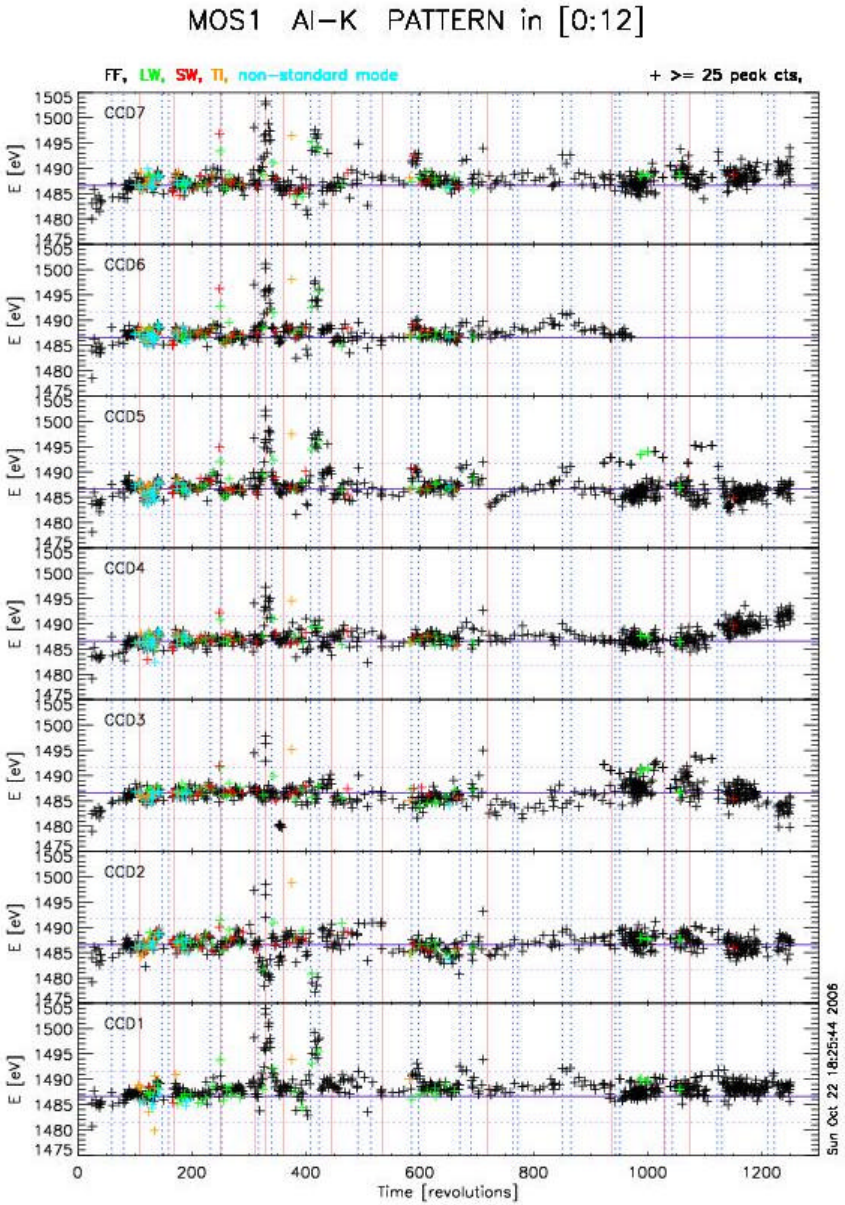
EPIC MOS Monitoring

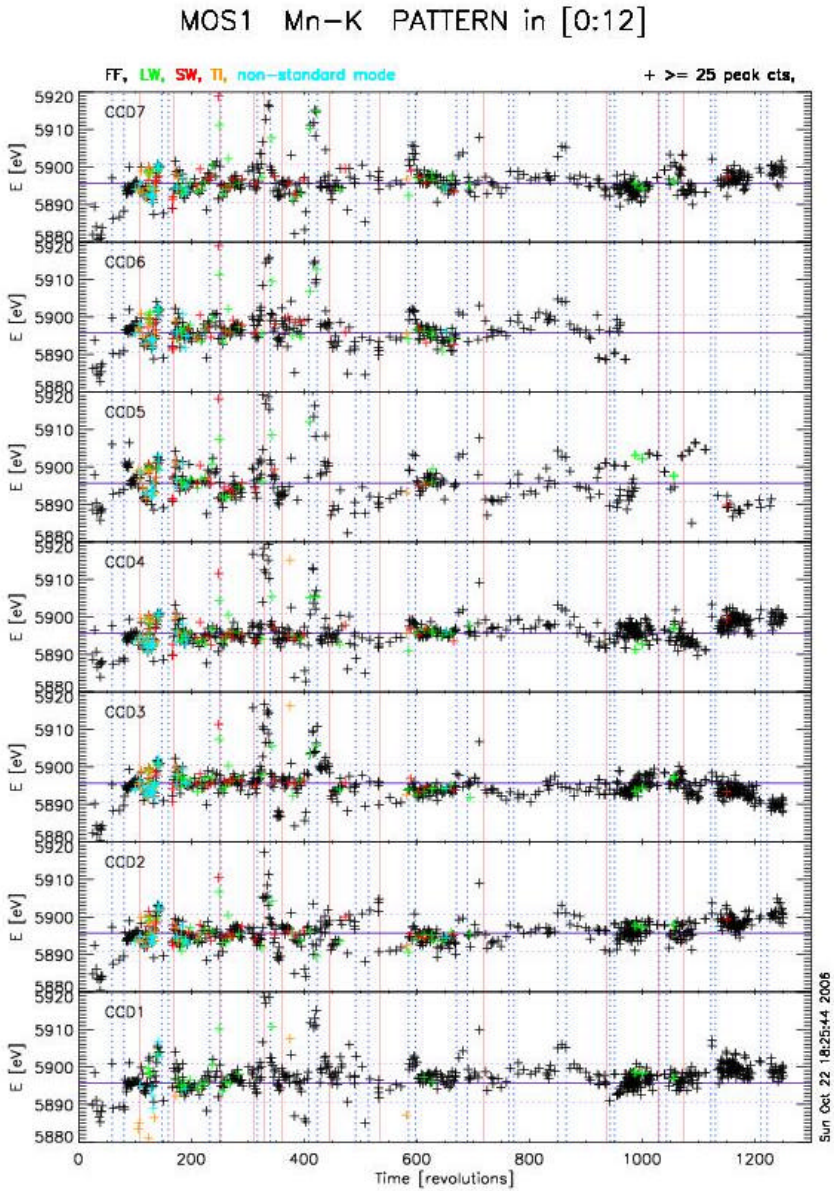
CAL/OPS Meeting

Mallorca 26.-27.10.2006

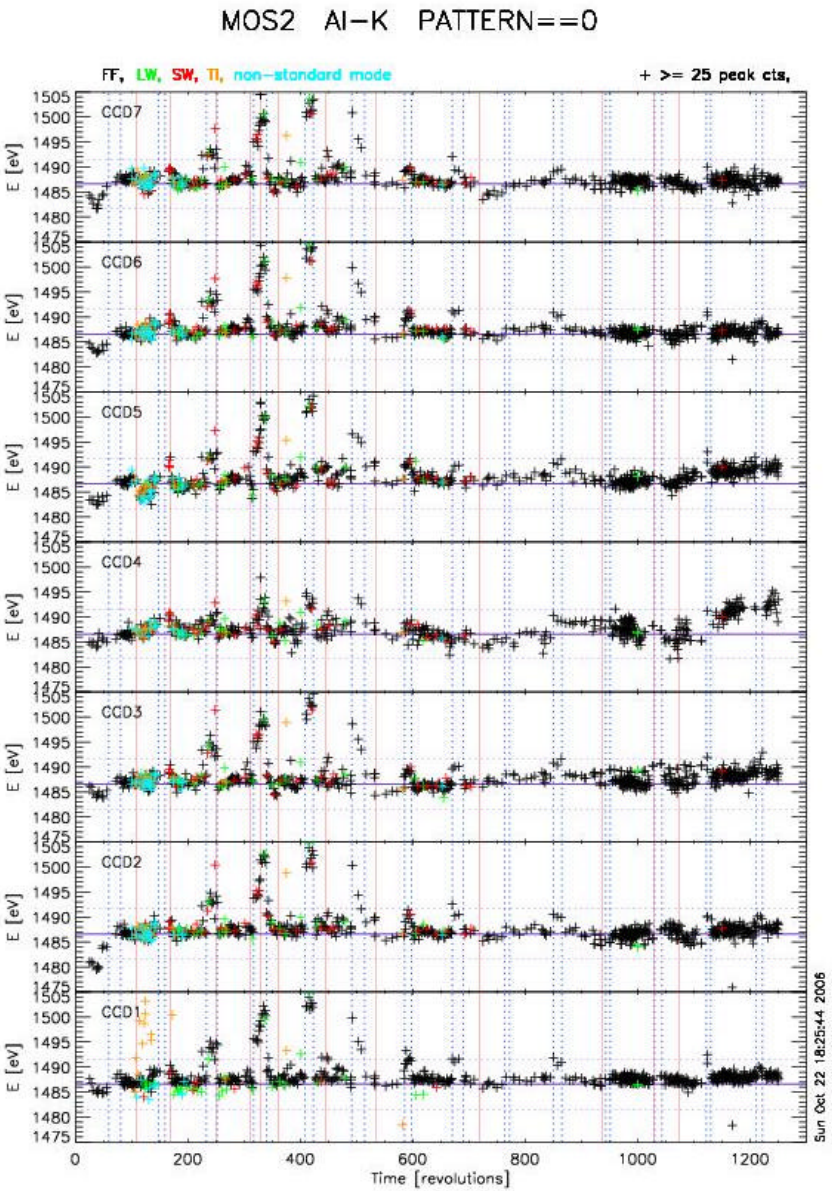
MOS line monitoring

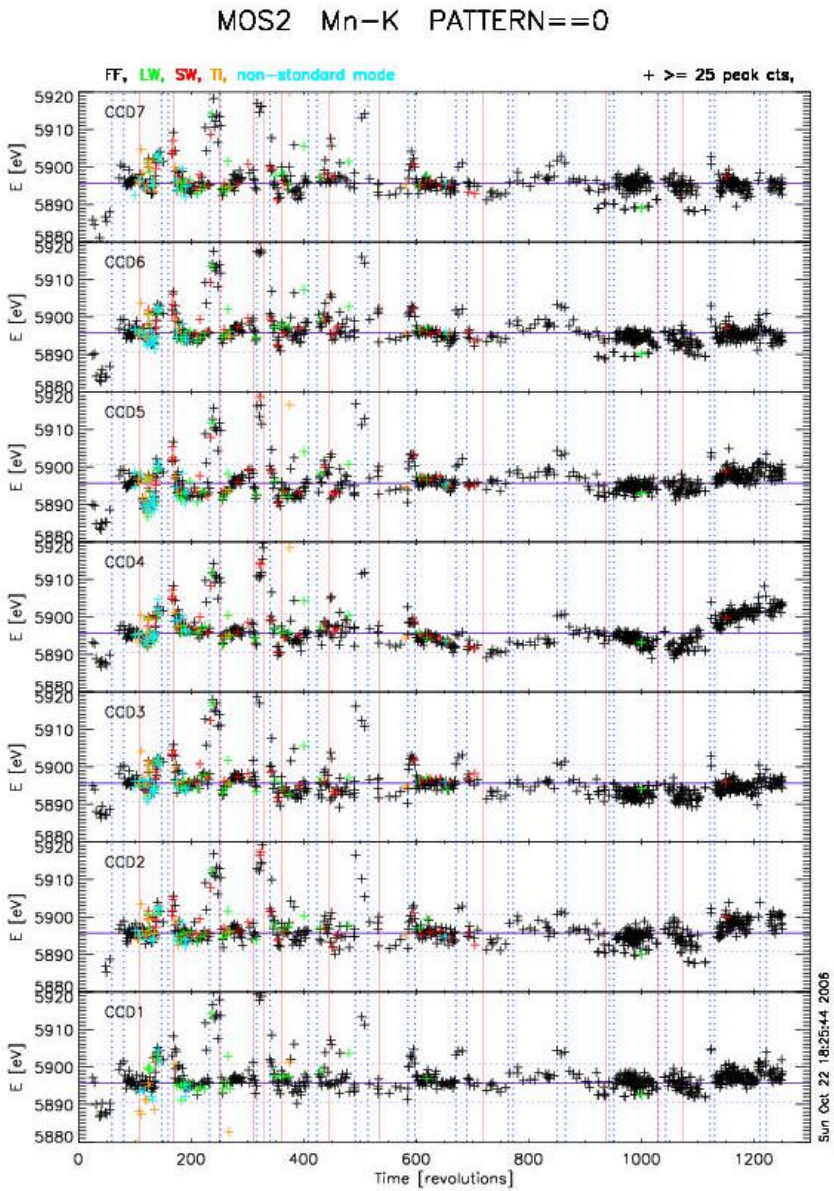
EPIC MOS line monitoring: public CCFs



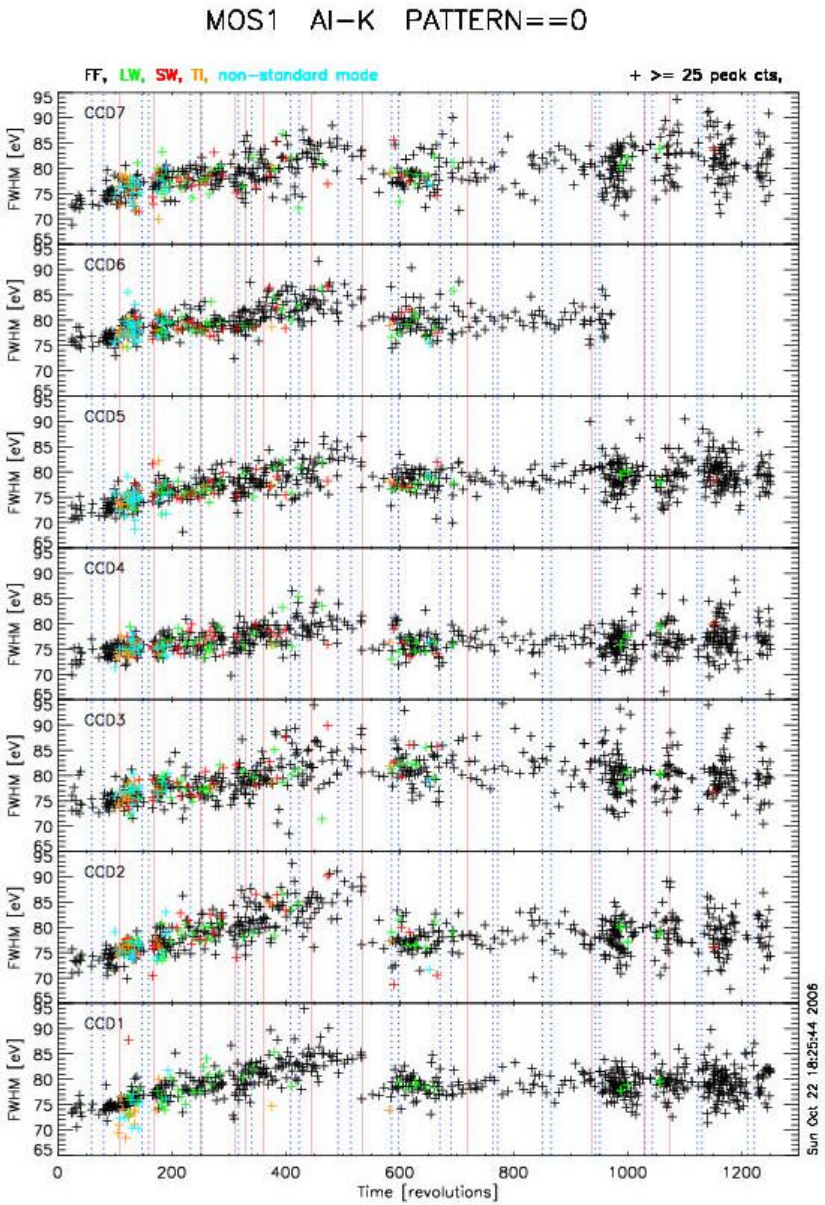


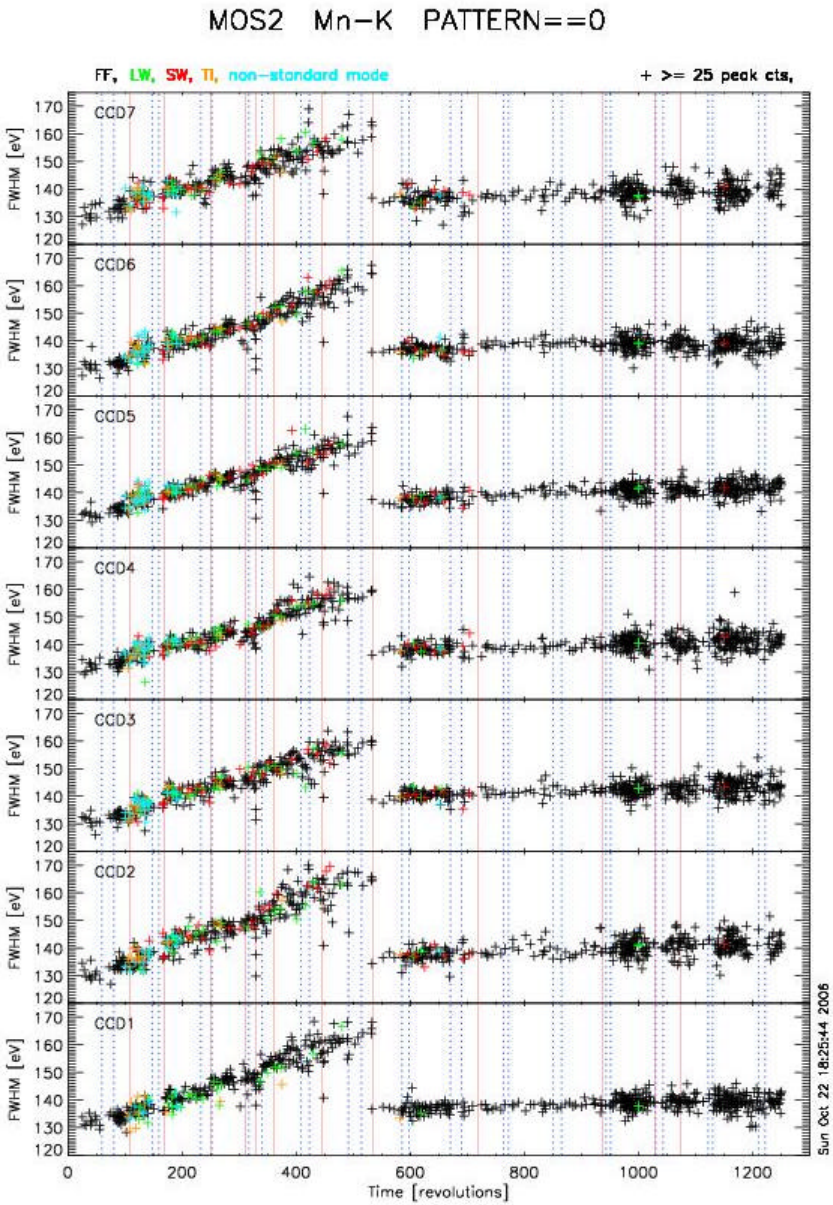
