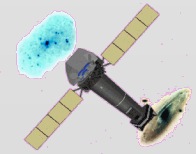


Reducing MOS data rate

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Overview

Recently, the MOS telemetry allocation was reduced to 12kb/s from 16kb/s and given to the PN

There have been many cases of MOS going into counting mode and sometimes buffers get 'stuck'

There is no simple solution to the stuck buffers problem for the EMDH's

We would be less likely to get into counting mode if the MOS cameras produced a lower data rate, and therefore less likely to suffer from stuck buffers

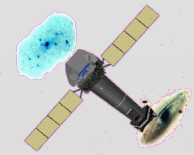
Examination of observations shows that when there are no strong sources on the outer CCDs, up to half and sometimes more of the events are cosmic ray events pattern 31

There is (or was?) a parameter which could be set to limit the range of event patterns which are telemetered on a given HBR

If that command cannot be found, we could also limit the upper energy limit to less than full scale to veto the cosmic ray events

Also we could raise the lower energy threshold to remove many of the noise events

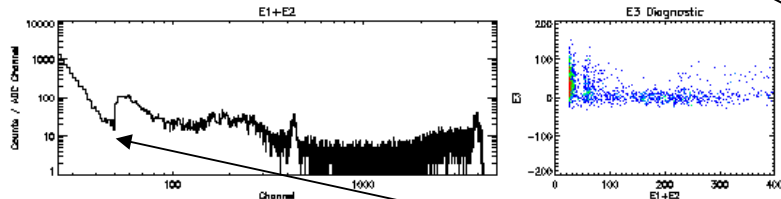
HBR buffer sizes could be revised to give more to the central CCDs



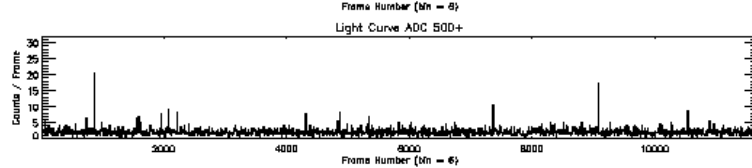
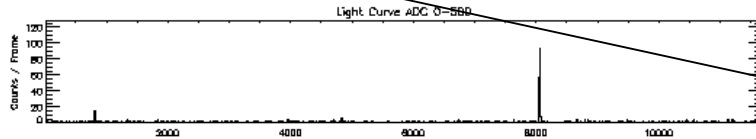
Typical no source peripheral CCD2 plot

```

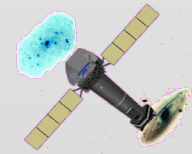
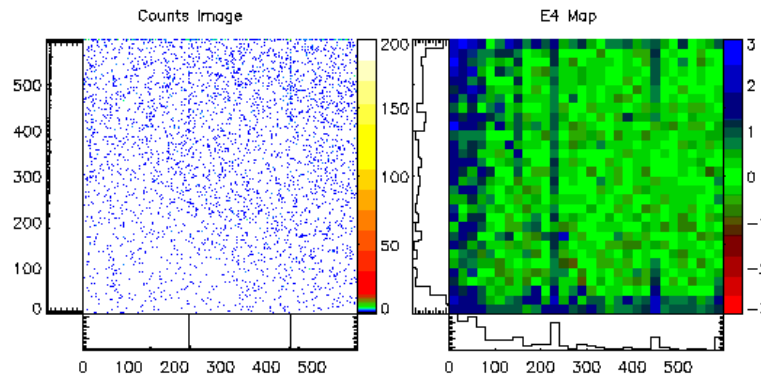
0552_0157161001_M1500320IME.FIT  Nevents = 40526
CCDID = 2          EDUID = 2          Mono (%) = 45.4572
CCDNODE = 0        EDUMODE = 3        BiPx (%) = 12.1305
WINDOWLO = 0       EDUTHR = 25       TrPx (%) = 0.688447
WINDOWYO = 0       FRMTHRE = 27      OdPx (%) = 0.636828
WINDOWDX = 610     EMDHLOW = 0          Pile (%) = 0.0740285
WINDOWDY = 602     EMDHUPP = 4095      P31 (%) = 39.5354
    
```



