

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 111
Week 45
08.11.04
Routine Phase

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1 General

The Flight Control Team at MOC has compiled this report with some input provided by the Flight Dynamics Team, ISOC and ISDC.

It addresses the activities from 30.10.04 until 05.11.04 (both dates inclusive) and covers the revolutions 250, 251 & 252.

2 Summary of Activities

The operations were performed according to the planning inputs from ISOC combined with some manual commanding by MOC.

The targets of these revolutions were the Galactic Plane; an OMC Flat Field target (RA 11:18:24.00; DEC +73:30:00.0); the Sagittarius arm tangent (RA 19:00:1.43; DEC +06:55:17.0) and Cygnus X (RA 20:33:10.00; DEC +41:12:00.0). The activities consisted of GPS, staring and raster dithering observations. In addition, OMC Flat Field and Dark Current calibrations were performed.

Note: Some further information concerning the activities is provided in the Appendix.

3 Satellite Status

3.1 Platform

The performance of the platform was good. No new unexpected behaviour / malfunction was identified.

3.1.1 AOCS

The AOCS operations were performed from the timeline during this period.

1 Closed Loop Slew was missed from the Timeline due to problem with guide star selection on DoY 308.

The fuel consumption over the period between 30/10/2004 and 05/11/2004 was 0.132 kg. The remaining propellant is in the order of 166.9323 Kg.

Note: Some more information concerning the AOCS operations and the fuel budget is provided in the Appendix.

3.1.2 Power

The EPS is working nominally, available power from the arrays is of the order of 2100W.

3.1.3 Thermal

The thermal control of the satellite is working well. The temperatures are currently all within the specified operational limits.

3.1.4 OBDH

The OBDH subsystem is working flawlessly. No on-board communications problem was identified.

3.1.5 RFS

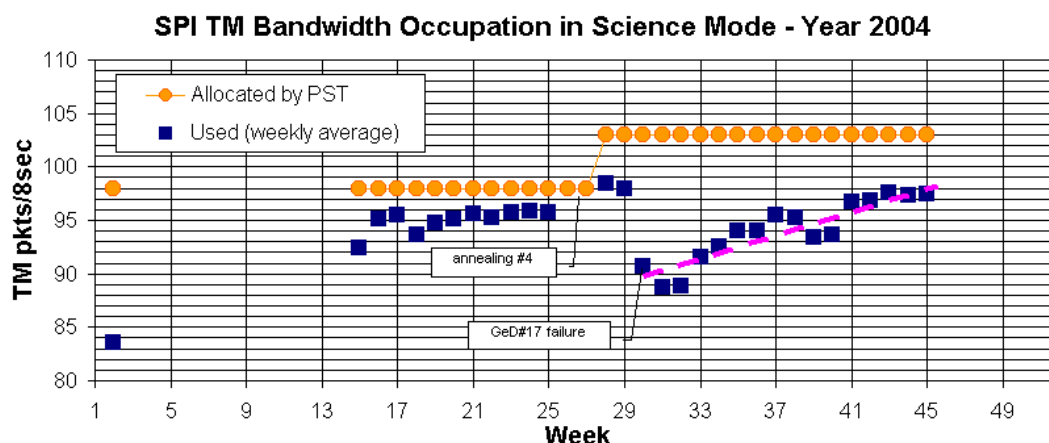
The RF subsystem is working properly. The link margin is sufficient to ensure proper TM reception and execution of commands with the ranging channel enabled.

3.2 Payload

3.2.1 SPI

The overall status of the instrument in this week is nominal, though the PSD (Pulse Shape Discriminator) still continues to randomly reproduce the malfunction of channel rates blanking and an increase in the radiation environment, probably as a consequence of abnormal solar activity, caused of a few other temporary alarms.

The instrument was kept in photon-by-photon mode with spectra TM enabled, an assigned TM bandwidth in the science observation windows of 103 pkts/cycle and an actual average occupation of 97.4 pkts/cycle. The following plot shows the occupied bandwidth, since beginning of 2004.



The cryo-cooler is working well, maintaining the temperature within 85+/-1K.

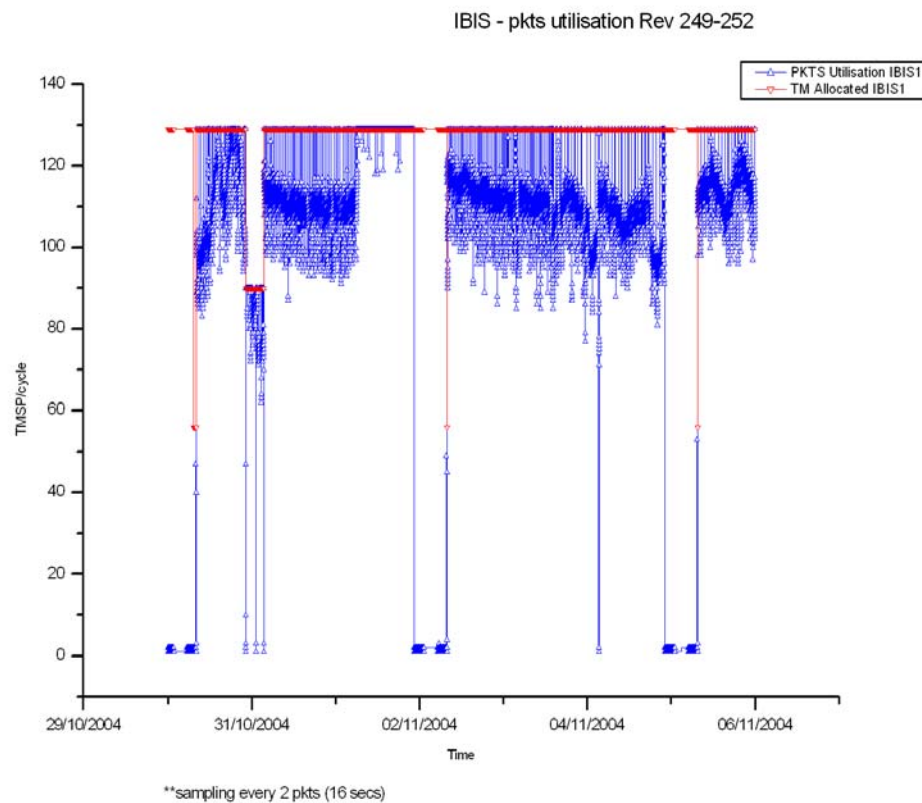
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

The overall status of the unit is Nominal.

During the reporting period the PST allocation to IBIS was 129 TMPS/cycle, but due to an OMC FFC calibration it was changed to 90 TMPS/cycle between 30/10/04 22:17:42 and 31/10/04 03:30:14. The IBIS mean bandwidth utilisation during the observation period was 112.4 TMPS/cycle, up 6.4 on last week.

A plot of the IBIS TM utilisation during the observation period is shown below:



Note: Some more information concerning the IBIS operations is provided in the Appendix.

3.2.3 JEM-X

The status of both JEM-X units is nominal.

JEM-X operations were performed by the automatic Timeline.

JEM-X1 was operated in Data Taking mode during science observations, with a TM allocation of 8 packets/cycle. JEM-X2 remained dormant (DFEE OFF) with a TM allocation of 1 packet/cycle.

Due to high background radiation levels as reported by IREM, JEM-X1 made an autonomous transition to Safe mode in revolution 250 at 2004-11-01T06:21Z. This was about 15 hours before it was due to be commanded to Safe mode before radiation belt entry.

In line with OCR-183, the Broadcast Packet override flags for the IREM count rates were set to DISABLED on 2004-11-05 at 09:42Z for JEM-X1 and at 09:43Z for JEM-X2.

Further information on the JEM-X operations can be found in the Appendix Section 8.3.4.

3.2.4 OMC

The status of OMC is nominal.

During the reporting period OMC operations were performed by the automatic timeline, with the TM allocation to OMC of 5 packets/cycle, except during the Flat Field and Dark Current calibrations from DoY 304 at 22:17:19 until DoY 305 at 03:30:11, when OMC was allocated 63 packets per TM cycle.

There were 171 OMC pointings executed nominally, 30 were lost.

Note: Some more information concerning the OMC operations is provided in the Appendix Section 8.3.5.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by moderate to high solar activity. On the 31st of October 2004, 2 sunspots (691 and 693) presented a threat of X-class solar flare. Consequently, on the 1st of November 2004, the IREM counters (proton & electron) reported moderate to high values. The major event reported was:

SUMMARY: Proton Event 100MeV Integral Flux exceeded 1pfu
Begin Time: 2004 Nov 01 0641 UTC
Maximum Time: 2004 Nov 01 0645 UTC
End Time: 2004 Nov 01 0800 UTC
Maximum 100MeV Flux: 1 pfu

Note: Some more information concerning the IREM operations is provided in the Appendix Section 8.3.6.

4 Ground Facilities

The performance of the Operational ground facilities was very good this week, well above the system performance requirements, 1 pointing was lost due AOCS problems, and 29 due to high radiation.

4.1 Mission Operations Centre

The performance of the MOC was in general good in the reporting period, although there were problems cpu usage on some machines.

4.2 Ground Stations & Network

The performance of the ground stations and Network was in general good this week. There was only one instance of a lost packet from Redu, apart from that nothing. The overall performance was nearly 100%.

4.3 Science Ground Segment

4.3.1 ISOC

1. AO-3

The AO-3 proposal submission was closed as expected 29 October. For statistics reference is made to ISOC newsletter # 13. The proposals were distributed via CD to the TAC members early this week. Internal scrutiny of the proposals has started.

2. Mission planning

PSF's up to rev 259 received. Revolutions up to 255 have been planned. TSF's received up to rev 254. Revolution 250 had to be re-planned due to wrong instrument setting caused by a software bug in the ISOC system. No ToO request received. Since revolution 250 the modified sequence of moves of the centre of the 5 x 5 dither pattern, as requested by ISWT, is used. Revolution 250 contains OMC flat field calibration observation

3. Observation status

No ECS up to rev 239 have been received. Corresponding OCS's generated. No extra time credited.

4. ISOC science data archive

No new data available. Preparation for shipping the hardware to Spain is ongoing. The long awaited additional disk arrays has finally arrived. They will be shipped to Spain with the rest of the archive hardware. Agreement reached with ISDC to use the ISOC archive for distribution of public data. This system will provide a browser interface with a common look and feel with XMM-Newton and ISO.