EPIC MOS line monitoring: public CCFs





EPIC MOS line monitoring: public CCFs





MOS CTI monitoring

EPIC MOS CTI monitoring: public CCFs

Parallel CTI MOS1 Al

Parallel CTI MOS2 Al

CCD1

CCD2

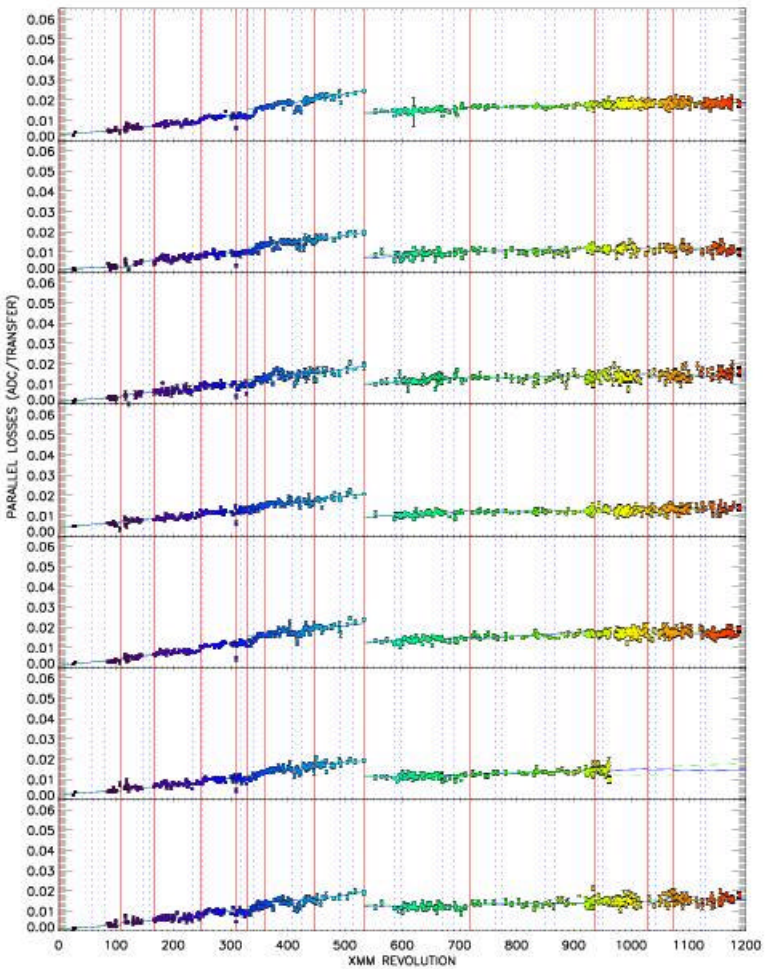
CCD3

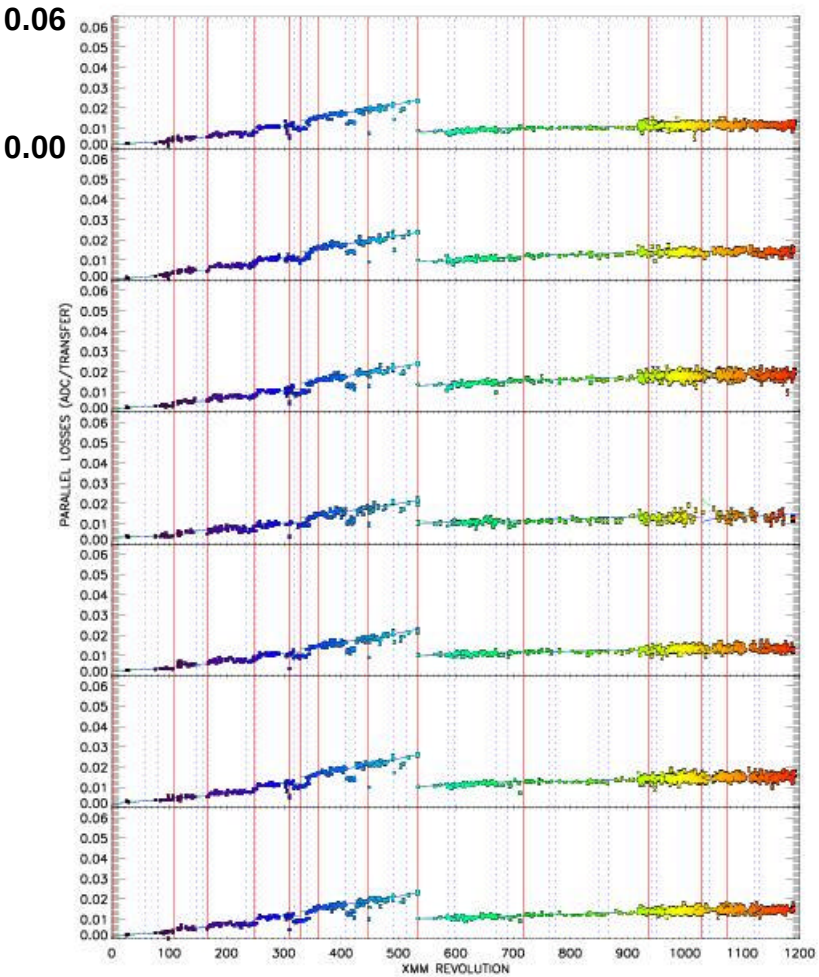
CCD4

CCD5

CCD6

CCD7





EPIC MOS CTI monitoring: public CCFs

