

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 194
Week 23
12.06.06
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 03.06.06 until 09.06.06 (both dates inclusive) and covers the revolutions 445 and 446.

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 raster dithers of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9), Field_13 (RA 02:54:53.00, DEC -38:54:33.0) and LEDA170194 (RA 12:39:06.30, DEC -16:10:47.8) a Galactic Centre Deep Exposure and some AOCS calibrations pointings.

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.

As part of the AOCS periodic calibrations, after the end of the eclipse season, the FSS/STR Misalignment calibration and the calibration of SAS (Alpha and Beta Scale Factors) were performed. The pointings required for the Calibrations were planned in dedicated window in the Timeline of revolution 446 (for FSS\STR).

The calibration activities were executed nominally from the Automatic Timeline.

3 slews were lost during the observation period due to problem on the FDS.

The fuel consumption over the period between 02/06/2006 and 08/06/2006 was 0.2104 kg. The remaining propellant is in the order of 153.9206 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

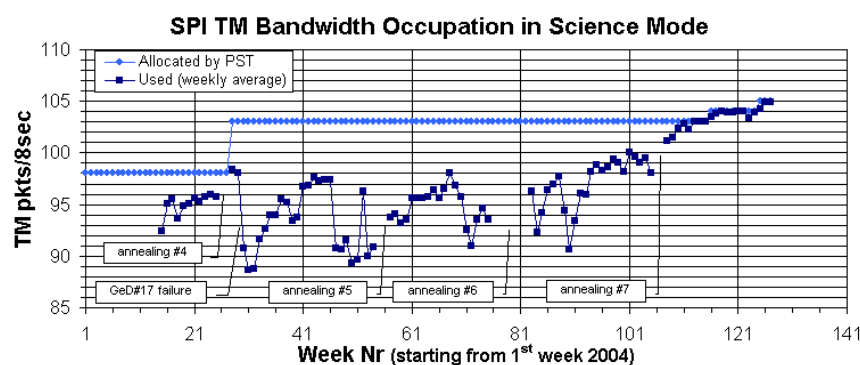
3.2.1 SPI

The overall status of the gamma-ray spectrometer is nominal.

After the annealing in January 2006, the evolution of the energy resolution showed that SPI had to perform a new annealing of the Germanium detectors. The 8th annealing was therefore approved and has started on the 8th June, after radiation belt entry of revolution 445. A summary annealing timeline is included in the future activities section of this report.

During science operations, before annealing start, the instrument was kept in photon-by-photon mode, with spectra TM enabled, assigned TM bandwidth in the science observation windows of 105 pkts/cycle and average telemetry occupation of 104.9 pkts/cycle. The telemetry downlink of SPI has therefore reached the saturation.

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.

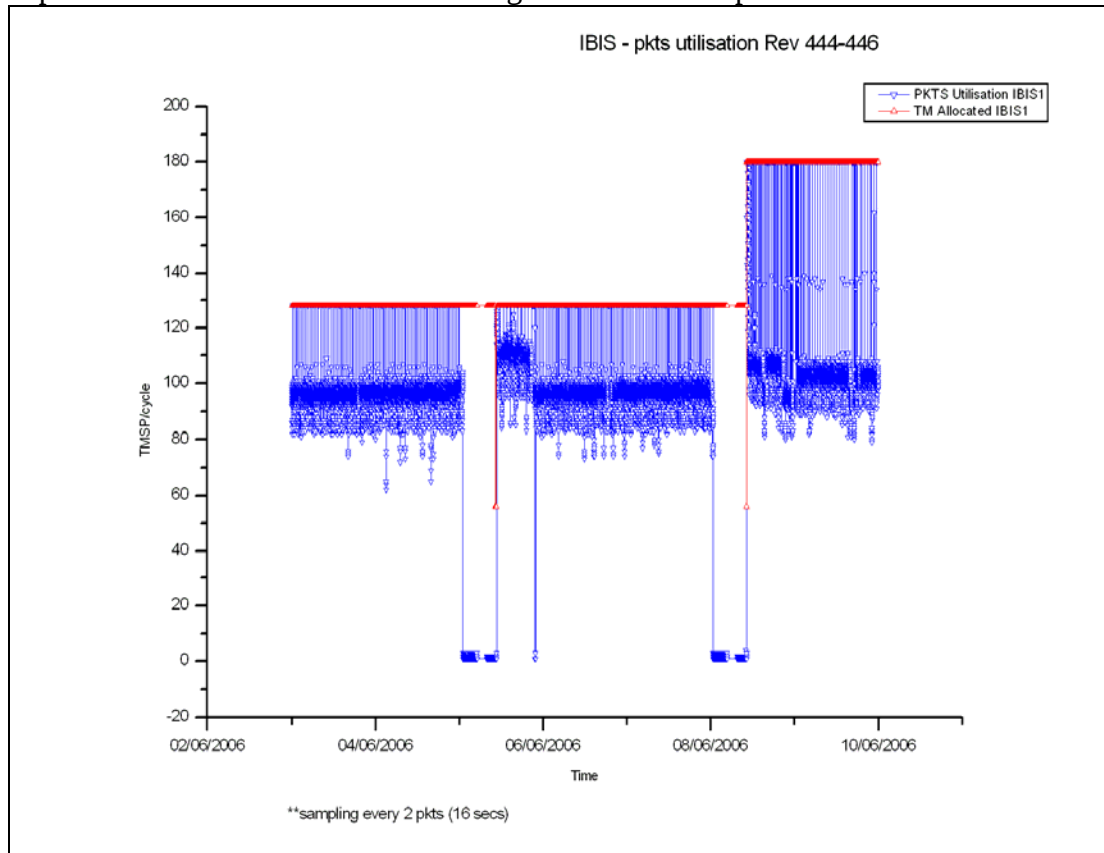
3.2.2 IBIS

The overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 128 TMPS/cycle. However it was 180 TMPS/cycle from 2006-06-08 at 10:26:35Z due to SPI annealing.

The IBIS mean bandwidth utilisation during the observation period was 102.68 TMPS/cycle, up 0.24 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 in revolutions 444 and 445, and 15 packets/cycle in revolution 446. JEM-X2 was dormant (DPE OFF) with no TM slots allocated.

On 2006-06-08 the high voltage activation of JEM-X1 at the start of revolution 446 failed completion due to high values of the Hardware Trigger causing a transition of JEM-X1 back to Safe mode. JEM-X1 was then activated manually and reached Data Taking mode ~20 minutes later than planned.

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, 218 of the 221 planned science pointings for OMC were executed nominally, 1 was delayed and 2 were lost.

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

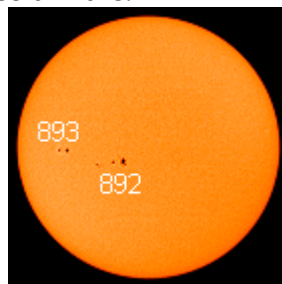
3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised low solar activity.

The beginning of the observation period was quiet as the sun was blank. Sunspot 892 that emerged on 04 June, started posing threat for M-class solar flares on 06 June until the end of the week (cf picture of the sun on 9 June). Sunspot 893 that appeared on 6 June did not pose any threat of solar flare.



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 very good this week, although 2 pointings were lost and another delayed due to FD problems.. There were a few other minor problems with ground stations, and the links with ISDC, but these had no impact. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week, with FD problems causing the loss of 2 pointings with a third delayed. The overall performance was over the 95% requirement.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week, there were a few instances of bad frames and TM drops from Redu, but these had no impact on the mission. The overall performance though was well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF for revolution 451 to 454 were delivered. Mission planning of revolutions 451 was performed. The SPI annealing started as planned in revolution 446. One ToO request was received during the weekend. Final decision on implementation will be taken early next week. TSF for revolution 447 was received from MOC.

2. Observation status

ECS for revolution 432 to 437 were received. The corresponding OCS's have been sent to ISDC. No extra time was credited.

3. ISOC science data archive

The data ingestion from ISDC that was stopped a couple of weeks ago due to a problem has now resumed. A statistics tool has been developed and is now under test.

4. ISOC system

The ISOC system version 12.4 was installed this week. This upgrade also included a data base update. The system is working but a possible problem with the data base migration was detected that could lead to loss of the instrument parameter settings used in some special situations. Therefore the migration of the data base will be re-performed early next week after correction of the script performing this task. This will ensure no information is distorted.

5. AO 4

The TAC has now finished their task for the AO. After approval by D/SCI ISOC will start to update the data base and inform the PI's of the results of the TAC process.

6. Problems

No new problems encountered

4.3.2 ISDC

Status of ISDC observation processing on 12/06/2006:

- Latest Standard Analysis completed: observation 03200920003 (Galactic Centre, Revolution 421, 424-428) on 11/06/2006.

- Latest products archived: observation 03201090065 (Galactic Bulge, Revolution 428) on 11/06/2006.

- Latest observation products sent to the observer: observation 03201090063 (Galactic Bulge, Revolution 426) on 01/06/2006.

5 Special Events

6 Anomalies

The following problems impacted operations this week:

- On DoY 157, at 19:00, a FDS problem caused the update for slew 04450047 to fail. A manual recovery was executed, and the manoeuvre completed with a 12 minute delay.
- On DoY 159, at 14:42, the TC A3189 'Start Guide Star' failed release, as there was no suitable guide star in slot number 2. A manual recovery was performed, and the timeline rejoined at 15:01. The impact was the loss of pointing 04460009.
- On DoY 160, at 21:57, the update for slew 04460056 failed. A manual recovery was performed, and the timeline rejoined at 22:58. The impact was the loss of pointing 04460056.

See AOCS section of details on all these problems.

The following anomaly reports were entered into the ARTS system this week:

AR id	Date Created	Subject	Segment	Status
INT-2859	31/05/2006	Setting error of MISConfig - sun127	IMCS	Closed
INT-2860	09/06/2006	Commands pass acceptance when no Telemetry is flowing.	IMCS	Pending
INT_SC-152	12/06/2006	IREM Anomaly: Reset of IREM_CSCI S/W #31, 10/06/2006sun122	Payload	Open

7 Future Milestones

A new imcs release will be installed in June. This release will be based on SCOS 2000 3.1 patch M04, to bring the system in-line with that used by XMM.

The 8th SPI annealing started on 8th June at belts entry of rev.445. Here is the summary timeline of the planned annealing activities:

8th SPI ANNEALING - revs 445-451					
ID	Task Name	Duration	Start	Resource Names	
2	Start SPI Annealing - Warm-up Phase	35.35 hrs	08 Jun 00:43	PST[20 pkts]	8 Jun '06
16	Annealing at 104degC	192 hrs	09 Jun 12:04	PST[20 pkts]	12 Jun '06
22	Stop SPI Annealing - Passive Cooling Phase	96.02 hrs?	17 Jun 12:04	PST[20 pkts]	16 Jun '06
33	ACS Switch-on and Calibration	40.4 hrs	17 Jun 12:04	PST[20 pkts]	26 Jun '06
45	Start Cryocoolers - Active Cooling Phase	138 hrs	20 Jun 18:05	PST[20 pkts]	
57	Active Cooling Fine Tuning	72 hrs	26 Jun 12:05	PST[20 pkts]	
59	Camera Switch on & Performance Tests	31.8 hrs?	24 Jun 14:35	PST[104 pkts]	
80	Resume SPI POS Observations	62 hrs	26 Jun 08:50	PST[104 pkts]	

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 445

The observations in revolution 445 began with a raster dither of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9), which lasted ~9.8 hours. This was followed by a Galactic Centre Deep Exposure, which lasted ~47.4 hours, until the end of the revolution.