5. ISOC system

Version 10.6.1 has been installed operationally. Due to a bug (see point 2 above) it had to be patched to a version 10.6.2. This version is now stable. This version contains a modification to the sequence of moves of the centre of the 5 x 5 dither pattern as requested by ISWT. A version of the ISOC system that would improve further the sensitivity achievable with a 5x5 dither is available. This version will be used to generate a special test observation to be executed in revolution 257 (TBC). After that this version will be put in operational use if the results from the test observation is satisfactory.

6. Problems

See under point 2 and 5.

7. Move to ESAC / Vilspa

The IFTS upgrade to include the new ESAC node for ISOC has been installed and checked that no interference with current operations occurred. A test to see that the ESAC node can also send data to MOC and ISDC will be performed later this week. The functional tests of the ISOC system installation at ESAC is started and progresses very smoothly.

4.3.2 ISDC

Status of ISDC observation processing on 08/11/2004:

- Latest Standard Analysis completed: observation 02700020001 (3C 273, Revolution 207) on 31/10/2004

- Latest products archived: observation 02200100003 (SGR1806-20, Revolution 225) on 05/11/2004

- Latest observation products sent to the observer: observation 02201450001 (Mkn 590, Revolutions 207 & 209) on 08/11/2004

5 Special Events

6 Anomalies

There were a number of problems related to the ground segment that impacted the operations:

- On DoY 304, at 18:45, it was noted that the Archiving and file clean tasks were not running on MADDS-B idda, and the fileclean not running on MADDS-B iddb, these were later started at 20:03, 20:06 & 20:09 respectively.
- Later, at 21:57, a bad frame was received from Redu, there was no impact.
- On DoY 306, at 06:14, the nctrs-a was in a yellow state, with the event logger briefly consuming 67% of the cpu.
- On DoY 307, at 06:47, the event log on the nctrs-a was using 42% of the available cpu.
- On DoY 308, at around 23:00, during the handover from Redu to DSS-16, the links were set incorrectly such that the TC was via DSS-16, and the TM from Redu. This was noticed before it impacted the mission, and corrected.
- On DoY 309, at 08:50, the TM desktop on sun121 had to be restarted due to high cpu load, which caused some TM packets to be discarded..
- At 13:50, the ssh2 process on nctrs-a was using between 65 and 91% of the cpu.
- On DoY 310, at 00:20, the event logger on nctrs-a was consuming 50% of the available cpu for about 1 minute. No action was taken.
- At 13:32, the idda displays were red in the MMI, due to a failed burn process that was later restarted, there was no impact.
- At 21:37, the MMI for nctrs-a was indicating yellow with the event log consuming 73% of the available cpu.

No new anomaly reports were entered into the ARTS system this week.

7 Future Milestones

The Next eclipse season starts on the 23rd November 2004, and continues until the 17th December 2004. There will be a total of 9 eclipses, with a maximum duration of 57 minutes 41 seconds on 8th December 2004.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 250

The observations in revolution 250 began with a GPS lasting ~13 hours. This was followed by a staring observation at the OMC Flat Field target (RA 11:18:24.00; DEC +73:30:00.0) lasting ~3.5 hours, during which OMC Flat Field and Dark Current Calibrations were performed. A raster dithering observation of the Sagittarius arm tangent (RA 19:00:1.43; DEC +06:55:17.0) was then performed for the remaining ~42.5 hours of observation time.

Throughout these observations SPI, IBIS and JEM-X1 were in their nominal science modes and the JEM-X2 DFEE remained off. During the OMC Flat Field observation, OMC was in FFCalibration followed by DCCalibration mode and for the other observations it was in Normal Science mode. The TM allocation between the instruments was IBIS 90; SPI 84; JEM-X1 8; JEM-X2 1; OMC 63 for the OMC Flat Field observation and IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5 during the other observations.

Revolution 251

The observations in revolution 251 consisted of a raster dithering observation of the Sagittarius arm tangent (RA 19:00:1.43; DEC +06:55:17.0) lasting ~30 hours, followed by a raster dithering observation of Cygnus X (RA 20:33:10.00; DEC +41:12:00.0), performed for the remaining ~31 hours of observation time.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 for which the DFEE remained off, and the TM allocation was IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

Revolution 252

In revolution 252 a raster dithering observation of Cygnus X (RA 20:33:10.00; DEC +41:12:00.0) was performed throughout the available observation time (~62 hours).

Throughout this observation all instruments were planned to be in their nominal science modes, except JEM-X2 for which the DFEE remained off, and the TM allocation was IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2004-10-19T17:16:10.000Z	167.2332	F	Automatic TM processing.
2004-10-21T06:33:34.000Z	167.2191	F	Automatic TM processing.
2004-10-22T16:45:21.000Z	167.1977	F	Automatic TM processing.
2004-10-24T06:23:41.000Z	167.1802	F	Automatic TM processing.

2004-10-24T19:23:59.000Z	167.1656	F	Automatic TM processing.
2004-10-25T17:00:41.000Z	167.1399	F	Automatic TM processing.
2004-10-27T06:15:17.000Z	167.1296	F	Automatic TM processing.
2004-10-27T15:07:26.000Z	167.1141	F	Automatic TM processing.
2004-10-27T22:16:39.000Z	167.0645	F	Automatic TM processing.
2004-10-30T06:05:56.000Z	167.0501	F	Automatic TM processing.
2004-10-30T14:58:21.000Z	167.0200	F	Automatic TM processing.
2004-10-31T16:27:12.000Z	166.9899	F	Automatic TM processing.
2004-11-02T05:51:32.000Z	166.9730	F	Automatic TM processing.
2004-11-03T16:21:19.000Z	166.9442	F	Automatic TM processing.
2004-11-05T05:39:15.000Z	166.9323	F	Automatic TM processing.

This report was generated Fri Nov 5 08:00:19 GMT 2004

8.3 Detailed Satellite Information

This section contains some detailed information concerning the various subsystems of the satellite and instruments.

8.3.1 AOCS Summary Operations Report 30/10/2004-05/11/2004

AOCS operations were executed from the Automatic Timeline.

During this period, 60 Open Loop Slews, 153 Closed Loop Slews and 6 Momentum Biases were executed. 1 slew was missed. This is equivalent to a 0.5 % loss.

30/10/04 (Day of Year 304, Revolution 249-250)

Loss of Guide star: At 05:37:51, the guide star at location [18630, 2198], magnitude 7.65 (catalogue: 0471-02351-1, M_{V_i} 7.58) was released due to the SEU threshold being exceeded, this caused the OEM 'ACC STR THR EX' to be sent. At 05:38:11, the IMU switched on, and remained on for 10 minutes until 05:48:10. A new guide star was selected at location [-1286, 4544] magnitude 8.45 (catalogue: 0466-02696-1, M_{V_i} 8.37). There was no impact.

31/10/04 (Day of Year 305, Revolution 250)

Nothing to report.

01/11/04 (Day of Year 306, Revolution 250)

Nothing to report.

02/11/04 (Day of Year 307, Revolution 250-251)

Nothing to report.

03/11/04 (Day of Year 308, Revolution 251)

Incorrect guide star used during slew: At 04:11, the guide star was briefly lost causing the IMU to switch on at 04:12:06, a new guide star was chosen (0461-00769-1, M_{V_i} 5.63), which was the star selected by FD for the next slew. The IMU switched

off at 04:22:05. The search and track had failed due to the same guide star being tracked in slot #1 as that selected for the manoeuvre. For this reason, the star initially in slot #2 (0460-00326- 1, M_{Vi} 8.31) and subsequently used as the trim and post-trim guide star was incorrect, leading to the spacecraft performing a manoeuvre to the wrong attitude. A corrective slew was then performed to the attitude of pointing 02510040. The impact was the loss of pointing 02510039.

04/11/04 (Day of Year 309, Revolution 251)

Nothing to report.

05/11/04 (Day of Year 310, Revolution 251-252)

Nothing to report.

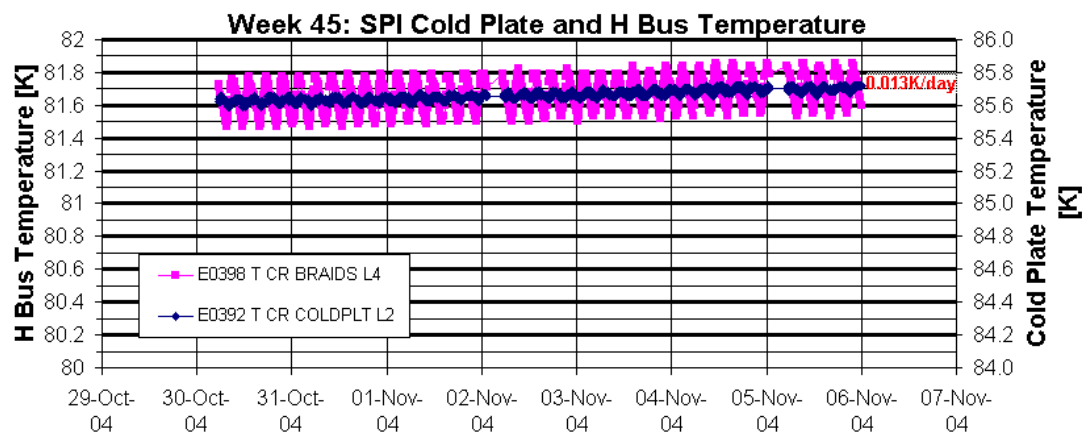
8.3.2 SPI Operations

Cryo-cooler / Detector Cold-Plate:

The performance of the cryo-cooler is nominal.

The cold plate temperature was maintained at 85K $\pm$ 1K showing the expected small positive drift.

The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.