Parallel CTI MOS1 Mn

Parallel CTI MOS2 Mn

CCD1

CCD2

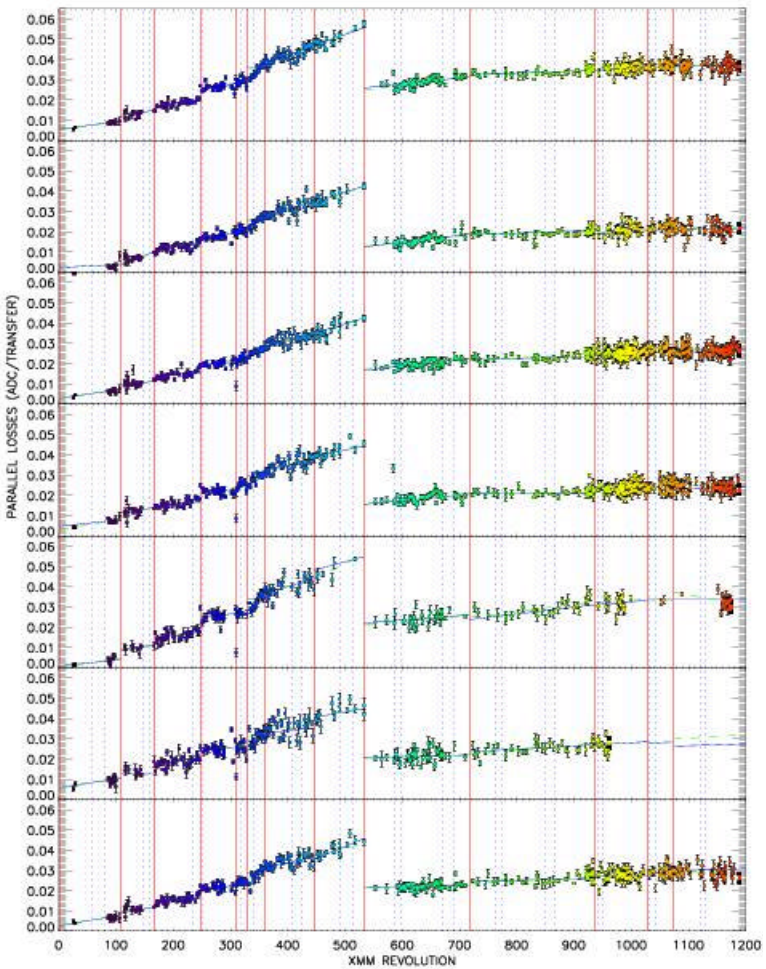
CCD3

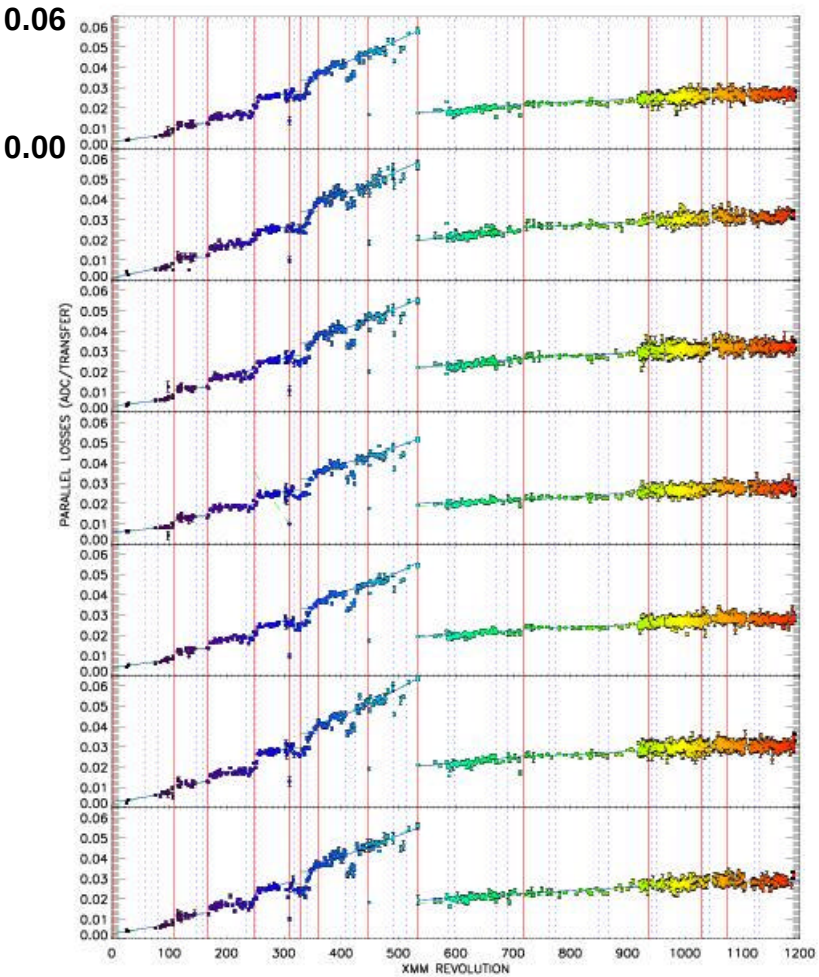
CCD4

CCD5

CCD6

CCD7





EPIC MOS CTI monitoring: public CCFs

Serial CTI MOS1 Al

Serial CTI MOS2 Al

CCD1

CCD2

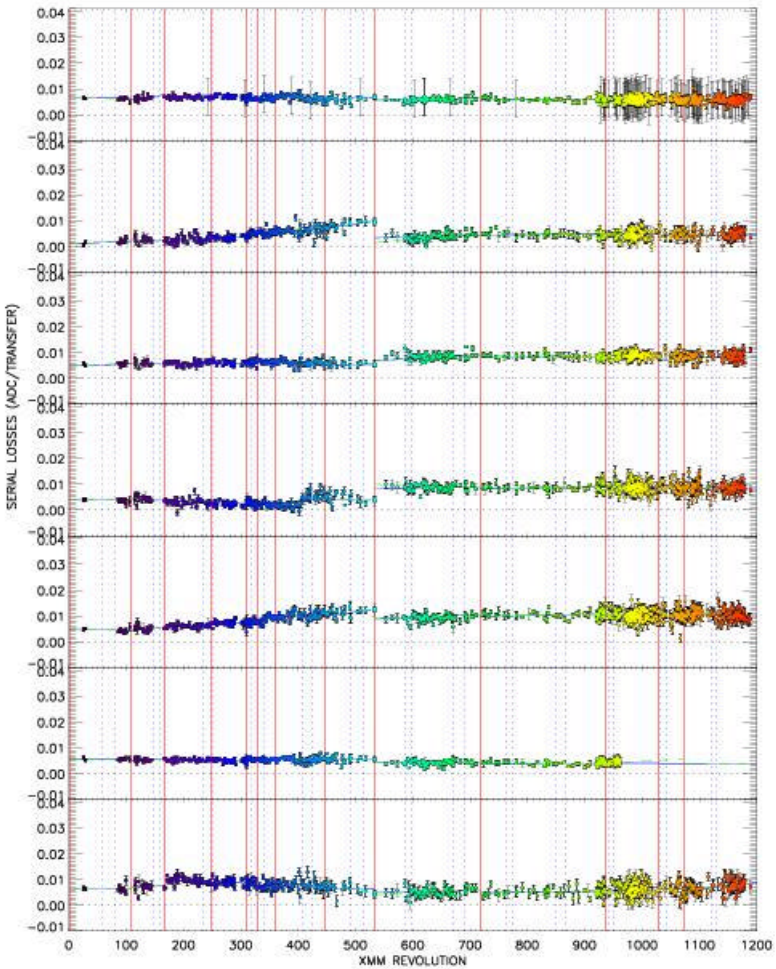
CCD3

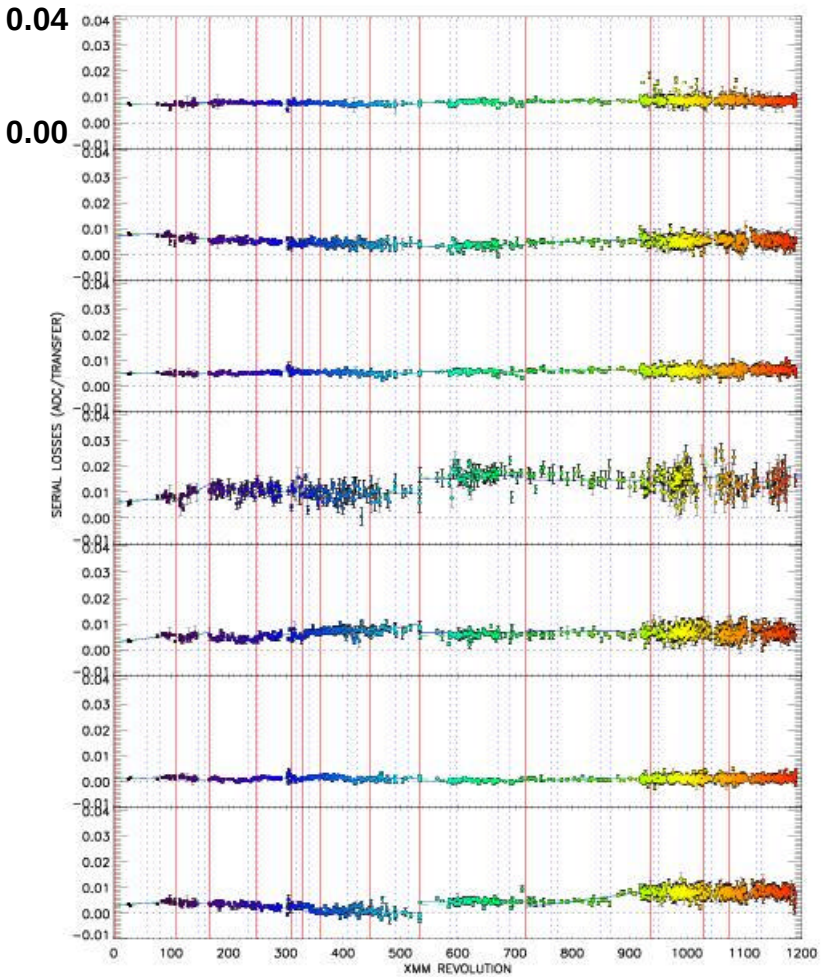
