

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 234
Week 11
19.03.07
Routine Phase

Prepared by: M. Walker (OPS-OFO)

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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 10.03.07 until 16.03.07 (both dates inclusive) and covers the revolutions 538, 539 and 540.

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 consisted of a raster dither of Orion OB1 (RA 05:17:00.30, DEC +01:47:17.7), raster dithers of AO-4 KP: l=-6.9 (RA 17:28:08.54, DEC -34:45:18.6) and AO-4 KP: l=+6.9 (RA 18:01:12.94, DEC -22:59:28.5), hexagonal dithers of the Galactic Bulge Region (RA 17:45:36.00, DEC -28:56:00.0), and the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), and a raster dither of GX 339-4, which was a Target of Opportunity (RA 17:02:49.50, DEC -48:47:23.0)

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.

Three slews were missed from TL, during the observation period, due to problems on DSS-27 station and SEU on the STR unit.

The fuel consumption over the period between 08/03/2007 and 13/03/2007 was 0.0850 Kg. The remaining propellant is in the order of 147.7798 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 has been 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

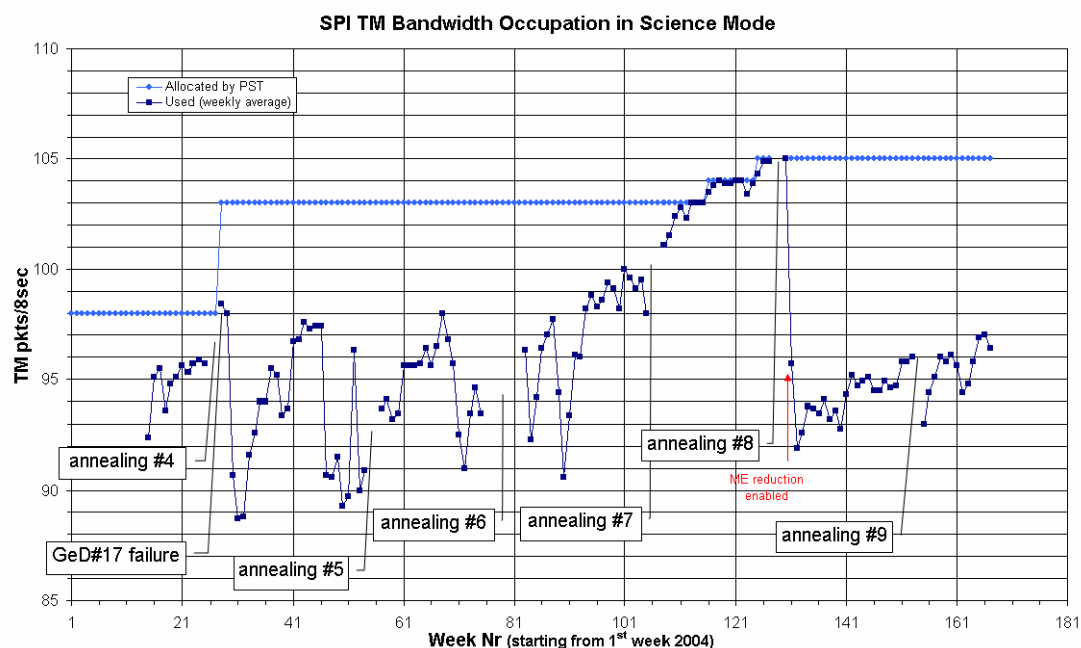
3.2.1 SPI

Following the 9th annealing, which ended on 22nd December, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #12 which is showing a slightly degraded energy resolution and is therefore operating at a lower HV setting of 3.5kV (instead of 4kV). The energy resolution of GeD#4 was recovered with this annealing. Detector #2 is failed since 06.12.2003 and detector #17 since 17.07.2004.

The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K. The stroke of all four compressors has been set to 40 since 03.02.2007 at 13:16Z..

During science operations, the instrument was kept in photon-by-photon mode with spectra TM enabled. The assigned TM bandwidth in the science observation windows was 105 packets/cycle, with an average telemetry occupation of 96.4 packets/cycle.

The following plot shows the assigned and the average occupation of the SPI TM bandwidth.



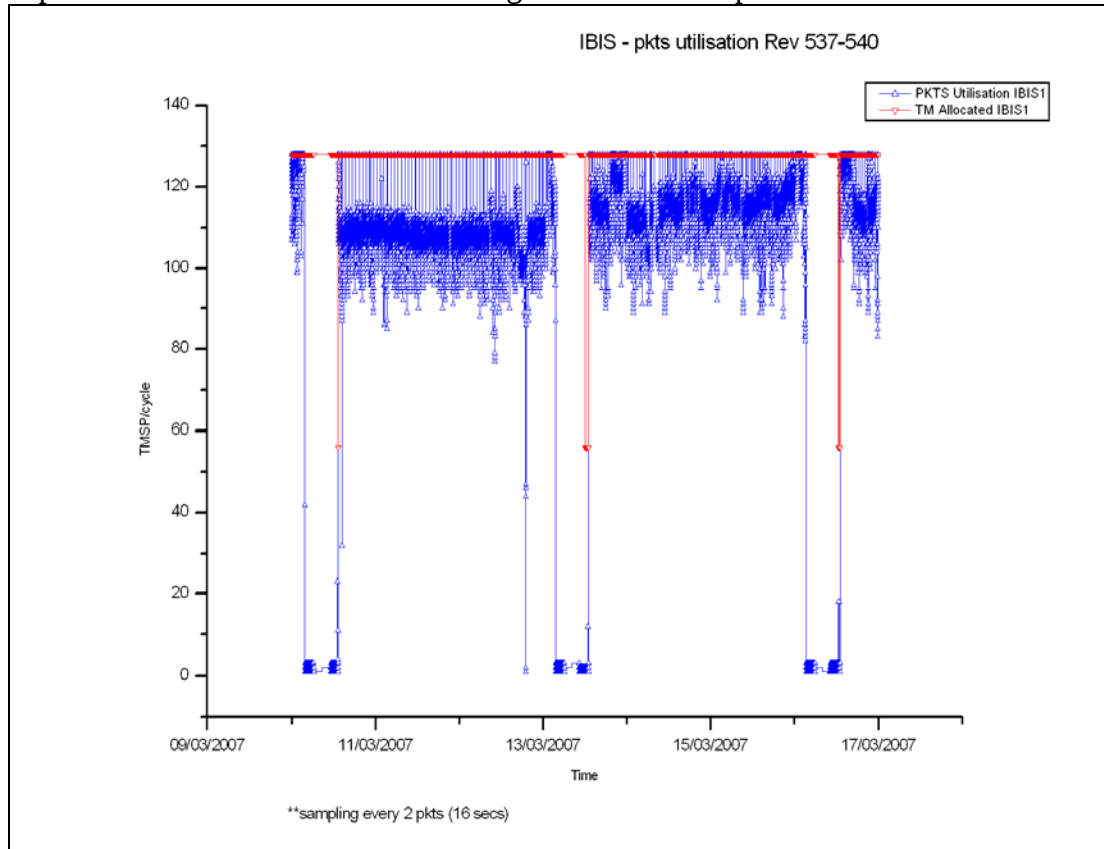
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

The overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 128 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period (when IBIS was in Science mode) was 113.05 TMPS/cycle, down 3.55 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 with a TM allocation of 8 packets/cycle during science observations. JEM-X2 was dormant (DPE OFF) with no TM slots allocated.

Due to high background radiation conditions, JEM-X1 made an autonomous transition to Safe mode on 2007-03-13 at 01:21:32Z, about 1 hour 20 minutes before planned before radiation belt entry of revolution 538.

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.

OMC operations were performed by the automatic Timeline. OMC was operated in Science Normal mode during science observations, with a TM allocation of 5 packets/cycle.

During this reporting period, 159 of the 160 planned science pointings for OMC were executed nominally, 1 was 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 low solar activity.

The sun was quiet this week. Between 11/03/2007 and 13/03/2007, small sunspot 946 posed no threat of strong solar flares. The rest of the time, the sun was blank.

Reference: www.spaceweather.com

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

4 Ground Facilities

The Operational ground facilities performance was good this week. One science pointing and one engineering pointing were lost. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week although unscheduled maintenance on the nctrs system nearly caused major problems and was fixed with 5 minutes to spare, also the TC history task crashed, and there was an occasion when there was a one second drop in connection to the TM RT cache, there was no impact. The overall performance was nearly 100%.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. There were, however, 3 occasions of data drops from Redu, and 3 from DSS-27, which led to the loss of the 2 pointings. The overall performance was well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSFs are available up to revolution 547. Observations have been planned and files sent up to revolution 545.

TSF's up to revolution 542 have been received.

2. Observation status

ECS files have been received and processed up to revolution 531.

3. ISOC Science Data Archive

A beta version of ISDA 2.7 has been released and is under testing.

4. ISOC system

Work is ongoing on version 14.5.

5. Problems

None.

4.3.2 ISDC

Status of ISDC observation processing on 19/03/2007:

- Latest Standard Analysis completed: observation 04200560170 (GX 339-4, Revolution 531) on 19/03/2007.
- Latest products archived: observation 04200560170 (GX 339-4, Revolution 531) on 19/03/2007.
- Latest observation products sent to the observer: observation 04200300001 (IGRJ11215-5952, Revolution 529-530) on 19/03/2007.

5 Special Events

6 Anomalies

The following problems were reported that impacted operations:

- On DoY 073, at 08:11, antenna problems at DSS-27 caused TM data gaps. This led to the loss of pointing 05390029. The corresponding DR# is G-107572.
- At 17:11, the loss of the guide star led to the loss of pointing 05390040, however, this was not a science pointing.

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

7 Future Milestones

The following activities are foreseen in the next few weeks.

- Crab Calibration 19/03/2007 Rev. 541
- IMU Calibration and Health Check 10/04/2007 Rev. 548
- RMU-B Health Check 10/04/2007 Rev. 548
- Summer eclipse season starts 18/04/2007 Rev. 550
- Periodic Thruster Torque rescaling 24/07/2007 Rev. 583

Appendix

The appendix includes various detailed information.

7.1 Overview of Revolutions

Revolution 538

The observations in revolution 538 consisted entirely of a raster dither of Orion OB1 (RA 05:17:00.30, DEC +01:47:17.7), lasting ~58.4 hours.

Revolution 539

The observations in revolution 539 began with a raster dither of AO-4 KP: l=-6.9 (RA 17:28:08.54, DEC -34:45:18.6), lasting ~5.9 hours. This was followed by a hexagonal dither of the Galactic Bulge Region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. Subsequently, another hexagonal dither was performed, this time of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), for ~5.6 hours. The revolution continued with a raster dither of AO-4 KP: l=+6.9 (RA 18:01:12.94, DEC -22:59:28.5), and AO-4 KP: l=-6.9 (RA 17:28:08.54, DEC -34:45:18.6), both lasting ~18.5 hours. Finally another raster dither of AO-4 KP: l=+6.9 (RA 18:01:12.94, DEC -22:59:28.5), lasting ~3.0 hours was performed up to the end of the revolution.

Revolution 540

The observations in revolution 540 began with a hexagonal dither of the Galactic Bulge Region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. It continued with a Target of Opportunity, namely a raster dither of GX 339-4 (RA 17:02:49.50, DEC -48:47:23.0), lasting ~36.1 hours. After that, came a hexagonal dither of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), lasting ~5.6 hours. The revolution continued with a raster dither of AO-4 KP: l=+6.9 (RA 18:01:12.94, DEC -22:59:28.5), lasting ~7.4 hours. Finally another hexagonal dither of the Galactic Bulge Region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours was performed up to the end of the revolution.

Throughout these observations, all instruments were in their nominal science modes, except JEM-X2, which is switched off. The TM allocation was IBIS 128; SPI 105; JEM-X1 8; JEM-X2 0; OMC 5.

7.2 Consumables

7.2.1 Detailed Fuel Book-keeping

2007-02-20T12:29:06.000Z	148.1000	F	Automatic TM processing.
2007-02-21T22:56:06.000Z	148.0840	F	Automatic TM processing.
2007-02-23T12:14:58.000Z	148.0579	F	Automatic TM processing.
2007-02-26T12:01:53.000Z	148.0404	F	Automatic TM processing.
2007-02-27T21:53:09.000Z	148.0126	F	Automatic TM processing.
2007-03-01T11:50:33.000Z	147.9996	F	Automatic TM processing.
2007-03-02T21:58:45.000Z	147.9808	F	Automatic TM processing.
2007-03-04T11:39:44.000Z	147.9728	F	Automatic TM processing.
2007-03-05T21:13:00.000Z	147.9590	F	Automatic TM processing.
2007-03-07T11:29:29.000Z	147.9456	F	Automatic TM processing.
2007-03-07T17:27:46.000Z	147.8648	F	Automatic TM processing.

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2007-03-10T11:15:21.000Z	147.8492	F	Automatic TM processing.
2007-03-11T21:44:52.000Z	147.8042	F	Automatic TM processing.
2007-03-13T11:04:56.000Z	147.7933	F	Automatic TM processing.
2007-03-13T23:32:58.000Z	147.7798	F	Automatic TM processing.

This report was generated Fri Mar 16 08:00:32 GMT 2007

7.3 Detailed Satellite Information

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

7.3.1 AOCS SUMMARY OPERATIONS REPORT, 10/03/2007 –16/03/2007

AOCS operations were executed from the Automatic Timeline.

During this period, 88 Open Loop Slews, 82 Closed Loop Slews and 5 Momentum Biases were executed.

3 slews (2 CSL, 1 OSL) were missed from TL during the observation period due to an antenna problem at DSS-27 station and STR threshold exceeded due to false events.

The OTF was not reached during PID 053939-05400059, due to STR SEU threshold exceeded and lost of guide star.