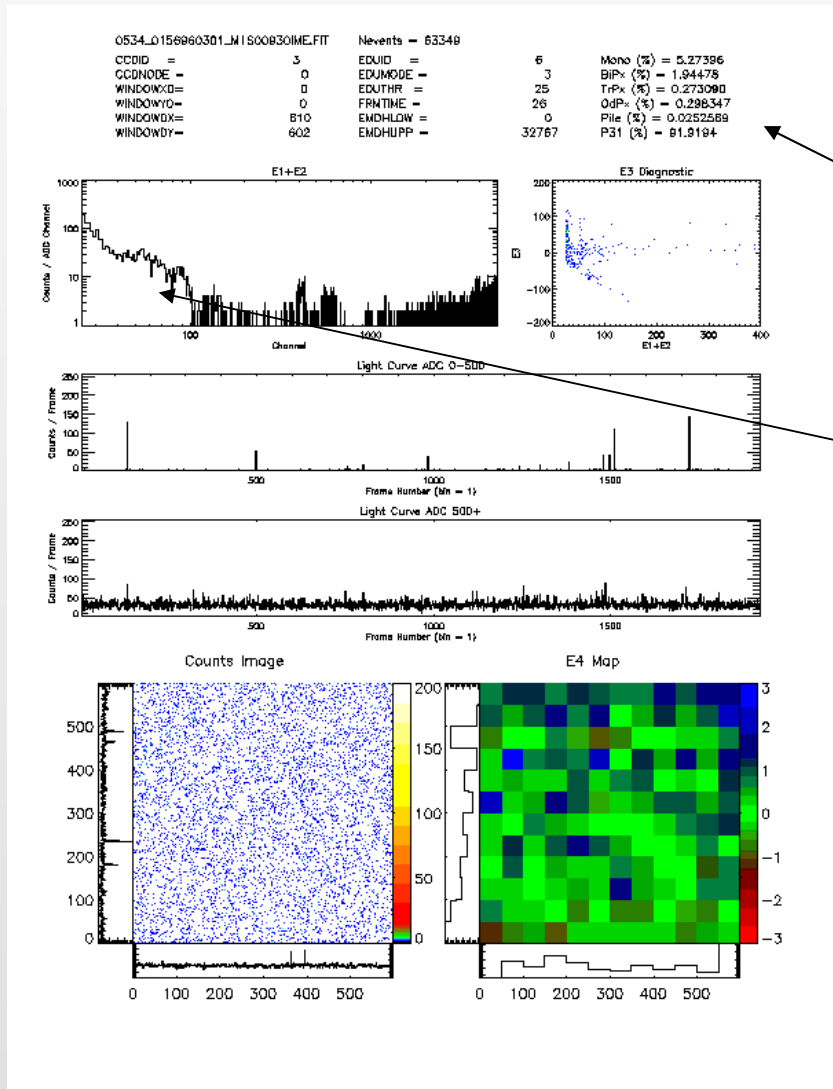
39.5% of events are pattern 31



Raising lower threshold from 25DN to 50 DN would also reduce count-rate dramatically

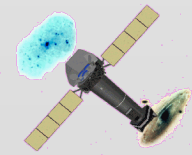


Very promising no source peripheral CCD3 plot



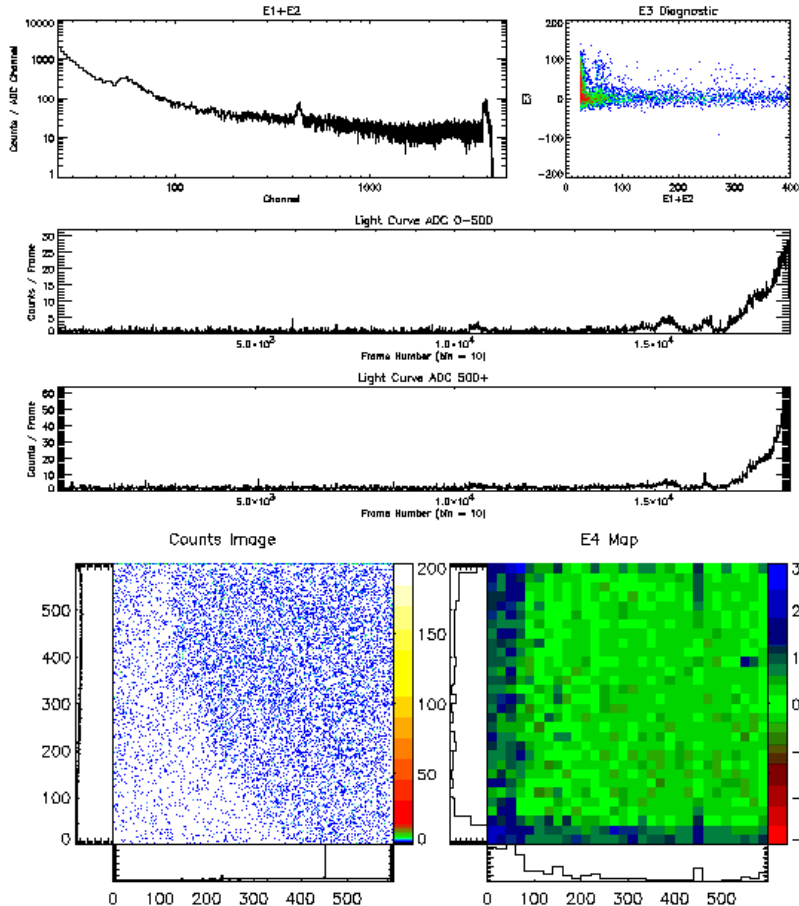
91.9% of events are pattern 31

Raising lower threshold from 25DN to 50 DN would also reduce count-rate dramatically



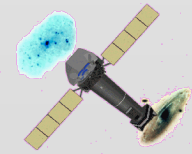
Higher background CCD2 plot

0550_0082890101.J11500120IME.FIT Nevents = 112831
CCID = 2 EDUID = 2 Mono (%) = 59.6494
CCDNODE = 0 EDUMODE = 3 BiP% (%) = 16.0275
WINDOWID = 0 EDUTHR = 25 TrP% (%) = 0.378670
WINDOWY0 = 0 FRNTIME = 26 OdP% (%) = 0.357171
WINDOWDX = B10 EMDHLOW = 0 Pile (%) = 0.0815379
WINDOWDY = 602 EMDHUPP = 4095 P31 (%) = 22.5745



More soft proton background
reduces P31 to 22.6%

But raising LLD to 50 would still
give some reduction



Reducing the MOS data rate

Conclusions

Simple changes to pattern acceptance and lower threshold could reduce the MOS data rate

HBR buffer sizes could be reallocated to give more to CCD1

Need to check if any adverse effect on peripheral CCD radiation monitoring

