XMM-Newton CCF Release Note

XMM-CCF-REL-303

Modifications to EMOS Bad Pixel Table

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1   CCF Components

Name of CCF	VALDATE	EVALDATE	Blocks Changed	XSCS Flag
EMOS1_BADPIX_0037	2012-12-11T03:01:00	2013-01-21T06:31:40	BADPIX	NO
EMOS1_BADPIX_0038	2013-01-21T06:31:40	2013-04-23T00:07:42	BADPIX	NO
EMOS1_BADPIX_0039	2013-04-23T00:07:42	–	BADPIX	NO

2   Changes

Following the suspected MOS1 impact event of revolution 2382, several instances of offset tables and bad pixel tables were uploaded in an effort to mitigate the effects of hot or noisy MOS1 CCD areas, mainly in MOS1 CCD4. These CCFs reflect the on-board bad pixel tables for various epochs since the event.

Despite the on-board vetoing of the most severely damaged segments there remained an area of enhanced noise in MOS1 CCD4 in rows below RAWY $\sim$ 150, resulting in a severely compromised source detection efficacy for data from this CCD. In order to address this issue, in this set of CCFs all pixels in these rows have been declared as non-uploaded hot pixels (type "H"). Standard SAS processing will exclude events in these flagged pixels from the final calibrated event list.

3   Scientific Impact of this Update

The CCF identifies the flagged detector areas, thus allowing SAS tasks correctly to calculate the effective area. Especially in extended dead areas, in the form of flagged column or row segments, the correction to the effective area will be substantial.

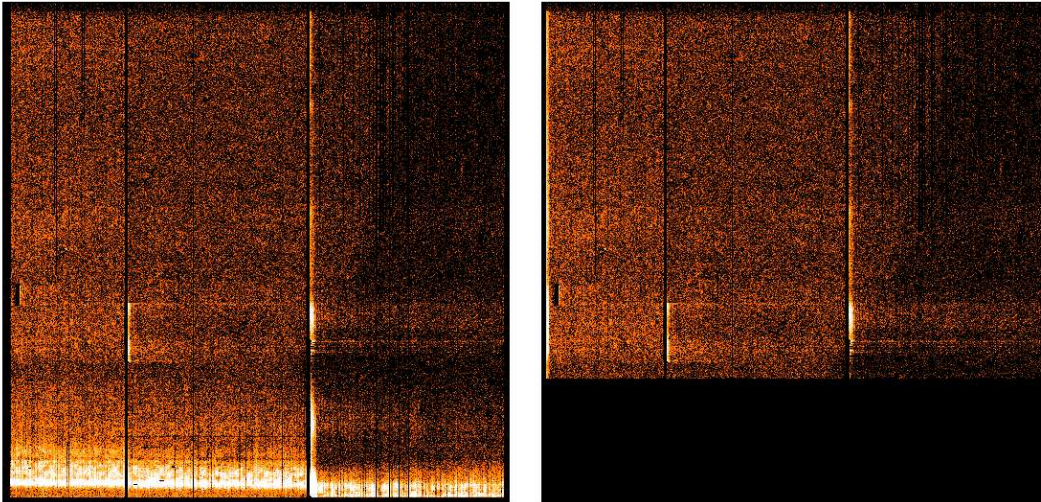The result of the flagging of the noisy rows in MOS1 CCD4 is shown in Fig 1.

Figure 1: Result of standard SAS processing of MOS1 CCD4 data using old CCFs (left) and the new CCFs (right). The region of enhanced noise in the first 150 rows has been removed through the bad pixel flagging.

4   Estimated Scientific Quality

The CCFs correctly reflect the status of uploaded bright pixels in the relevant epochs.

The validity of the MOS1 CCD4 non-uploaded pixels declared as hot has been verified through pipeline analysis of several observations. The EPIC source detection shows a marked improvement, finding a reduced number of false sources in the affected area.

5   Expected Updates

Depending on further development of hot, noisy or dead pixels.

6   Test Procedures and Summary of the Test Results

- Verification of content with `calview`;

- Testing of correct functionality with `emproc` (SAS 13.0.1).

Results as expected. In particular, no warnings issued of the type:
```
embadpixfind:  warning (getCalBadpix10), Bright pixel at [...]  [...]
```

is declared uplinked in the CCF but is present in the data.