XMM-Newton CCF Release Note

XMM-CCF-REL-127

EPIC MOS CTI

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1 CCF components

Name of CCF	VALDATE (start of val. period)	EVALDATE (end of validity period)	List of Blocks changed	CAL VERSION	XSCS flag
EMOS1_CTI_0015	2002-11-07T05:00:00		CTI_EXTENDED	cal 3.147+	NO
EMOS1_CTI_0015	2002-11-07T05:00:00		CTI_EXTENDED	cal 3.147+	NO

2 Changes

A new set of MOS CTI parameters has been derived for the MOS cool operations that started in revolution 533, when the operating temperature of MOS CCD was lowered from -100C (since the launch) down to -120C, in order to mitigate the effects of the CTI degradation on the energy resolution.

The parallel CTI is reduced by a factor 2 to 3 depending on the CCD, at this new operating temperatureas can be seen in figures 1 and 2 for central CCDs only. The MOS CTI parameters have been derived according to the latest algorithm that will be immplemented and available in SAS 5.4.

3 Scientific Impact of this Update

The use of this new CCF is mandatory for all observation acquired after revolution 533 for MOS, otherwise the energy scale will be completely wrong, as the CTI was seriouly improved.

4 Estimated Scientific Quality

With the same caveat as discussed in detail in the previous delivery note (XMM-CCF-REL-124) is is assessed that the MOS energy scale with this new CCF shall be correct within 5eV at about 2 keV and within 10 eV at 6keV, for not too bright sources.

With this new operating temperature, the energy resolution of the MOS camera that degraded by 20% since launch is improved, with a FWHM decreasing from 160eV to 140eV.

5 Test procedures & results

The new CTI CCFs have been tested with the Development Track (DT) version of the SAS at VilSpa that includes the new CTI algorithm, called by the FITS header keyword ALGOID = 2. The results have be shown in the previous section.

6 Expected Updates

The parameters of this CCF will have to be refined in the future as they are based only on the measurements made with the internal calibration source in revolutions 533 and 534. Besides, as the degradation rate of the CTI at this temperature is not yet known, it has been put to zero.

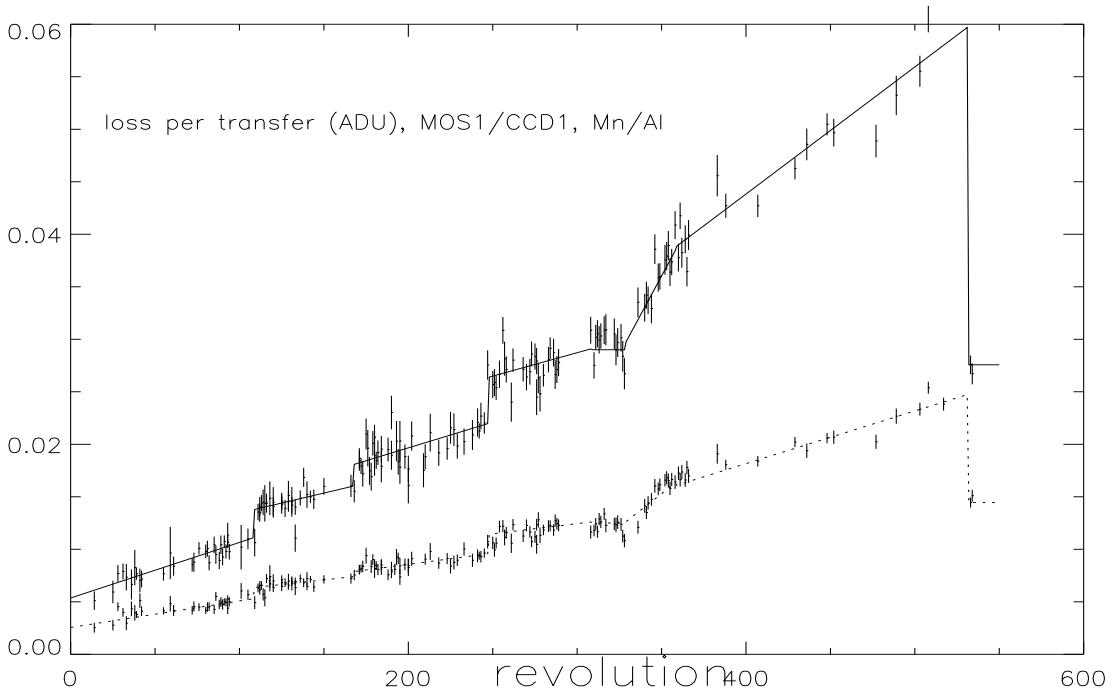

Figure 1: MOS1 transfer losses since launch at Mn and Al energies, for the central CCD, overlayed with the CTI model as parametrized in the new set of CCFs

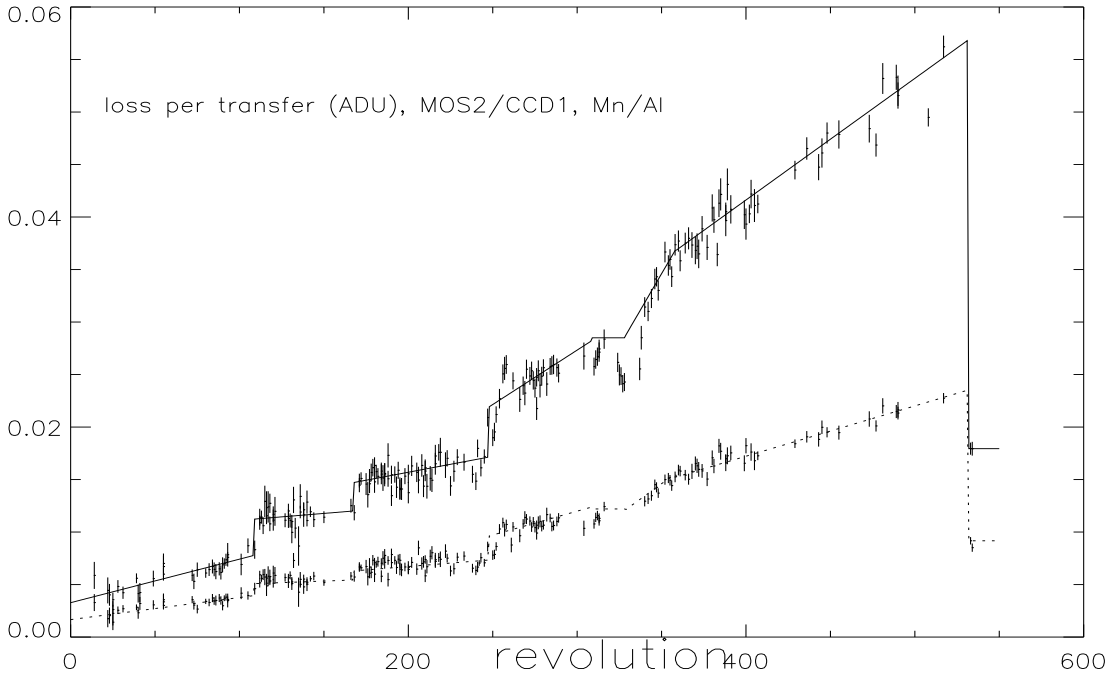

Figure 2: MOS2 transfer losses since launch at Mn and Al energies, for the central CCD, overlayed with the CTI model as parametrized in the new set of CCFs