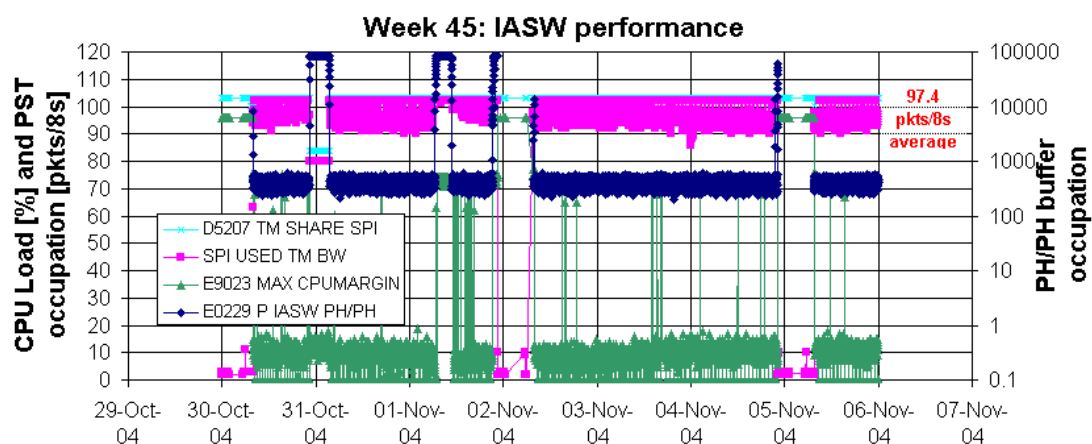


IASW/DPE:

The performance of the IASW/DPE is nominal.

The following diagram shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.

Note: The photon buffer saturation peaks are the consequence of the increased radiation environment.

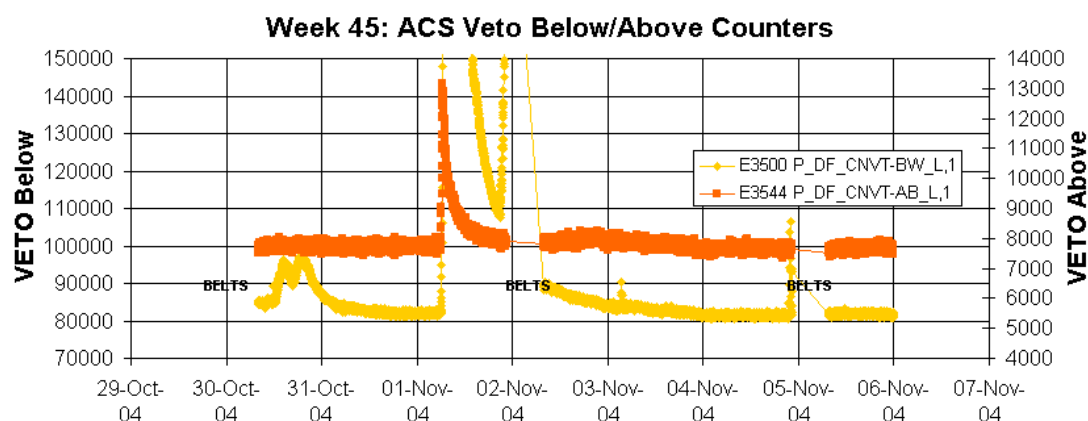


ACS:

The performance of the ACS is nominal.

The following plot shows the ACS overall count rate evolution during the reporting period.

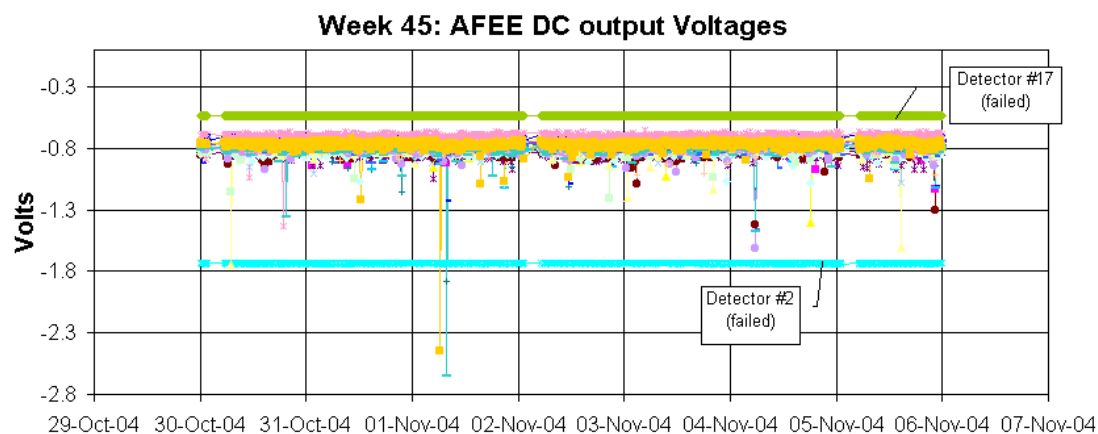
Note: The peaks outside the belts are due to the increase in the radiation environment.



AFEE:

The performance of the detectors is nominal except for the detector #2, failed since 06.12.2003, and detector #17, failed since 17.07.2004.

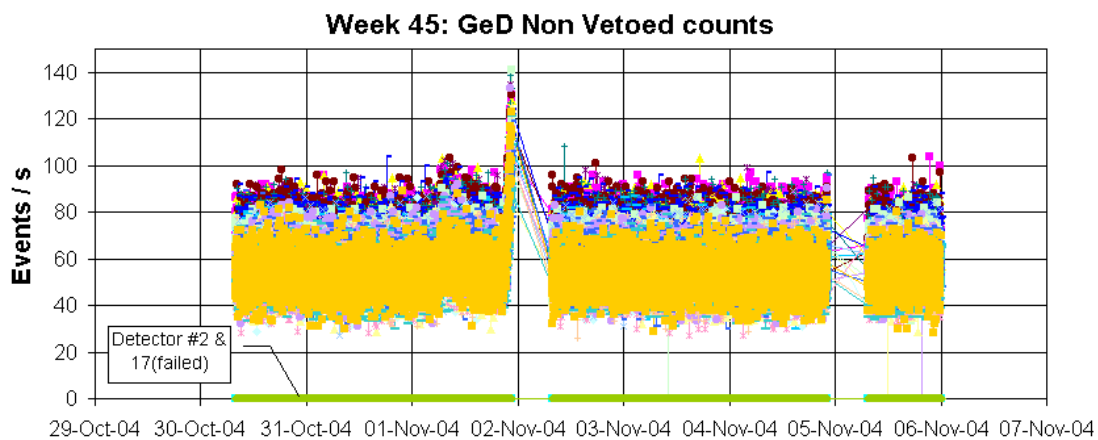
The following plot shows the AFEE dc output signals during the reporting period.



DFEE:

The performance of the unit is nominal.

The following plot shows the Non Vetoed event rates, processed by the DFEE during the reporting period. The count rate of each detector is within the expected range, except for the failed detector #2 and #17.

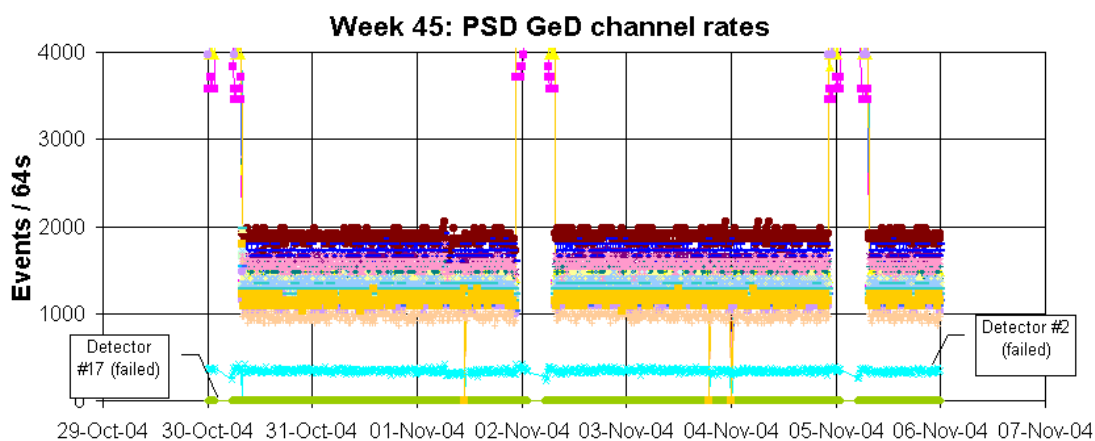


PSD:

The performance of the unit is nominal, though the malfunction of the channel rates blanking reproduced itself also this week (see AR INT_SC-90 for a detailed description of the anomaly).

An IASW patch is under final acceptance testing at Cessr to enable the Sci HK TM downlink inside the radiation belts. This would allow the deletion of the Out-Of-Limit currently defined for the PSD channel rates, thus removing the false alarms associated to the malfunction.

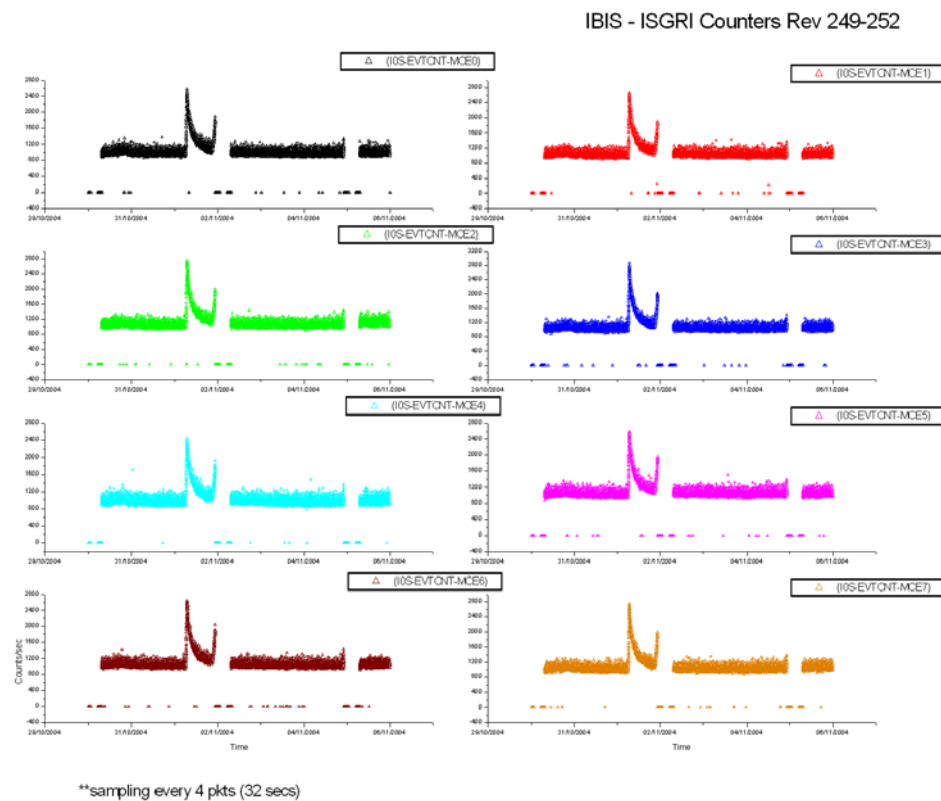
The following plot shows the PSD channel rates during the reporting period.