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

Revolution 446

The observations in revolution 446 began with series of AOCS calibration pointings lasting ~11.9 hours. This was followed by a raster dither of Field_13 (RA 02:54:53.00, DEC -38:54:33.0), which lasted ~14.1 hours. Finally, another raster dither, this time of LEDA170194 (RA 12:39:06.30, DEC -16:10:47.8) was performed, which lasted ~28.3 hours until the end of the revolution.

Throughout these observations all instruments were in their nominal science modes, except SPI, which is undergoing annealing and JEM-X2, which is switched off. The TM allocation was IBIS 180; SPI 46; JEM-X1 15; JEM-X2 0; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2006-05-27T09:25:31.000Z	154.2319	F	Automatic TM processing.
2006-05-28T19:35:35.000Z	154.2031	F	Automatic TM processing.
2006-05-30T09:08:19.000Z	154.1858	F	Automatic TM processing.
2006-05-31T19:17:42.000Z	154.1702	F	Automatic TM processing.
2006-06-02T01:46:58.000Z	154.1310	F	Automatic TM processing.
2006-06-02T08:54:42.000Z	154.0874	F	Automatic TM processing.
2006-06-02T19:38:19.000Z	154.0689	F	Automatic TM processing.
2006-06-03T19:23:50.000Z	154.0548	F	Automatic TM processing.
2006-06-05T04:37:21.000Z	154.0382	F	Automatic TM processing.
2006-06-05T08:32:18.000Z	154.0240	F	Automatic TM processing.
2006-06-05T20:58:03.000Z	154.0014	F	Automatic TM processing.
2006-06-06T18:47:10.000Z	153.9852	F	Automatic TM processing.
2006-06-08T04:21:05.000Z	153.9785	F	Automatic TM processing.
2006-06-08T08:17:46.000Z	153.9655	F	Automatic TM processing.
2006-06-08T23:49:15.000Z	153.9206	F	Automatic TM processing.

This report was generated Fri Jun 9 08:00:30 GMT 2006

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, 03/06/2006 – 09/06/2006

AOCS operations were executed from the Automatic Timeline.

During this period, 109 Open Loop Slews, 125 Closed Loop Slews and 9 Momentum Biases were executed.

As part of the AOCS periodic calibrations, after the end of the eclipse season, the FSS/STR Misalignment calibration and the calibration of SAS (Alpha and Beta Scale Factors) were performed. The pointings required for the Calibrations were planned in dedicated window in the Timeline of revolution 446.

3 slews (CSL) were lost during the observation period due to problem on the FDS.

Orbit Control

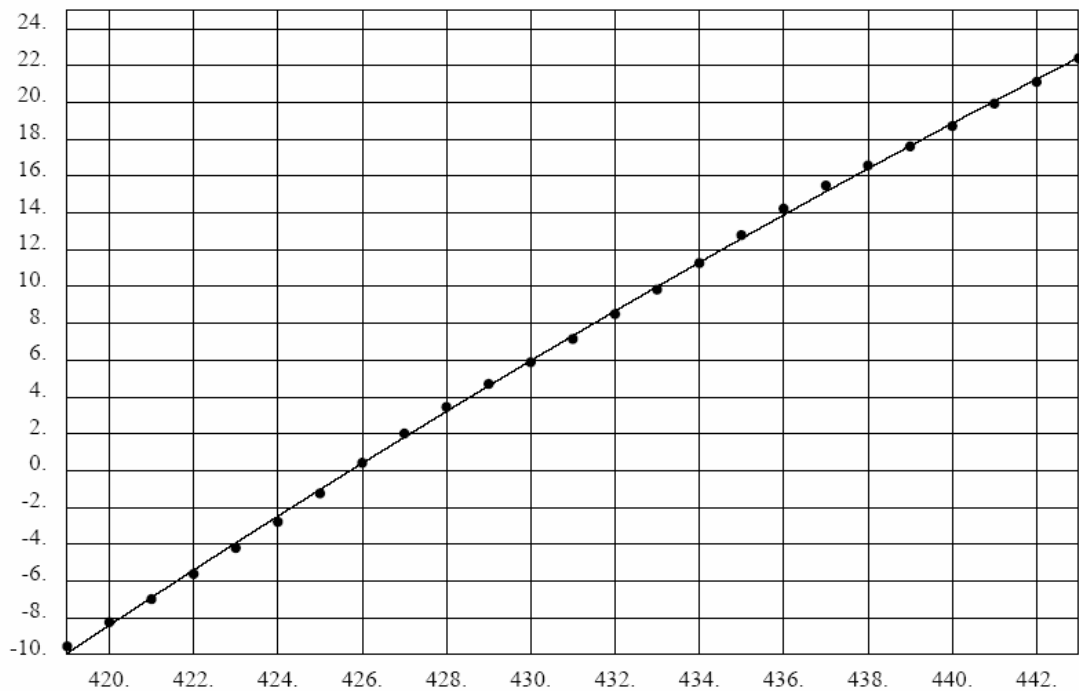
The following table shows the shortening of the necessary Goldstone pass:

Orbit number	Apogee passage date	Time from LOS Redu to 40000 km altitude
362	2005/10/01	284 min
372	2005/10/31	268 min
382	2005/11/30	244 min
393	2006/01/02	213 min
402	2006/01/29	188 min
412	2006/02/28	159 min
422	2006/03/30	122 min
433	2006/05/01	80 min
443	2006/05/31	46 min

From orbit 460 and onwards Redu will give coverage down to 40000 km altitude.

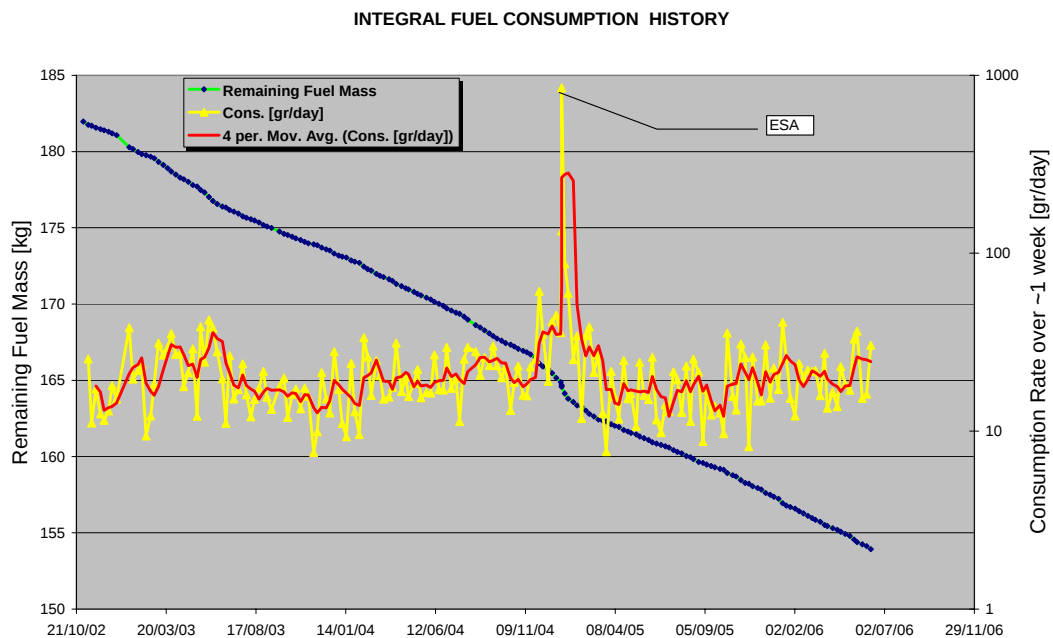
The attached plot shows the apogee longitude of Integral as a function of the orbit number. From this, an estimate of the rate of semi-major axis increase of about 800m per orbital revolution can be made.

APOGEE LONGITUDES OF INTEGRAL 21.03.2006 - 01.06.2006
 LEAST SQUARES APPROXIMATION WITH PARABLE

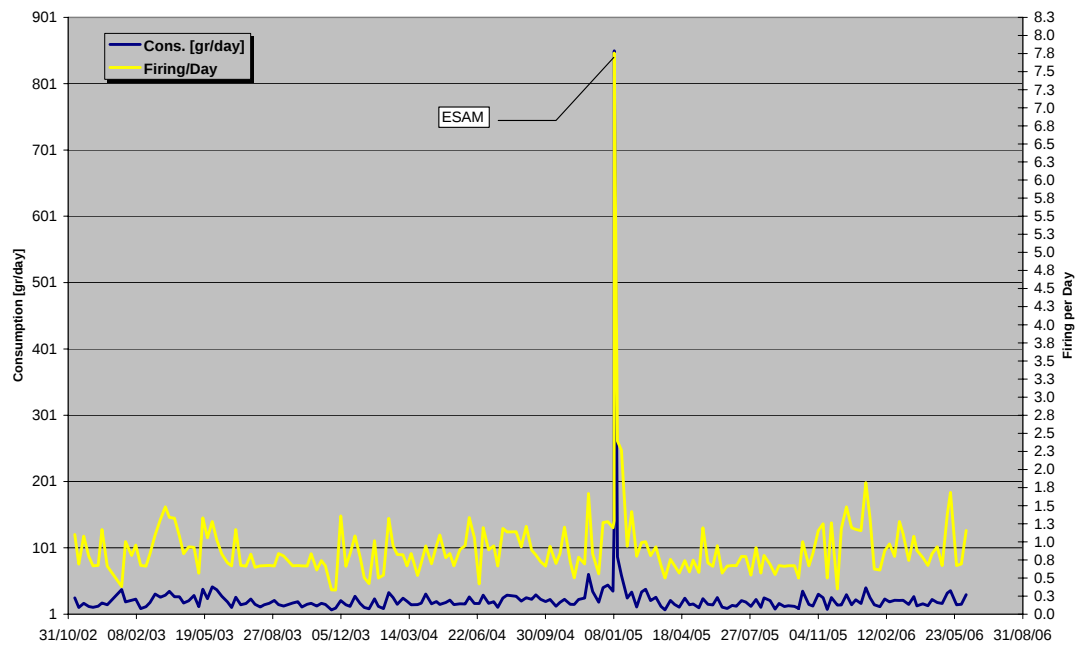


Fuel consumption

The fuel consumption (total, grams/day) over the period between 01/11/2002 and 08/06/2006 is reported in the plot below.

