

MOS Bad Pixels monitoring

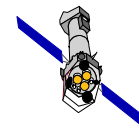
B. Altieri

EPIC TTD operations meeting # 6

Paris, 7/8 Feb. 2001



VilSpa, 16 October 2000



XMM-Newton

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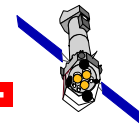
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MOS BadPix: status

- **v4.0.0-06-dec-2000 uploaded in Dec. 2000**
 - derived by P. Bennie
 - apply for rev186 onwards
 - 66 pixels for MOS1 and 149 pixels for MOS2
- **Scope : eliminate hot pixels above 1% frequency**
 - derived from TM bandwidth & event file size perspective
 - most of them masked with v4.0
- **Stable situation since**
 - Typical count rate in peripheral CCDs : 3 c/s \Leftrightarrow ~0.7 kb/s
 - most of it electronic noise & background
 - less than 1 c/s on MOSs since rev 186 due to hot pixels



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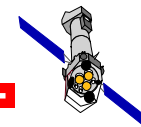
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MOS BP: monitoring strategy (proposal)

- **Use of CACLOSED observations** (derived product)
 - Ascending part of the orbit up to 3 hrs (PP +4h to PP+7h)
 - Full-frame *half of the time*, rest LW, SW and 3x3 diagnostics
 - but very few data since rev 200.
 - Strategy to be revised if less but longer calclosed.
- **Use of CLOSED exposure w/o BP masking**
 - twice manually (engineering tests) in revs 181 & 203 (also w/o HBR threshold)
 - From March onwards as an activity (i.e. can be planned directly by mission planning) : ~ **every 2 months**



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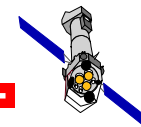
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MOS BP results/features

- **CLOSED w/o BP masking (revs181 & 203)**
 - “known” hot pixels are very stable in energy and frequency down to the 1% level.
 - Spectrum of hot pixels seems to peak at certain energies
 - different types of detector defects ?
 - 4 high-energetic (bi-) pixels identified
 - == > “dead” zone of 3x3 or 3x4 pixels.
- **Peculiar cases:**
 - one of above hot-pix appears only in LW (c.f. Cas A, rev193)
 - Temporary very hot pixels (>99%) for one exposure
 - only one one example so far (MOS2, calclosed, rev 193)
 - 5 very hot pixels, all shifted 8 pixels away from a known hotpix
 - readout noise ? Release of charges after perigee passage ?
 - One very hot pixel (MOS2, CCD4) the disappeared completely



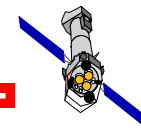
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MOS BP tools

- **LUX tools (P. Bennie), database of hot pixels**
 - more focus on low-level hot pixels and flickering pixels to be flagged in CCF (science orientated)
- **SOC tool to be plugged on the CTI/calclosed**
 - deals only with hot pix $> 1\%$ (operations oriented)
 - in the process of generating a DB of hot pixels too.
- **Generation of CCF, s/w tools (config. Control) at ESTEC**
 - urgent need to derived updated MOS BP CCF.
- **SAS tasks (badpixfind, embadpixfind) to be used for**
 - low-level hotpix (not handled in “sc_upload” list nor CCF)
 - flickering pixels



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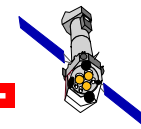
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MOS Bad Pixels: conclusion

- **Very good on-board bad pixel table (v4.0) currently.**
- **Stable situation since July 2000 (rev108) event.**
 - but unexpected features
- **No TM bandwidth (file size) issue (BP are a negligible contribution), at variance with p-n**
- **S/W tools and monitoring in place at LUX and SOC.**
- **Update of CCF “badly” needed**



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