8.3.3 IBIS Operations

IBIS Event Counters Plots.

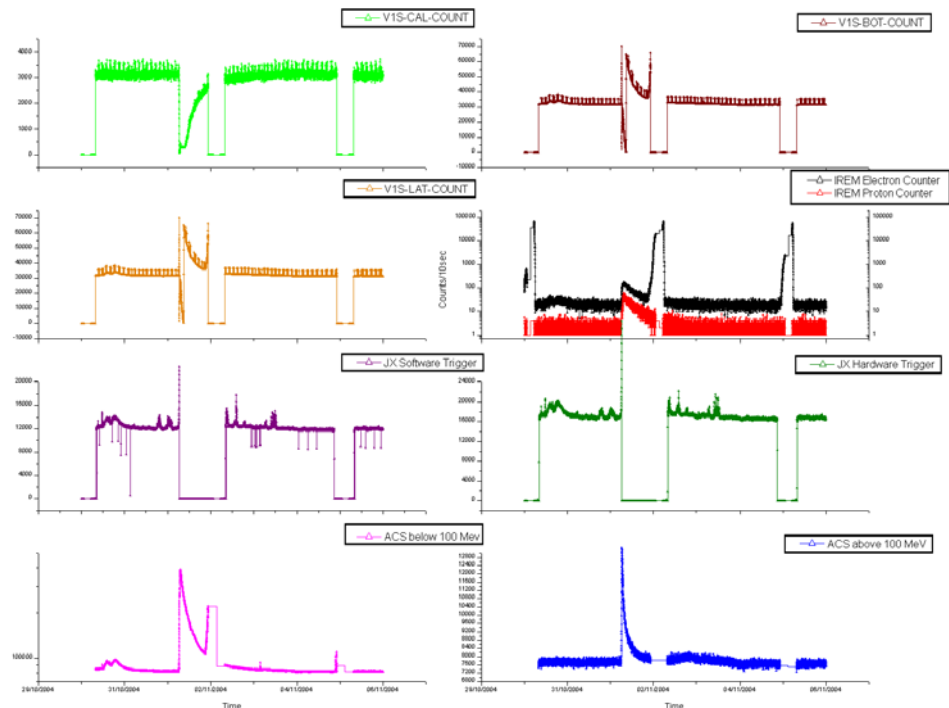
ISGRI Counters:



VETO vs Payloads Counters

The week was characterised by moderate to high solar activity. On the 1st of November 2004, the IREM counters (proton & electron) reported moderate to high radiation but still within the IBIS radiation thresholds set on these IREM counters.

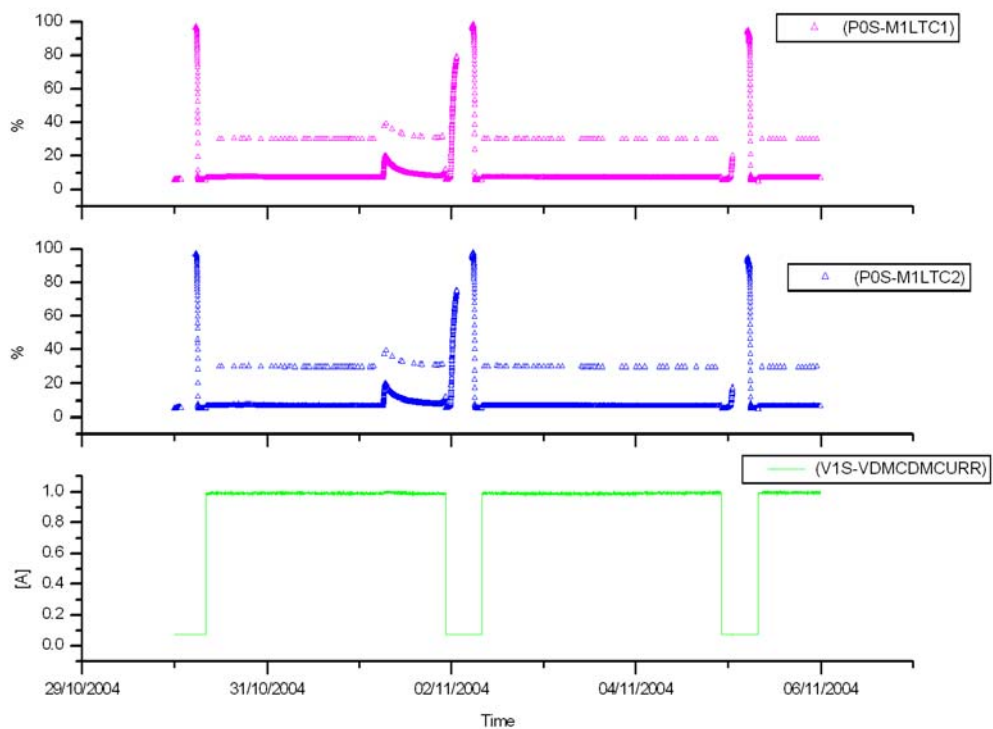
IBIS-VETO vs Payloads Counters Rev 249-252



**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

Veto Current:

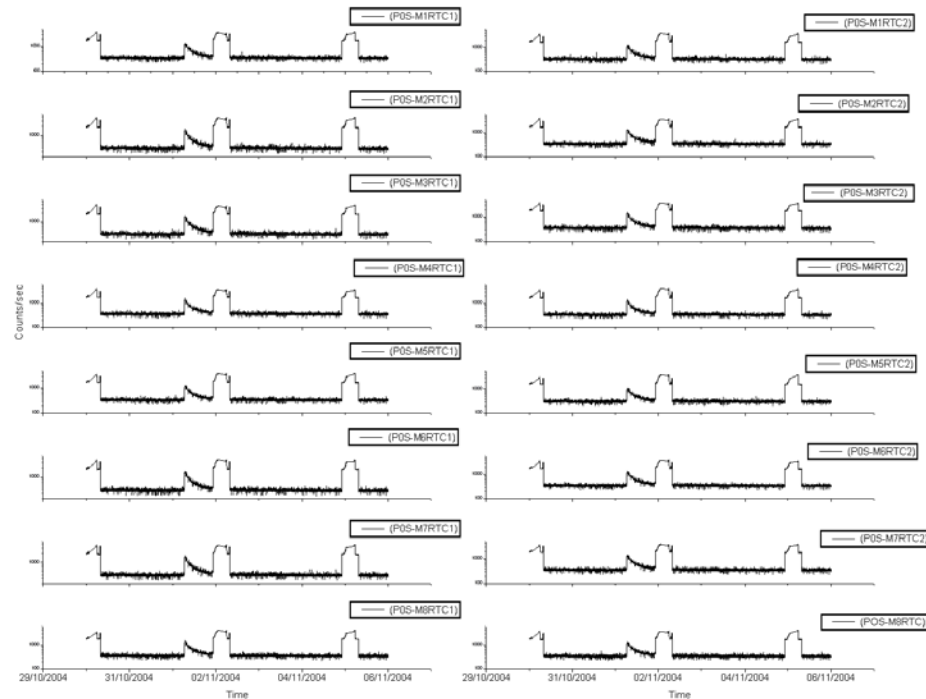
IBIS-VETO Current & PICsIT dead times Rev 249-252



**sampling every 4 pkts (32 secs)

Picsit Counters:

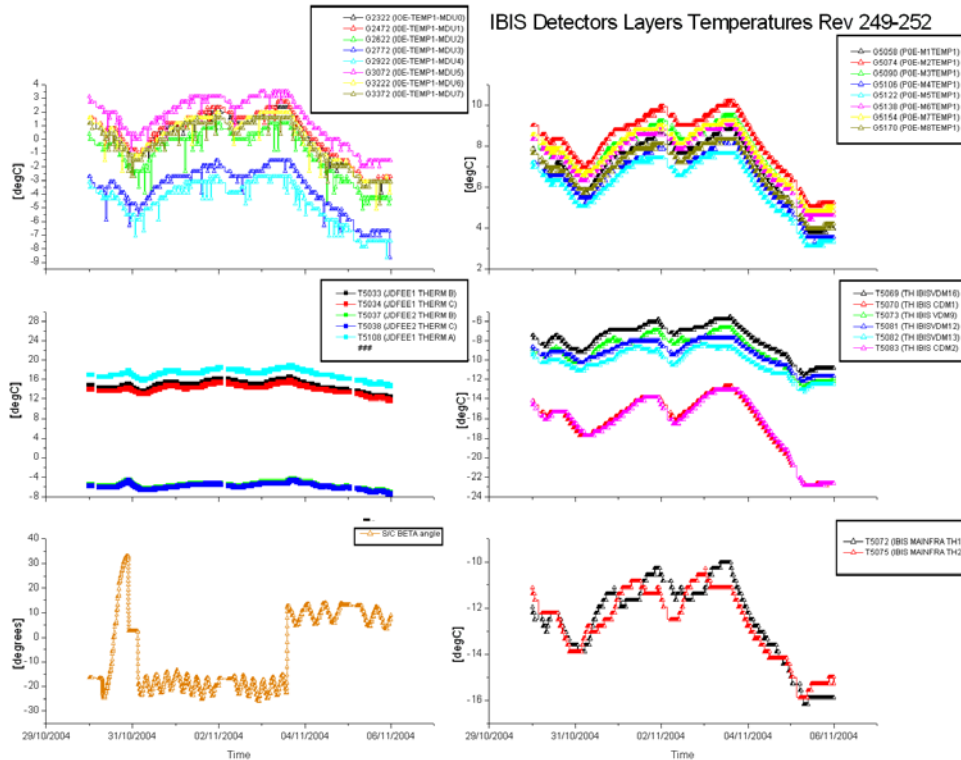
IBIS - PICsIT Counters Rev 249-252



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures

IBIS Detectors Layers Temperatures Rev 249-252



**sampling every 8 pkts (64 secs)

IBIS daily report

DoY 2004.304 (30/10/04)

Nothing to report.