CCD4

CCD5

CCD6

CCD7





EPIC MOS CTI monitoring: public CCFs

Serial CTI MOS1 Mn

Serial CTI MOS2 Mn

CCD1

CCD2

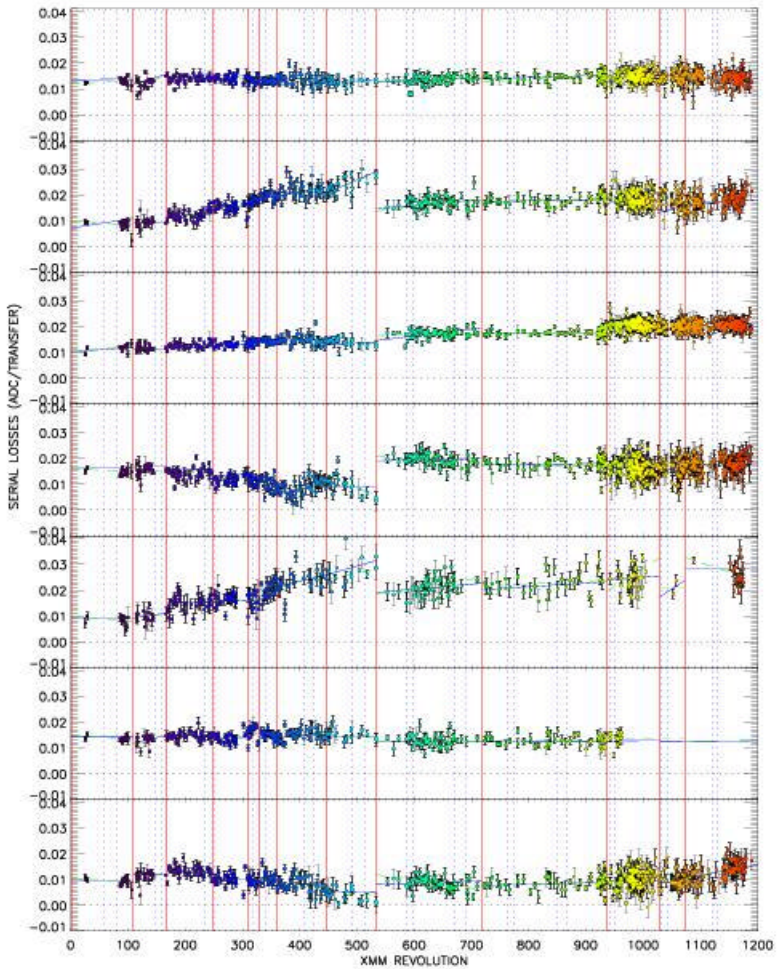
CCD3

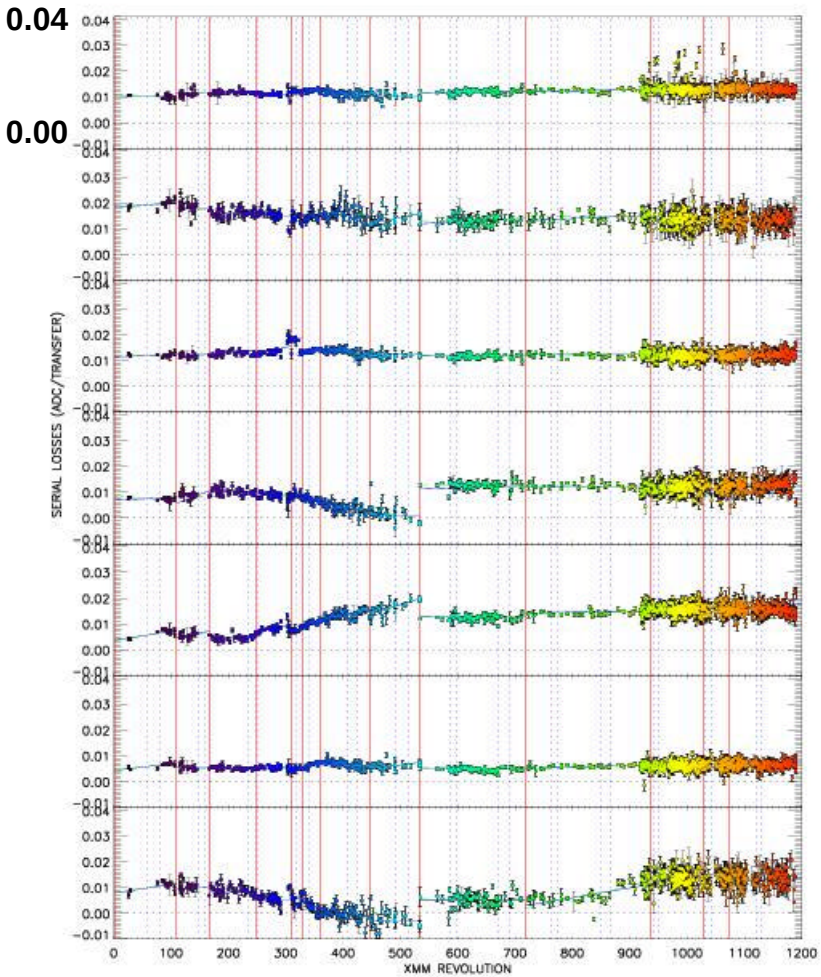
CCD4

CCD5

CCD6

CCD7

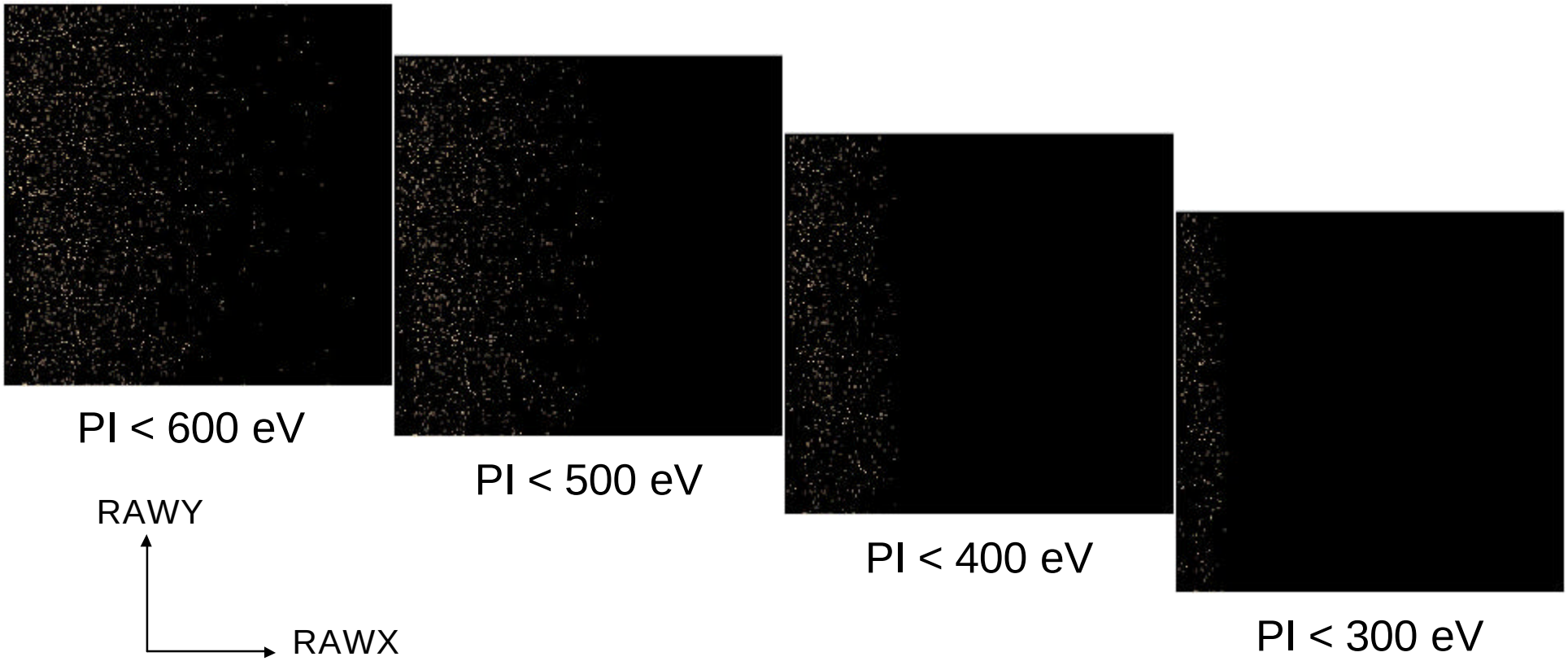




EMOS CTI/ADUCONV CCFs epoch07 update

Low energy images using EMOS2_CTI_0024.CCF:

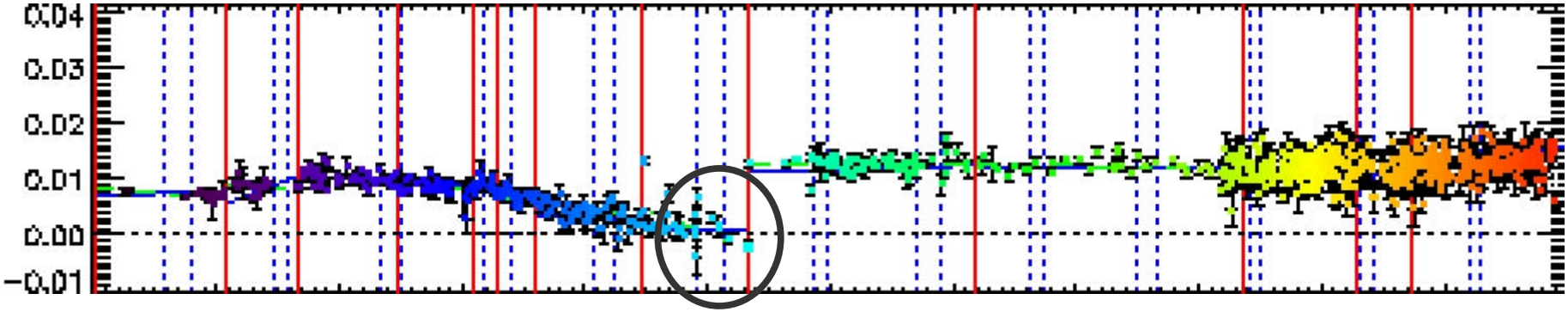
- RAWX/PI dependency for MOS2 CCD4



EMOS CTI/ADUCONV CCFs epoch07 update

Problem identified in MOS2 CCD4 serial CTI parameters:

- $CTIY = (601.97 + 0.0 \cdot t) \cdot E^{-1.83}$
- Serial CTI disappears for MOS2 CCD4 in this epoch.
- Maybe artifact caused by damage on 2002-08-12 (rev. 490)?



