

XMM-Newton CCF Release Note

XMM-CCF-REL-67

Partial Events Floor for RGS CCD's

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1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
RGS1_REDIST_0004	2000-01-01T00:00:00	CCD_REDISTRIBUTION	kmxinsas_20010111_1900	NO
RGS2_REDIST_0004	2000-01-01T00:00:00	CCD_REDISTRIBUTION	kmxinsas_20010111_1900	NO

2 Changes

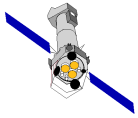
The parameters for the partial events floor were added. See [1, function `CAL_getRedistribution`] for a description of the functionality.

3 Scientific Impact of this Update

The partial events tail of the CCD redistribution was under-estimated before. This resulted in too high quantum efficiency inside the order-selection regions in the modeling of the RGS response. Additionally, due to the wrong shape of the CCD response, the dependency of the calculated effective area on the width of the order selection regions was incorrect.

4 Estimated Scientific Quality

The in orbit CCD response function was compared with pre-launch synchrotron measurements and the redistribution function was found to be unchanged. This allowed to separately assess CCD



redistribution function and to derive these parameters.

For in flight data, there are two contributions to flux outside the order selection regions in the PI-BETA plane:

1. the partial event floor of the CCD response, causing spreading along PI, at given BETA, and
2. the scatter of the gratings, causing spreading along BETA for given PI.

Since the order-selection regions are slightly tilted in the PI-BETA plane, these effects both cause cross-talk between different parts of the spectrum, and therefore there is no unique separation possible. Hence these parameters need to be iteratively improved together with the parameters describing the scatter function.

References

- [1] Christian Erd, Phillipe Gondoin, David Lumb, Rudi Much, Uwe Lammers, and Giuseppe Vacanti. *Calibration Access and Data Handbook*. XMM-PS-GM-20, issue 1.0, ESA/SSD, September 2000. <http://xmm.vilspa.esa.es/calibration/docs/general/calhb.ps.gz>.