DoY 2004.305 (31/10/04)

Nothing to report.

DoY 2004.306 (01/11/04)

At 06:14Z the VETO calibration counter (G6061) went Out Of Limit hard-low due to an incoming solar flare, it then returned within limits. At 06:19 for the same reason both VETO lateral and bottom counters (G6063 and G6062) went OOL high.

Between 6:34Z and 6:50Z, counters of semi-module 1 for PDM 2, 3, 4, 6, 7 and 8, and of semi-module 2 for PDM 3 (G5007, G5012, G5017, G5027, G5032, G5037 and G5013) went OOL high, in addition to the event counters for MCE 2, 3, 4, 5, 6 and 7 (G2041, G2055, G2069, G2083, G2097 and G2111), and the temperature 2 of MDU 1 (G2023). The comparison with the equivalent reference parameter G2472 (Temp1 MDU1) reported by HK3 pkt does not show evidence of any problem for the unit.

At 06:28Z and 08:36Z, G8080 went OOL high and back. This TM parameter features the rate of valid event on HBRA interface, and was triggered by the high radiation context.

Finally at 17:32Z, G6061 went OOL hard-low again, still due to the high radiation background.

All these OOL were due to the high radiation background that characterised this period. No reaction was required and no automatic on-board reaction reported because none of the on-board radiation thresholds was exceeded.

DoY 2004.307 (02/11/04)

At 06:35Z, the VETO 28V PMT set by IASW (G8015) was continually toggling between nominal and warning high. According to the Payload Recovery document, as this happened inside Radiation Belts, no further action was taken. Investigations are on going at IBIS team to understand the origin of the misbehaviour.

DoY 2004.308 (03/11/04)

Nothing to report.

DoY 2004.309 (04/11/04)

At 03:26Z, the downloading of the PICsIT histograms stopped, therefore the recovery defined by INT_OR_109 was applied. Then IBIS was set back to Scientific Mode at 03:30Z. And at 03:40Z histograms were reported OK.

DoY 2004.310 (05/11/04)

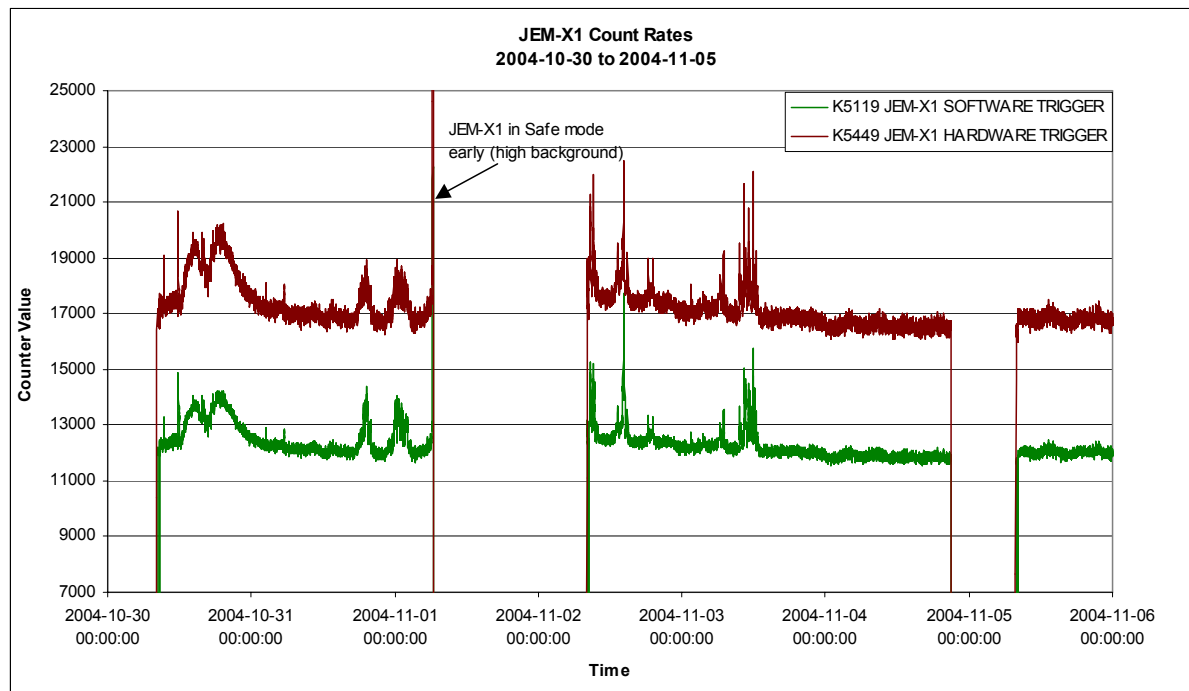
At 05:08Z the VETO 28V PMT set by IASW (G8015) was again toggling between nominal and warning high. According to the Payload Recovery document, as this happened inside Radiation Belts, no further action was taken. Investigations are on going at IBIS team to understand the origin of the misbehaviour.

At 07:26Z, the parameter G2084 (ISGRI Overflow of the noisy pixel address buffer in MCE6) reported OOL (SCC fail), it returned within limits after 10s. According to the Payload Recovery document, no action was taken.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

JEM-X count rates over the reporting period are displayed in the following graph¹.

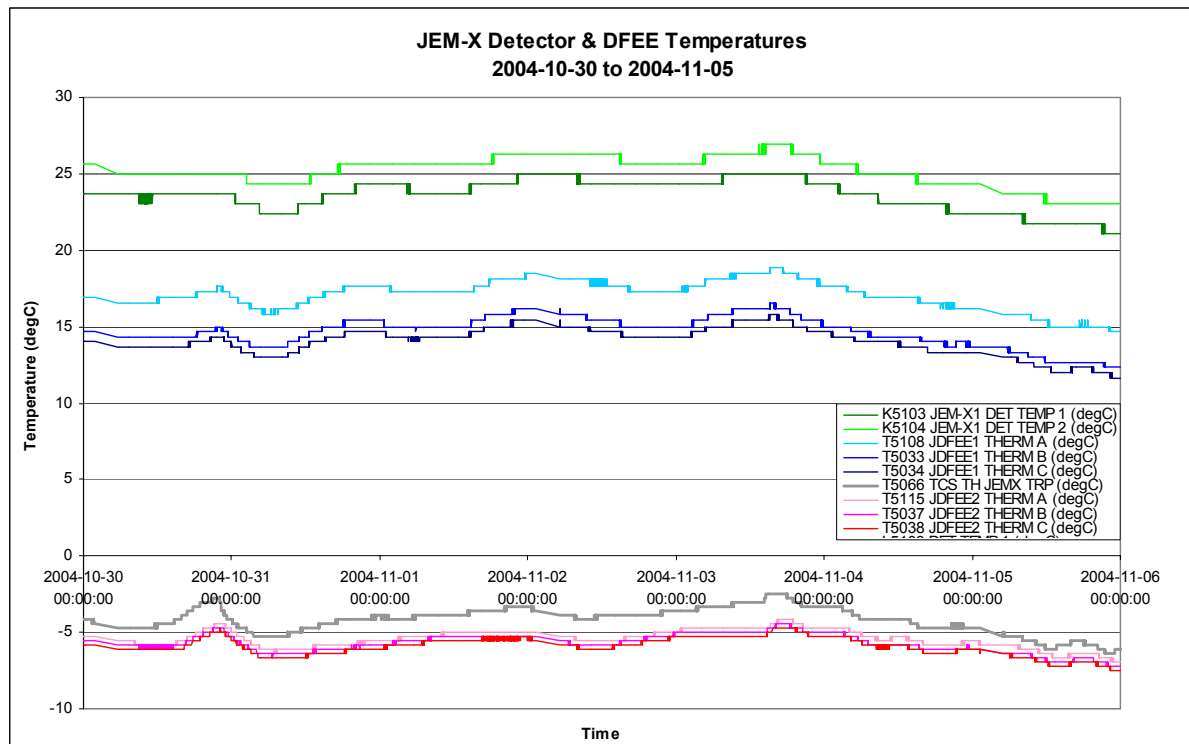


8.3.4.2 JEM-X Temperatures

JEM-X Detector and DFEE temperatures over the reporting period are displayed in the following graph, along with the temperature on the detector bench between the two units².

¹ Data sampled (1 frame in 4) and smoothed to remove spikes in S/W Trigger due to flushing of buffer after slews.

² Data sampled (1 frame in 8)



8.3.4.3 JEM-X Daily Report

2004-10-30 (DOY 304, Rev 249-250) to 2004-10-31 (DOY 305, Rev 250)

Nothing to report

2004-11-01 (DOY 306, Rev 250)

At 06:17:49Z the parameter K5449 JEM-X1 Hardware Trigger went soft out of limits (value = 30007). At 06:18:21Z the parameter K5119 JEM-X1 Software Trigger also went soft out of limits (value = 20038). At 06:20:45Z K5317 RAD MONITOR 3 also went out of limits (value = 64) and, after remaining out of limits for 2 TM cycles, caused JEM-X1 to transition to Safe mode autonomously 06:21:09Z (issuing OEM 231 JEM-X1 AUTO EVENT 1). This was ~15 hours before JEM-X1 was due to be commanded to Safe mode by the ED KESAFE01 in the Timeline (scheduled at 21:10:12Z) before radiation belt entry of revolution 250. Commanding to JEM-X1 from the Autostack was disabled at 07:02:55Z. JEM-X1 remained in Safe mode, and Timeline commanding to JEM-X1 remained disabled, for the rest of the day (thus the ED KESAFE01 in the Timeline failed release).