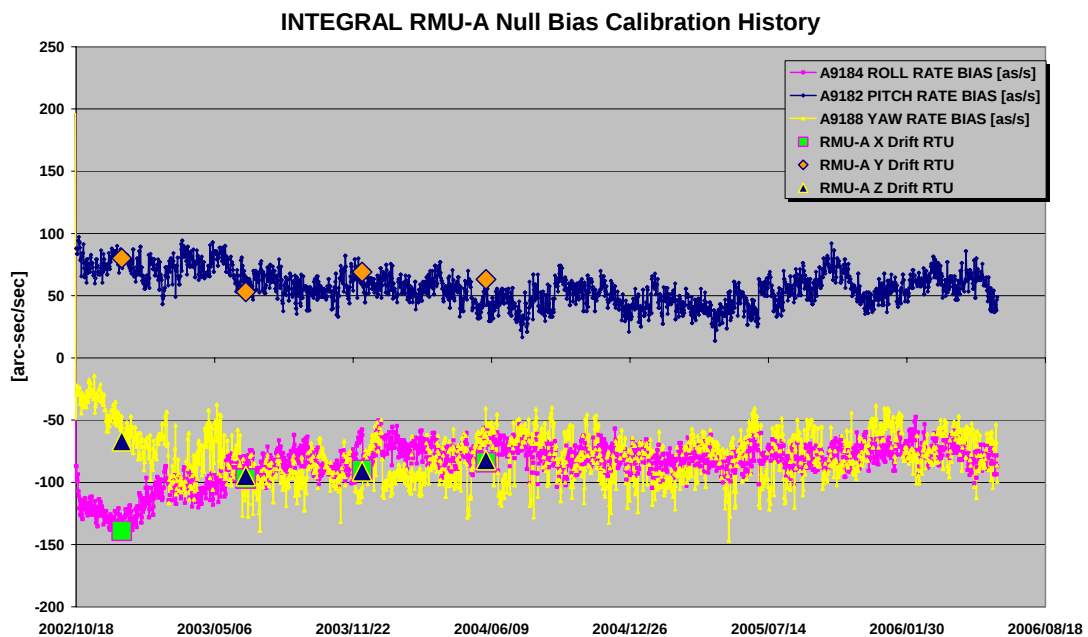


The firing\day over the period between 01/11/2002 and 08/06/2006 is reported in the plot below.

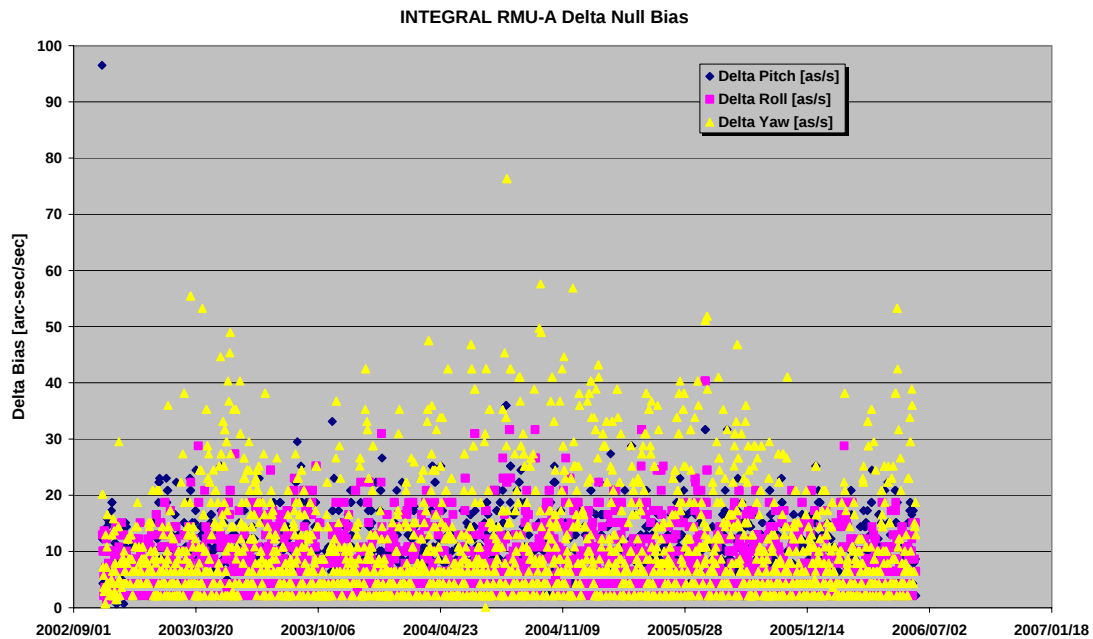


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 09/06/2006 is reported 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 09/06/2006 is reported in the plot below.



03/06/06 (Day of Year 154, Revolution 444)

Nothing to report.

04/06/06 (Day of Year 155, Revolution 444)

Nothing to report.

05/06/06 (Day of Year 156, Revolution 444-445)

Nothing to report.

06/06/06 (Day of Year 157, Revolution 445)

FDS failed slew update: At 19:00z the update of the slew ID 04450047 (CSL) failed due to a problem on FDS slew update task. The FD system did not find a suitable star for the IPF generation for the next planned close loop slew. The following criteria are nominally applied to a subset of suitable star in the STR FOV in order to generate the update of the next manoeuvre:

- star tracking (magnitude and star class)
- RWB constraints
- blemish pixel

During the event, the FD system reported a violation of those.

A manual recovery was performed to the attitude of PID 04450047 by generating it as an OSL. The update of the slew ID 04450048 was manually performed at 19:29z.

The following slew was not executed from TL: ID 04460056 (CSL).

07/06/06 (Day of Year 158, Revolution 445)

Nothing to report.

08/06/06 (Day of Year 159, Revolution 445-446)

Execution of the FSS/STR Misalignment Calibration: As part of the periodic AOCS calibrations, the FSS/STR Misalignment calibration and SAS calibration were performed in revolution 446. This operation was executed completely from the Timeline.

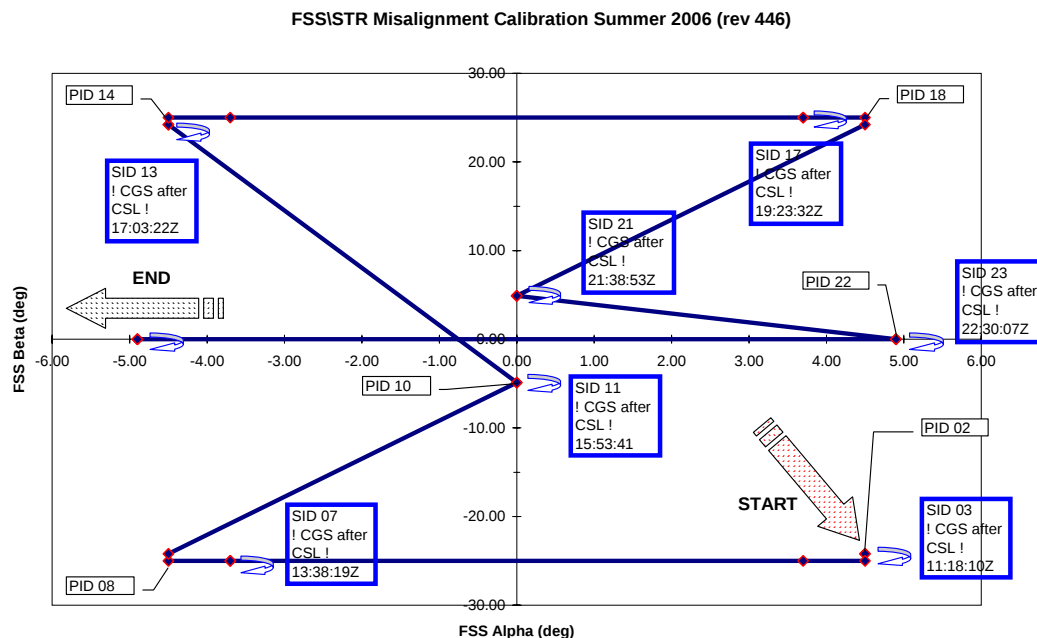
The STR/FSS misalignment calibration is scheduled after each eclipse season. The calibration is executed by performing a 4 corner x 3 points in the FSS FOV: for each point at max 4 SSTs activities are performed in order to acquire data for off-line evaluation.

from PID 04460002 Start of FSS/STR + SAS Calibration

to PID 04460025 End of FSS/STR + SAS Calibration

The FSS/STR calibration itself consists of 3 pointings of 0.8 degrees offset at each corner (Roll= $\pm 4.5^\circ$ Pitch = $\pm 25^\circ$) of the FSS FoV and tracking four stars (in addition to the Guide Star) for the duration of each pointing.

A plot of the PIDs used for the calibration as reported in the FSS FOV is shown below.



Due to a problem on the star { Mi 8.49 at CCD location [14299 , -20322]} to be used as slow star during PID 04460009, the sequence for PID 04460009 failed . A manual recovery was performed to update slew parameters for PID 04460010. The problem was likely due to the magnitude threshold set for the SST (≈ 8.5), during PID 04460009, at the margin of the star magnitude as resulted from the FD star catalogue.

The following slew was not executed from TL: ID 04460009 (CSL).

Execution of the SAS Calibration: As requested already in the past by FCT, four additional pointings were inserted inside the sequence of slews for the FSS/STR calibration, to be used for the calibration of the SAS Alpha and Beta Scale Factors and update of the SAS thresholds. These included four pointings with (Alpha, Beta) equal to (0.0, +4.9), (0.0, -4.9), (+4.9, 0.0) and (-4.9, 0.0) degrees.

09/06/06 (Day of Year 160, Revolution 446)

FDS failed slew update: At 21:57z the update of the slew ID 04460056 (CSL) failed due to a problem on FDS slew update task. The FD system did not find a suitable star for the IPF generation for the next planned close loop slew. The following criteria are nominally applied to a subset of suitable star in the STR FOV in order to generate the update of the next manoeuvre:

- star tracking (magnitude and star class)
- RWB constraints
- blemish pixel

During the event, the FD system reported a violation of those.

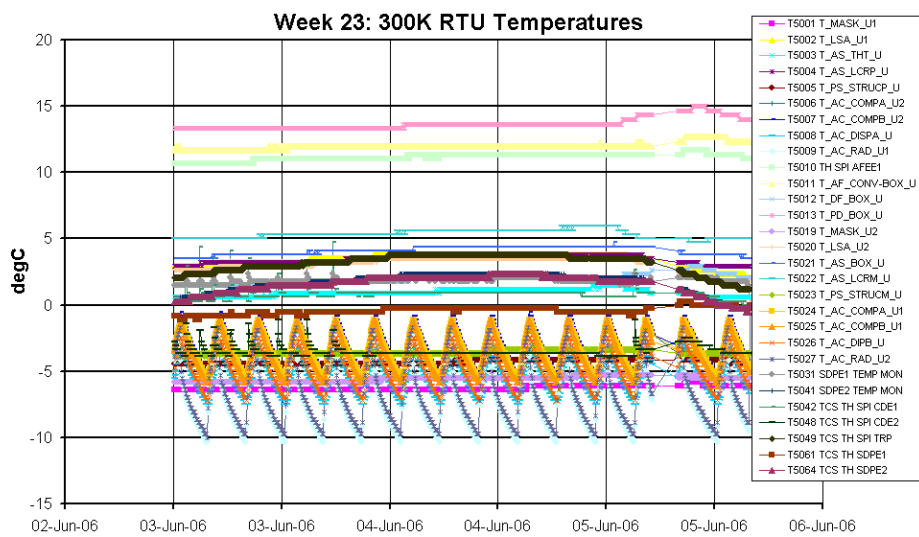
A manual recovery was performed to the attitude of PID 04460056 by generating it as an OSL. The update of the slew ID 04460057 was manually performed at 22:58z.

