

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 261
Week 38
24.09.07
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 15.09.07 until 21.09.07 (both dates inclusive) and covers the revolutions 601, 602 and 603.

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 two hexagonal dithers of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), three hexagonal dithers of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), a raster dither of the Galactic centre (RA 17:45:40.00, DEC -29:00:29.0), and three raster dithers of the Galactic Plane Region 1 (RA 18:04:41.75, DEC -05:04:48.4).

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.

3 slews were missed from TL, during the observation period, due to problem with the FDS job scheduler.

The fuel consumption over the period between 15/09/2007 and 20/09/2007 was 0.0521 Kg. The remaining propellant is in the order of 144.5000 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

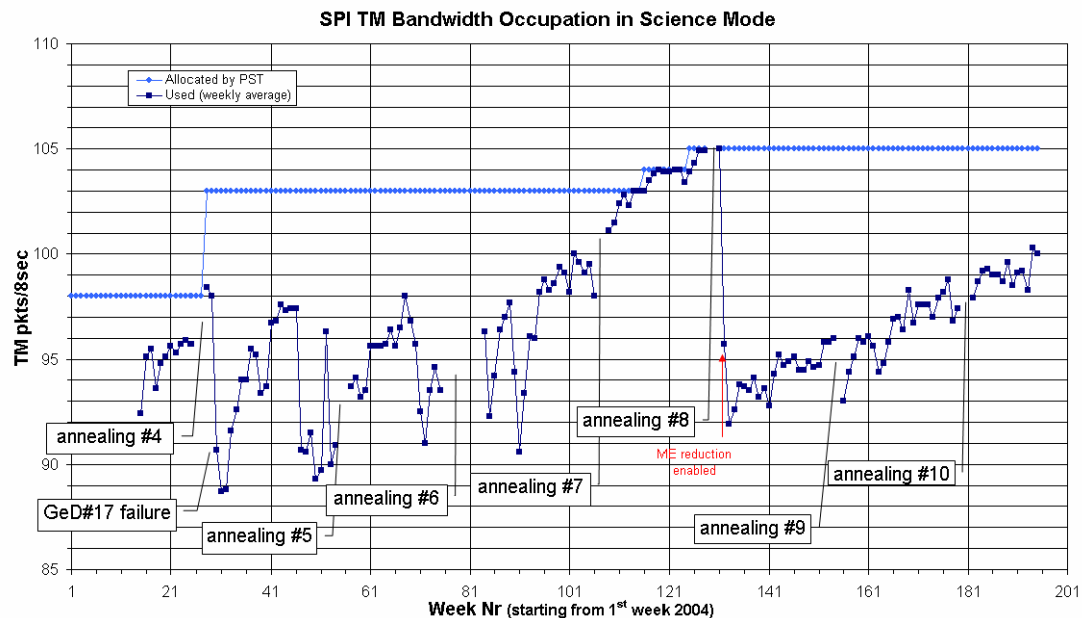
3.2.1 SPI

Following the 10th annealing, which ended on 17th June, 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). 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.

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. The average telemetry occupation when the TM allocation was 105 packets/cycle was 100 packets/cycle.

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



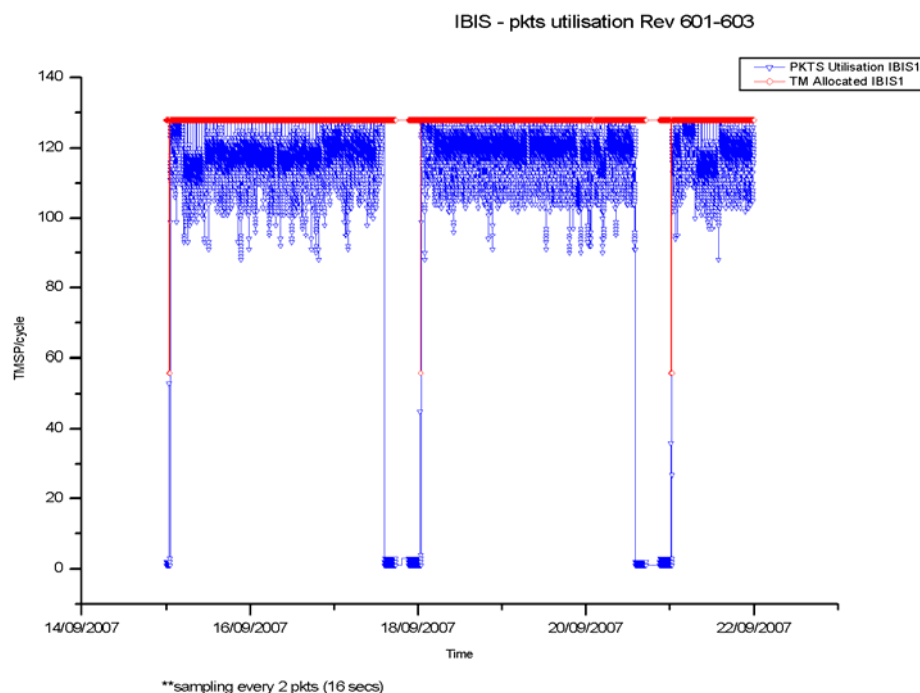
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