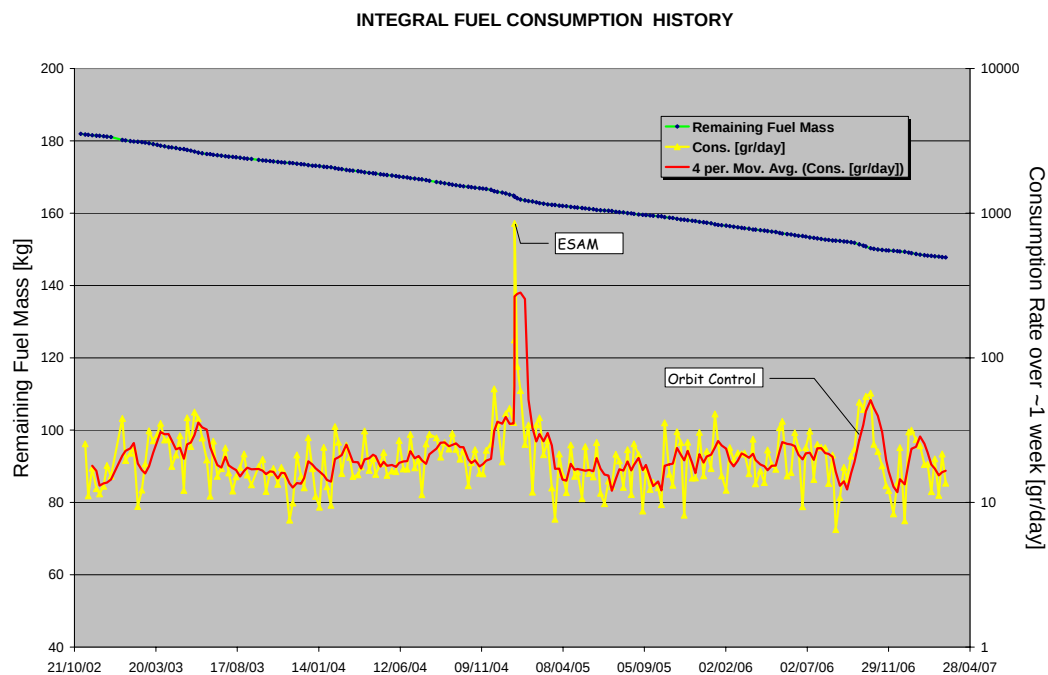
This is equivalent to a $\sim 1.7\%$ of the total number of slews planned (172).

Orbit Control

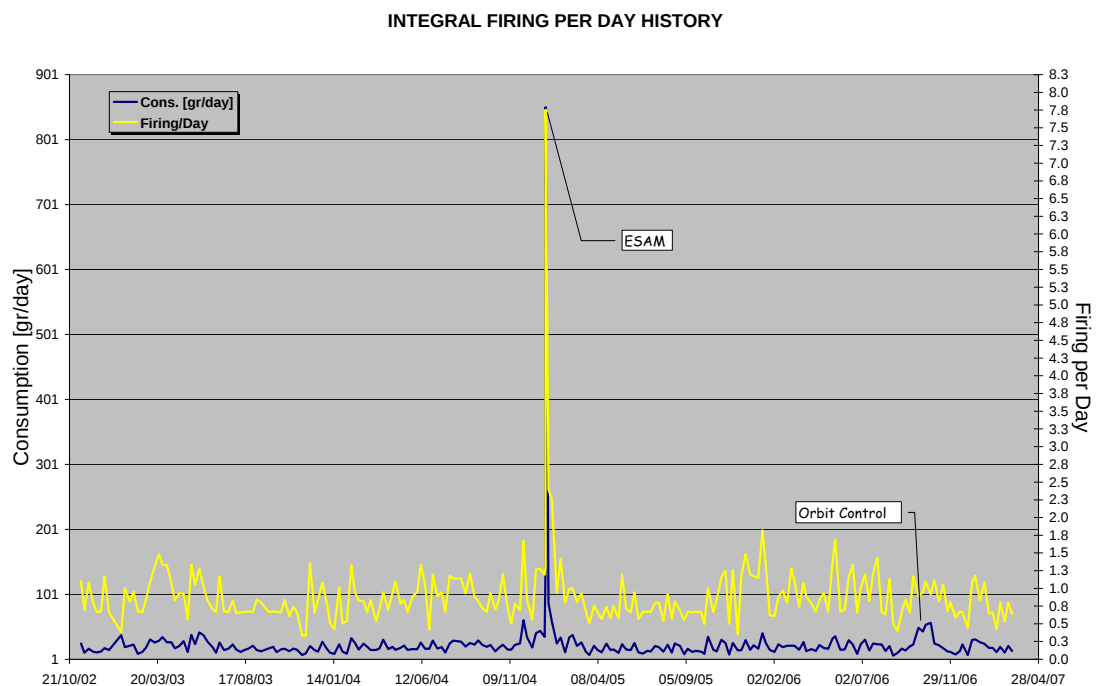
No update.

Fuel consumption

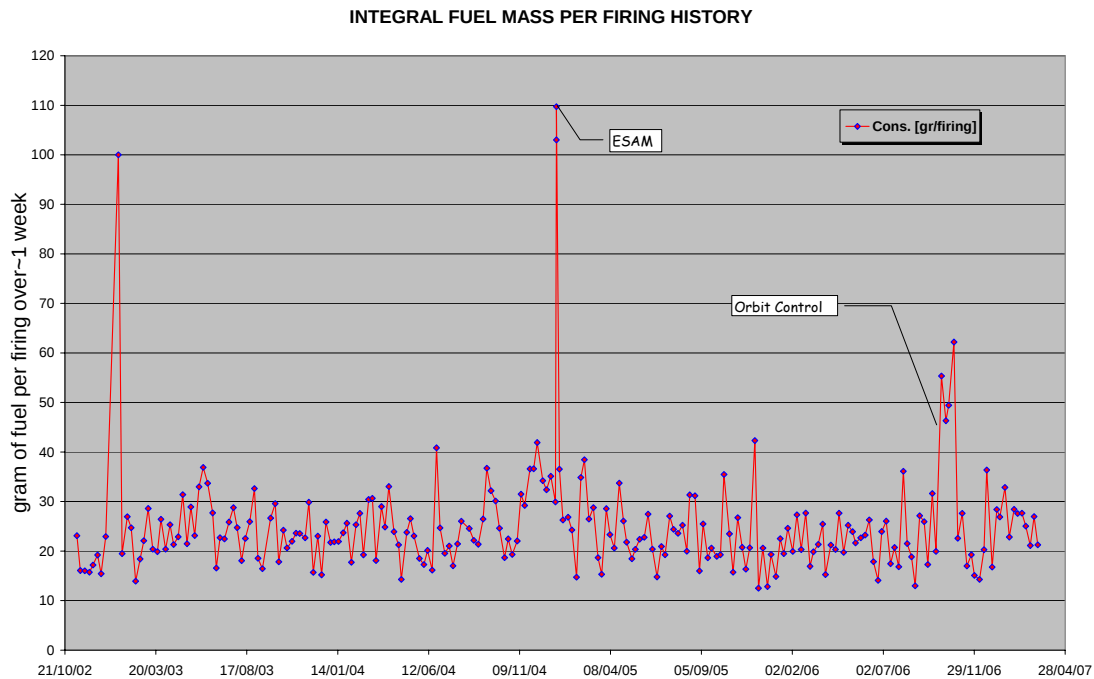
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 13/03/2007 is shown in the plot below.



The firing per day over the period between 01/11/2002 and 13/03/2007 is shown in the plot below.

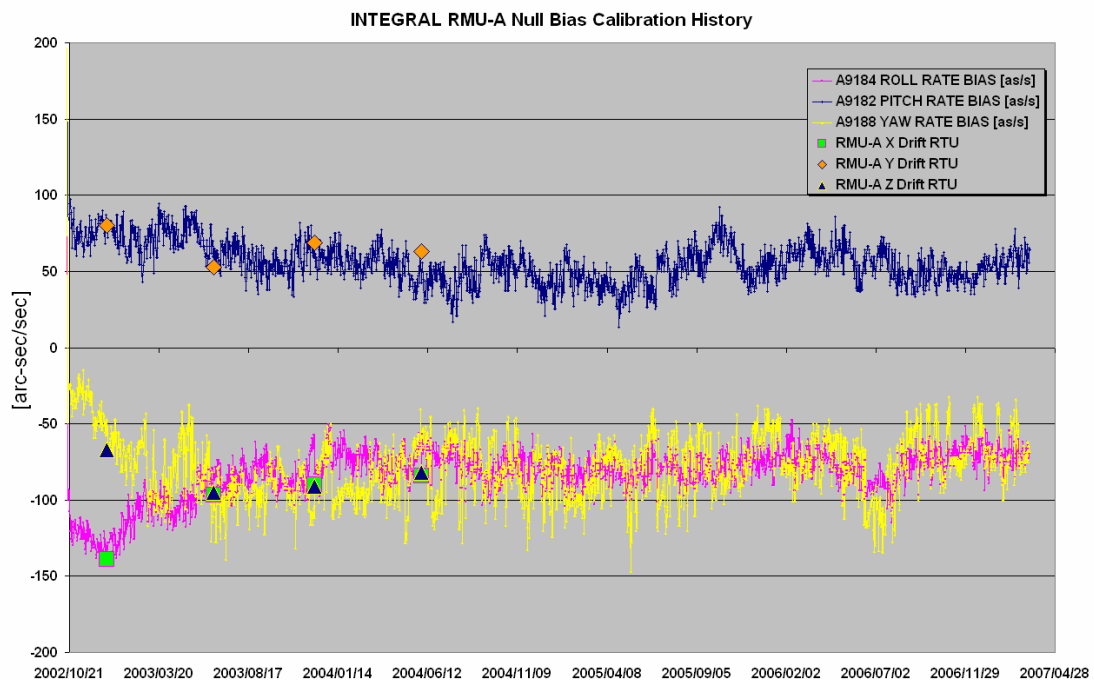


The fuel per firing over the period between 01/11/2002 and 13/03/2007 is shown in the plot below.

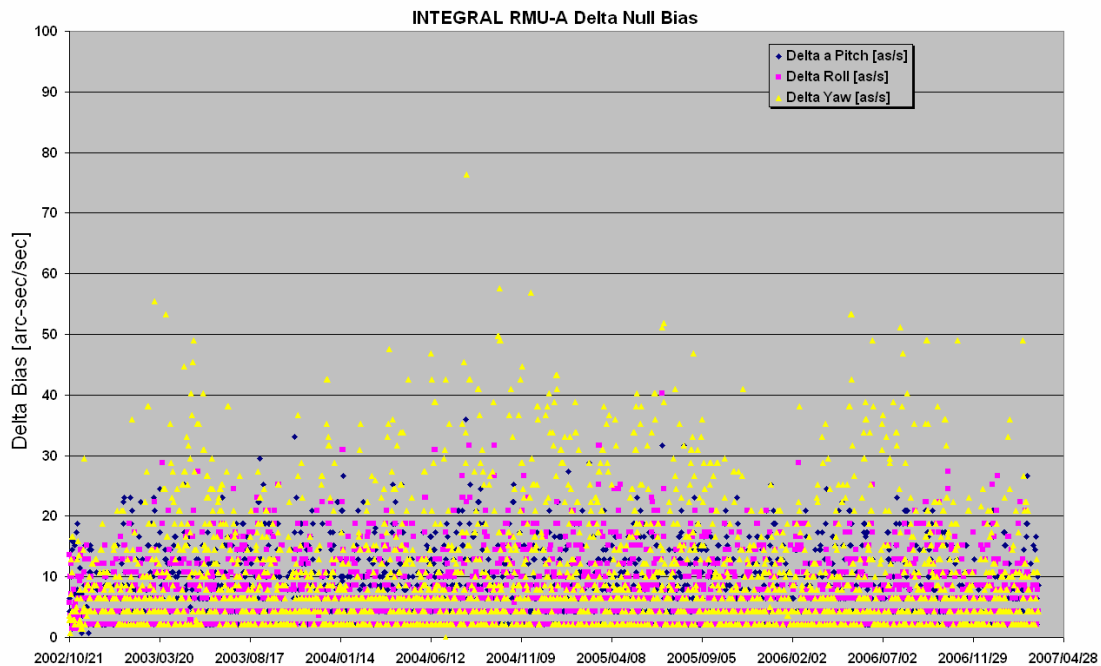


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 16/03/2007 is shown in the plot below.



The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 16/03/2007 is shown in the plot below



10/03/2007 (Day of Year 069, Revolution 537-538)

Nothing to report.

11/03/2007 (Day of Year 070, Revolution 538)

Nothing to report.

12/03/2007 (Day of Year 071, Revolution 538)

Nothing to report.

13/03/2007 (Day of Year 072, Revolution 538-539)

Nothing to report.

14/03/2007 (Day of Year 073, Revolution 539)

Problem on DSS-27 station: at 08:39z due to a problem on DSS-27 antenna (DR# G-107572), the TC/TM links dropped out and as consequence the slew ID 05390029 failed release.

A manual recovery, by using VILSPA2 antenna as back-up, was then performed from attitude of PID 05390028 to PID 05390030. The next slew ID 05390031 was manually updated in TL and the AOCS enabled in TL at 09:49z.

The following slews were not executed from TL: 05390029 (CSL) – 05390030(OSL).

STR SEU threshold exceed: at 16:57:55z the STR SEU threshold was exceeded due to false events during PID 05390039. As automatic reaction the IMU1 was switched

ON and an automatic mapping was commanded by ACC. A jump in the guide star Y coordinate (117 CCD units) was observed at the moment of the false event.

The guide star (ID 6262-19), at the occurrence of the event, was Mi 7.55 @ CCD location [-12675, 20827].

After the automatic mapping a new guide star was picked, Mi 6.2 @ CCD location [9325, -883].

The following slew was not executed from TL: 05390040 (CSL) and the OTF not reached during PID 05390039.

