XMM-Newton CCF Release Note

XMM-CCF-REL-178

Masking of MOS bright patches in MOS1 CCD4

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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_BADPIX_0025	1999-12-10 06:30:00	2000-05-12 06:29:59	BADPIX		NO
EMOS1_BADPIX_0026	2000-05-12 06:30:00	2000-07-10 20:59:59	BADPIX		NO
EMOS1_BADPIX_0027	2000-07-10 21:00:00	2000-12-13 11:59:59	BADPIX		NO
EMOS1_BADPIX_0028	2000-12-13 12:00:00	2001-09-17 23:59:59	BADPIX		NO
EMOS1_BADPIX_0029	2001-09-18 00:00:00	2001-11-27 17:59:59	BADPIX		NO
EMOS1_BADPIX_0030	2001-11-27 18:00:00	2002-12-11 11:59:59	BADPIX		NO
EMOS1_BADPIX_0031	2002-12-11 12:00:00		BADPIX		NO

2 Changes

Some bright patches of hot pixels in MOS1 CCD4 have been present for a long time.

As these hot pixels are contiguous they are not detected as such by the bad pixel finding algorithms of the SAS, as they mimic somewhat true X-ray sources. Hence they generate spurious sources at the same position (in detector coordinates), in many observations. These features are present very often though not systematically. It seems that they occur preferentially in the first part of revolution, but it has not been evidenced quantitatively.

These cosmetic defects seem to have appeared at revolution 325, when the MOS1 camera was impacted by a micrometeoroid, mostly on CCD6 and CCD7, causing high-energy very hot pixels.

The effects of these bright patches were mitigated by the cooling of the MOS CCDs in revolution 533, some patches disappearing completely. The 3 main patches, surviving the cooling are shown in figure 1.

Therefore it has been decided to flag these time-dependent areas in the BADPIX CCF, to avoid

spurious sources in the pipeline products as well as in the upcoming 2XMM catalogue.

The first 3 columns of the CCD have also been very noisy on average, since the beginning of the mission, and are flagged in this release as hot in the CCFs too.

3 Scientific Impact of this Update

Spurious sources from the pipeline at the position of the patches will disappear.

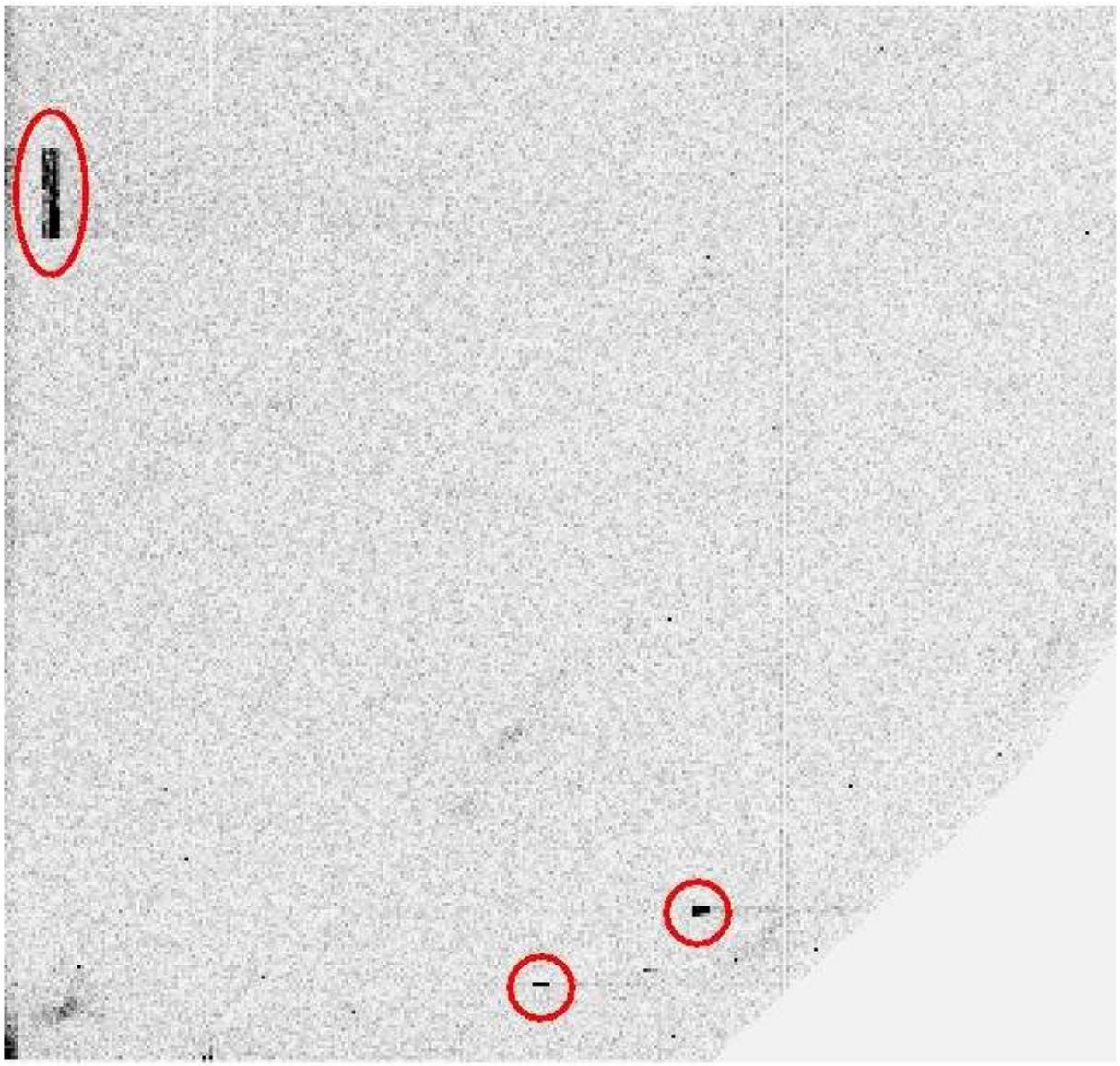

Figure 1: MOS1 CCD4 bright patches of hot pixels after the CCD cooling. The image was obtained by summing numerous observations in CCD coordinates.

4 Estimated Scientific Quality

See above.

5 Test procedures & results

These new CCFs have been tested with SAS 6.0 at ESAC, all expected bright patches are now properly masked.

6 Expected Updates

None.

7 References

E-mails, Jean Ballet, 02 July 2004 and 12 July 2004, subject:"MOS1 CCD4"