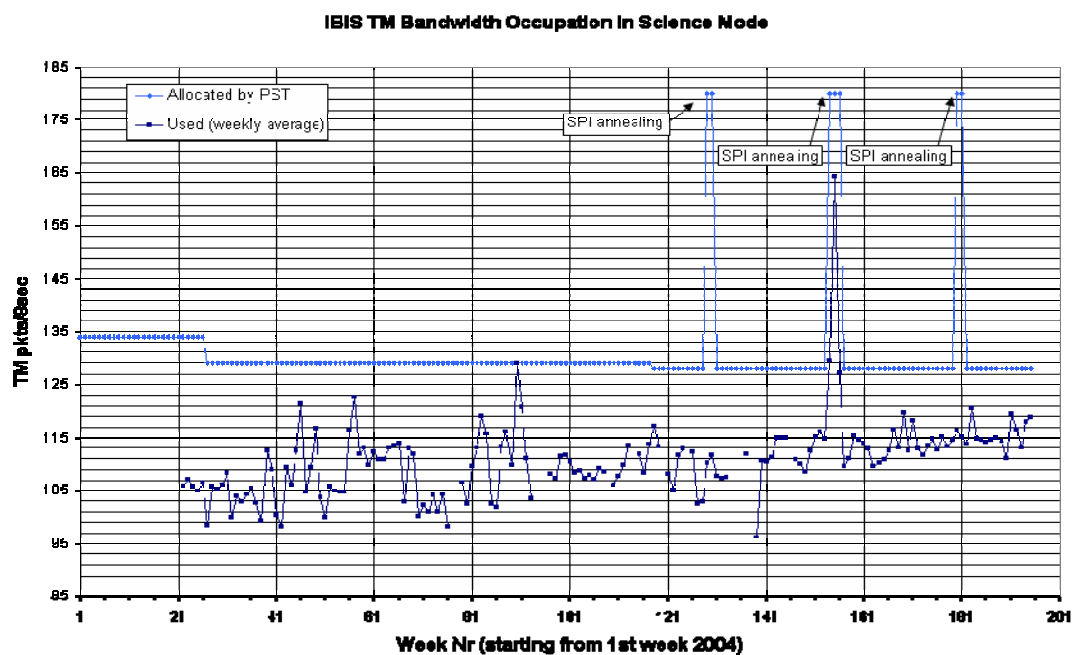
The overall status of the unit is nominal.

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 118.79 TMPS/cycle, up 0.74 on last week.

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



A plot of the IBIS weekly bandwidth utilisation since 2004 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.
JEM-X2 was dormant (DPE OFF) with no TM slots allocated.

Note: Some more information concerning the JEM-X operations is provided in the Appendix.

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, 149 of the 151 planned science pointings for OMC were executed nominally, 2 were lost.

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

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 blank the whole week. There was no risk of solar flares or radiation.



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, 2 pointings were missed from the Timeline. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. There were, however, 2 occasions when the FDS slew updates failed to arrive, and on each occasion a pointing was lost. The overall performance was well over the 95% requirement.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were, however, 5 occasions of TM drops from Redu, 1 occasion where DSS-27 stopped tracking for 20 minutes, and 2 occasions of errors sending data to the isds, all with no impact reported. The overall performance was well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSFs for revolutions 610 and 611 have been received.
Observations have been planned up to revolution 610.

Due to a TOO request which has been accommodated in revolution 606 this and the subsequent revolutions up to 610 have been replanned.

TSFs have been received up to revolution 605. An update for revolution 604 has been received this week.

2. Observation status

ECS files for revolutions 590 & 595-595 have been received and processed. The file for 591 is missing still.

3. ISOC Science Data Archive

Some problems have been found in the automatic ingestion procedure so recent data is not always available. The INVITE tool will be demonstrated at the upcoming ADASS conference in London.

4. ISOC system

Version 16.0 and PGT are converging. The formal release is expected next week.

5. Problems

A hardware problem in the archive server led to the ISDA and other services being unavailable from 19-21 Sep.

The connection between the TVP page and the Flight Dynamics server failed without being noticed by the automatic monitoring leading to unavailability of TVP for a short while.

4.3.2 ISDC

Status of ISDC observation processing on 24/09/2007:

- Latest Standard Analysis completed: observation 05200010004 (Galactic Bulge region, Revolution 595) on 23/09/2007.
- Latest products archived: observation 05200010004 (Galactic Bulge region, Revolution 595) on 23/09/2007.
- Latest observation products sent to the observer: observation 05200010004 (Galactic Bulge region, Revolution 595) on 24/09/2007.

5 Special Events

6 Anomalies

The following problems were reported that impacted operations:

- On DoY 261, at 01:18, the FD slew update for pointing 06020002 did not arrive. At that time the Timeline was stopped and a recovery performed. The Timeline was rejoined at 02:14. The impact was the loss of pointing 06020002.
- At 02:46, the slew update for pointing 06020005 did not arrive. Again the Timeline was stopped and a recovery performed. The Timeline was rejoined at 03:28. The impact was the loss of pointing 06020005.
- On DoY 263 at 02:15, DSS-27 stopped tracking, the TM was recovered at 02:35. No pointings were missed, but 20 minutes of TM was lost.

The following anomaly report was entered into the ARTS system this week.

AR id	Date Created	Subject	Segment	Status
INT_SC-204	2007-09-12	JEM-X CSSW Anomalies observed	Payload	Pending
INT_SC-205	2007-09-13	Problem in acquisition of block 10 of SPID 60602 at radiation belt exit	Payload	Pending
INT-2955	2007-09-20	DSS27 Stopped Tracking	NASA Station	Pending

7 Future Milestones

The following activities are foreseen in the next few weeks.

- Eclipse season begins on 11th October 2007, at the beginning of revolution 610.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 601

The observations in revolution 601 began with a hexagonal dither of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. They continued with a hexagonal dither of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), lasting ~5.6 hours. Finally, a raster dither of the Galactic centre (RA 17:45:40.00, DEC -29:00:29.0), lasting ~47.4 hours was performed, until the end of the revolution.

Revolution 602

The observations in revolution 602 began with a hexagonal dither of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. They continued with a raster dither of the Galactic Plane Region 1 (RA 18:04:41.75, DEC -05:04:48.4), lasting ~53.7 hours, until the end of the revolution.

