked filter for the OM, when the spacecraft is pointing at very bright star, the dark rate is noticably increased (e.g., up to 65% higher for the V=0 star Capella), suggesting some straylight leakage.

The file *om_pixtopixsens* describes the pixel to pixel response variation and the LED illumination template. The latter is derived from 8 ksec smoothed LED 8 ENG4 flats. The pixel to pixel response variation had to be set to unity, as the largescale flatfield was absent and because the statistics in individual pixels was not sufficient.

All three files describe the redundant OM detector channel.

An update of the LED illumination template in the file *om_pixtopixsens* is expected once more ENG4 and tim16 data with LED on are analysed.
We expect an update of the file *om_darkframe* either when a change in the dark count rate is noticed or once significantly more ENG4 darks or dark tim16 datasets become available. The latter shall mainly affect the uncertainties.
Updates on the file *om_largescalesens* can be expected after careful analysis of revisited fields with pointing offset.

3 Scientific Impact of this Update

First release

4 Estimated Scientific Quality

The dark count rates are accurate to the 10 % level.
Because of the poor statistics in the aquired data the LED illumination template is only accurate within a factor 2.

Pixel to pixel variation and large scale flatfield response are best guess estimates.

5 Acknowledgements

Thanks to OM team members, especially Bob Shirey (UCSB) for providing the input.