2004-11-02 (DOY 307, Rev 250-251) to 2004-11-04 (DOY 309, Rev 251)

Nothing to report

2004-11-05 (DOY 310, Rev 251-252)

OCR-183, Disable JEM-X1 (& JEM-X2) reactions to IREM count rates in the Broadcast packet, was implemented. The operations were performed according to INT_OR_0177, as follows:

09:42Z FCP_JEM1_0120 executed to set the JEM-X1 BCP override flags for the IREM Radiation Monitor Counters (TM parameters K5474; K5475 and K5476) to DISABLED;

09:43Z FCP_JEM2_0120 executed to set the JEM-X2 BCP override flags for the IREM Radiation Monitor Counters (TM parameters L5474; L5475 and L5476) to DISABLED.

8.3.5 OMC Operations

On DoY 304 at 22:17:31, a sequence of OMC Flat Field calibration started. The schedule continued as follows:

Calibration 1 start 22:17:31 end 22.44.58

Calibration 2 start 22.48.19 end 23.15.38

Calibration 3 start 23.16.34 end 23.44.02

Calibration 4 start 23.44.50 end 00.12.18 on DoY 305

Calibration 5 start 00.13.06 end 00.27.38

Calibration 6 start 00.28.26 end 01.05.54

Finally there was a Dark Current calibration, which started at 01.12.19, and finished at 01.27.47. The unit was returned to stand-by at 01.44.18. During the time from 22:17:19 on DoY 304 until 03:30:11 on DoY 305, OMC was allocated 63 packets per TM cycle.

On DoY 306, at 06:32:19, due to high levels of radiation, the unit autonomously switched to SAFE mode. Later at 07:00, the OMC commands from the timeline failed owing to the unit still being in this state:

```
2004.306.07.00.58.808 2004.306.07.00.51.430 1792 Real Time Rejection 131
REJECTED TC1
FIX2=0 M5010=2,SAFE M9079=3 M9080=131 M5001=60,IM A M9068=1 FIX2=0 M9069=630
2004.306.07.00.50.479 2004.306.07.00.45.430 1792 Real Time Rejection 131
REJECTED TC1
FIX2=0 M5010=2,SAFE M9079=3 M9080=131 M5001=130,RESET IM M9068=1 FIX2=0
M9069=629
```

These commands correspond to the M1130 RESET IM, and MU1310 IMAGING A commands for the pointing 02500076. The impact of the radiation was that pointings 02500075 through to 02500103 were lost.

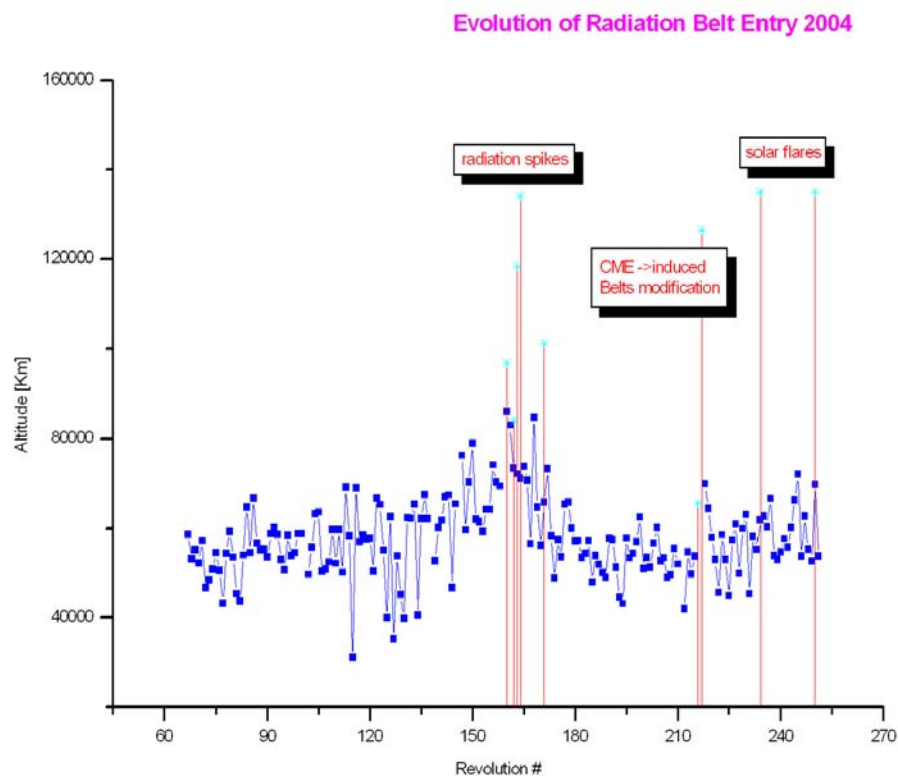
On DoY 307, at 07:52:17, the M1131 RESET ROE command failed owing to the unit still being in SAFE mode due to the high radiation levels experienced before perigee. The M1511 SAFE OFF command was quickly sent at 07:54:04, and the ROE was manually reset at 07:52:17, in time for the next pointing at 07:57:29, there was no impact.

On DoY 308 at around 04:20, the slew to the attitude for pointing 02510039 failed, and this pointing was lost. The following pointing was recovered and executed nominally.

On DoY 309, at 22:19:52, OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

Radiation Belts Entry



Electron Belts

REV	S/C BCPKT (electron)	Electron CUT-OFF Observed Entry/Exit	Observed Entry/Exit Altitude [Km]	Electron CUT-OFF Predicted Entry/Exit	Predicted Entry/Exit Altitude [Km]
250	RAD_EXIT R 2004-10-30T07:54:25Z	2004-10-30 06:02:54	21542.9	2004-10-30 06:40:12	28206.99
250	RAD_ENTR R 2004-11-01T22:32:51Z	2004-11-01 21:11:34	69818.7	2004-11-01 23:14:50	543445.41
251	RAD_EXIT R 2004-11-02T07:41:57Z	2004-11-02 06:09:10	>23202.6	2004-11-02 06:24:50	27692.32
251	RAD_ENTR R 2004-11-04T22:19:28Z	2004-11-04 23:06:30	53793.2	2004-11-04 23:04:50	53973.95
252	RAD_EXIT R 2004-11-05T07:28:40Z	2004-11-05 05:48:30	23204.7	2004-11-05 06:14:50	28141.89