Revolution 603

The observations in revolution 603 began with a raster dither of the Galactic Plane Region 1 (RA 18:04:41.75, DEC -05:04:48.4), lasting ~3.0 hours. They continued with a hexagonal dither of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. This was followed by a hexagonal dither of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), lasting ~5.6 hours. Finally, a raster dither of the Galactic Plane Region 1 (RA 18:04:41.75, DEC -05:04:48.4), lasting ~43.7 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. The TM allocation was IBIS 128; SPI 105; JEM-X1 8; JEM-X2 0; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2007-08-30T23:22:23.000Z	144.7460	F	Automatic TM processing.
2007-09-01T09:23:55.000Z	144.6994	F	Automatic TM processing.
2007-09-02T23:07:59.000Z	144.6898	F	Automatic TM processing.
2007-09-04T08:59:23.000Z	144.6674	F	Automatic TM processing.
2007-09-05T22:52:39.000Z	144.6570	F	Automatic TM processing.
2007-09-07T08:44:11.000Z	144.6440	F	Automatic TM processing.
2007-09-08T22:55:43.000Z	144.6280	F	Automatic TM processing.
2007-09-09T07:31:28.000Z	144.5960	F	Automatic TM processing.
2007-09-11T22:58:39.000Z	144.5837	F	Automatic TM processing.
2007-09-14T17:34:14.000Z	144.5585	F	Automatic TM processing.
2007-09-14T22:12:55.000Z	144.5521	F	Automatic TM processing.
2007-09-16T07:40:58.000Z	144.5361	F	Automatic TM processing.
2007-09-17T22:01:10.000Z	144.5282	F	Automatic TM processing.
2007-09-19T07:50:26.000Z	144.5111	F	Automatic TM processing.
2007-09-20T21:49:58.000Z	144.5000	F	Automatic TM processing.

This report was generated Fri Sep 21 08:00:19 GMT 2007

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, 15/09/2007 – 21/09/2007

The AOCS operations were executed from the Automatic Timeline.

During this period, 92 Open Loop Slews, 69 Closed Loop Slews and 4 Momentum Biases were executed.

3 slews (1 CSL, 2 OSL) were missed from TL, during the observation period, due to problem with the FDS job scheduler at the beginning of rev 602.

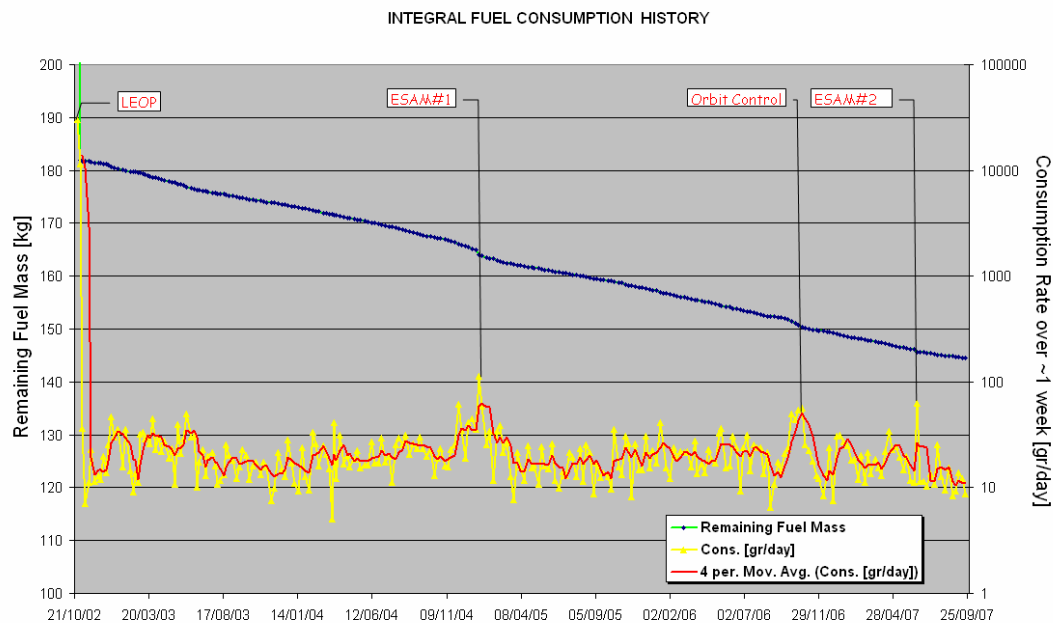
This is equivalent to $\sim 1.8\%$ of the total number of slews planned (162).

Orbit Control

No update.

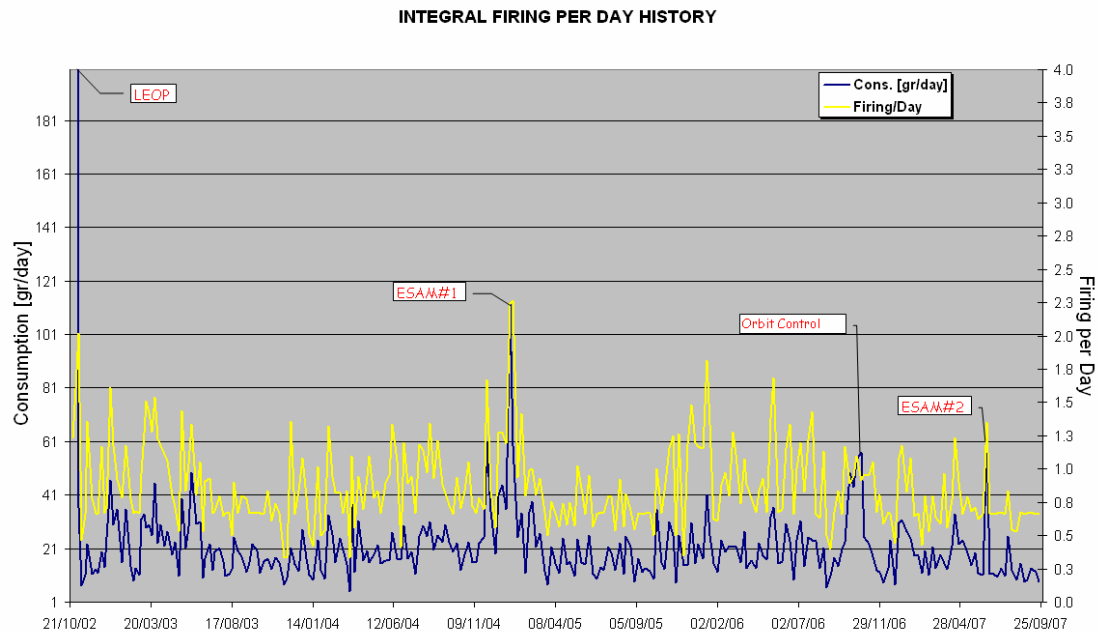
Fuel consumption

The fuel consumption (total, grams per day) over the period between 01/11/2002 and 20/09/2007 is reported in the plot below.