15/03/2007 (Day of Year 074, Revolution 539)

STR lost of guide star: at 09:07:39z the guide star was lost during PID 05390059. As automatic reaction the ACC switched ON the IMU 1 and an automatic mapping was commanded.

The guide star (ID 7361-498), when the event occurred, was Mi 8.5 @ CCD location [19970, 21636], about at the edge of the STR FOV (in Z coordinate).

After the automatic mapping a new guide star was picked Mi 6.1 @ CCD location [2923, -5997].

The reason of the lost of guide star is likely to be due to the selected guide star (ID 7361-498) for PID 05390059, identified, later, as double star in the available star catalogues.

No impact in TL, except that the OTF was not reached during PID 05390059.

16/03/2007 (Day of Year 075, Revolution 539-540)

STR SEU threshold exceed: at 16:13:00z the STR SEU threshold was exceeded due to false events occurred during the last part of OSL ID 05390007. As automatic reaction an automatic mapping was commanded by ACC but no IMU was switched ON, being the manoeuvre timer for the open loop slew still running.

The guide star (ID 7377-24), at the occurrence of the event, was Mi 8.35 @ CCD location [1430, 1279].

No impact on TL reported because the event was reported during the last part of the slew ID 05400007, with manoeuvre time still running and the open loop slew still in execution.

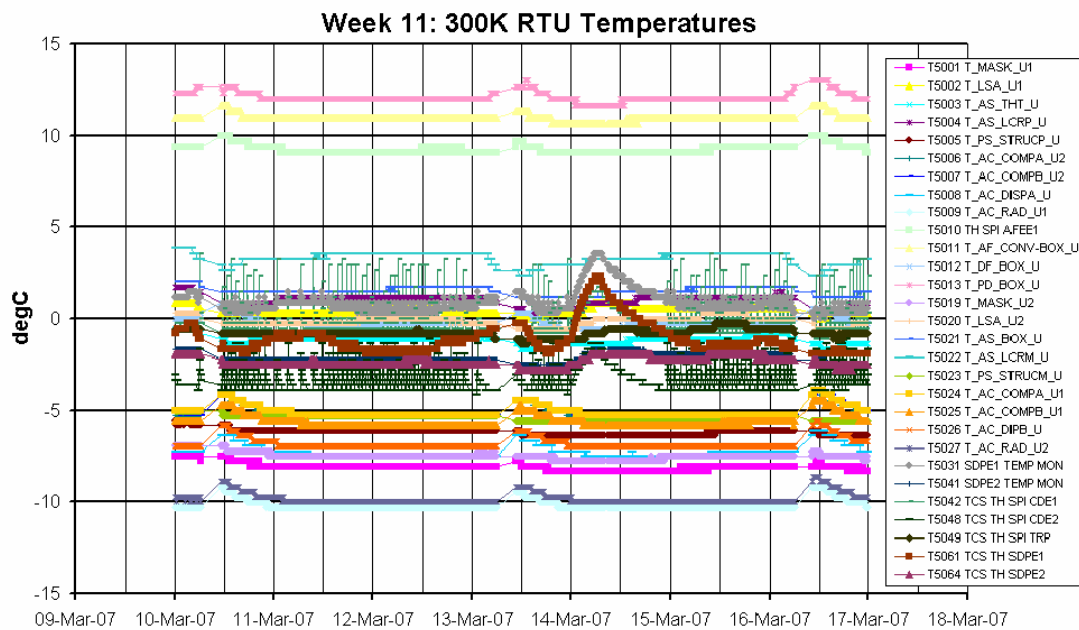
Problem on FDS: at 16:58z due to maintenance on the FDS causing an overload of the machines, the automatic process update for slew ID 05400010 failed.

After verification of the attitude, RWs and guide star constraints, was decided, with the agreement of FD on call support, to leave the slew executing with the default slew parameters as defined in TL.

No impact on TL reported.

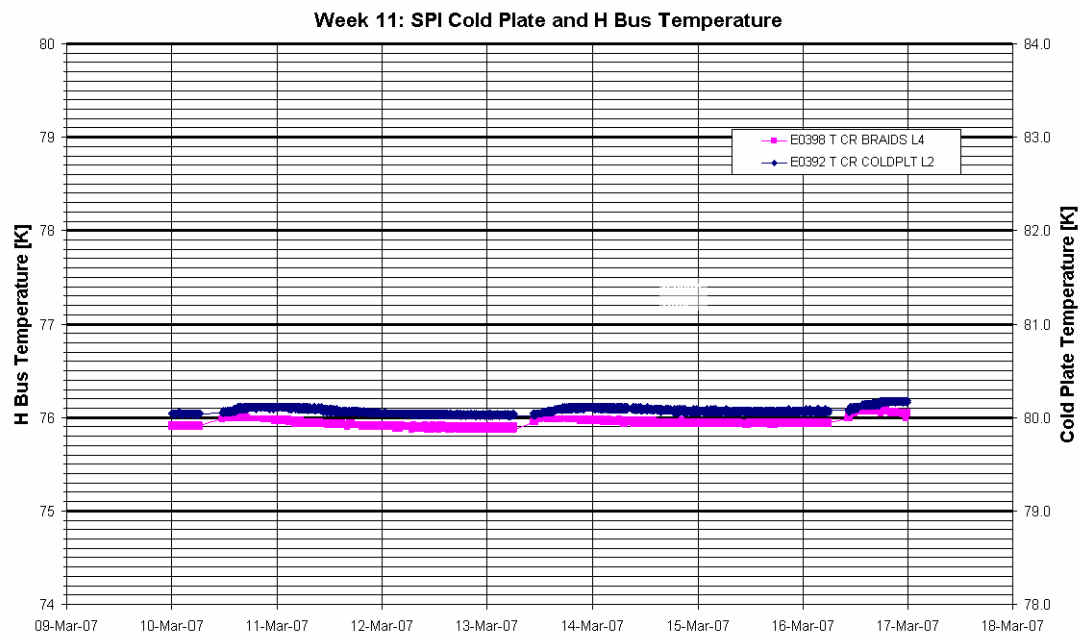
7.3.2 SPI Operations

Unit Temperatures: All the equipment temperatures are inside the operational limits. The following plot shows their evolution during the reporting period:



Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K.

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

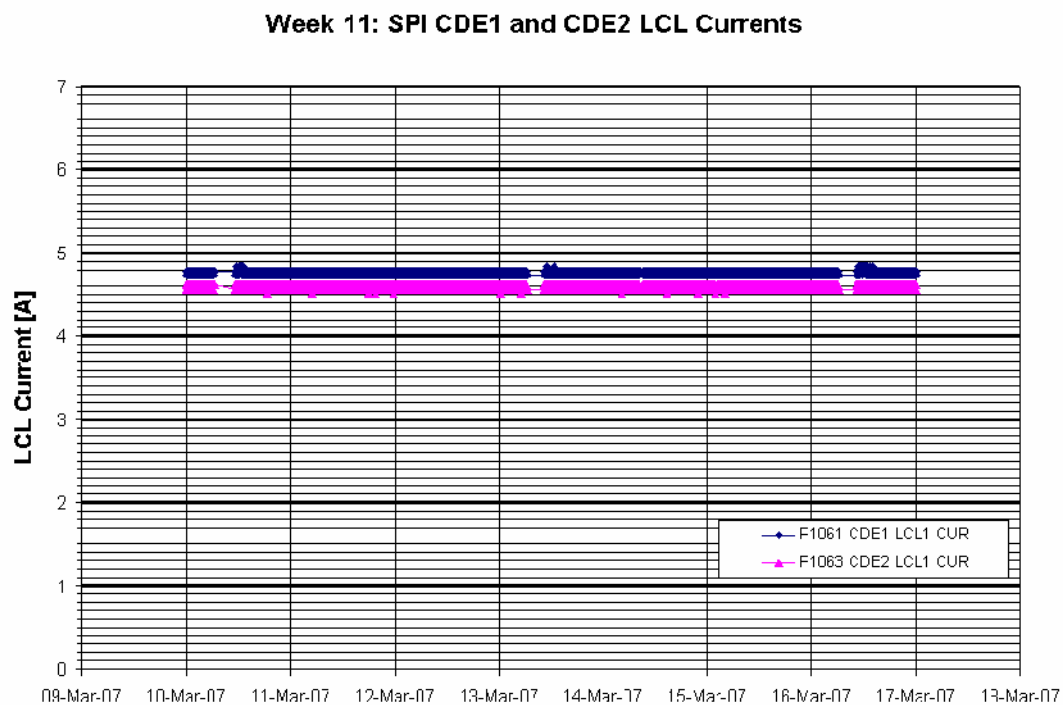


The stroke of all four compressors has been 40 since 03-02-2007 at 13:16Z.

The average LCL currents of the CDEs over the week were:

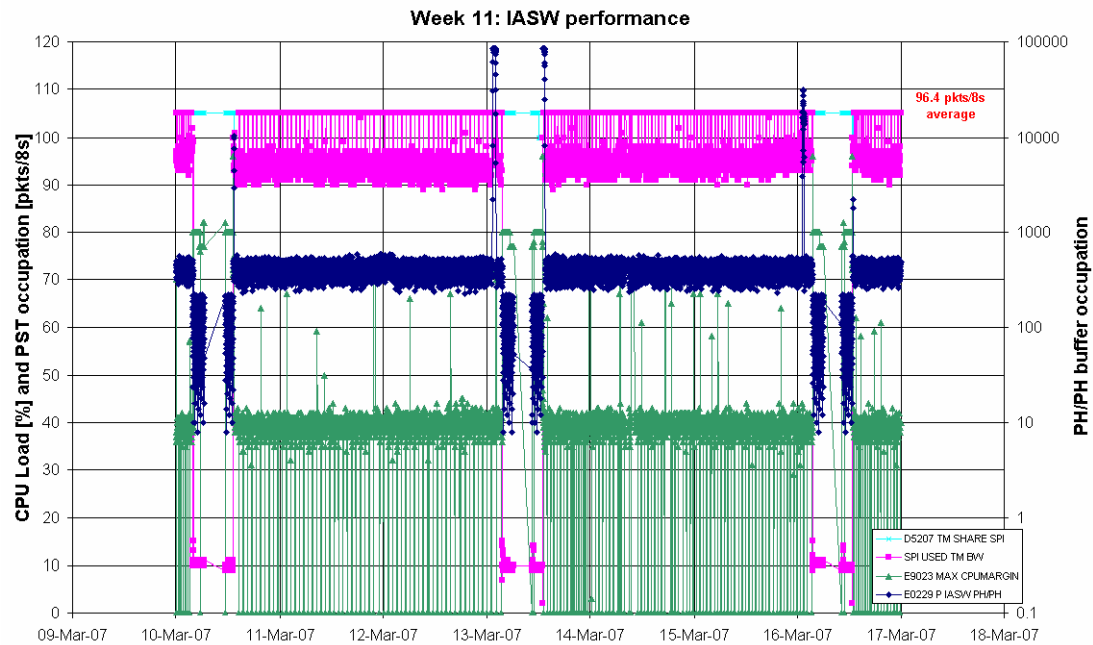
- Average CDE1 LCL Current = 4.76A
- Average CDE2 LCL Current = 4.57A

The following plot shows the evolution of the CDE currents during the reporting period.



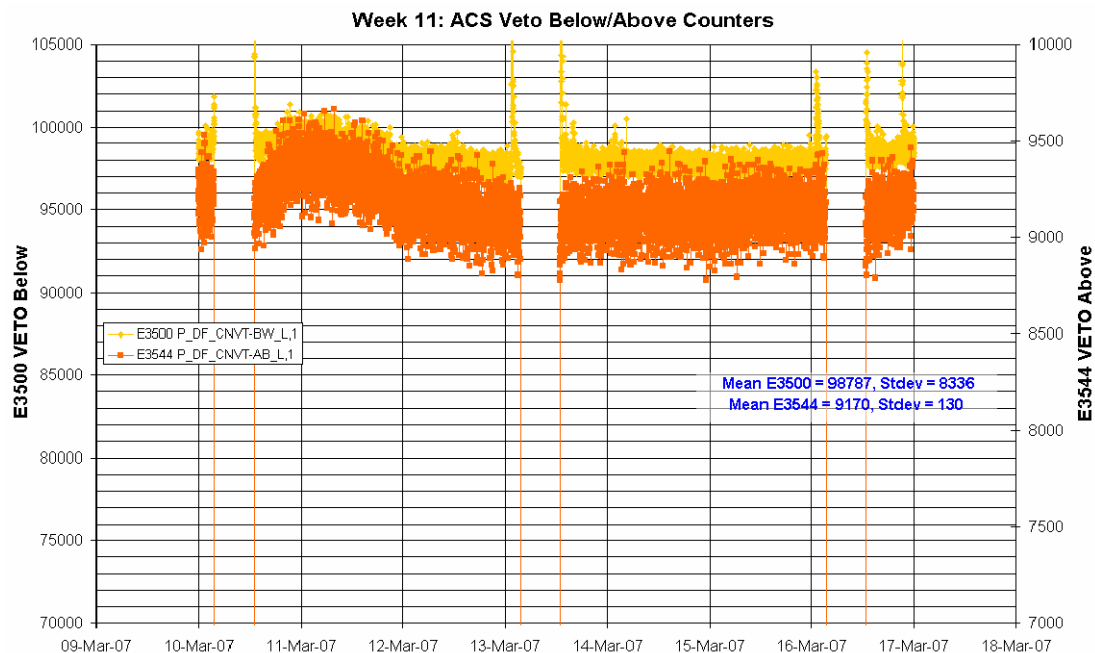
DPE & IASW: The DPE health and IASW performance is nominal. The IASW version installed is 433. The spectra scaling parameter was set to 9/19 SE.

