MOS Bad Pixels monitoring

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EPIC TTD operations meeting # 6

Paris, 7/8 Feb. 2001

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 peripherical CCDs : 3 c/s <=> ~0.7 kb/s
    - most of it electronic noise & background
    - less than 1 c/s on MOSs since rev 186 due to hot pixels

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

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 complietely

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

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**