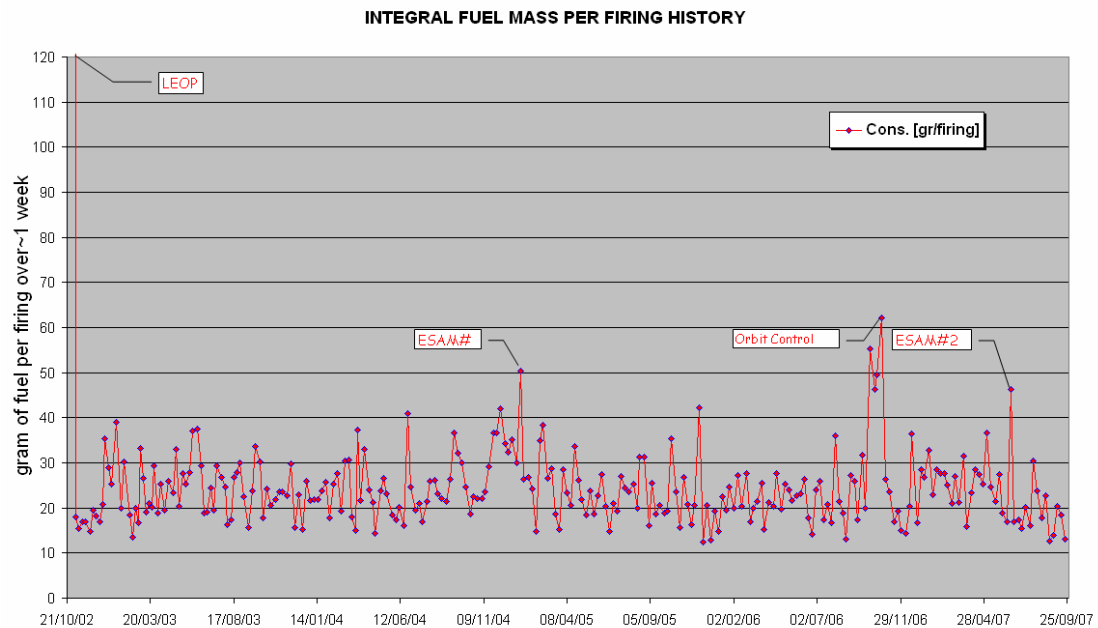
The plot above consider the ESAM fuel consumption spread over period of ~ 1 week.

The firing per day over the period between 01/11/2002 and 20/09/2007 is reported in the plot below.



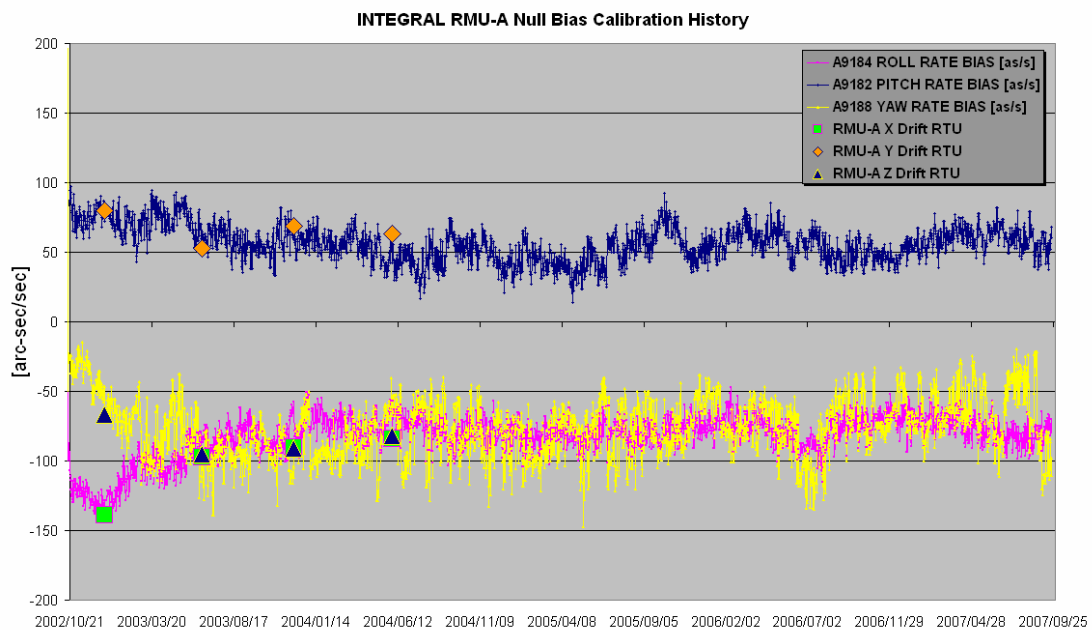
The plot above consider the ESAM fuel consumption spread over period of ~1 week.

The fuel per firing over the period between 01/11/2002 and 20/09/2007 is reported in the plot below.



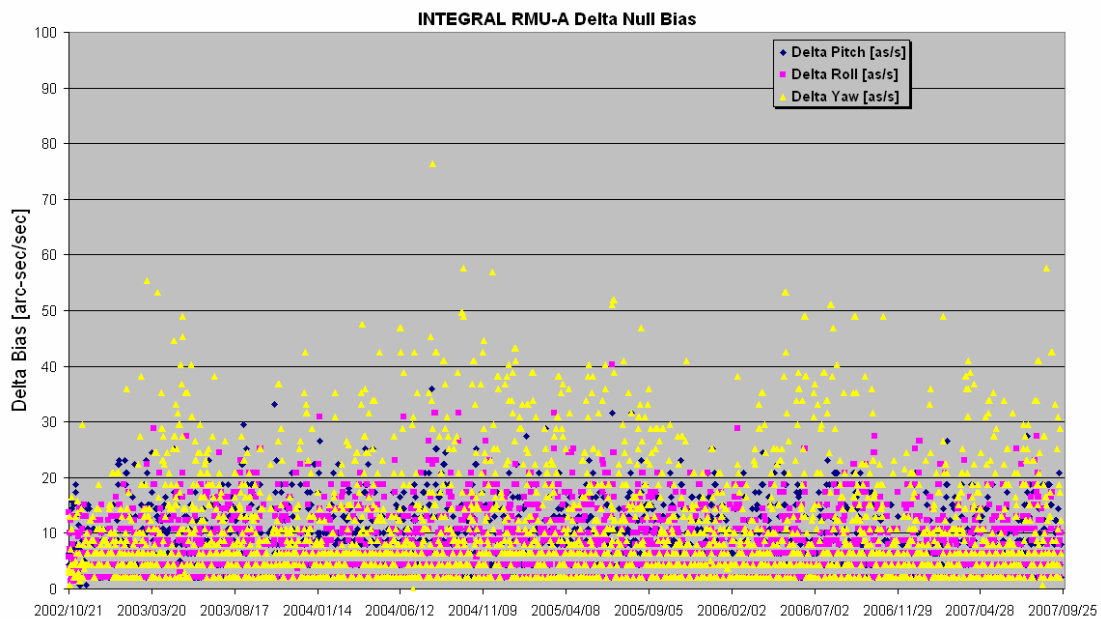
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 21/09/2007 is reported in the plot below.