The following slew was not executed from TL: ID 04460056 (CSL).

8.3.2 SPI Operations

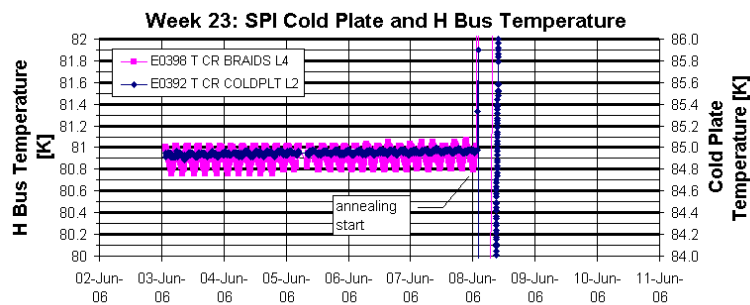
Unit Temperatures:

All the equipment temperatures are inside the operational limits. The following plot shows their evolution along the reporting period (due to data retrieval problems some gaps could be present).

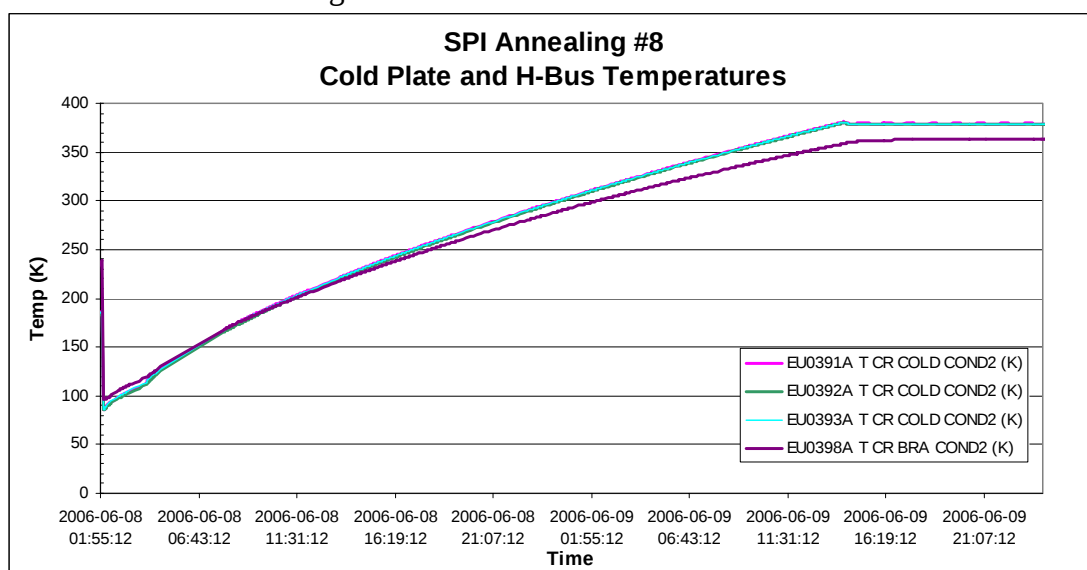


Stirling Compressors and Cryostat:

The performance of the compressors is nominal. Before annealing start, the cold plate temperature was maintained at 85K $\pm$ 1K showing the expected positive drift. The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.



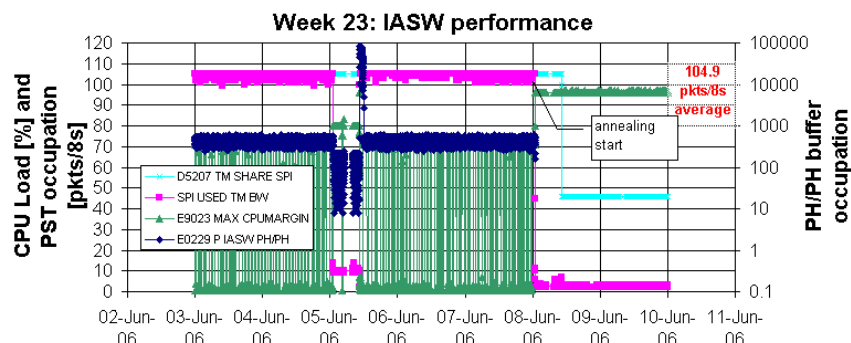
The following plot shows the evolution of the cold-plate and H bus temperatures since the start of annealing:



DPE & IASW:

The IASW performance is nominal. The current IASW version installed is 432.

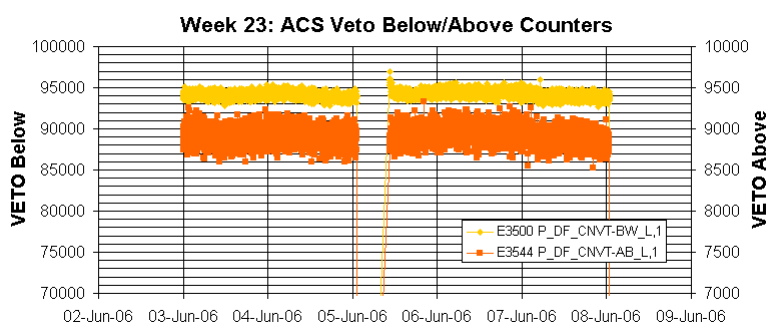
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS:

The performance of the ACS is nominal.

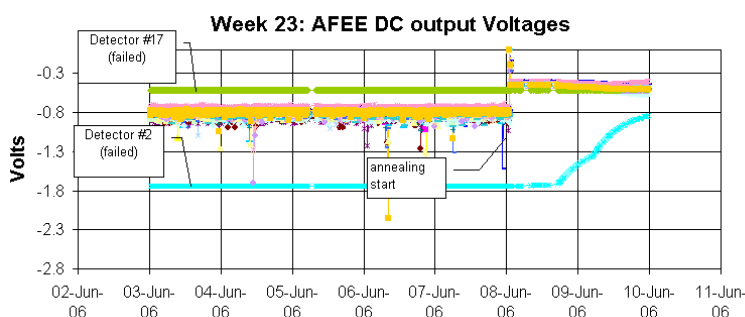
The following plot shows the ACS overall count rate evolution during the reporting period



AFEE:

The performance of the AFEE and the detectors is nominal, except for detector #15, which shows a degraded energy resolution and for this works with a reduced bias of 3Kv (anomaly INT_SC-140).

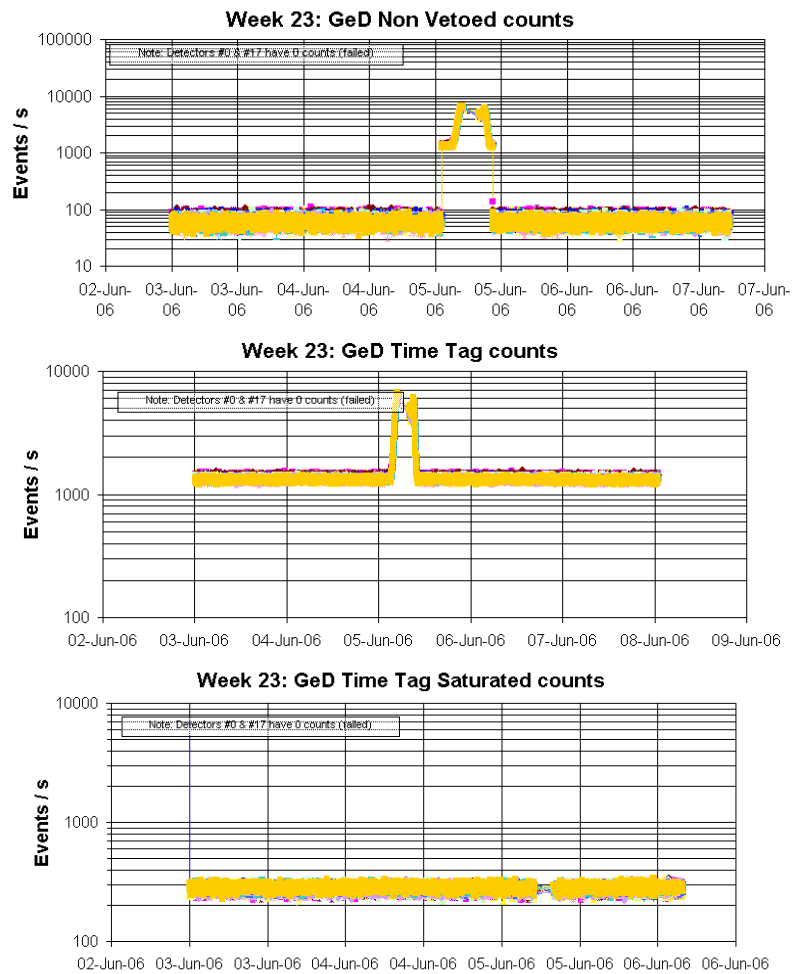
The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06.12.2003 and detector #17 is failed since 17.07.2004.



DFEE:

The performance of the unit is nominal.

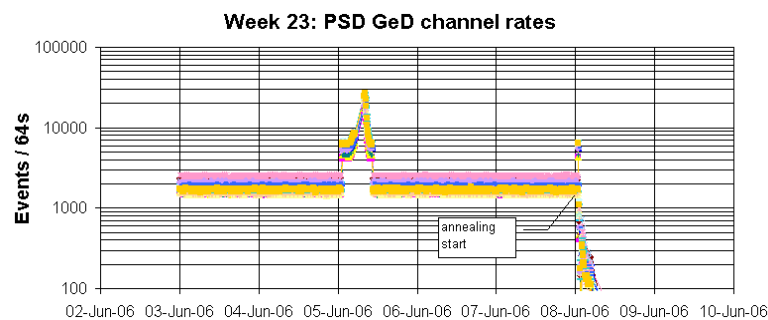
The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period (due to data retrieval problems, some gaps could be present).



PSD:

The performance of the unit is nominal.

The following plots show the PSD channel rates during the reporting period.



