XMM-Newton CCF Release Note

XMM-CCF-REL-353

OM bad pixels: Update

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1 CCF components

Name of CCF	VALDATE	EVALDATE	List of Blocks changed	XSCS flag
OM_BADPIX_0006	2017-07-17T00:00:00	—	BADPIX	NO

2 Changes

The accidental observation of Jupiter with the OM V filter has produced a decreased sensitivity patch in the OM detector. It occurred on July 16, 2017. This low sensitivity patch has been monitored since then and both the loss of sensitivity and the extension of the patch are stable. The sensitivity loss is higher in the V filter, although all filters have been affected.

A sensitivity correction is being studied. Nevertheless, it has been decided to include the pixels in the patch into the OM bad pixels map CCF. This will produce a flag in any source detected within the patch.

The list of OM bad pixels contained in OM_BADPIX_0005 (see XMM-REL-252) has been updated with the inclusion of the patch region.

Although the structure of the CCF allows us to define each "bad" pixel (or area) by its position and extent in X and Y axis, as we did in the previous issue of this CCF we have preferred to list X and Y of all affected sub-pixels (with extent unity).

The distribution of the bad pixels is shown in Figure 1

The previously known bad pixels are listed in Table 1 (reproduced from XMM-REL-252). It gives the center (sub-pixel) of the bad pixels, excluding the triangular edge emission regions extending for as much as 100 pixels from the corners of the detector. The size of the bad pixel has been defined
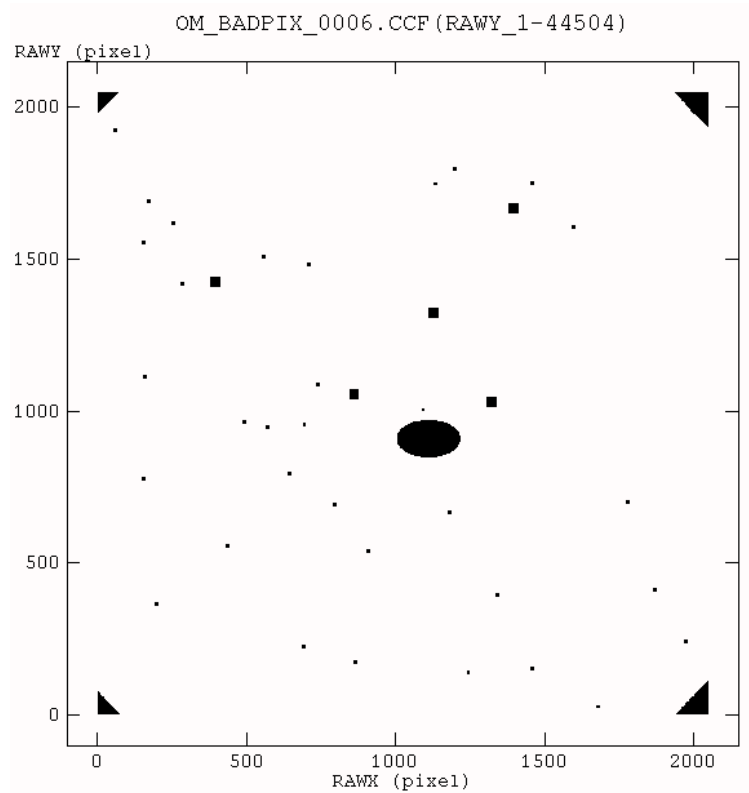
Figure 1: Distribution of bad pixels and low sensitivity patches in the new OM_BADPIX_0006.CCF

slightly larger than a physical one as a conservative approach accounting for the fact that a sub-pixel comes from interpolation into more than one physical pixel.

The new sensitivity depletion patch is elliptical centered at (1010, 910), with semi-axis 110 and 60 in X and Y respectively.

3   Scientific Impact of this Update

The bad pixels list is used by the SAS to flag the quality of the count rate measurement of a detected source containing one or more of them. The flagging mechanism is carried on through all processing steps till the final combined source list.

With the new table sources detected into the Jupiter depletion patch will be flagged as well.

4   Estimated Scientific Quality

The level of decreased sensitivity is defined "by eye" in the flat field image. It is not used to correct the measured count rate. Instead, the flagging triggered by the bad pixels table indicates that a

Table 1: OM Bad Pixels

X	Y	Description	Size (sub-pixel)
396	1426	low sensitivity patch	31 x 31
860	1056		
1128	1326		
1320	1030		
1394	1670		
159	1112	dead pixel	9 x 9
199	365		
866	176		
1680	28		
1869	412		
909	540	hot pixel	9 x 9
1180	668		
1340	396		
1459	155		
59	1925	low sensitivity pixel	9 x 9
154	1557		
155	779		
173	1692		
252	1619		
285	1420		
435	558		
492	965		
557	1510		
571	949		
644	794		
690	224		
693	955		
710	1484		
738	1090		
794	692		
1092.	1002		
1132	1749		
1197	1796		
1243	140		
1459	1750		
1598	1607		
1974	242		
1778	701		
1010	910	sensitivity depletion patch	ellipse 105 x 60

source measurement may be less accurate due to the presence of a bad pixel or to its location in a low sensitivity area.

5   Expected Updates

The appearance of new bad pixels is monitored through the obtention and inspection of flat fields. A variation in the depletion patch and/or aging of the detector may require the table to be updated again in the future.

6   Test procedures

The new CCF has been verified with calview.

In addition, observations of BPM 16274, SA 92-45 and Hz 2 obtained after the Jupiter accident, with the targets located out and into the patch have been processed with SAS and the new CCF. The flags are properly assigned.

It should be noted that this new CCF requires a new version of the SAS task *ommodmap*, namely Version 2.25.

References