The evolution of the drift on yaw channel is under constant monitoring.

The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over period between 01/11/2002 and 21/09/2007 is reported in the plot below.



15/09/2007 (Day of Year 258, Revolution 601)

ACC Yaw & Pitch error: at 02:27z due to problem (an open stellar cluster in the neighbourhoods) on the current guide star selected, Mi 8.5 @ CCD location [-2587, -3672] (ID 6853-1745), the OTF thresholds on Pitch and Yaw axis were exceeded for PID 06010004.

As consequence the ACC generated the following OEMs APID 640 ID 50 <<ACC YAW OOL ERROR>> and ID 48 <<ACC PITCH OOL ERROR>> and the OTF flickered for few TM cycle affecting the OTF for PID 06010004.

During the last part of PID 06010004 the OTF was not reached.

16/09/2007 (Day of Year 259, Revolution 601)

Nothing to report.

17/09/2007 (Day of Year 260, Revolution 601-602)

Nothing to report.

18/09/2007 (Day of Year 261, Revolution 602)

FDS failed update: at 01:18z the FDS did not perform the update of the planned first slews of the rev 0602. The job scheduler was found not running after perigee passage and was only back at around 03:46z, after FD on call action, to kick off the update for CSL 06020008.

Manual recoveries were performed from attitude of PID 06020001 to the attitude of PID 06020003 and from attitude of PID 06020004 to the attitude of PID 06020005. The next slews 06020006-7 were manually updated in TL.

An AR (INT_2914) was already open on 04/2007 concerning this same problem with job scheduler and an action assigned to FD Team.

The following slews were missed in TL: 06020002(OSL)-06020003(OSL)-06020005(CSL)

19/09/2007 (Day of Year 262, Revolution 602)

Nothing to report.

20/09/2007 (Day of Year 263, Revolution 602-603)

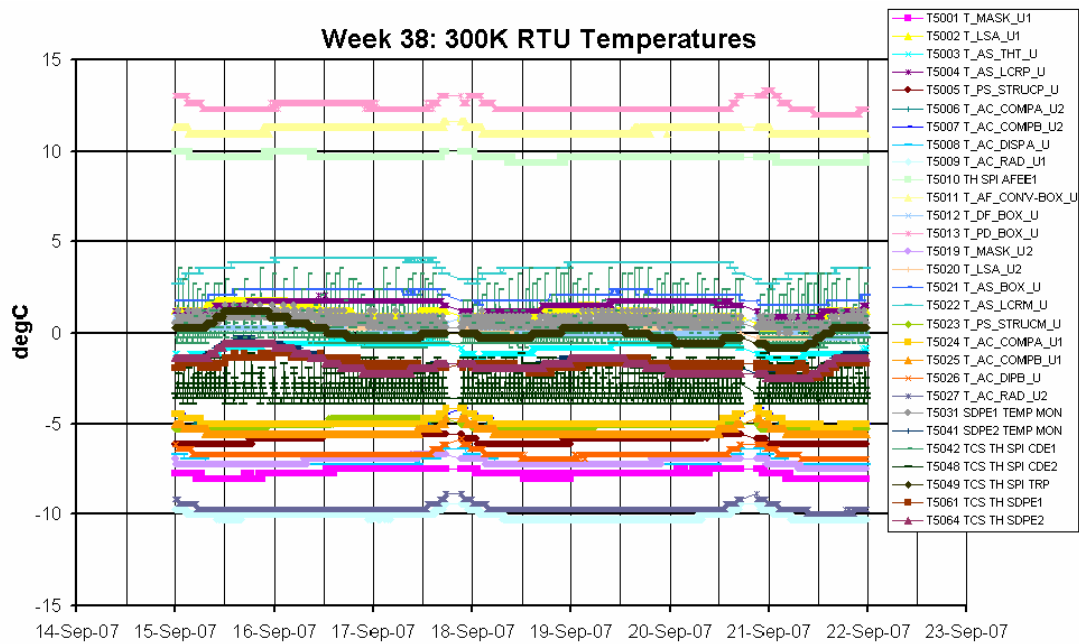
Nothing to report.

21/09/2007 (Day of Year 264, Revolution 603)

Nothing to report.