Reference

Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

Radiation Spike

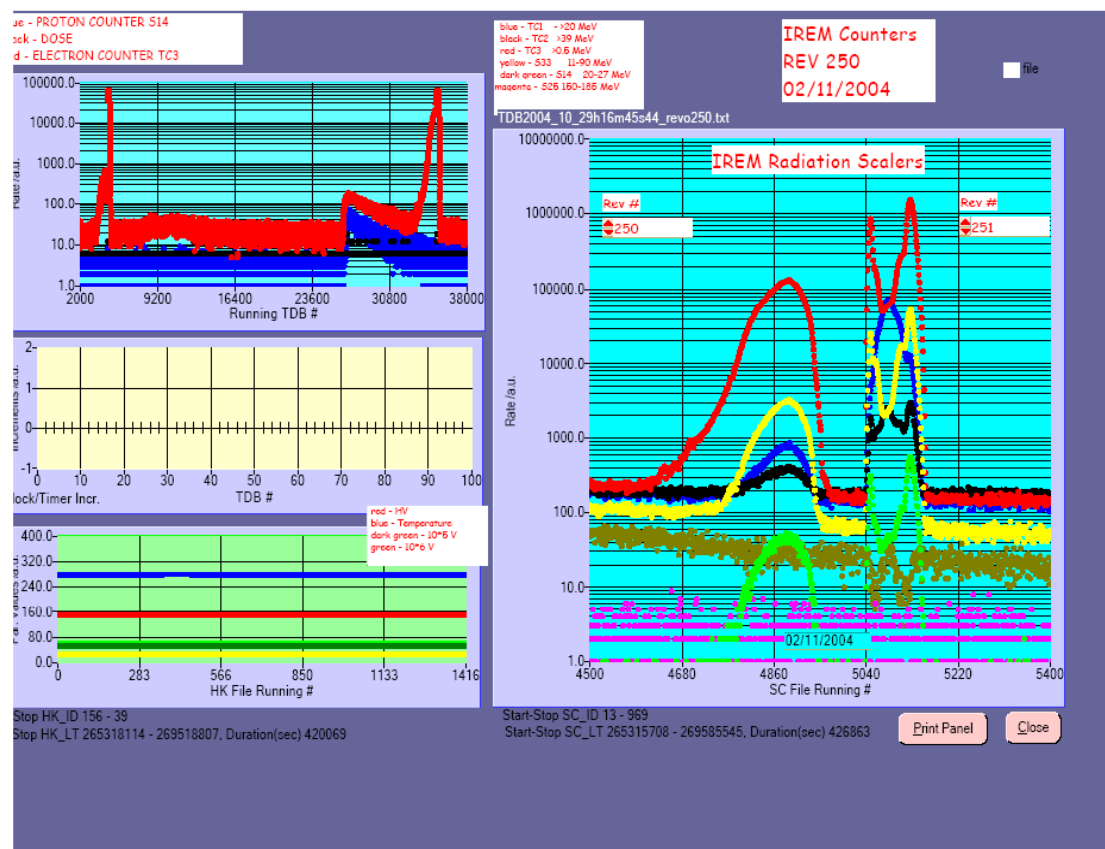
Proton Belts

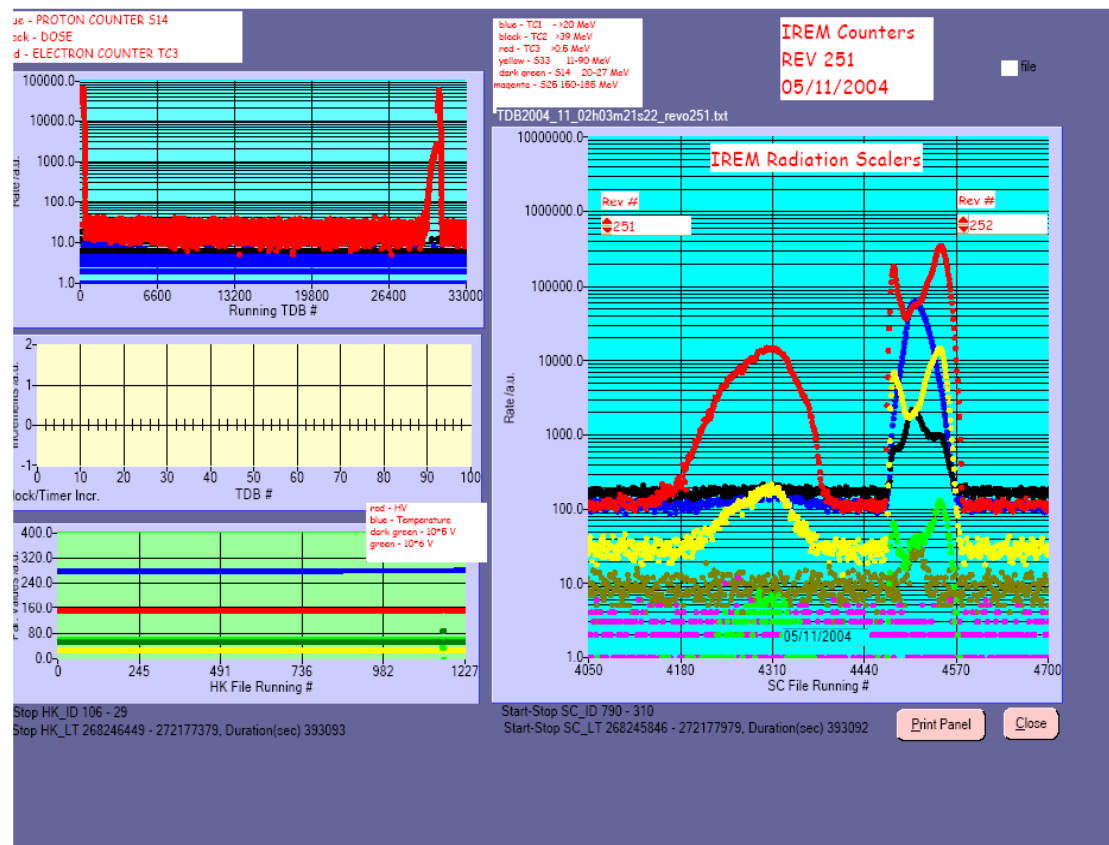
REV		Proton CUT-OFF Predicted Entry/Exit	ALT[Km] predicted
249	PROTON_RAD_ENTR	2004-10-30 05:10:12	14230.83
250	PROTON_RAD_EXT	2004-10-30 05:20:12	15474.76
250	PROTON_RAD_ENTR	2004-11-02 04:54:50	14011.58
251	PROTON_RAD_EXT	2004-11-02 05:04:50	15183.65
251	PROTON_RAD_ENTR	Not available in RadMon	-
252	PROTON_RAD_EXT	Not available in RadMon	-

IREM daily report

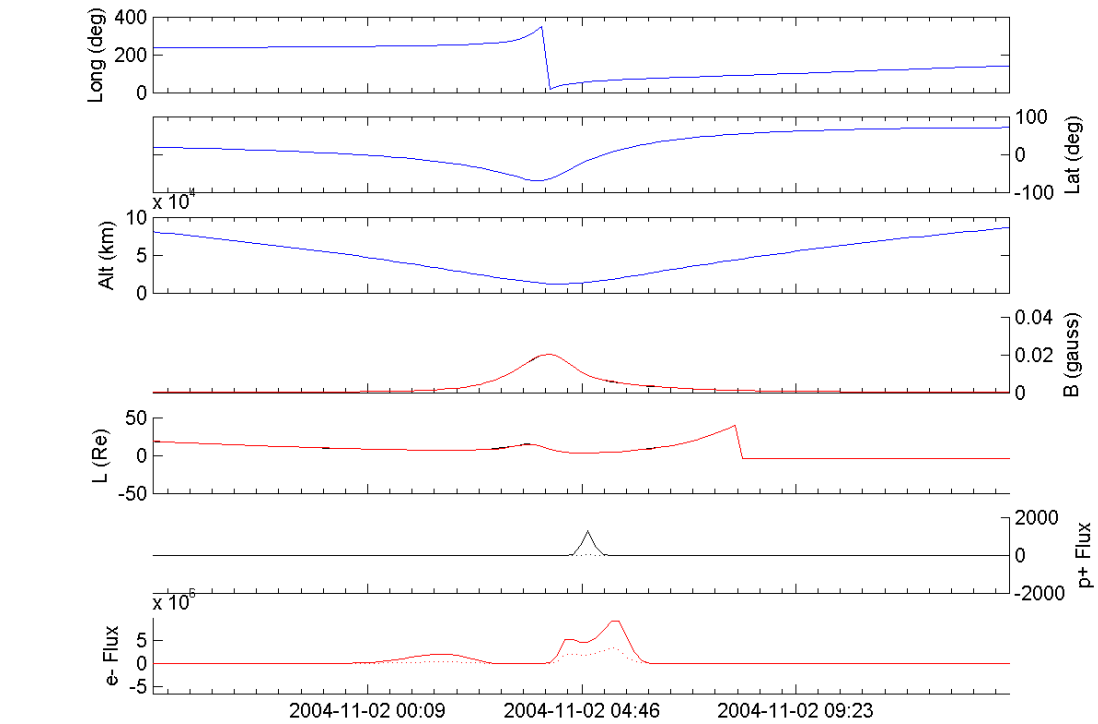
Nothing to report.

IREM radiation counters



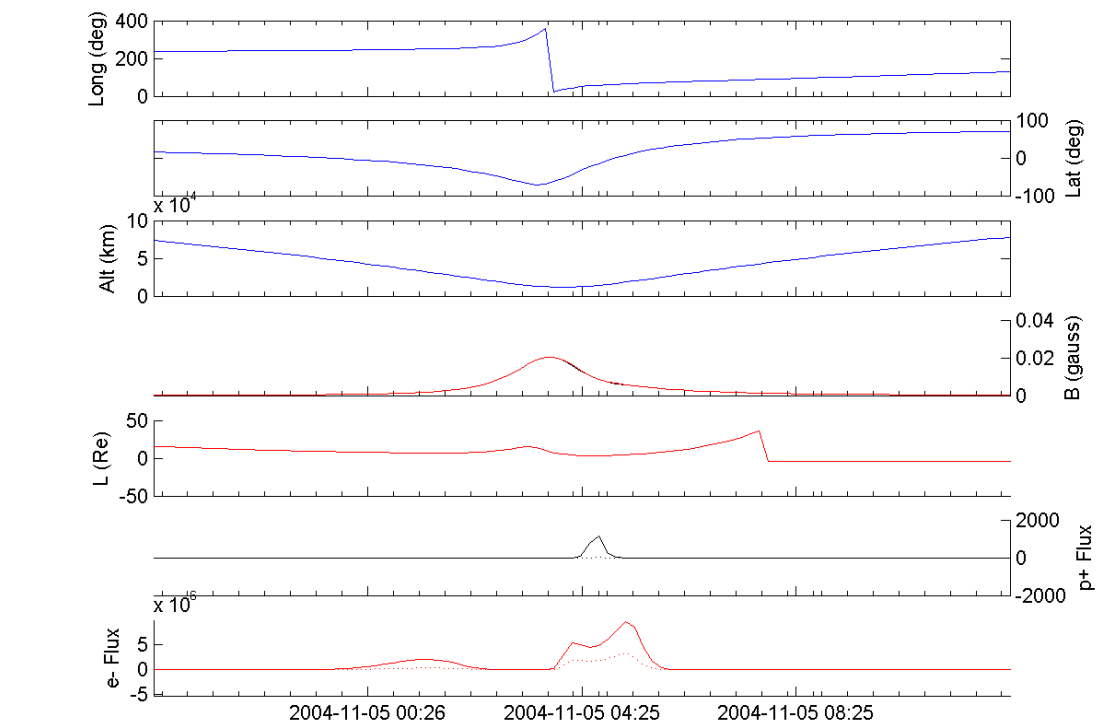


IREM Predicted Radiation Belt Passages. Rev 250



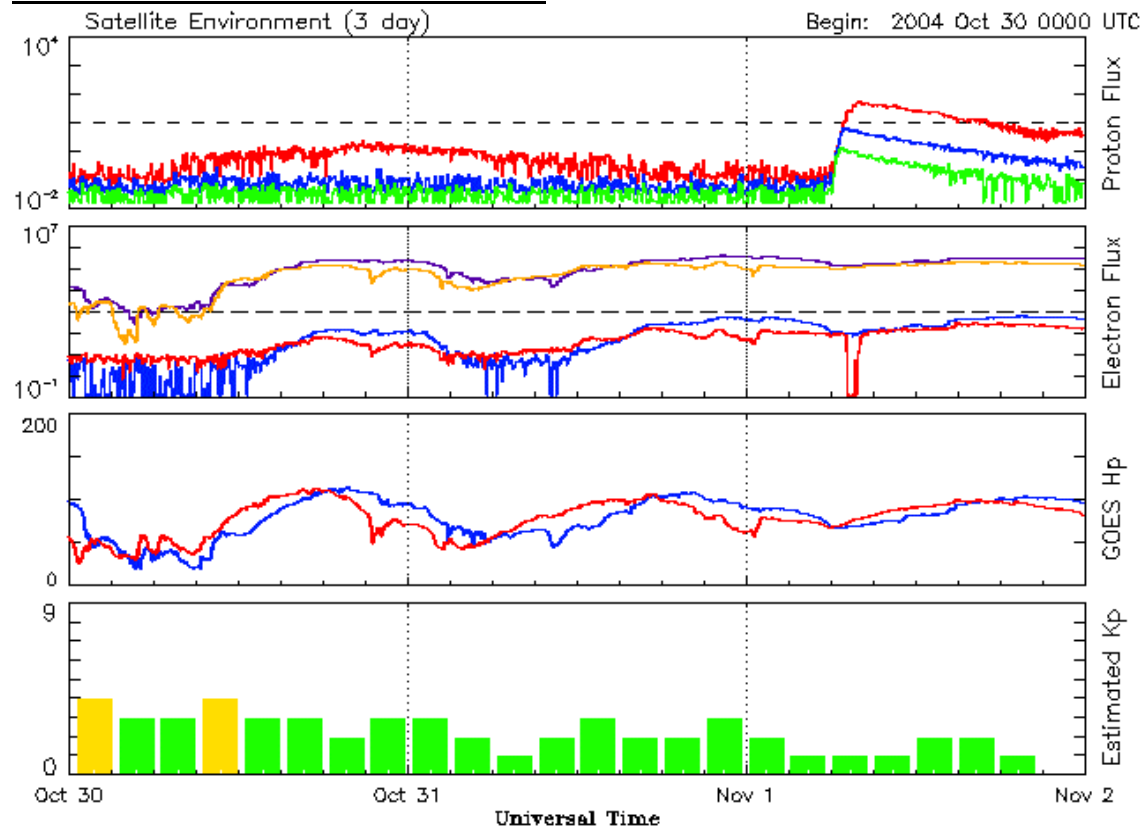
X: 0 C:\Documents Settings\obergo \INTEGRAL\PA\ DAD\IBIS\I...