The average TM bandwidth occupation of SPI was 96.4 packets/cycle over the science window, when the TM allocation was 105 packets/cycle. The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS: The performance of the ACS is nominal, except for FEE 81 which remains switched off since the anomaly on 29/10/2006 (INT_SC-162). FEE #57 is also still OFF due to the anomaly on 5/8/2003 (INT_SC-61).

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

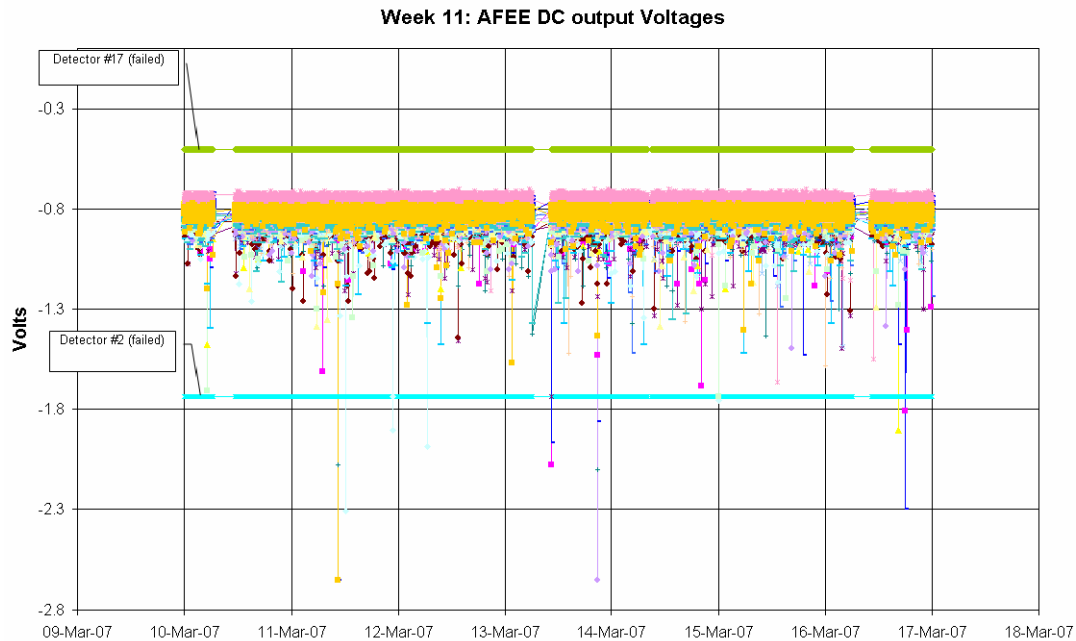


AFEE: The health of the AFEE is nominal. The performance of the AFEE and the detectors is nominal, except for the Ge detector #12 which is showing a slightly

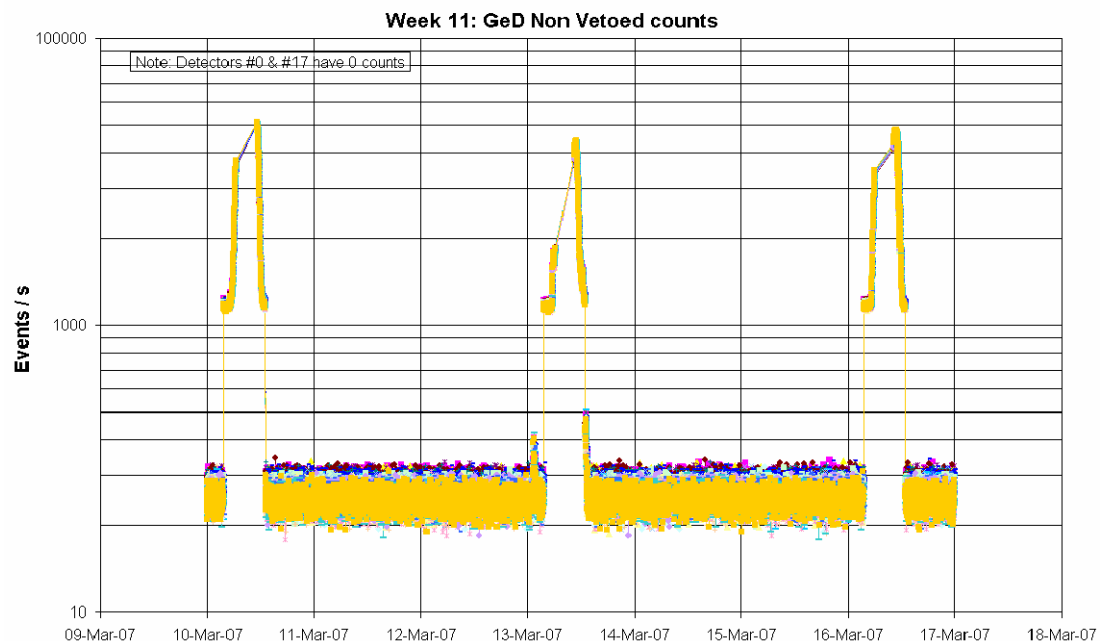
degraded energy resolution. The energy resolution of GeD#4 was recovered with the last annealing.

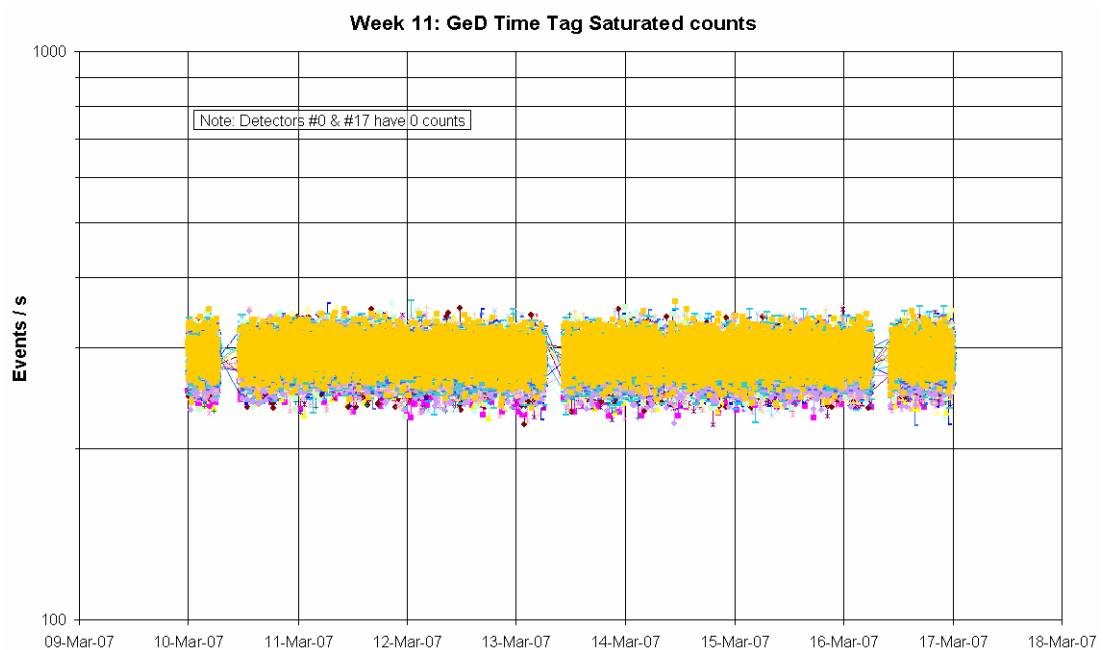
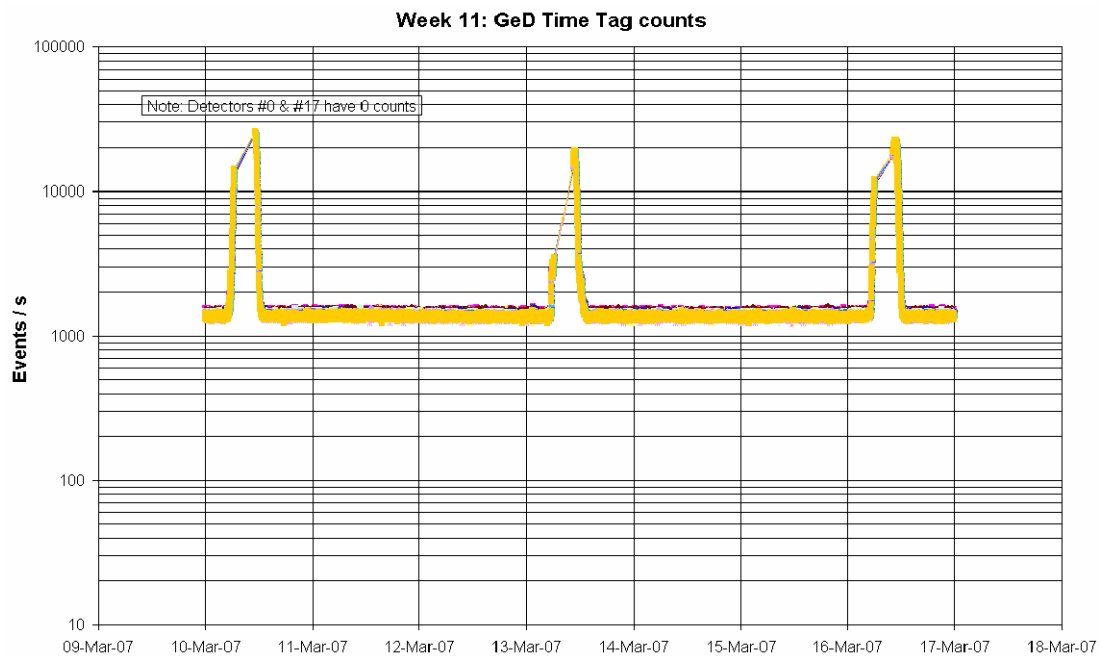
The GeD#12 HV remained at 3.5kV throughout the reporting period.

The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06.12.2003 and detector #17 is failed since 17.07.2004.

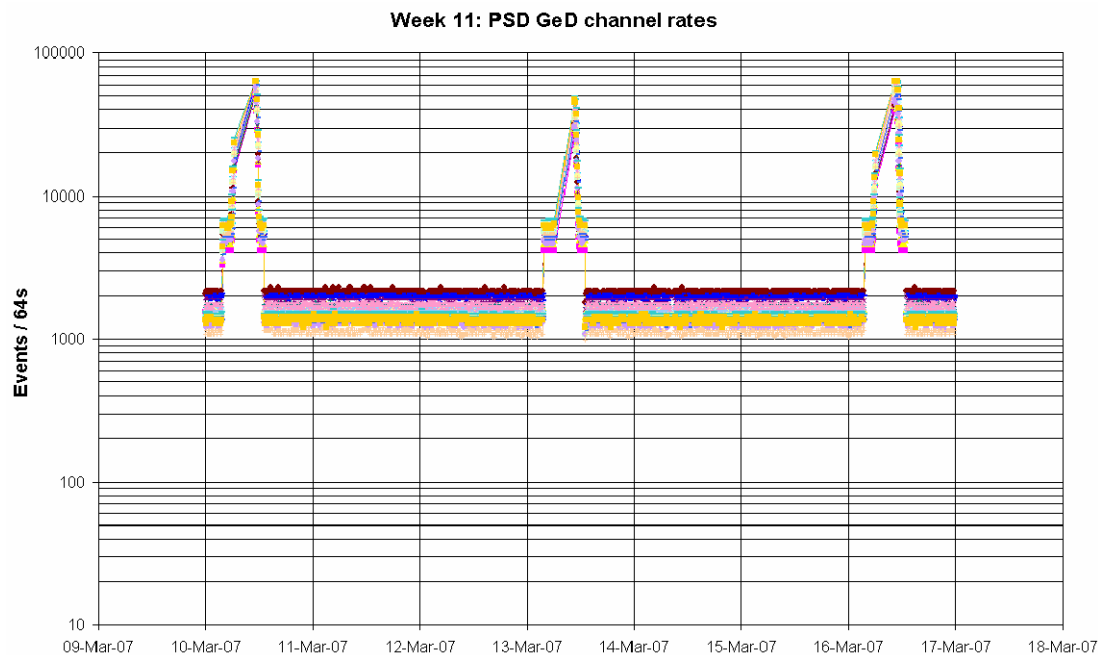


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period.





PSD: The health of the unit is nominal. The following plot shows the PSD channel rates during the reporting period.