8.3.2 SPI Operations

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

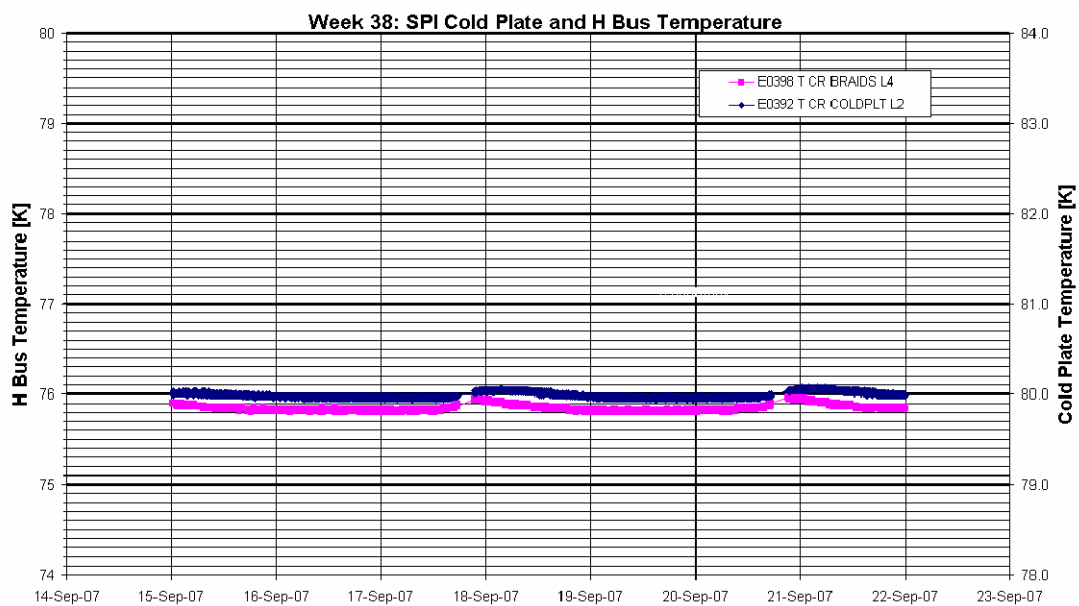


Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K.

The stroke of all four compressors was set 40 throughout the week with the average CDE LCL currents as follows:

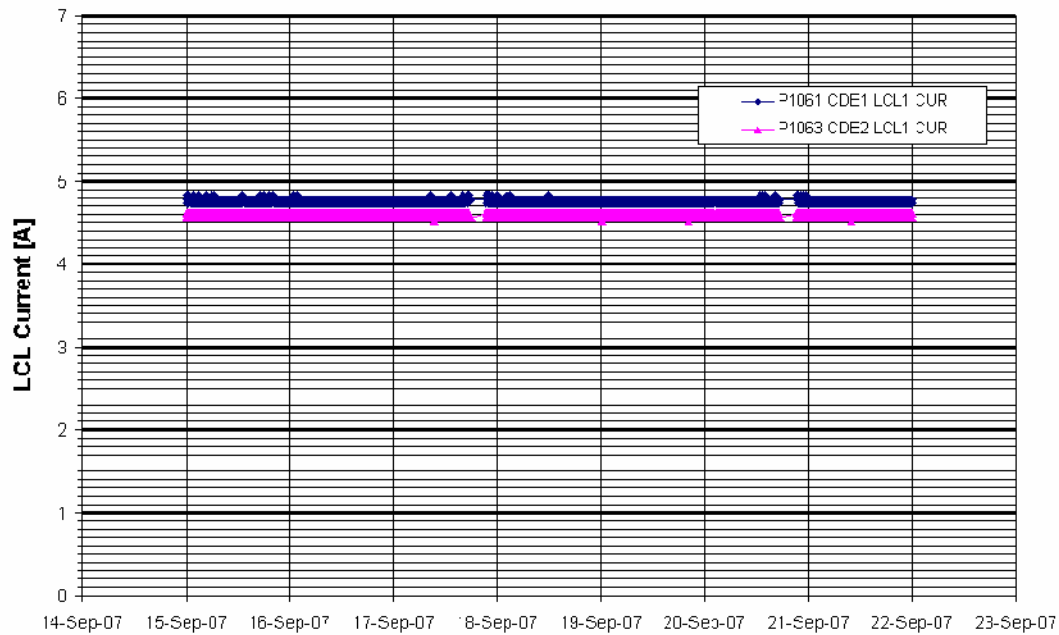
- CDE1 LCL Current = 4.77A
- CDE2 LCL Current = 4.58A

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



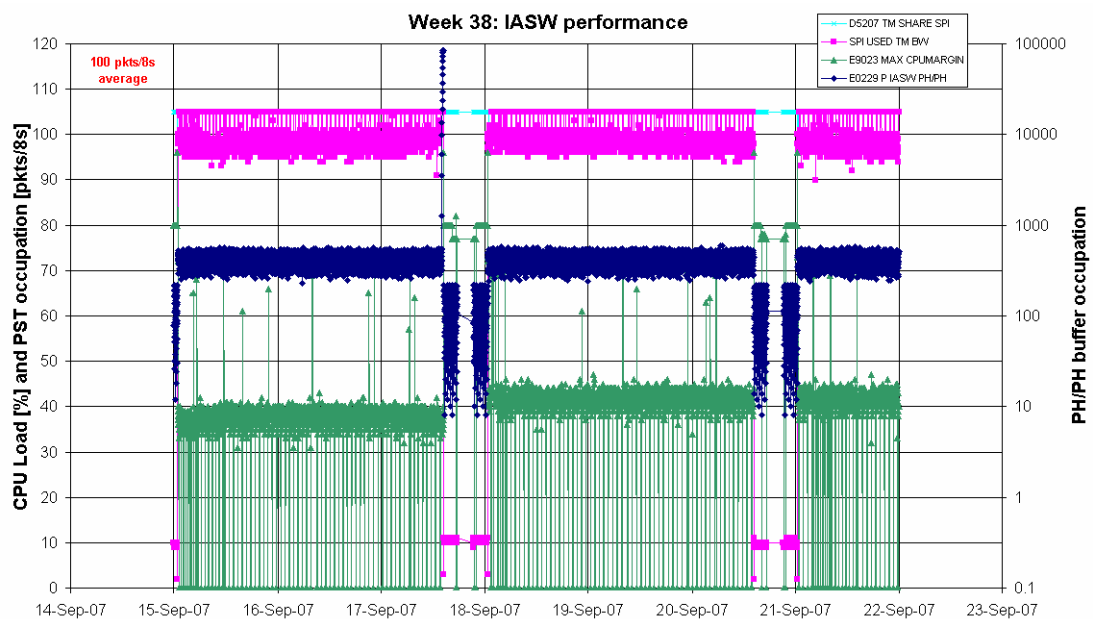
The following plot shows the evolution of the CDE currents during the reporting period.