Rev 251



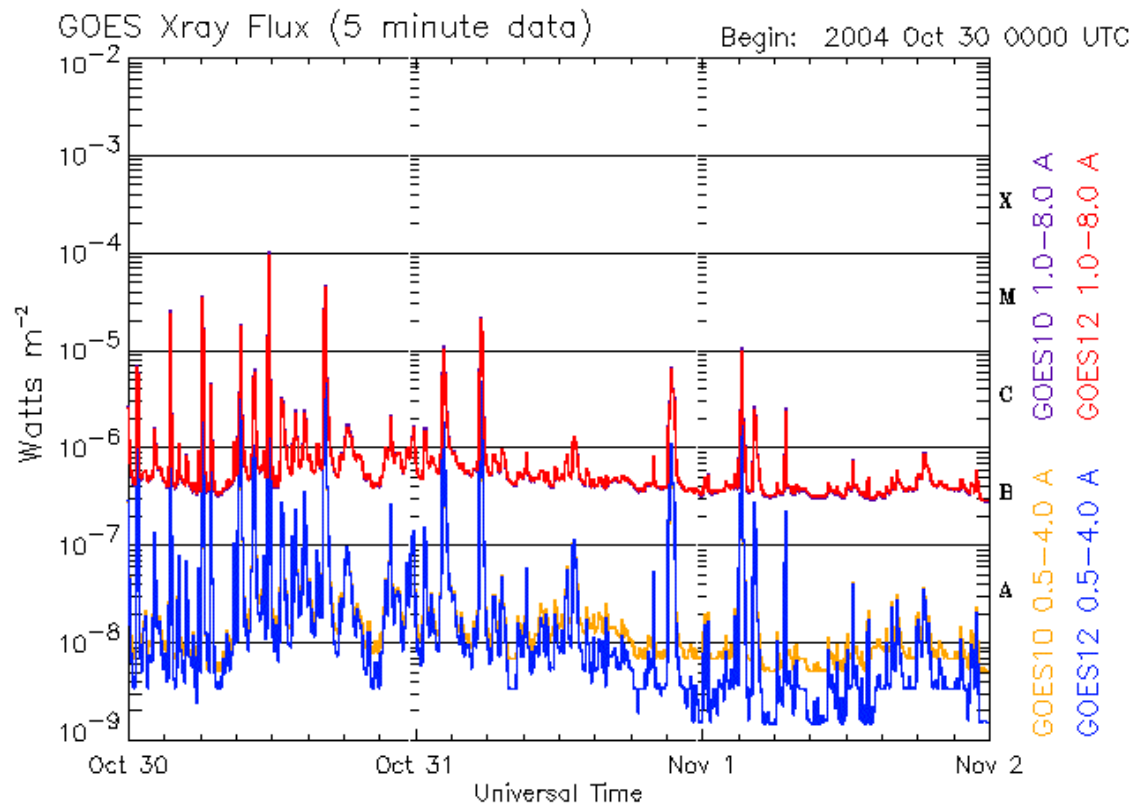
X: 0 Y: 0 get Data Zoom Print...

SEC-GOES Observed Particles Fluxes.



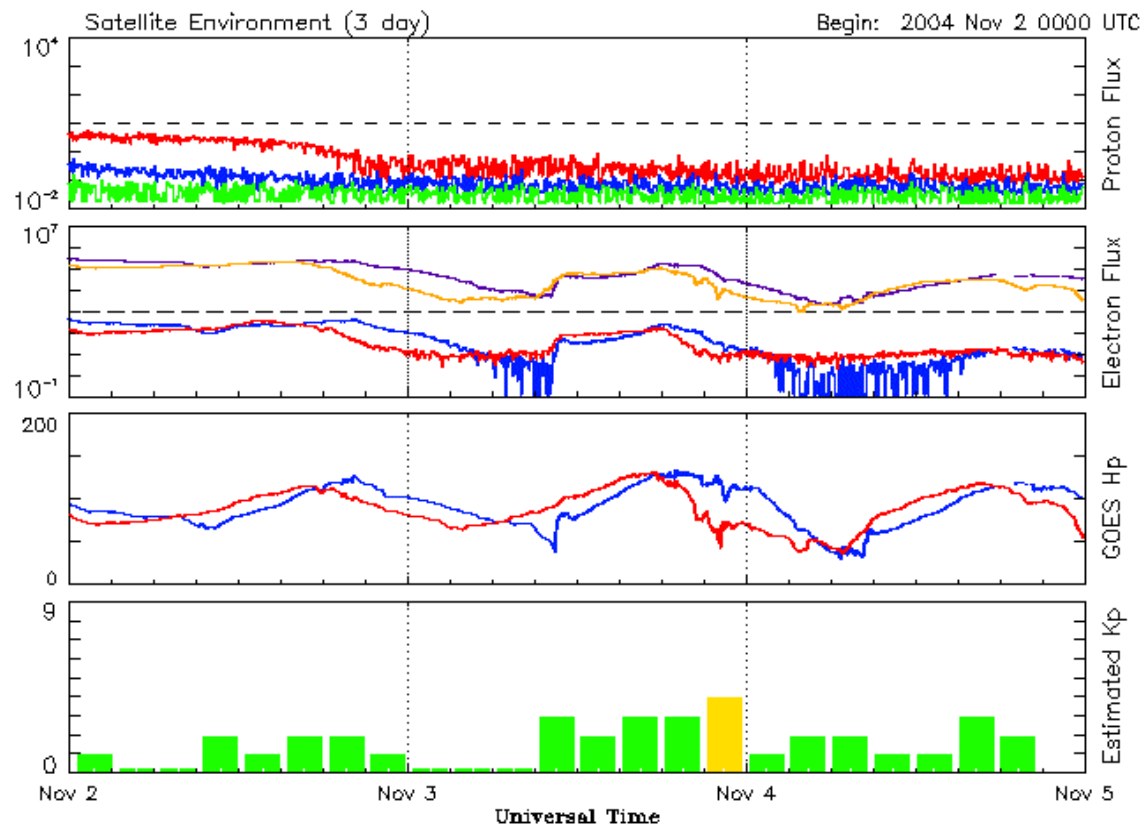
Updated 2004 Nov 1 23:56:10 UTC

NOAA/SEC Boulder, CO USA



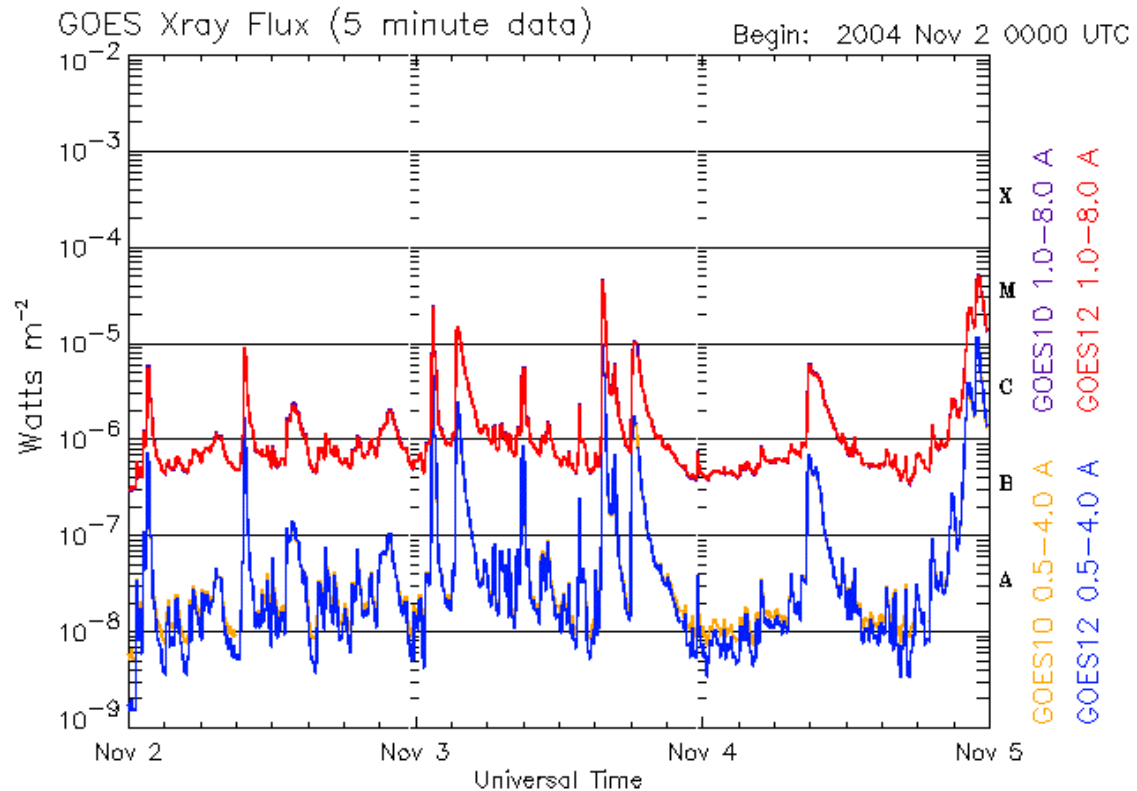
Updated 2004 Nov 1 23:56:04 UTC

NOAA/SEC Boulder, CO USA



Updated 2004 Nov 4 23:56:10 UTC

NOAA/SEC Boulder, CO USA



Updated 2004 Nov 4 23:56:04 UTC

NOAA/SEC Boulder, CO USA