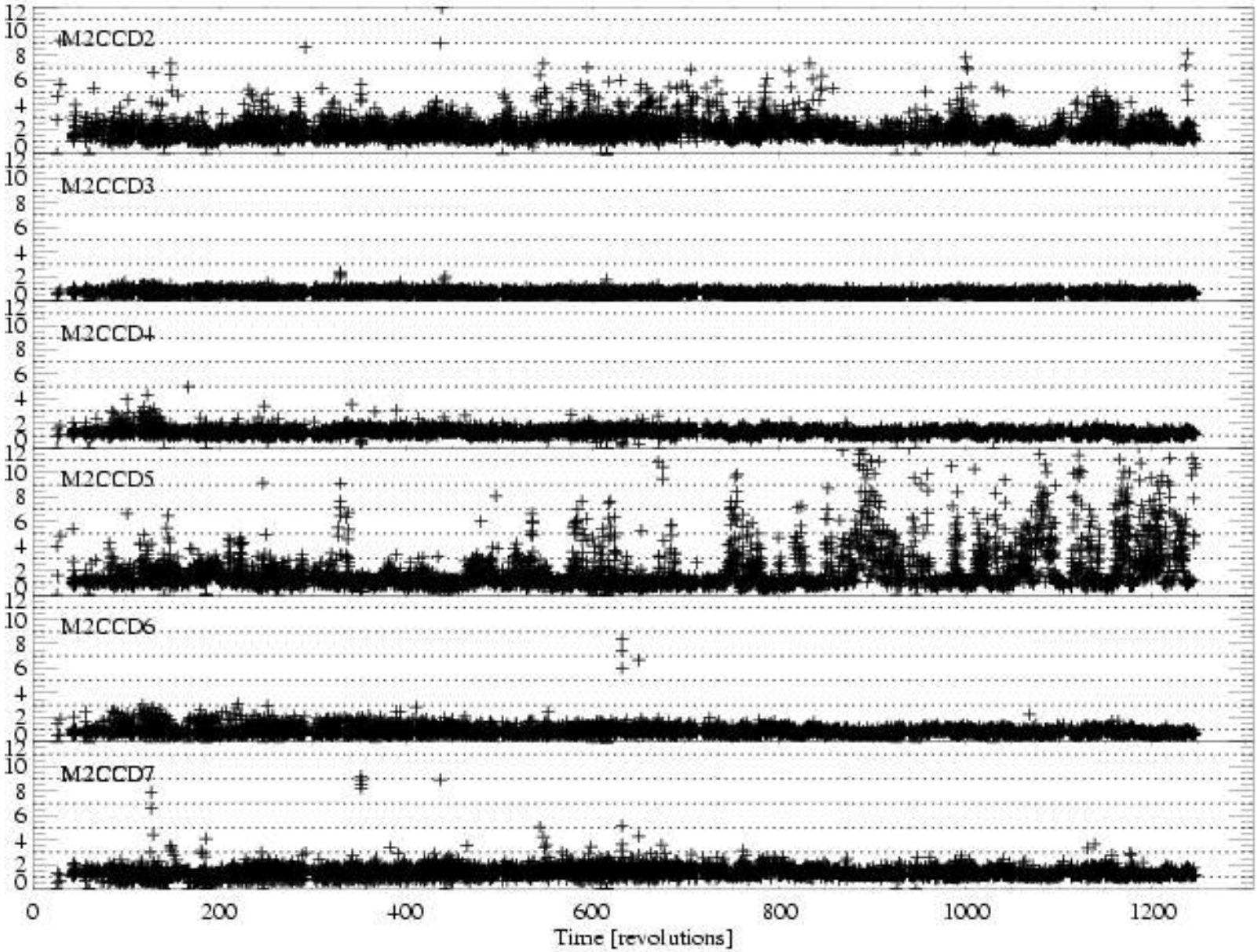
- Replace EMOS2_CTI_0024.CCF and EMOS2_ADUCONV_0036.CCF by new EMOS2_CTI_0030.CCF and EMOS2_ADUCONV_0042.CCF.

MOS low energy noise

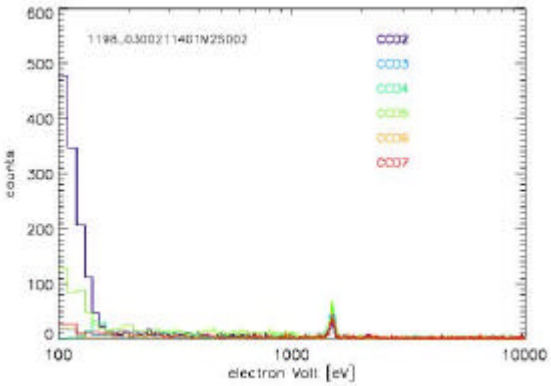
(“MOS2 CCD5 noise”)