Week 38: SPI CDE1 and CDE2 LCL Currents



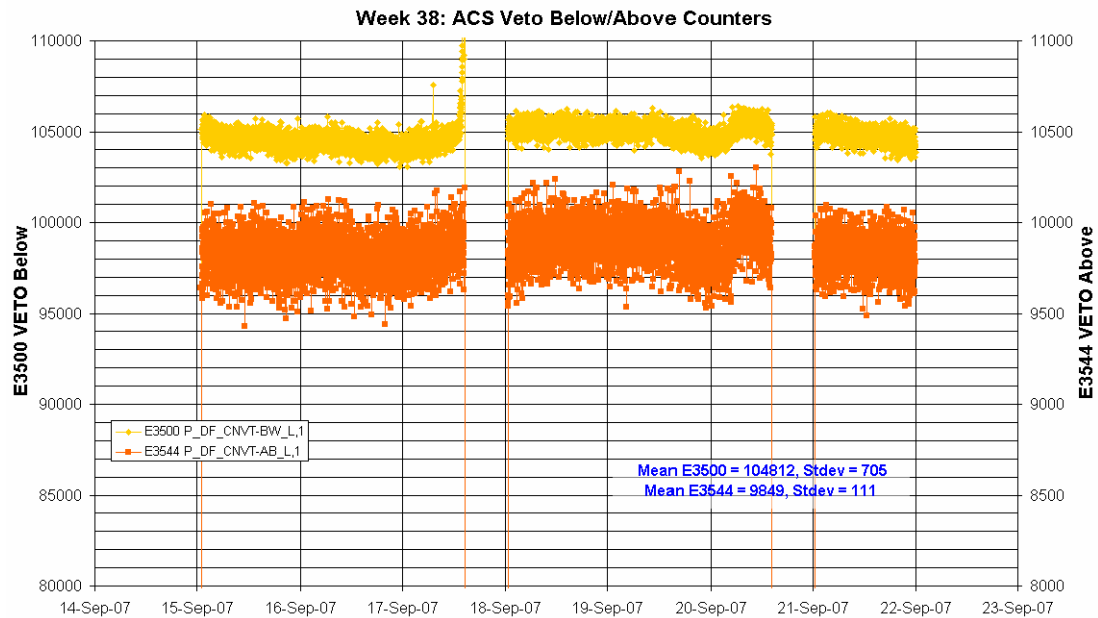
DPE & IASW: The DPE health and IASW performance is nominal. The IASW version installed is v433 patch #1 with the spectra scaling factor set to 9/19 SE until 2007-09-17 at 16:06Z, after radiation belt entry of revolution 601, when it was changed to 8/19 SE (by uplinking TPF ES1700_IASW-PAR_fmconfig_0013.TPF with the value for TC parameter E8980 changed from 9/19SE to 8/19SE). The average TM bandwidth occupation of SPI was 100 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.



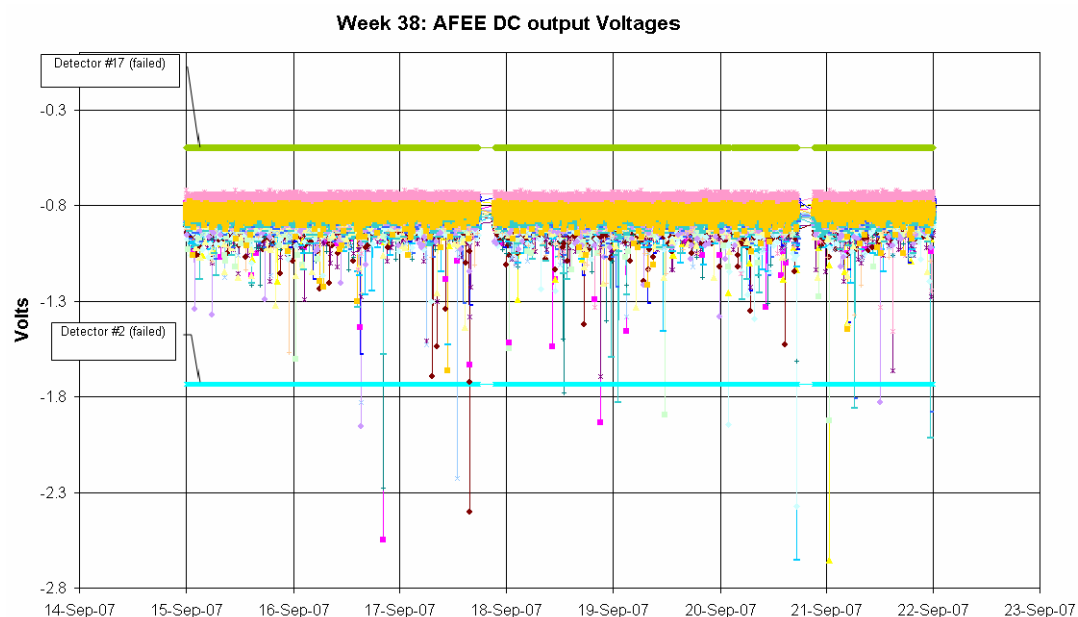
ACS: The performance of the ACS is nominal, except for FEE #81 which remains switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is still OFF due to the anomaly on 5/8/2003 (INT_SC-61).