SPI Event Log:

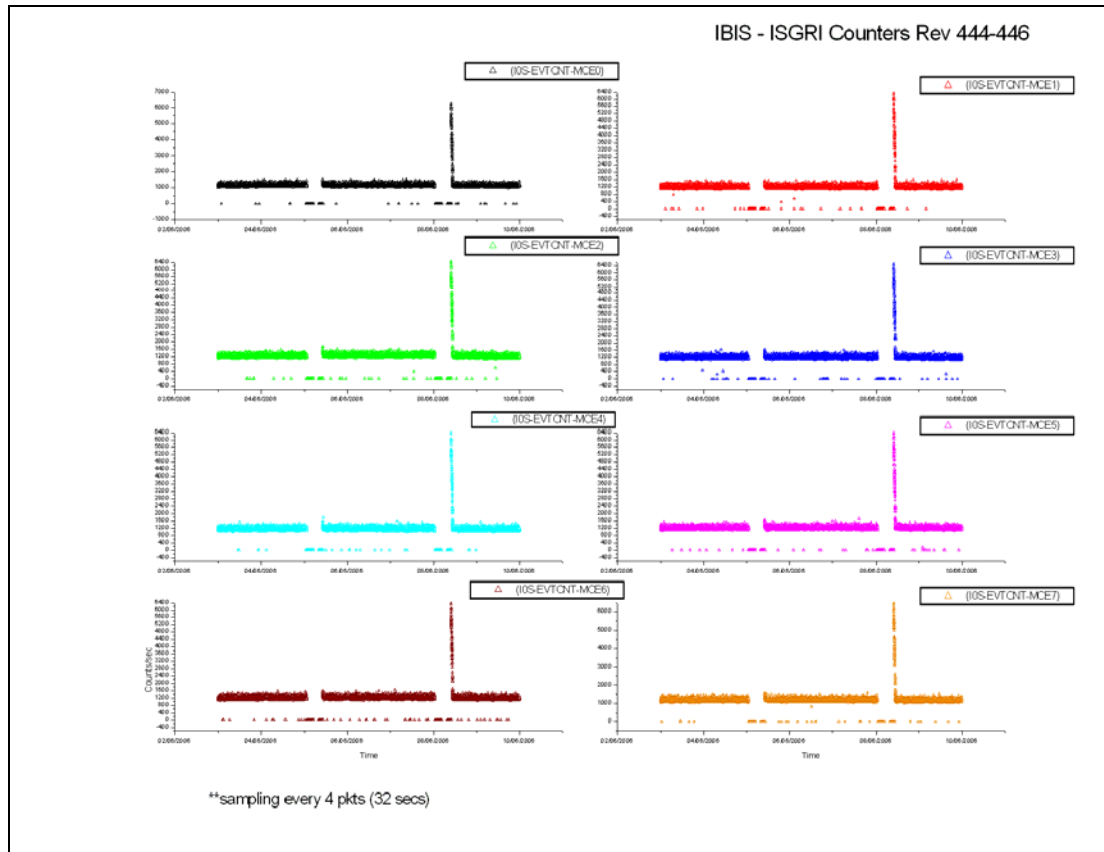
The following event log has been extracted from the revolution pass summary.

Time	Description	Analysis
-	Nothing to report this week	-

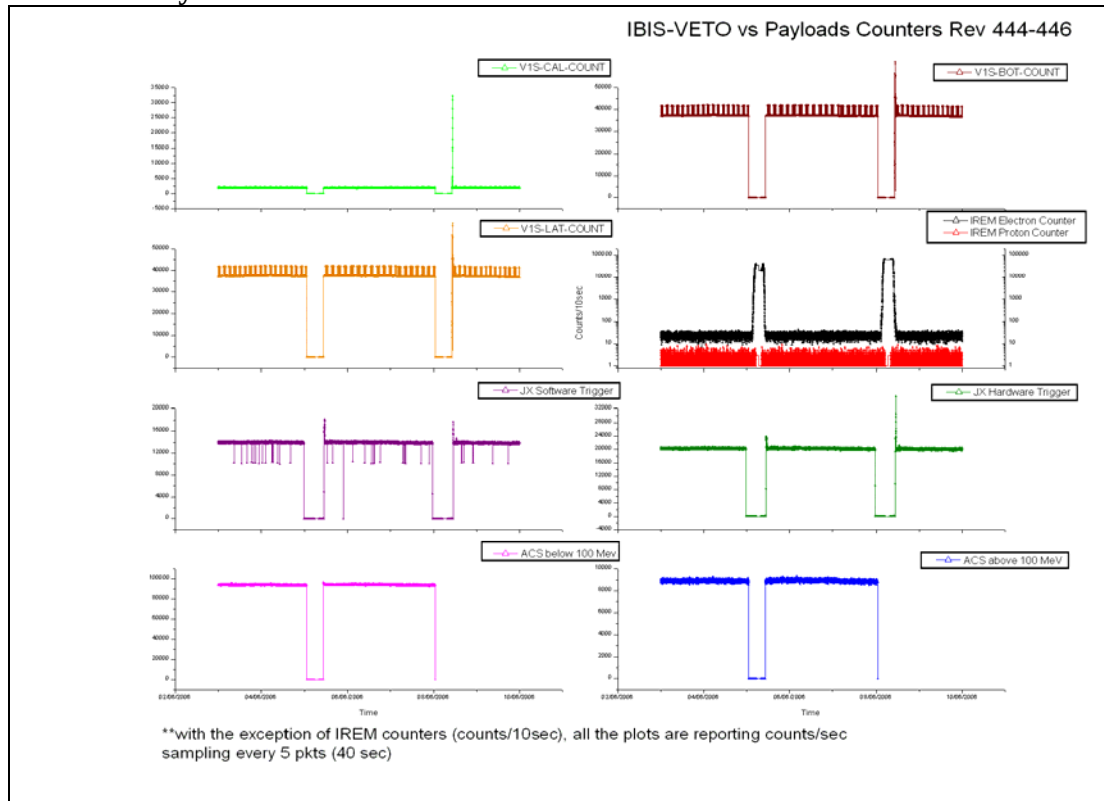
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

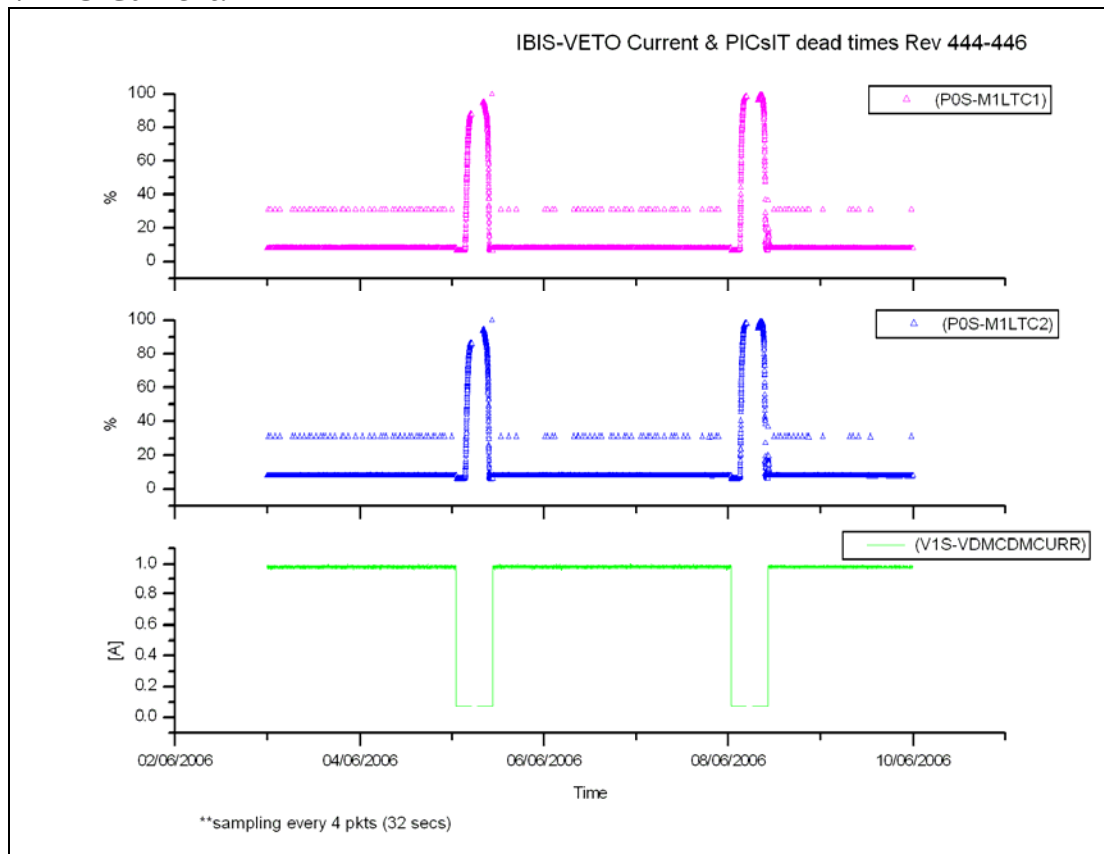


VETO vs Payloads Counters:

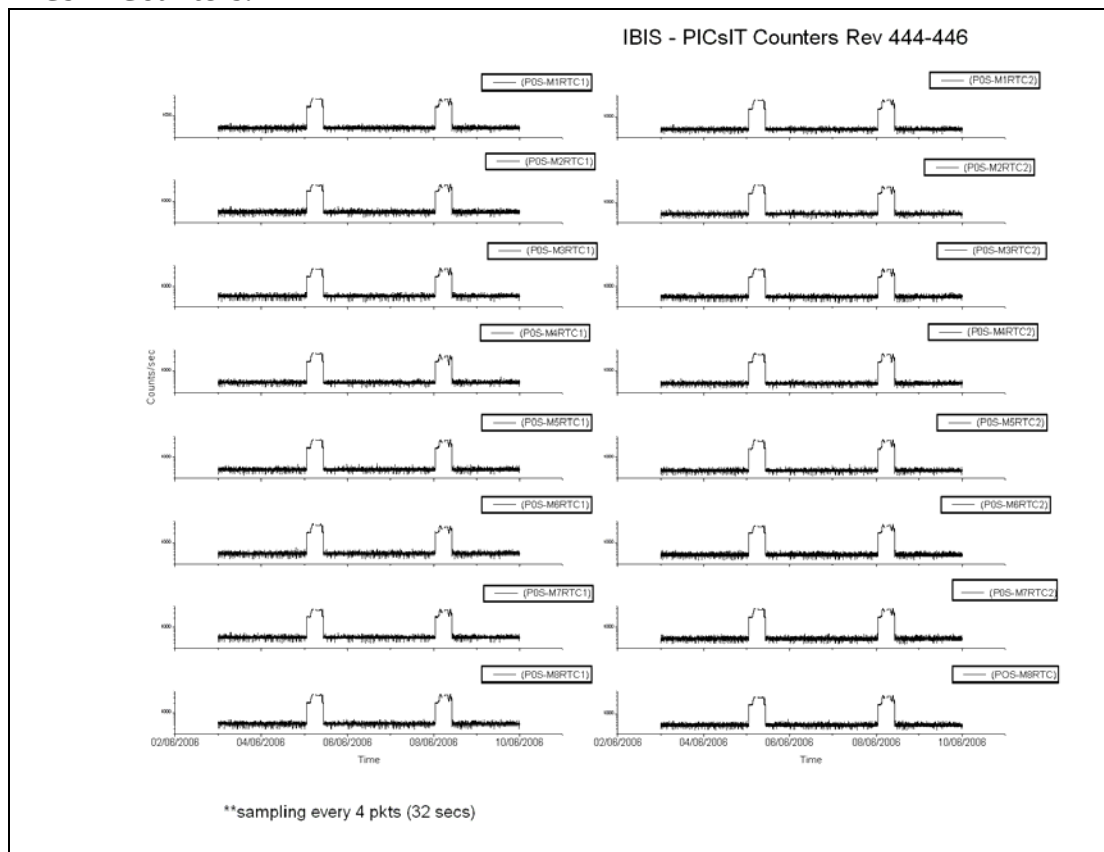


The week was characterised by low radiation.
 SPI data are missing from revolution 446 as the annealing has started.