Event Log:

The following non-nominal events occurred on SPI during the reporting period:

- On 2007-03-10 at 06:20:56Z TM parameter E4009 S DF HSLERR L went OOL for 1 TM cycle, indicating errors on the HSL. This was just before LOS of revolution 537.
- On 2007-03-13 at 01:20:21Z the TM parameter E3500 P_DF_CNVT-BW_L started toggling OOL High. This was about 2 hours 20 minutes before radiation belt entry of revolution 538 and therefore no action was taken. This parameter went OOL again on 2007-03-13 at 13:03:25Z, after radiation belt exit of revolution 539, returning within limits at 13:16:21Z.
- On 2007-03-10 at 13:59:12Z, after radiation belt exit of revolution 538, the ED EEORTM01 was uplinked manually to clear false OOLs which were present as this ED had been erroneously omitted from the Timeline for this revolution. This ED was then also uplinked manually after radiation belt entry of this revolution, on 2007-03-13 at 03:42:00Z. This is recorded in Anomaly Report INT-2909.
- On 2007-03-16 at 15:18:53Z one occurrence of the following OEM was received:

APID	1024	ID	243	EVENT	SPI1	SPECTRA	BUILDING
NOT COMPLETED							
	FIX6						0
	E9079		MESS CLASS				0
	E9080		MESS ID				243
	E9780		DETECTOR ID				11
	FIX16						0

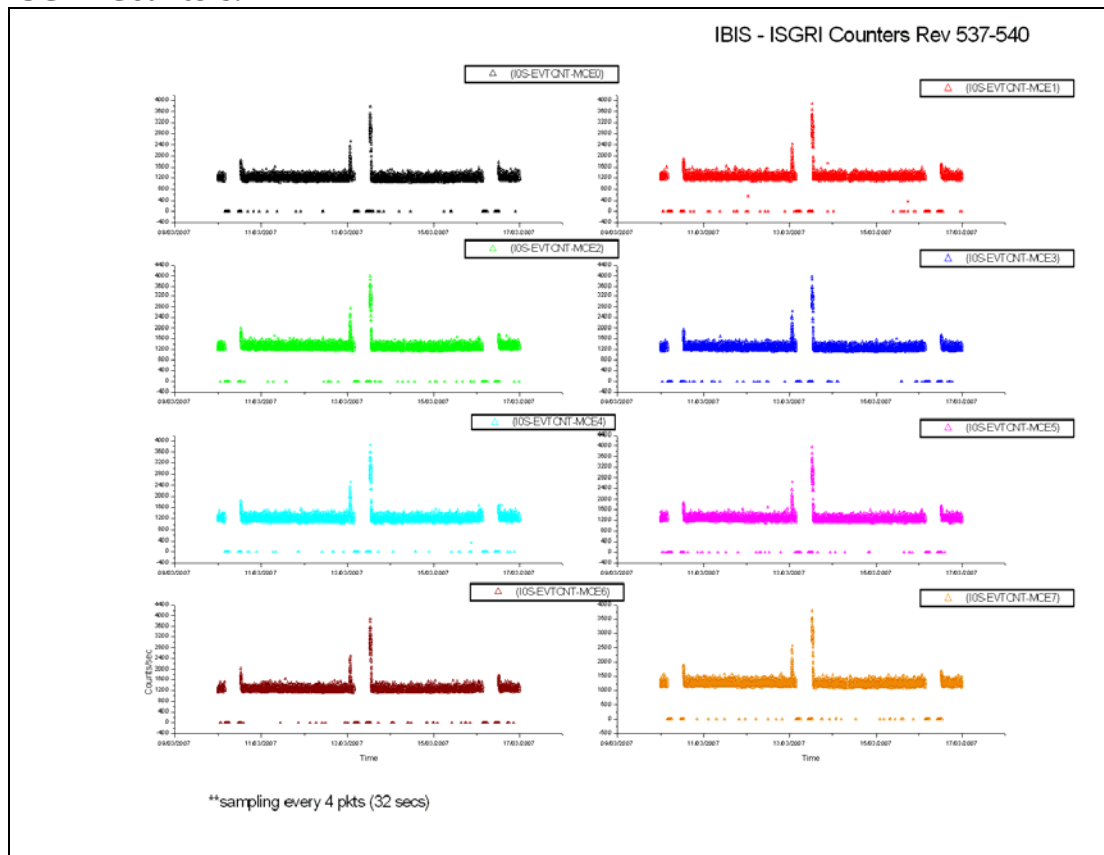
This was during pointing ID 05400006. As it was a one-off occurrence, no action was taken.

- On 2007-03-16 at 22:21:24Z one occurrence of OEM 1024 ID 229 EXCEPTION SPI1 PARTIAL FLAG OVERFLOW was received. This was during PID 05400017.

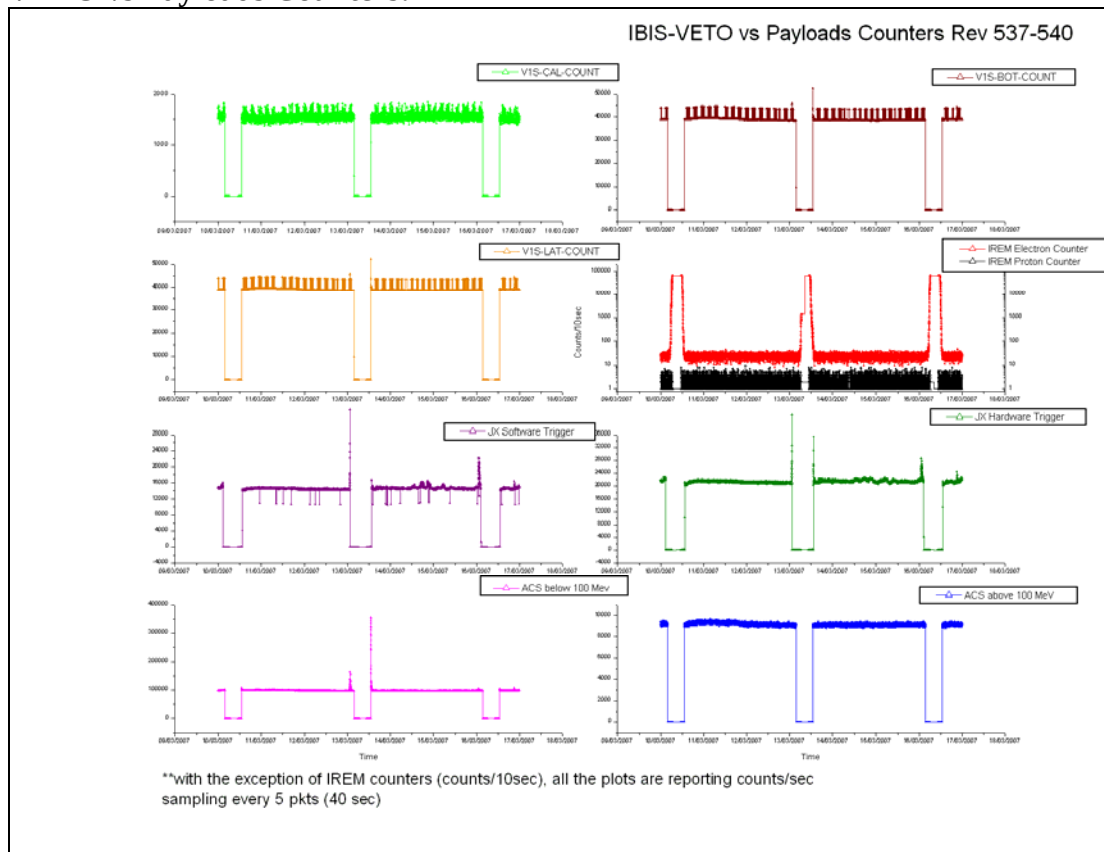
7.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

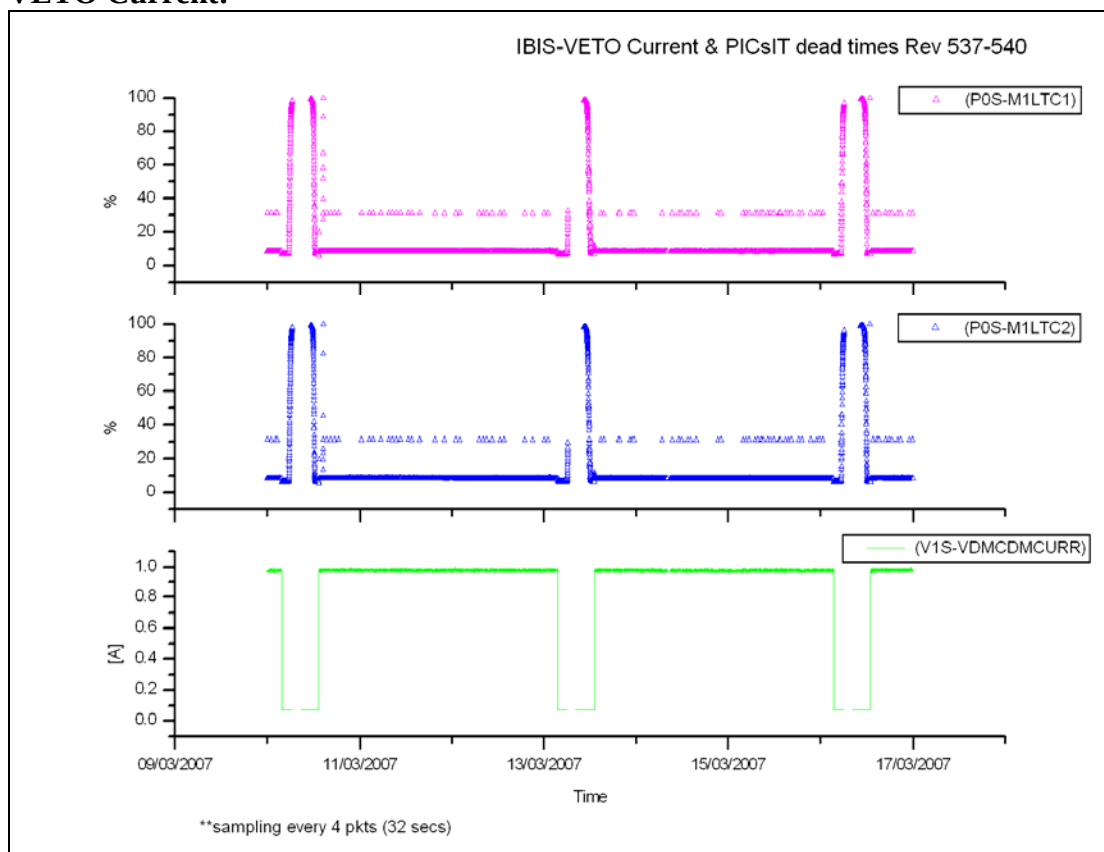


VETO vs Payloads Counters:

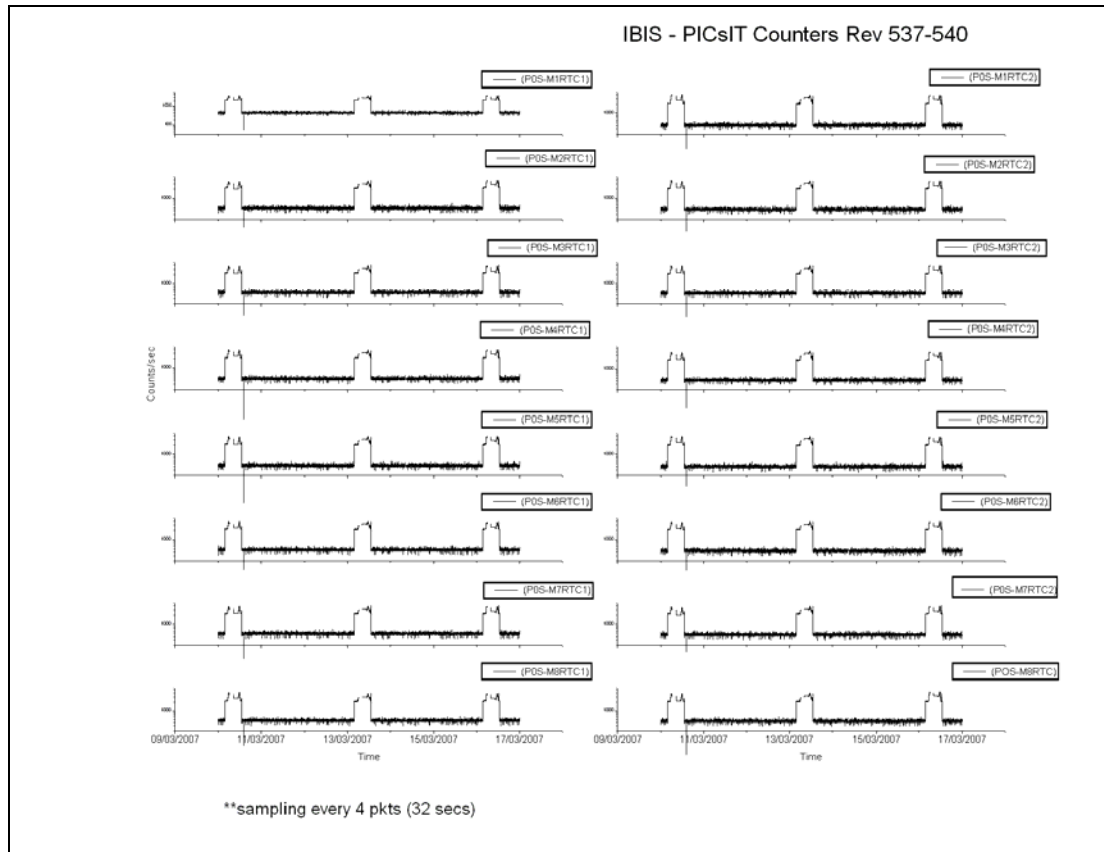


The week was characterised by low radiation.