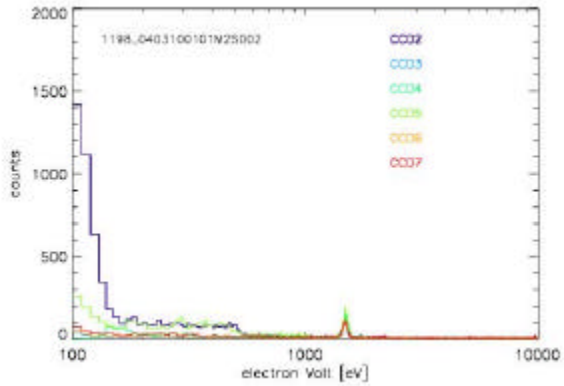
monitoring

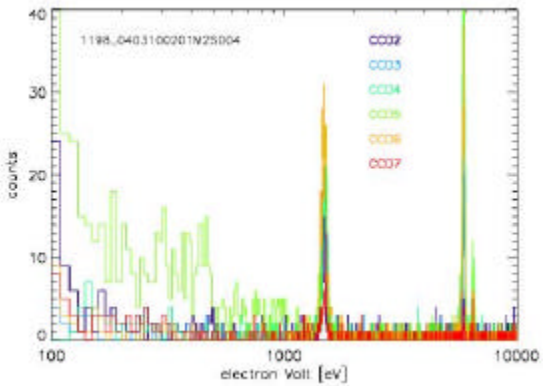
MOS2 low energy noise monitoring

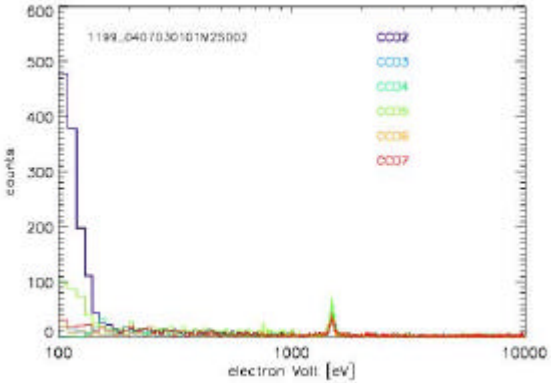


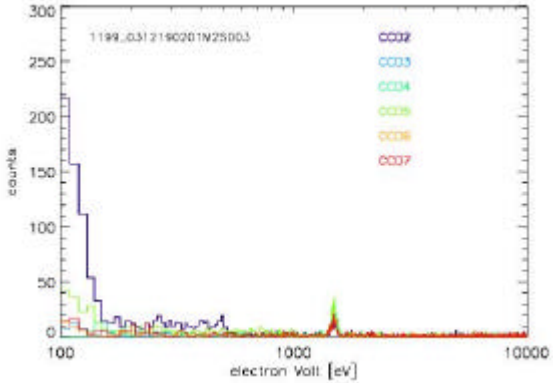
MOS2 noise examples of CCD5 and CCD2

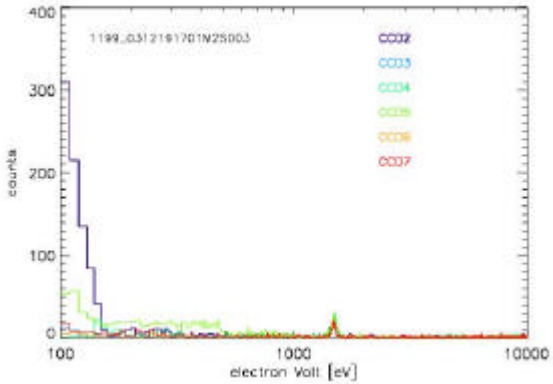


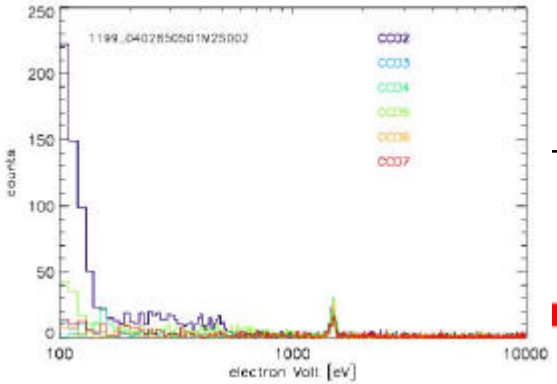


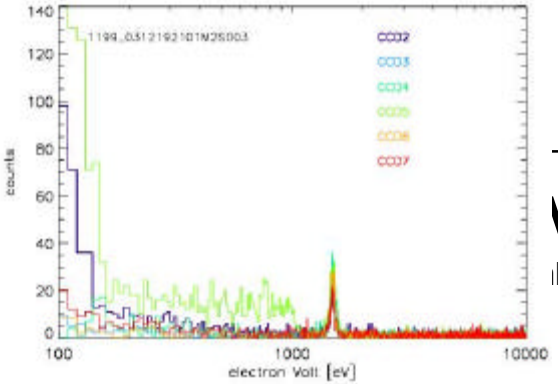




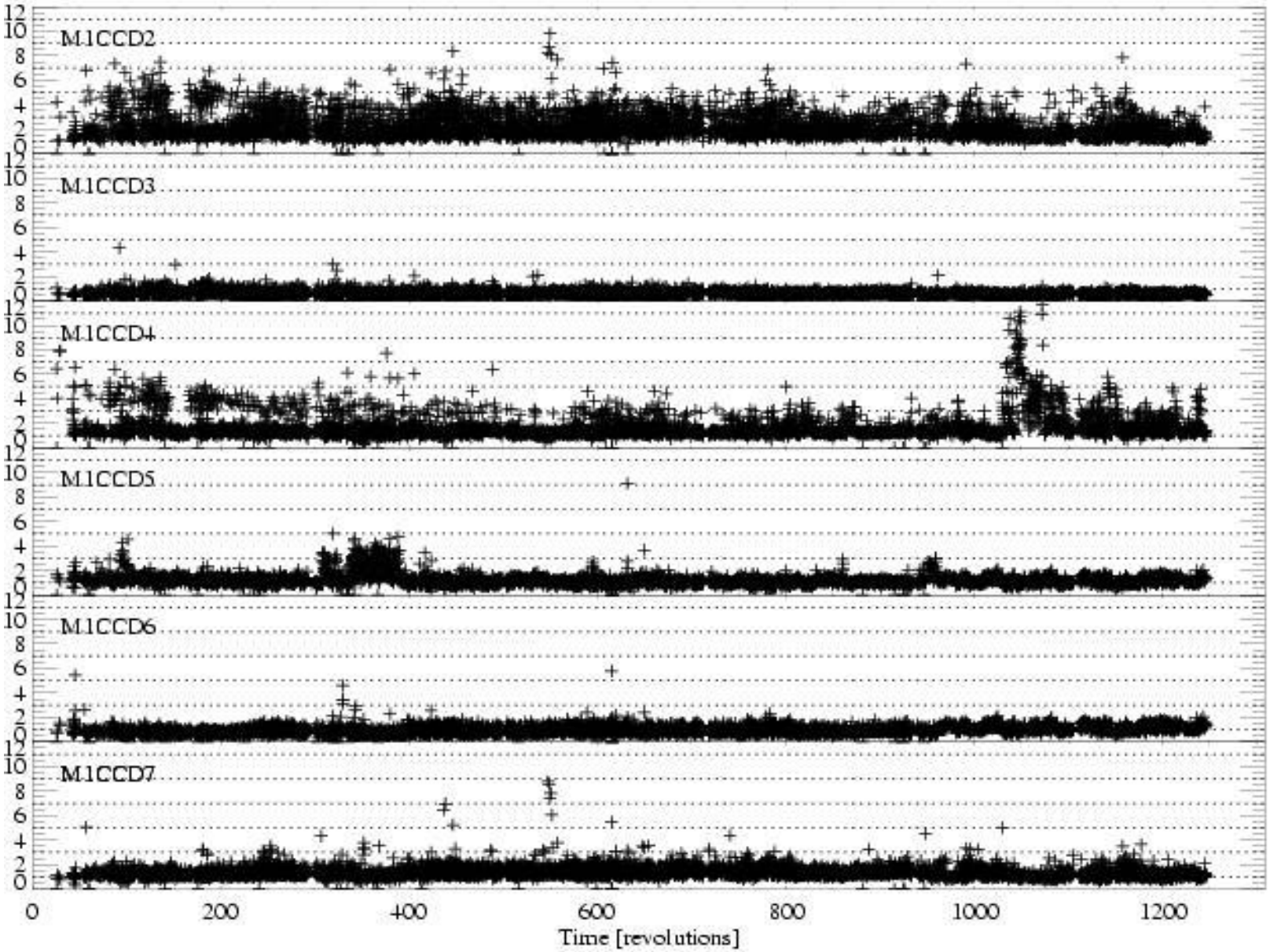




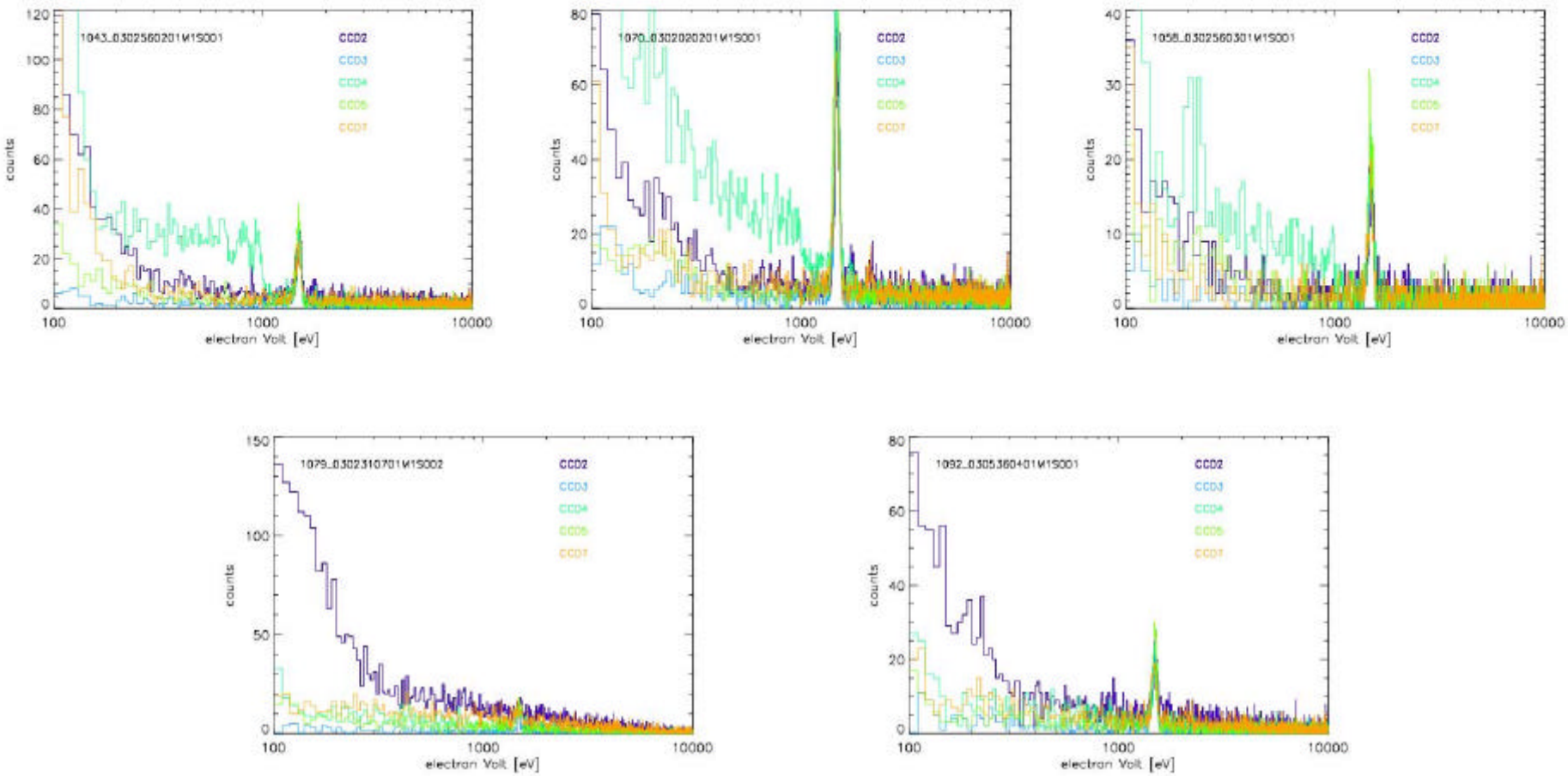




MOS1 low energy noise monitoring



MOS1 noise examples of CCD4 and CCD2



Low energy noise monitoring

- **Still searching possible triggers**

- **No trigger found for MOS2 CCD5 from HK parameters:**
  - Radiation monitors (HE0, LE0, RGS1, RGS2)
  - MOS2 CCD5 voltages (K1181-1196)
  - MOS2 Focal plane temperature (K1253)
  - Many more temperatures and voltages (EMVC, EMCR,…)

- **Search was repeated for MOS1 CCD4**
  - Present from begin of the mission,
  - Sudden and frequent re-appearance
  - No trigger could be found yet.

  - Any idea?