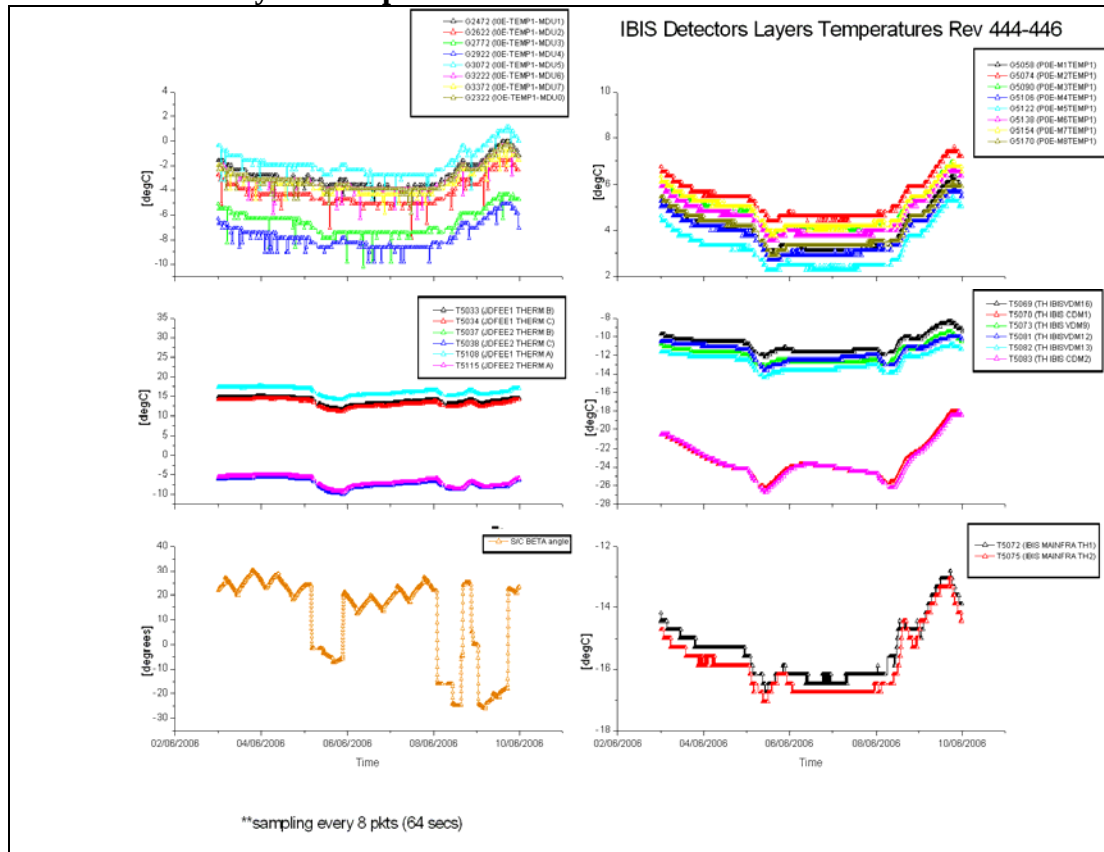
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2006.156 (05/06/2006):

At 01:08Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 10:41Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

TM parameters from G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) families were toggling OOL High while the spacecraft was in Radiation Belts. According to reaction P-CNT-1, no action was taken.

At 10:10Z TM parameter G2056 (I0E-OVFWPXADD-M4) failed SCC and back. At 10:25Z TM parameter G2014 (I0E-OVFWPXADD-M1) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 2006.159 (08/06/2006):

At 00:51Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 11:16Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

TM parameters from G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) families were toggling OOL High while the spacecraft was in Radiation Belts. According to reaction P-CNT-1, no action was taken.

Due to high radiation at the exit of Belts, at 09:50Z, TM family G2013 (i0S-EVTCNT-MCEi) started toggling OOL High. At 10:30Z, TM parameters G6062 (V1S-BOT-COUNT) and G6063 (V1S-LAT-COUNT) also started toggling OOL High. At 10:34Z, TM parameter G6061 (v1S-CAL-COUNT) started toggling OOL High-High.

They all went back inside limits at 10:39Z.

At 10:40Z, TM parameter G8080 (S1E-VS HBRA-RT) was reported OOL High and back.

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.

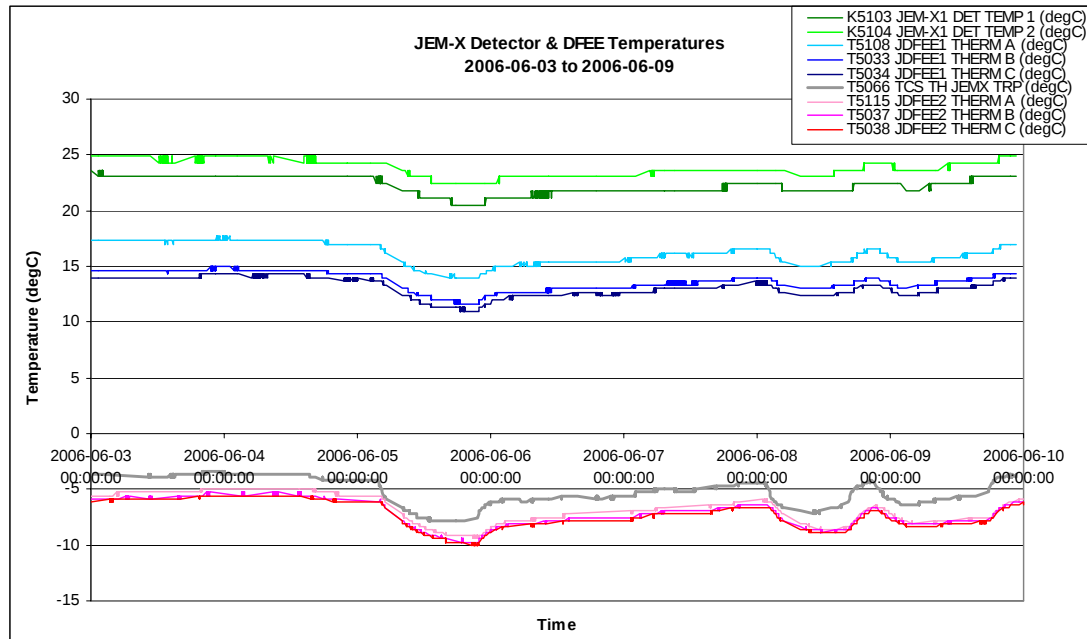


8.3.4.2 JEM-X Temperatures

JEM-X Detector and DFEE temperatures, 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)



8.3.4.3 JEM-X Daily Report

2006-06-03 (DOY 154, Rev 444) to 2006-06-07 (DOY 158, Rev 445)

Nothing to report

2006-06-08 (DOY 159, Rev 445-446)

After radiation belt exit of revolution 446, due to continuing high background radiation, the TM parameter K5317 RAD MONITOR 3 toggled in and out of limits from 10:25:46Z to 10:54:34Z.

In addition, the TC K0003 SET HVDELTA sent at 10:31:02Z (as part of the ED KEHVAC01 in the Timeline) failed completion as the high voltage was switched off autonomously at 10:31:22Z, i.e. during execution of the command, due to the HARDWARE TRIGGER exceeding its safe threshold (K5449 was 43232 at 10:31:14Z). Thus the other TCs of the sequence KEHVAC01 failed release and commanding to JEM-X1 from the Timeline was disabled.

Having observed that the background radiation was rapidly decreasing, JEM-X1 was recovered as follows:

- 10:42:29Z FCP_JEM1_0040 JEMX1 TRANSITION TO SAFE
- 10:43:06Z FCP_JEM1_0041 JEMX1 TRANSITION TO SETUP
- 10:44:58Z Sequence KEHVAC01 re-uplinked. This left JEM-X1 in Data Taking mode with the planned observation parameters at 10:59:44Z. The TM parameter K5449 HARDWARE TRIGGER went OOL Warning High briefly during the JEM-X1 activation but did not exceed the safe threshold.

Commanding to JEM-X1 from the Timeline was then re-enabled and JEM-X1 operations continued nominally.

2006-06-09 (DOY 160, Rev 446)

Nothing to report

8.3.5 OMC Operations

2006-06-03 (DOY 154, Rev 444) to 2006-06-05 (DOY 156, Rev 445)

Nothing to report

2006-06-06 (DOY 157, Rev 445)

At 19:00, a FD problem caused the start of a slew to be delayed. The impact was a delay in the start of pointing 04450047 from a scheduled ~19:09 to ~19:21.

2006-06-07 (DOY 158, Rev 445)

Nothing to report

2006-06-08 (DOY 159, Rev 446)

A problem with star selection during a slew led to the timeline again being interrupted. The impact was the loss of pointing 04460009. It was at this time that the following commands were rejected:

2006.159.14.46.06.917	2006.159.14.46.14.306	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535
PR N E E					
2006.159.14.46.00.917	2006.159.14.46.06.304	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535
PR N E E					

These correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) commands for that pointing.