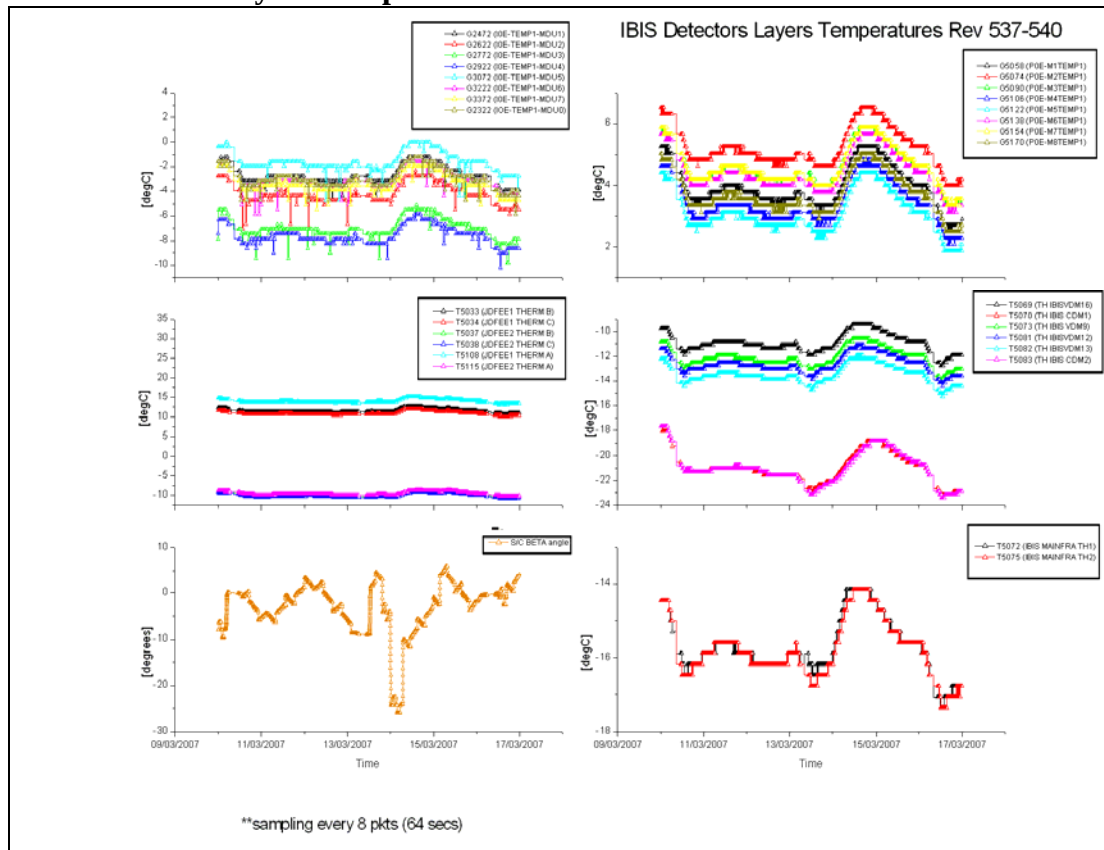
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report:

The usual Out Of Limits on TM parameter G8015 (S1E-A2_PMT_V), families G5002 (P0S-Mi_RTC1) and G5003 (P0S-Mi_RTC2), families G2014 (I0E-OVFWPXADD-Mi) were reported at Radiation Belts passage.

DoY 2007.071 (12/03/2007):

At 17:55Z after Ground Station Hand-Over, TM parameter X7500 (IBIS HIST DWN LD) was reported OOL flagging a problem with IBIS histograms downloading. As it went back inside limits 2 minutes later no action was taken.

At 18:02Z, X7500 triggered the OOL again. Following the indication in the FDIR, the operator waited to see if the histograms would restart after the next slew. This did not occur, and at 19:09Z the operator forced the downlink of all remaining histograms with FCP_IBIS1_0312 as indicated in FDIR. IBIS was back in Scientific Standard mode at 19:15Z and during the next pointing it was verified that the histograms were downloaded nominally.

DoY 2007.073 (14/03/2007):

At 21:11Z after a lost of TM, TM parameter X7500 (IBIS HIST DWN LD) was reported OOL flagging a problem with IBIS histograms downloading. As it went back inside limits 2 minutes later no action was taken.

The 2 previous problems are showing an anomaly with the HEPI HBRB interface that is sometimes not able to cope with an interruption of data flow such as ground station handover or TM gap.

This issue is to be monitored and if it happens more regularly a fix on HEPI level should be considered.

DoY 2007.069 (10/03/2007):

At 14:26Z parameters from TM families G5068 and G5072 (P0S-MiF1 and 2 ERRF) were reported failing SCC.

At 14:28Z parameters from TM families G5002 and G5003 (P0S-MiRTC1 and 2) were reported OOL Low-Low.

At 14:31Z the OEM APID 1280 ID 132 class 0 "HEPI Resynchronised" was reported. According to FDIR the coincidence of these 3 anomalies flagged an HEPI synchronisation problem that the unit fixed automatically. No action was hence required.

DoY 2007.072 (13/03/2007):

At 01:34Z TM family G2013 (I0S-EVTCNT_MCEi) was reported OOL High.

At 02:01Z, TM parameter G8080 (S1E-VS_HBRA-RT) was reported OOL high.

All these parameters returned inside limits in the next cycle. They all featured a noisy background as the S/C was approaching the Radiation Belts. At 03:39Z IBIS went to Safe configuration due to Belts entry (timeline).

No action was taken.

DoY 2007.072 (13/03/2007):

At 12:37Z TM family G2013 (I0S-EVTCNT_MCEi) was reported toggling OOL High. It stopped at 13:00Z, hence no action was taken.

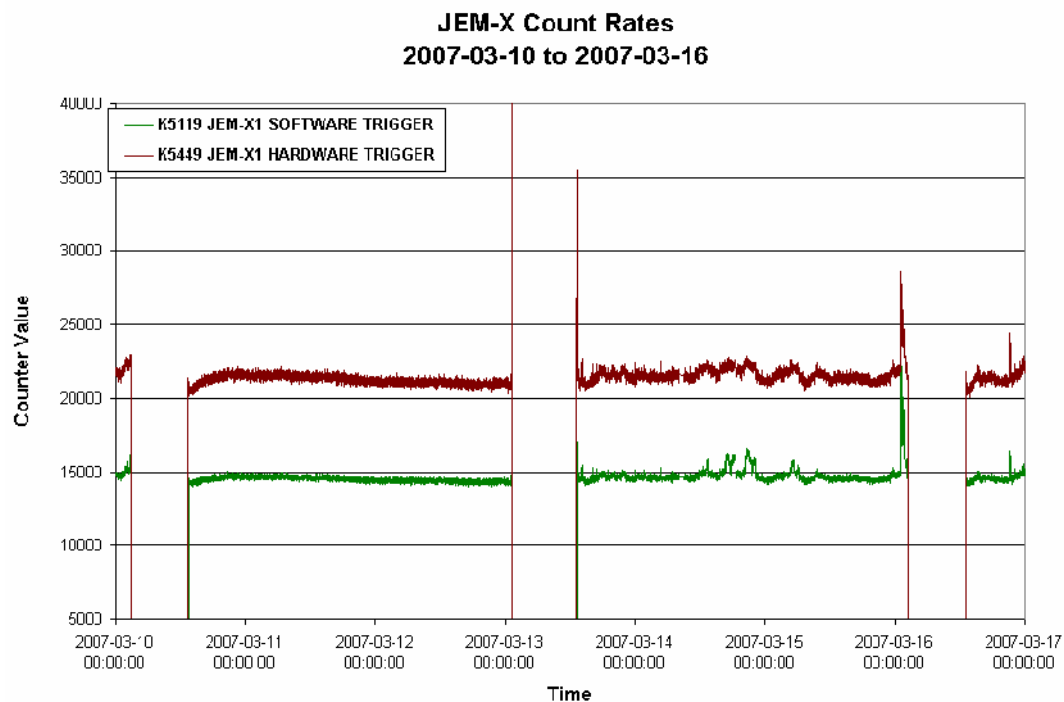
This featured a noisy background at belts exit after ISGRI calibration but when VETO was still in Stand-By.

This anomaly is a recent one, raised in the last 2 weekly reports. The situation should be monitored and a possible resolution should be considered (delay in ISGRI calibration, shift of Belts window...).

7.3.4 JEM-X Operations

JEM-X Count Rates

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

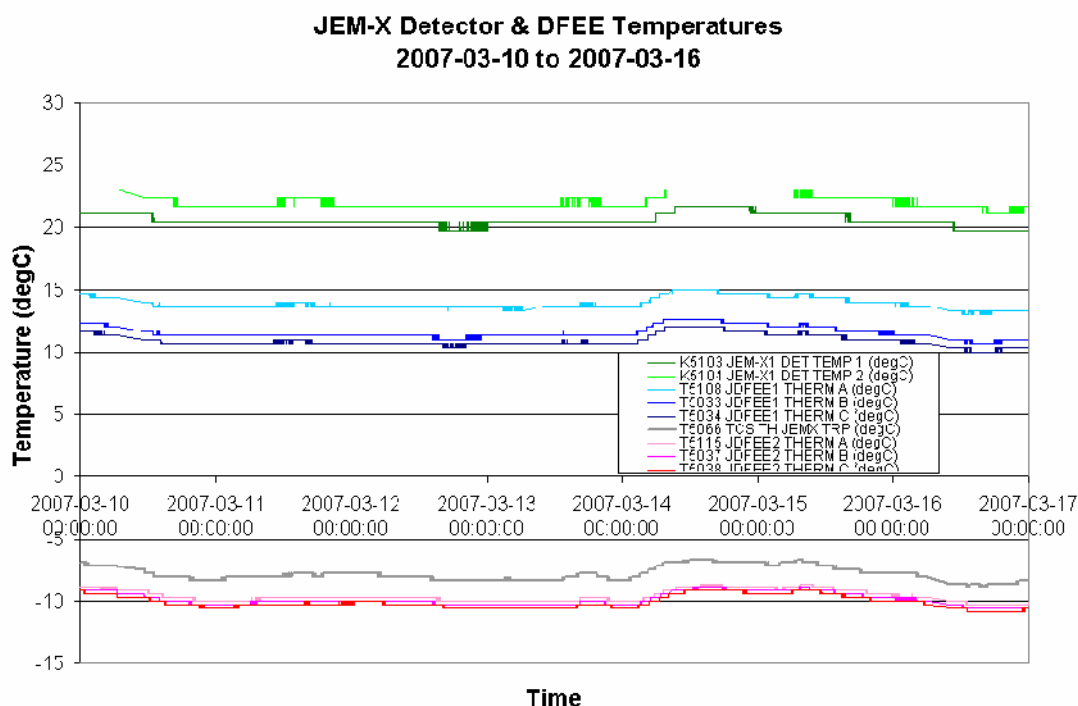


JEM-X Temperatures

JEM-X Detector and DFEE temperatures, along with the temperature on the detector bench between the two units, over the reporting period are displayed in the following graph².

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)



JEM-X Daily Report

2007-03-10 (DOY 069, Rev 537-538) to 2007-03-12 (DOY 071, Rev 538)

JEM-X1 operations executed nominally.

2007-03-13 (DOY 072, Rev 538-539)

Due to high background radiation conditions, at 01:18:41Z the TM parameter K5449 HARDWARE TRIGGER went OOL High and at 01:20:41Z K5119 SOFTWARE TRIGGER started to toggle OOL High. At 01:21:32Z JEM-X1 made an autonomous transition to Safe mode, triggered by the Software Ratemeter. OEM 189 JEM-X1 PROB DFEE 9 (Unexpected DFEE state reported in housekeeping) was received at this time, as the TM parameter K5462 DFEE STATE IASW was reporting state Setup while K5022 DFEE STATUS was Safe, followed immediately by OEM 254 ERROR OFF as K5462 DFEE STATE IASW went to Safe as well. This was about 1 hour 20 minutes before the planned transition to Safe mode before radiation belt entry of revolution 538.

Due to high background radiation conditions after radiation belt exit of revolution 539, at 13:24:41Z TM parameter K5449 HARDWARE TRIGGER went OOL High, returning within limits at 13:26:01Z. At this time TM parameter K5136 BUFFER LOSS went OOL High, returning within limits at 13:26:17Z.

JEM-X1 operations continued nominally.

2007-03-14 (DOY 073, Rev 539) to 2007-03-16 (DOY 075, Rev 539-540)

JEM-X1 operations executed nominally.

7.3.5 OMC Operations

2007-03-10 (DoY 069, Rev 537) to 2007-03-13 (DoY 072, Rev 538)

Nothing to Report

2007-03-14 (DoY 073, Rev 538)

At 00:12:24, a Trigger command was sent by ISDC. This command was rejected, as the unit was in Stand-by mode at the time. There was no impact.

```
2007.073.00.12.24.107  2007.073.00.12.28.470  1792  RealTime  131  TC REJECT  
REJECTED TC1          0          0  65535  PR    N  
E    E
```

At 08:11, ground station problems led to the loss of TM, and the suspension of the Timeline. After switching to another ground station, and performing a recovery, the Timeline was rejoined at 09:51. The impact was the loss of pointing 05390029.

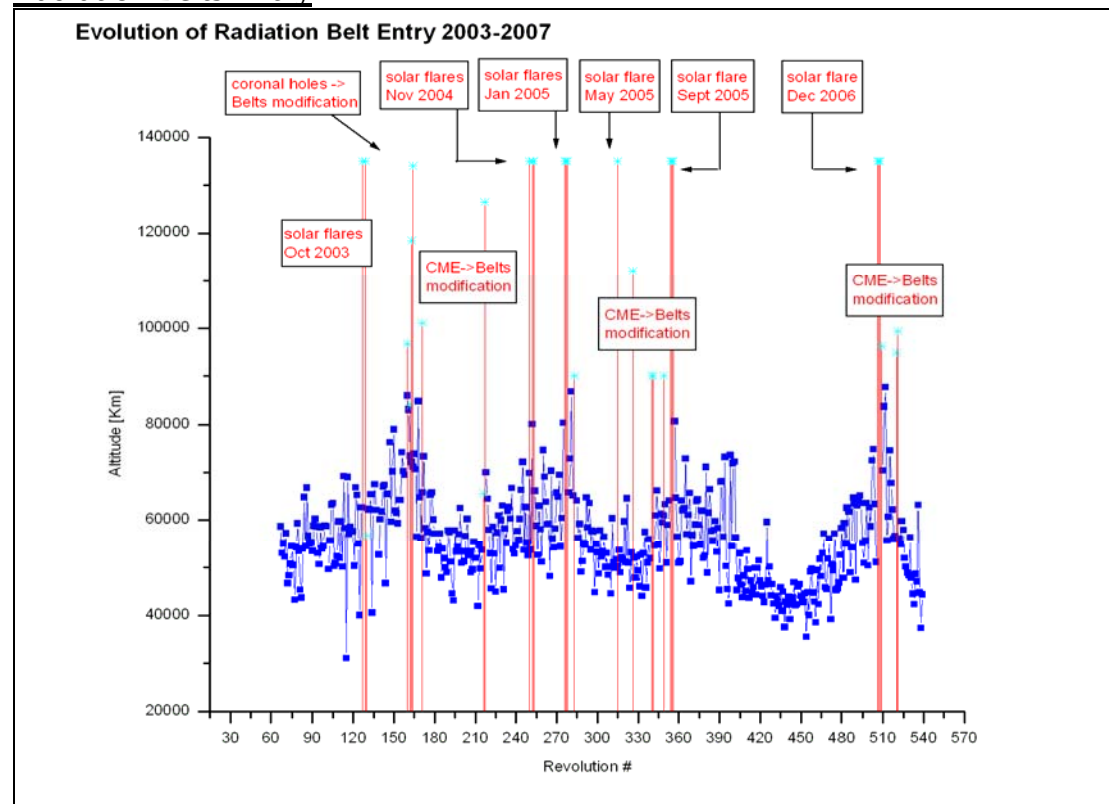
2007-03-15 (DoY 074, Rev 538) to 2007-03-16 (DoY 075, Rev 539)

Nothing to Report

On DoY 069 at 03:49:47, DoY 072 at 03:38:43 and DoY 075 at 03:28:35 OMC went to SAFE mode nominally, at the radiation belt entry time as set in the Broadcast Packet.