Monitoring of the “meteorite” column in MOS1 CCD1

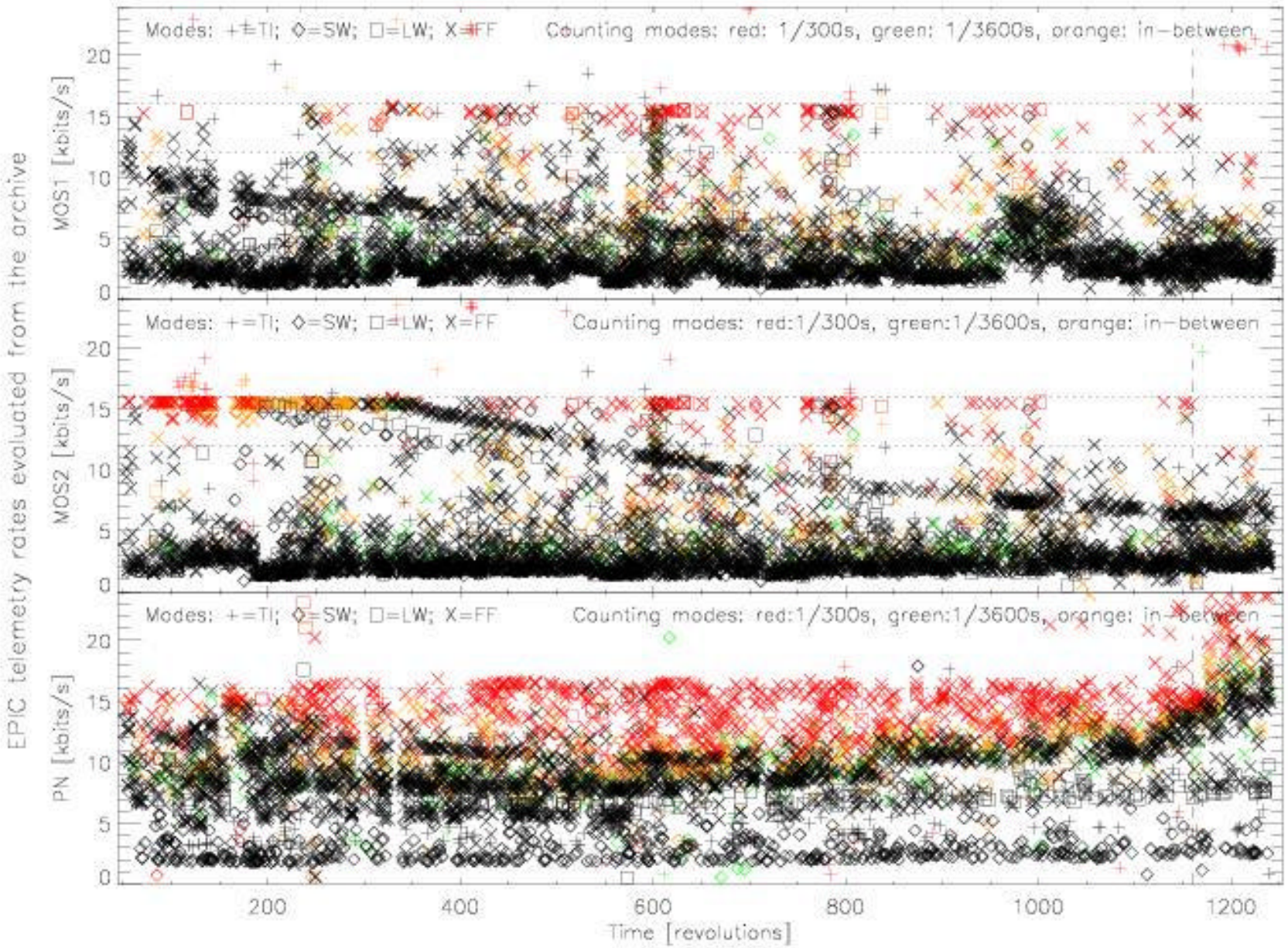
Disappeared (?)

- Column was off since change of on-board offset June 2005.
- Re-appeared in rev. 1100-1115: Diagnostic shows column offset to be 130 ADU (instead of 123 ADU).
- At lower level or disappeared in rev. 1116-1122: Diagnostics show column offset back on expected level.
- During and after eclipse phase rev.1123-1135 column sometimes is hot and sometimes normal.
- No hot column from rev. 1136-1148.
- Column present in single exposures from 1149-1156.

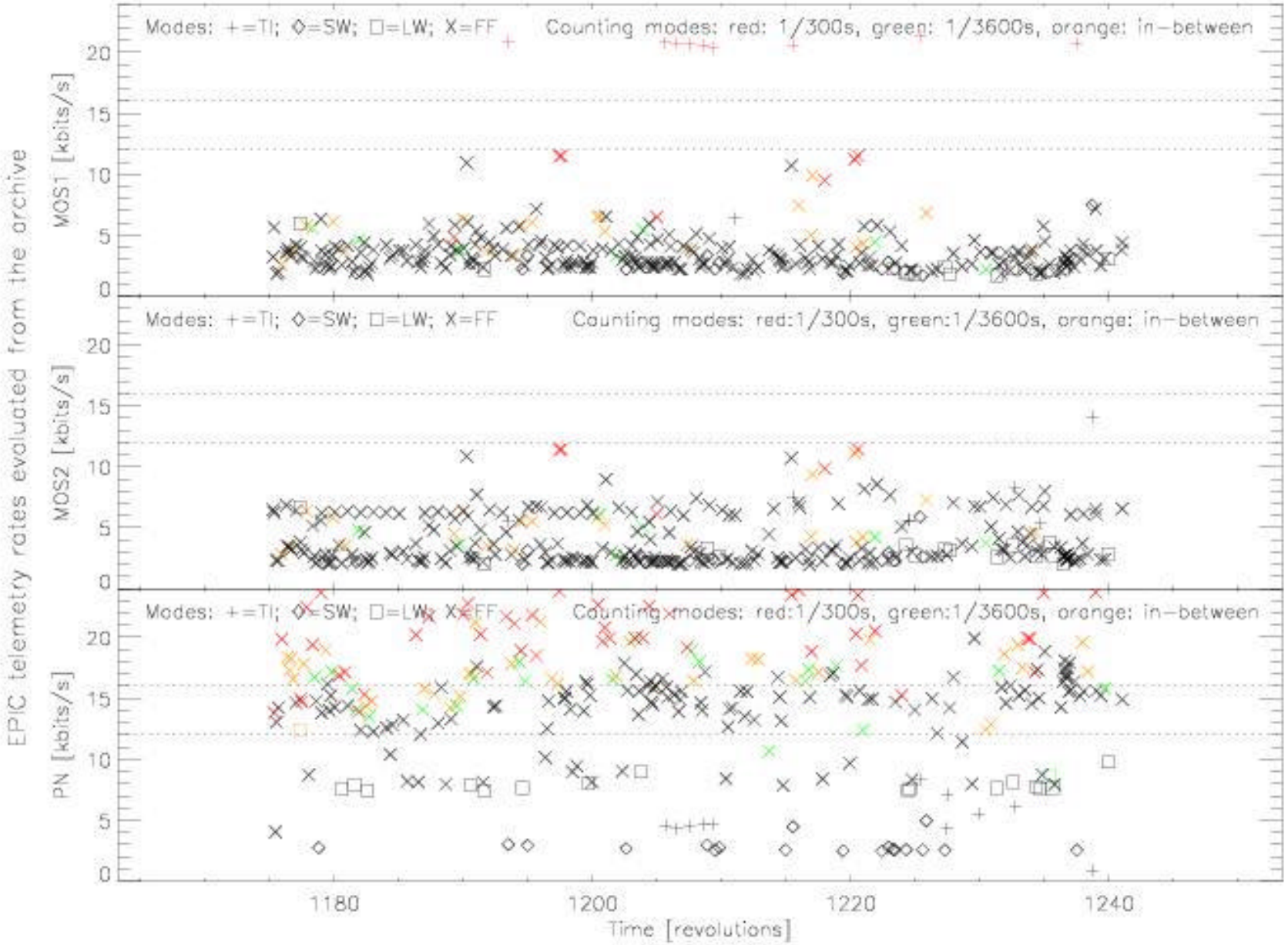
- **No hot column since rev. 1157 (-1258) in imaging modes, but in several timing modes.**

EPIC telemetry monitoring

Required telemetry of EPIC instruments



Required EPIC telemetry revs. 1175-1240



Critical observations of revs. 1175-1240

- In total 312 MOS1 and 311 MOS2 exposures.

- No MOS LW or SW observation was affected by counting modes.

- 28 MOS FF observations were affected by counting modes, most due to by high radiation. Exceptions are:
  - 1/300 sec: CAS A, IC 4518 A
  - 1/300-3600 sec: GRB 790406, 87GB 1625+5001, NGC 3976, PSR J1124-5916, GD 362

- 9 MOS1 TI observations were affected by counting modes, all with rates higher than 1/300 sec. None of these has a MOS2 counterpart. Due to hot “meteorite” column.
- 1 MOS2 TI observation exceeded the 12 kbits/sec. Not affected by counting mode. No MOS1 counterpart.

Conclusion

Line energies within 5 eV (MOS2 CCD4 at current epoch 7 eV).
Line widths (FWHM) stable since cooling: ~80 eV at Al energy and ~140 eV at Mn energy.

CTIs are very stable since cooling. Exchanged MOS2 epoch07 CCFs.

Low energy noise present in phases all over the mission, shows different characteristics for individual CCDs. Reason unknown.

MOS1 “meteorite” column did not appear again in imaging modes, but in several timing mode exposures.

New BRAT restricted 7 MOS observations between revs. 1175-1240 (not affected by high radiation).