2006-06-09 (DOY 160, Rev 446)

At 21:57, another FD problem caused the timeline to be interrupted. The schedule was later manually recovered. The impact was the loss of pointing 04460056. It was at this time that the following commands were rejected:

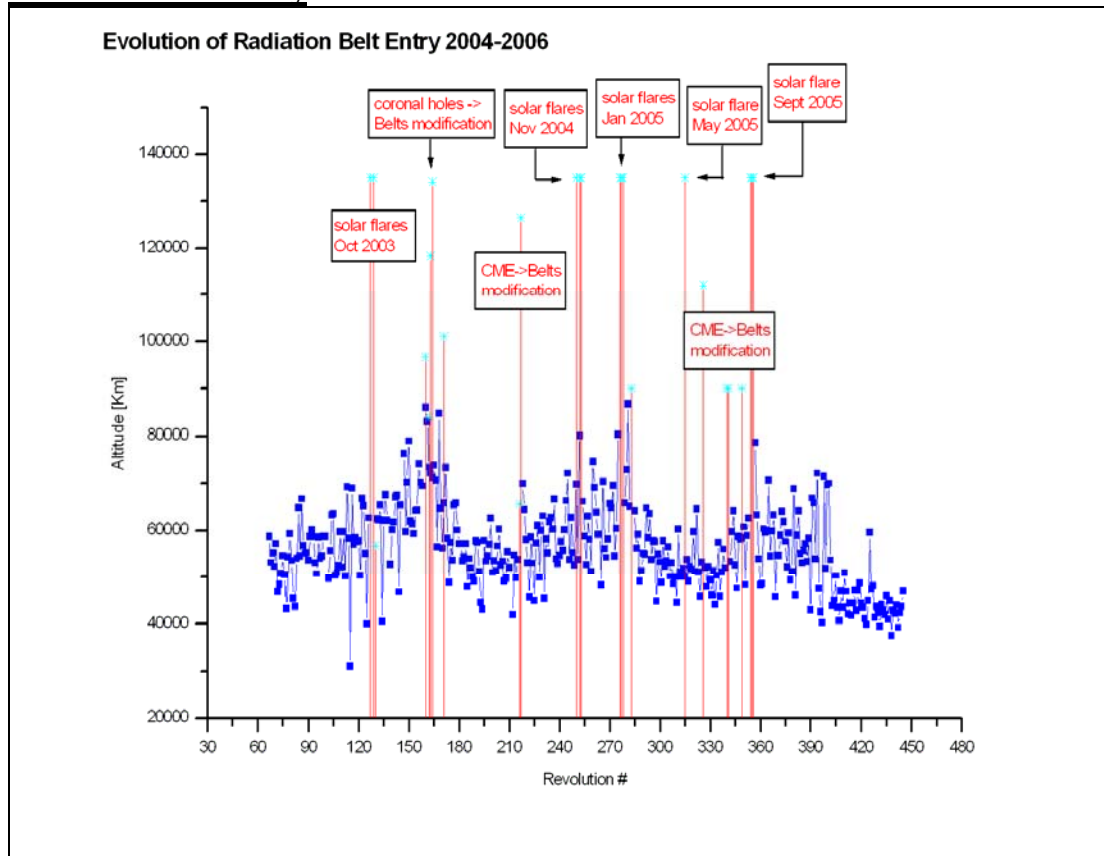
2006.160.22.41.12.107	2006.160.22.41.18.662	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535
PR N E E					
2006.160.22.41.06.107	2006.160.22.41.10.657	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535
PR N E E					

These correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) commands for that pointing.

On DoY 156 at 01:08:44 and DoY 159 at 00:51:00 OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 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]
444	RAD_ENTR R 2006-06-05T01:08:40Z	2006-06-05 03:07:07	>43702.3	2006-06-05 02:35:40	48185
445	RAD_EXIT R 2006-06-05T10:28:07Z	2006-06-05 09:58:43	<<39665.9	2006-06-05 10:05:40	36963
445	RAD_ENTR R 2006-06-08T00:50:57Z	2006-06-08 02:31:23	<46928.6	2006-06-08 02:17:31	48496
446	RAD_EXIT R 2006-06-08T10:10:30Z	2006-06-08 10:55:07	>46474.0	2006-06-08 09:57:31	38123

Reference

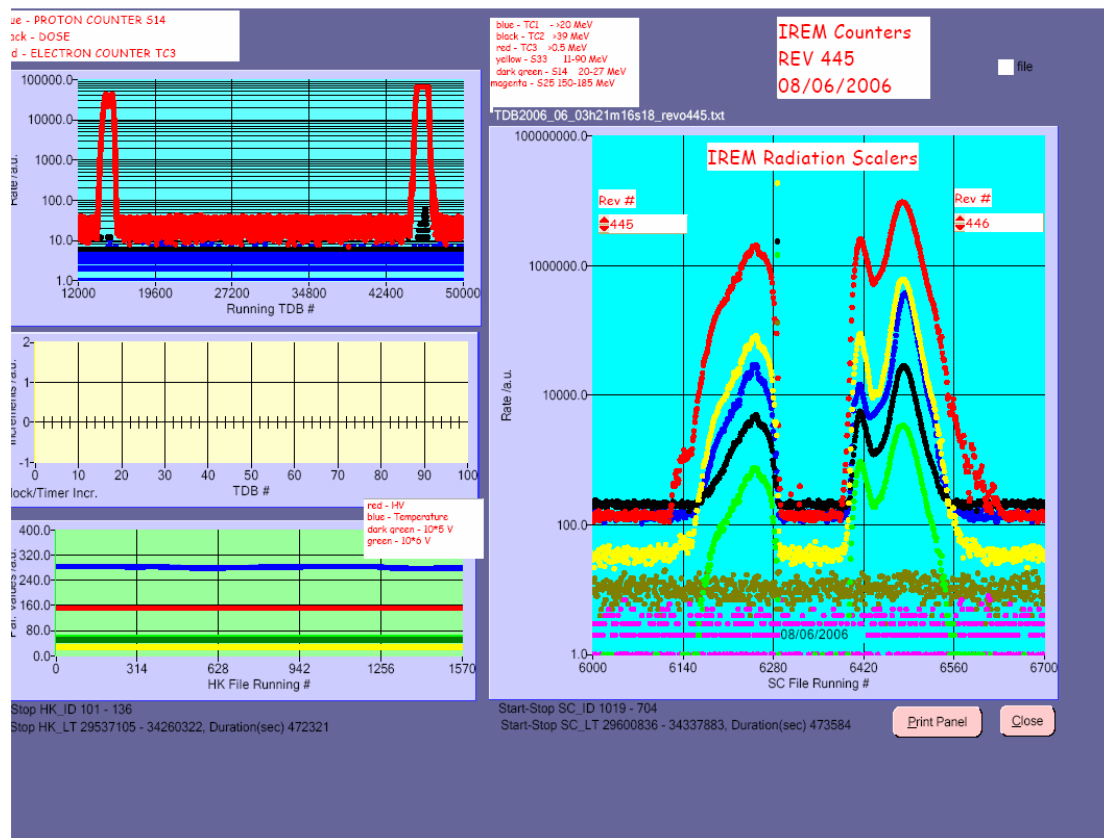
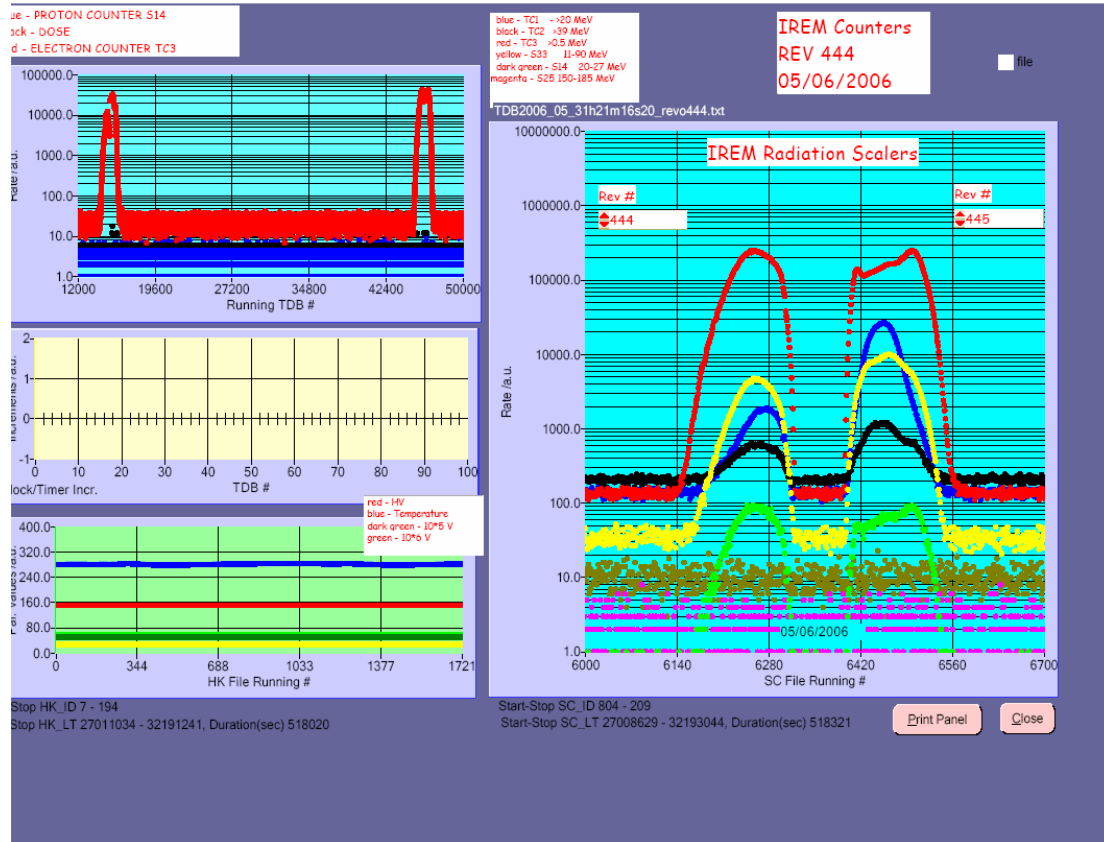
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

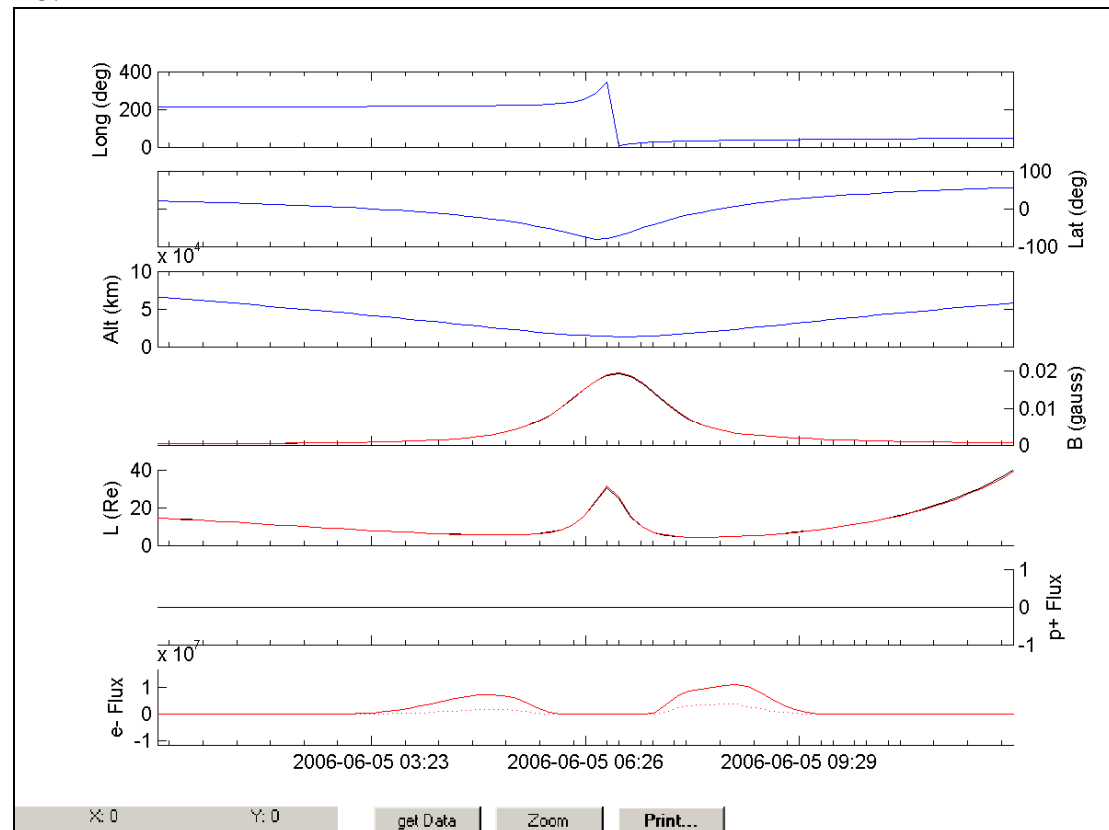
Radiation Spike

IREM radiation counters:

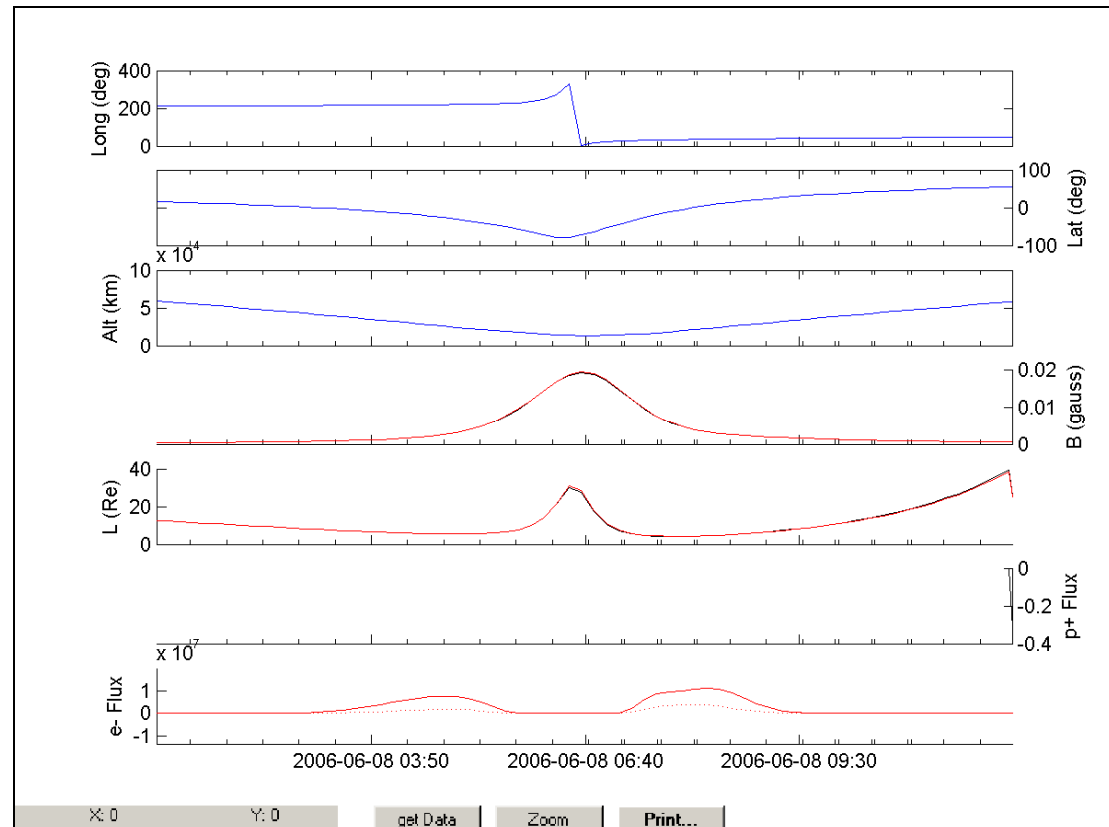


IREM Predicted Radiation Belt Passages:

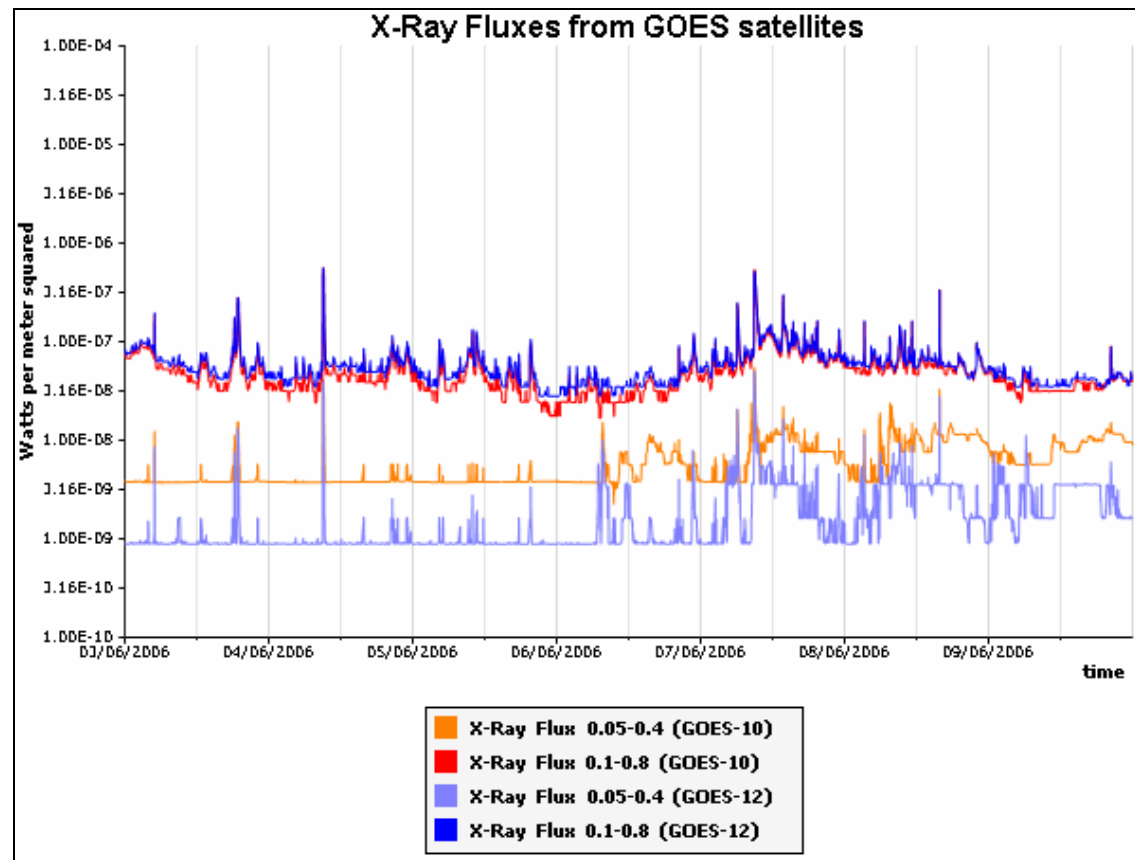
Rev 444



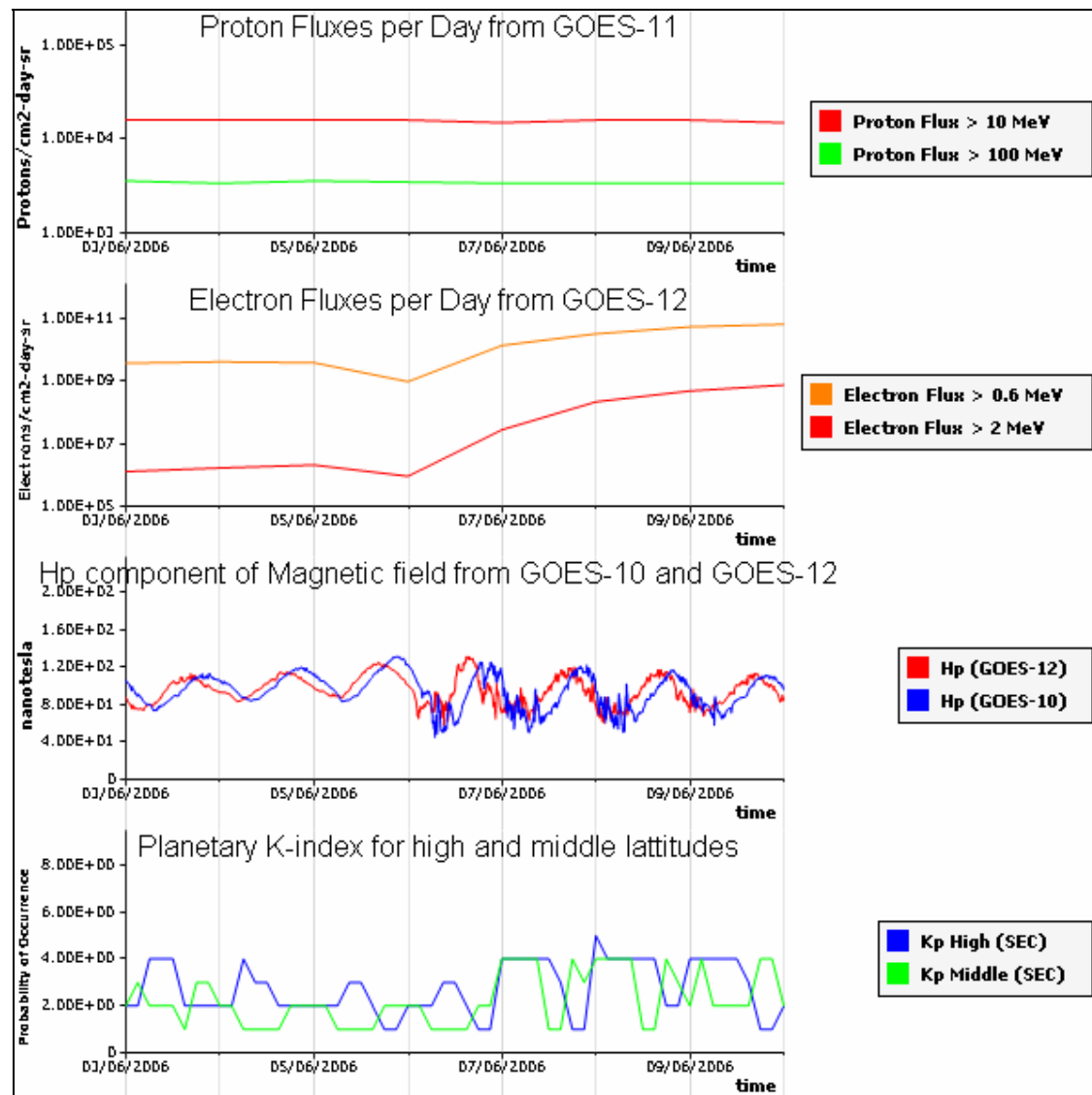
Rev 445



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



X-Ray fluxes start to be significant over 10^{-5}W/m^2 (corresponding to M-class flares). Above 10^{-4}W/m^2 , they correspond to strong X-class flares.



Proton and electron flux are rather low, reporting no high radiation background. 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. Kp index is based on ground magnetometers. Kp ≥ 5 features storm-level geomagnetic activity.