7.3.6 IREM Operations

Radiation Belts Entry



IREM daily report

Nothing to report

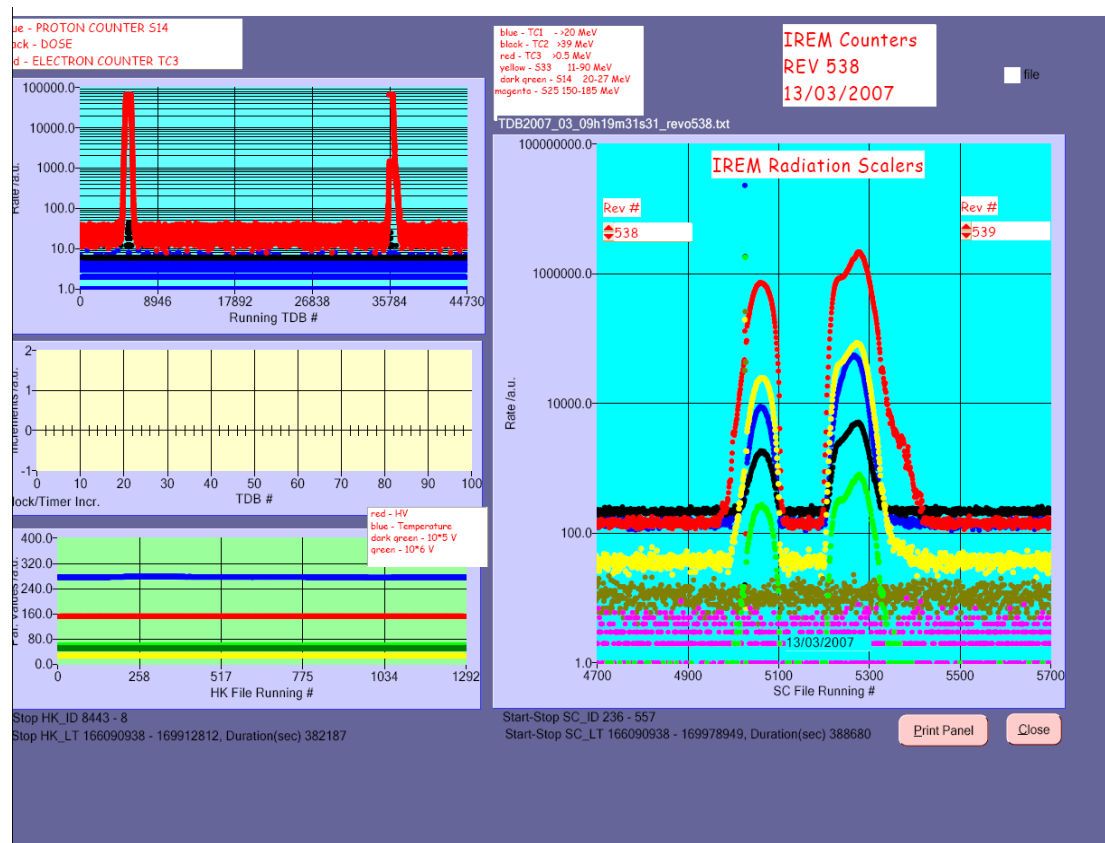
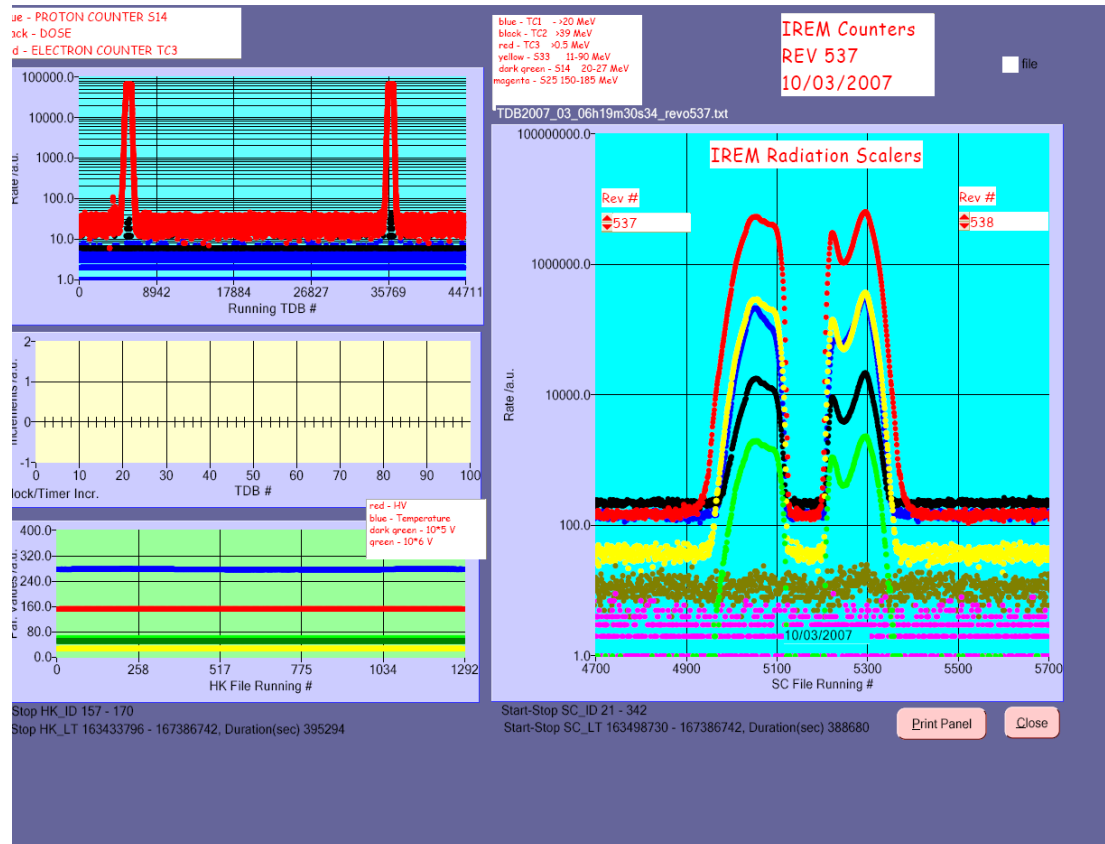
Electron Belts

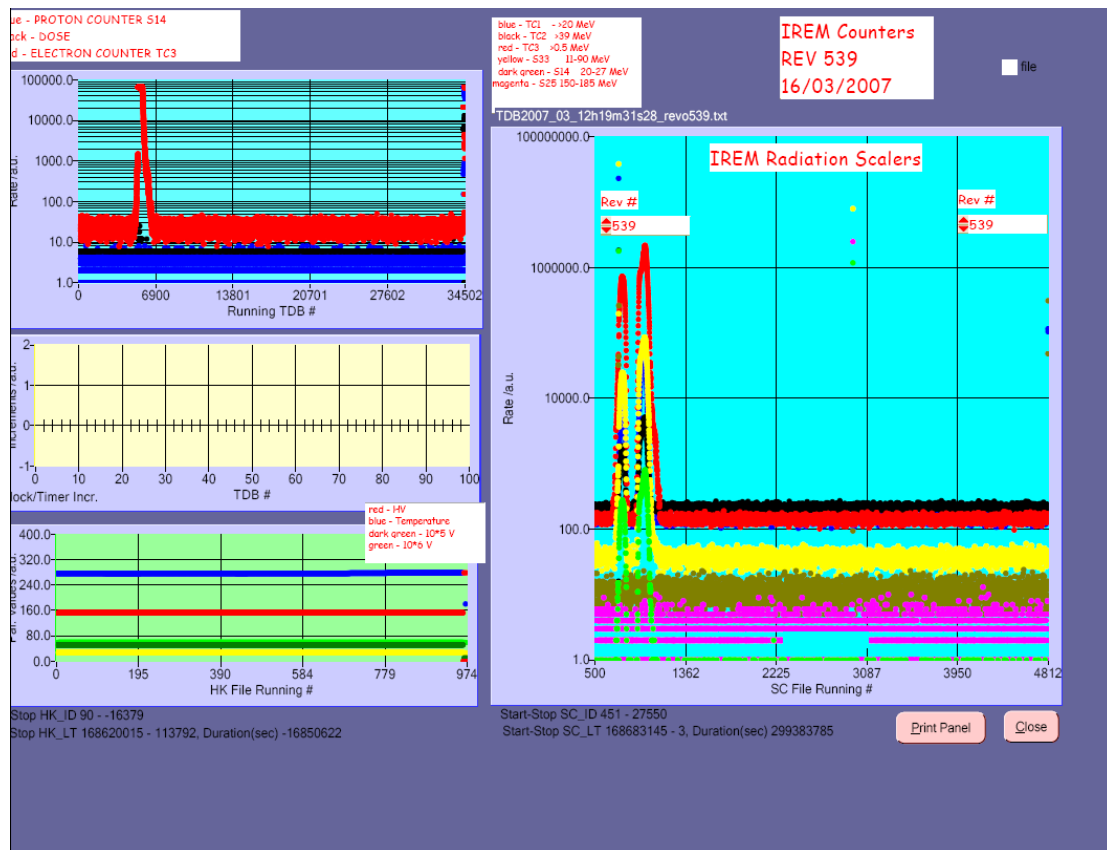
REV	S/C BCPKT (electron)	Electron CUT-OFF Observed Entry/Exit	Observed Entry/Exit Altitude [Km]	Electron CUT-OFF Predicted Entry/Exit	Predicted Entry/Exit Altitude [Km]
537	RAD_ENTR R 2007-03-10T03:49:45Z	2007-03-10 05:11:05	44747.2	2007-03-10 04:47:37	47954
538	RAD_EXIT R 2007-03-10T13:07:35Z	2007-03-10 12:34:57	<<47163.3	2007-03-10 12:47:37	42237
538	RAD_ENTR R 2007-03-13T03:38:37Z	2007-03-13 05:51:45	37318.5	2007-03-13 04:43:12	47098
539	RAD_EXIT R 2007-03-13T12:56:05Z	2007-03-13 13:09:29	47112.5	2007-03-13 12:33:12	41711
539	RAD_ENTR R 2007-03-16T03:28:34Z	2007-03-16 04:54:57	44369.5	2007-03-16 04:33:12	47223
540	RAD_EXIT R 2007-03-16T12:46:01Z	2007-03-16 12:19:29	<<44953.6	2007-03-16 12:23:12	41576

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

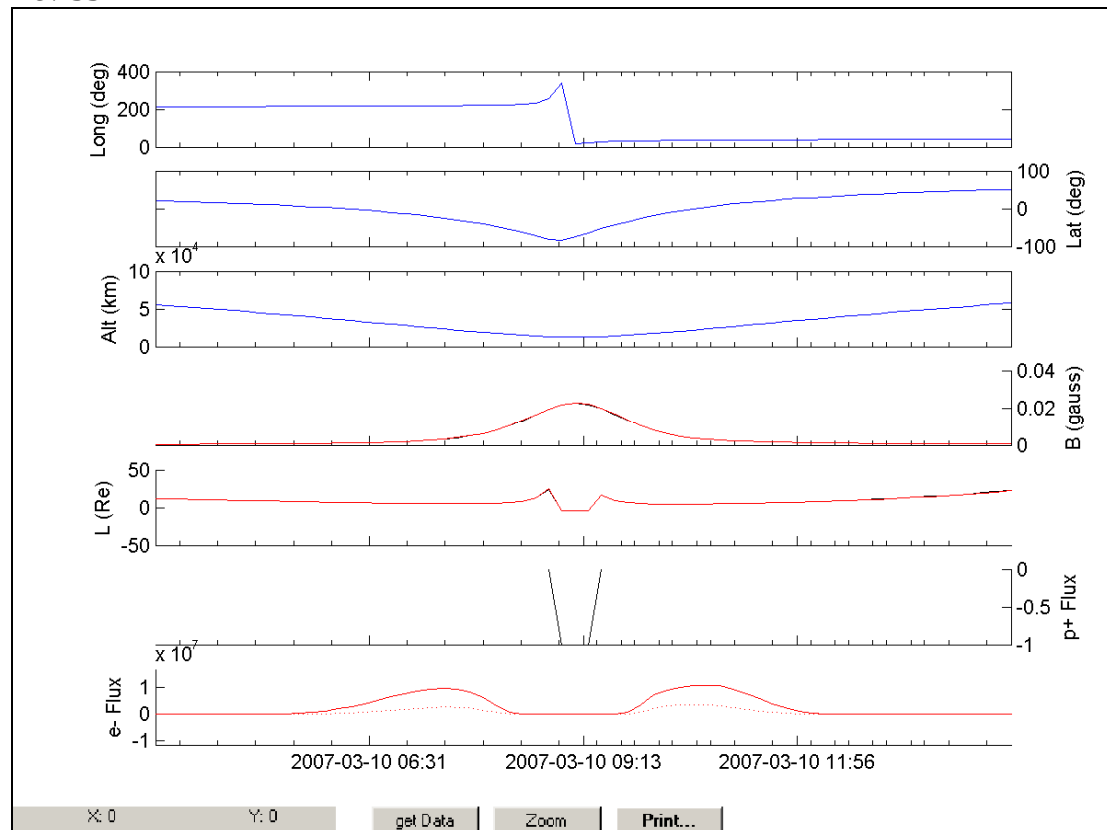
IREM radiation counters:



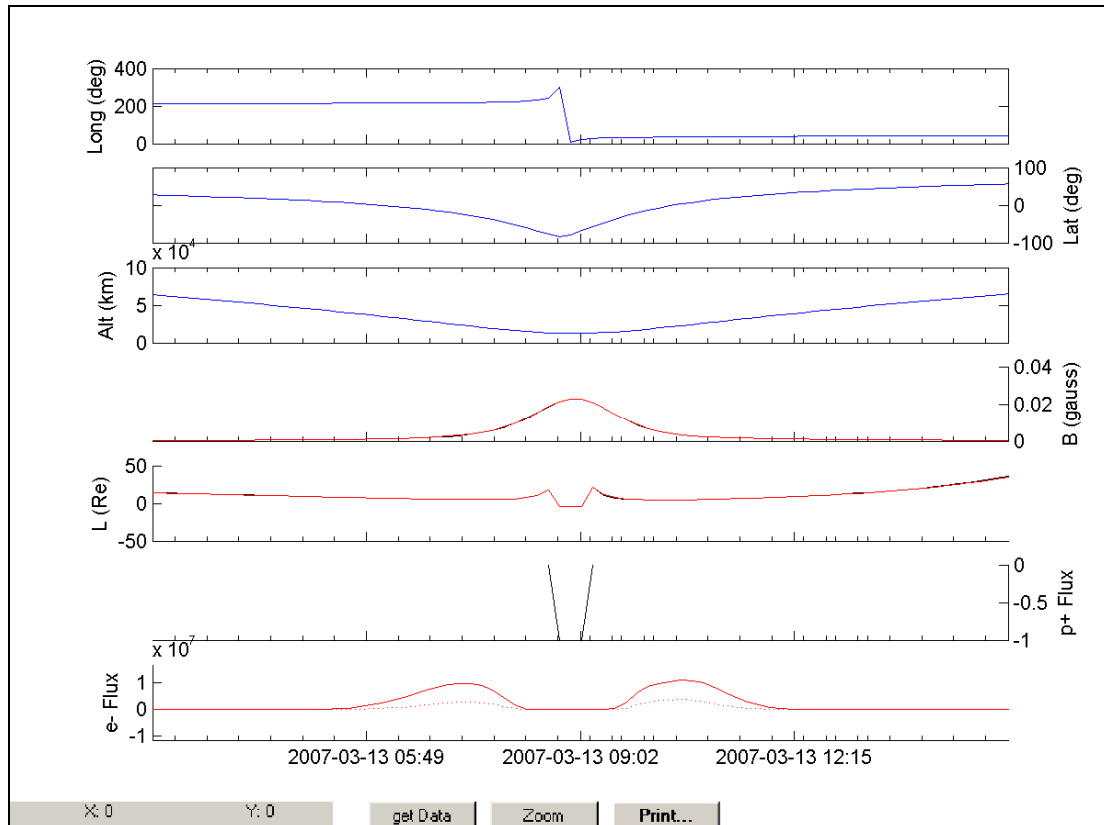


IREM Predicted Radiation Belt Passages

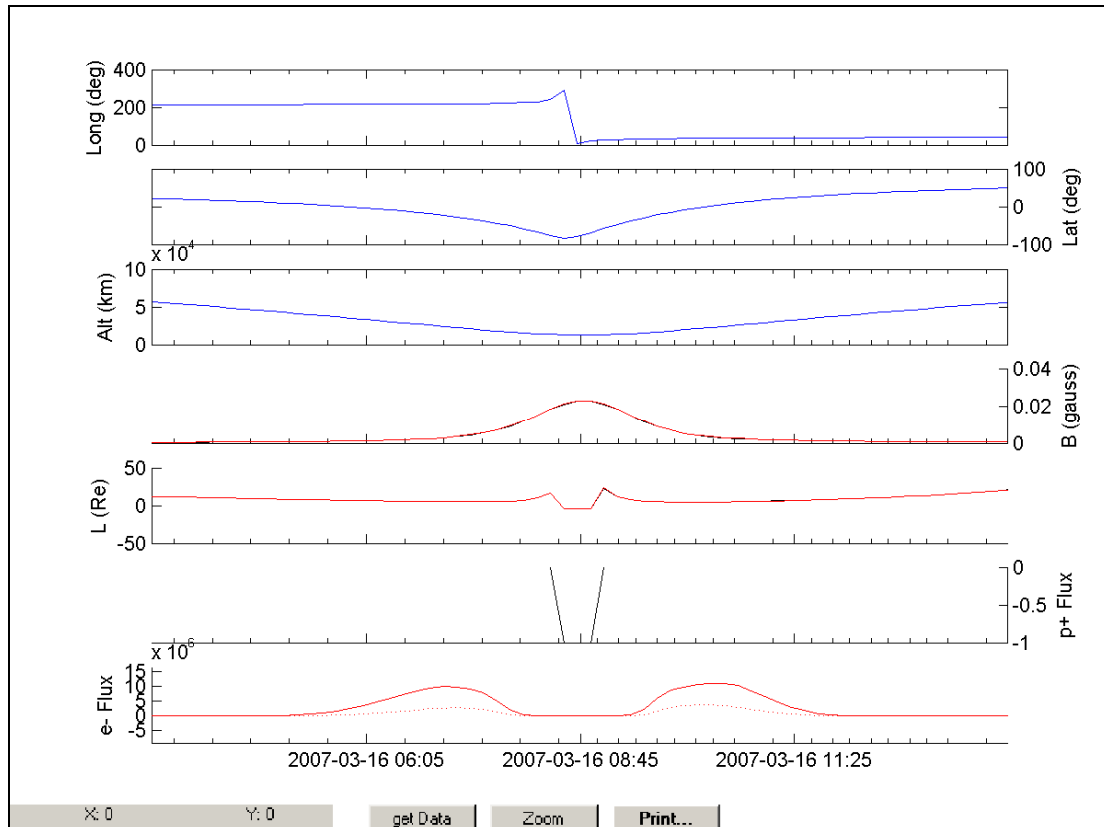
Rev 537



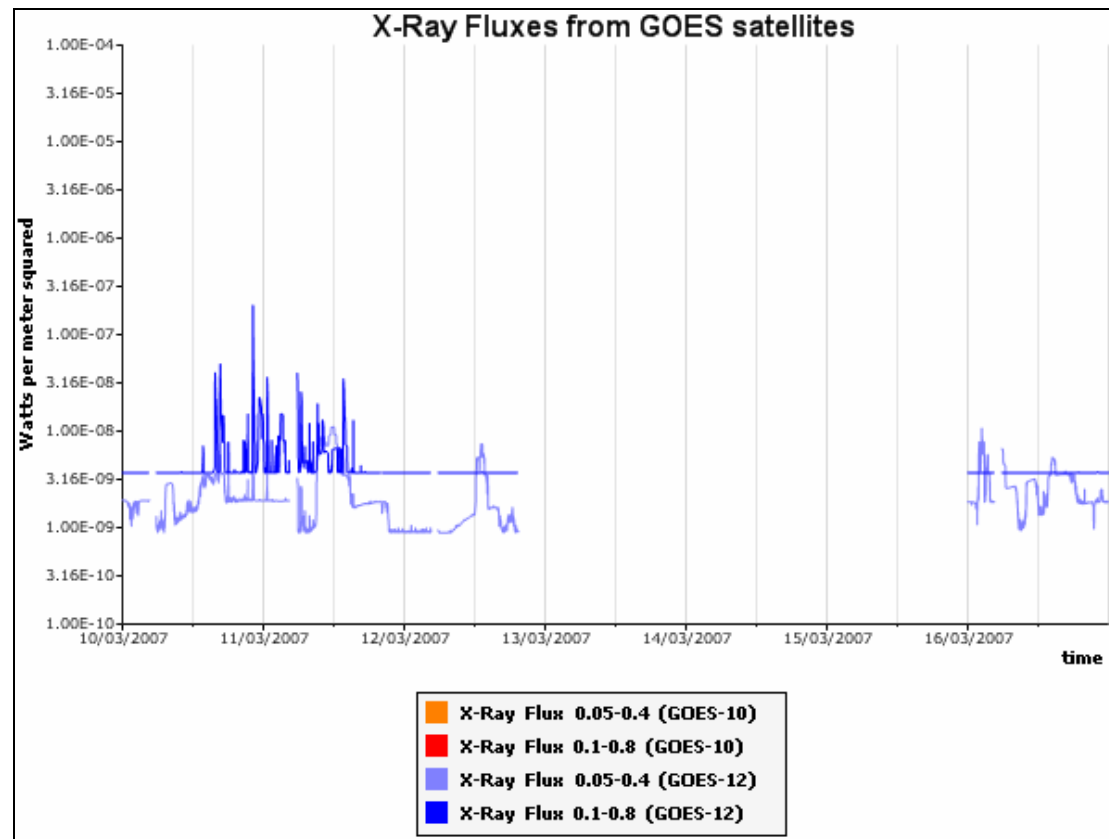
Rev 538



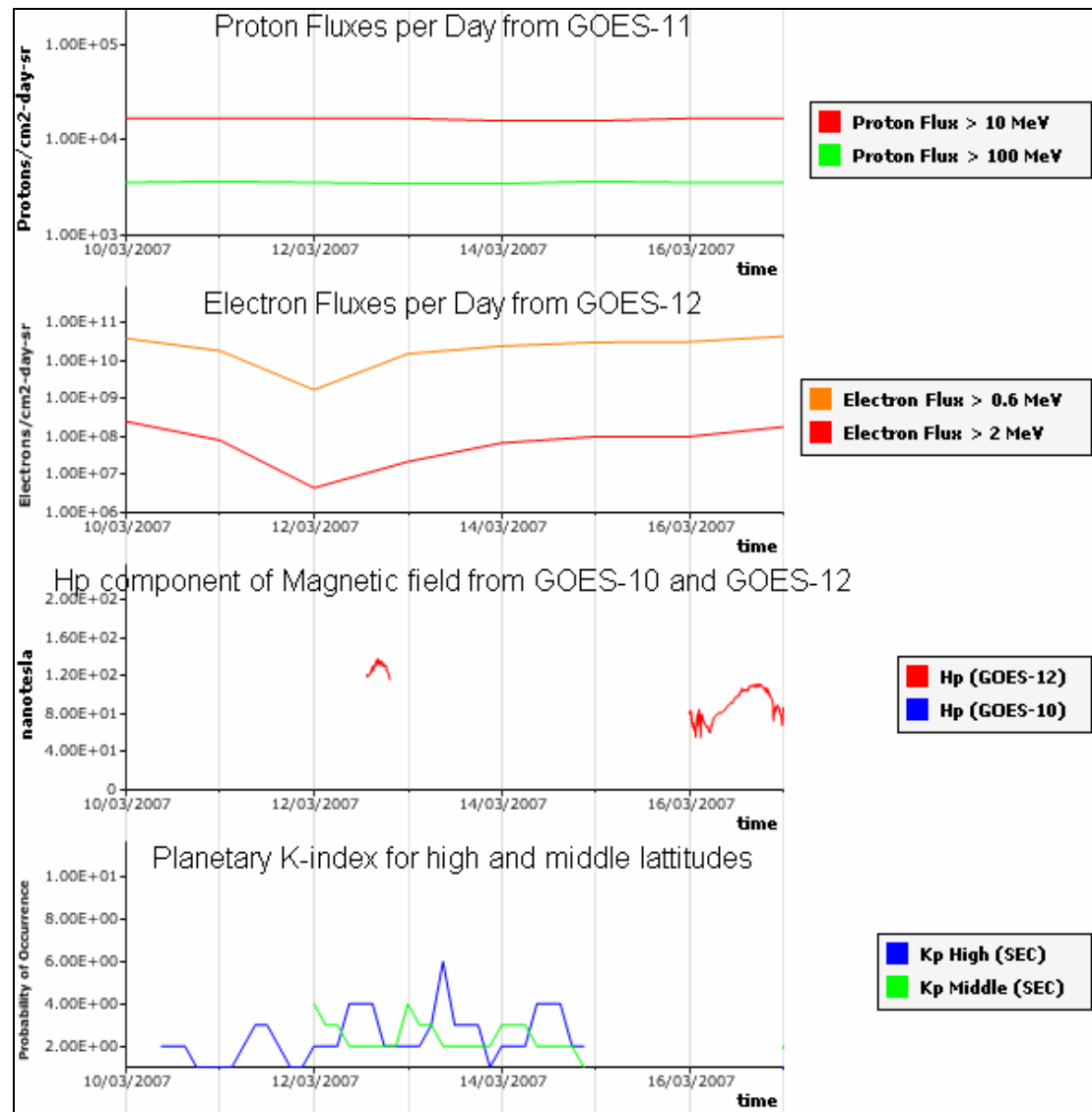
Rev 539



SEC-GOES Observed Particles Fluxes (using SEIS/RAT tool):



X-Ray fluxes start to be significant over 10^{-5} W/m² (corresponding to M-class flares). Above 10^{-4} W/m², they correspond to strong X-class flares.



Proton and electron flux are reporting low radiation background this week.
 Hp component of the Geomagnetic Field is essentially parallel to the Earth's rotation axis. A drop near 0 nT is associated with a significant variation in the magnetic field. No Hp data are available this week.
 Kp index is based on ground magnetometers. Kp ≥ 5 features storm-level geomagnetic activity.