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

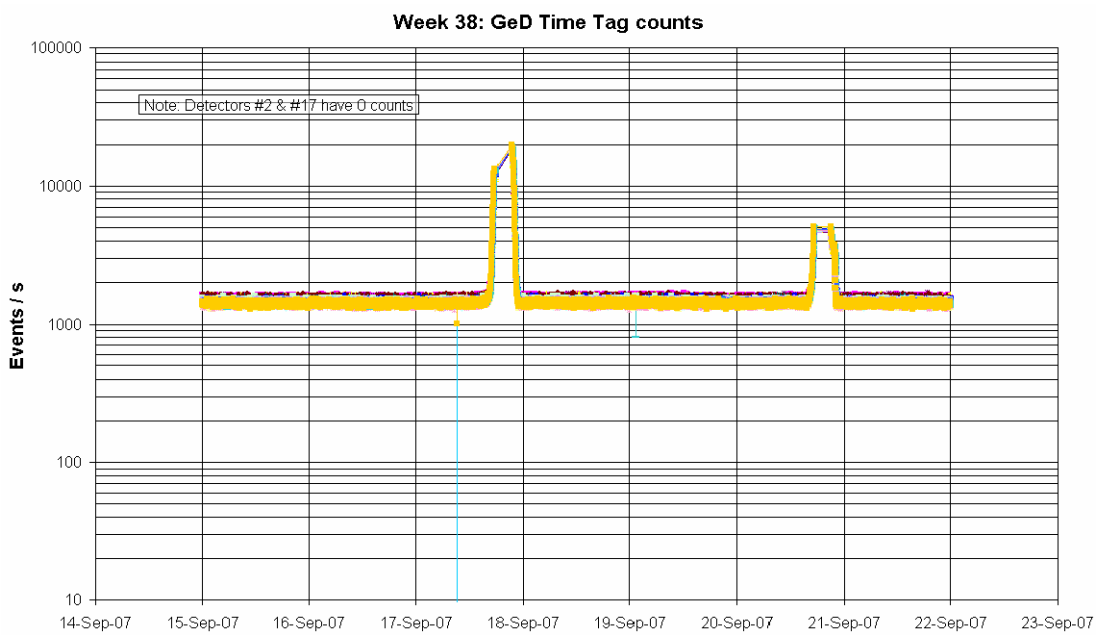
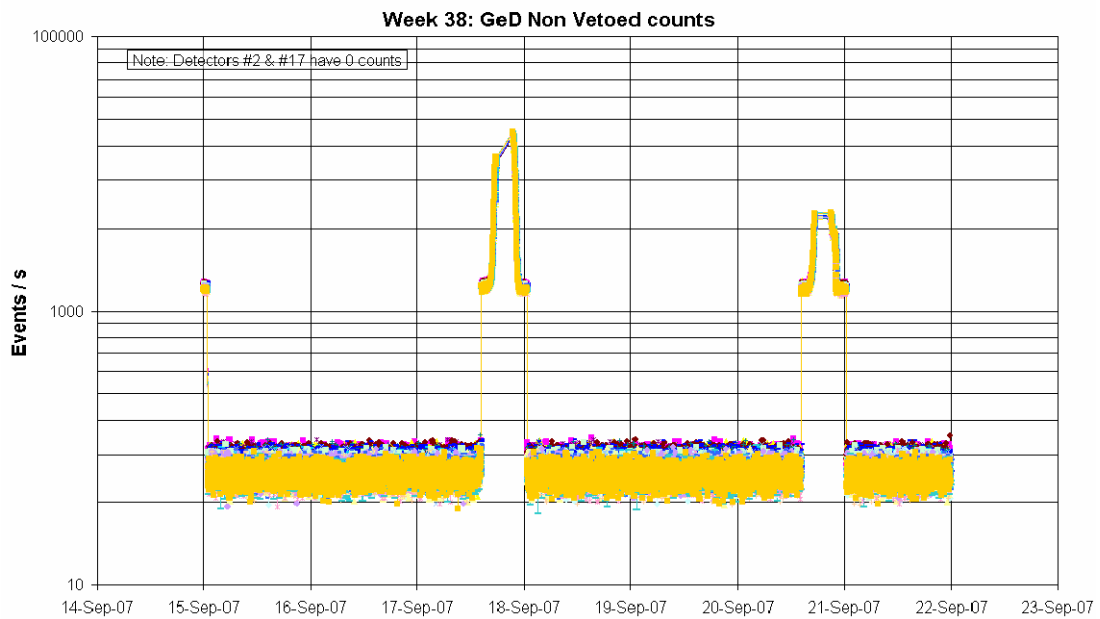


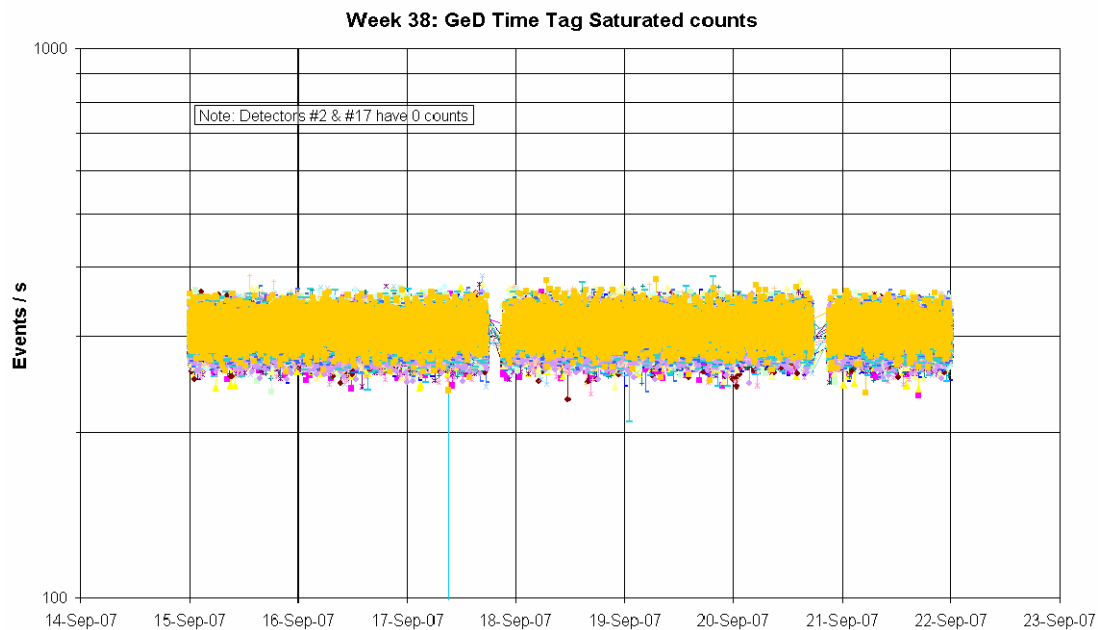
AFEE: The health of the AFEE is nominal. The performance of the AFEE and the detectors is nominal, except for the Ge detector #12 which is showing a slightly degraded energy resolution and is therefore operated at a lower HV setting of 3.5kV (instead of 4kV).

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.

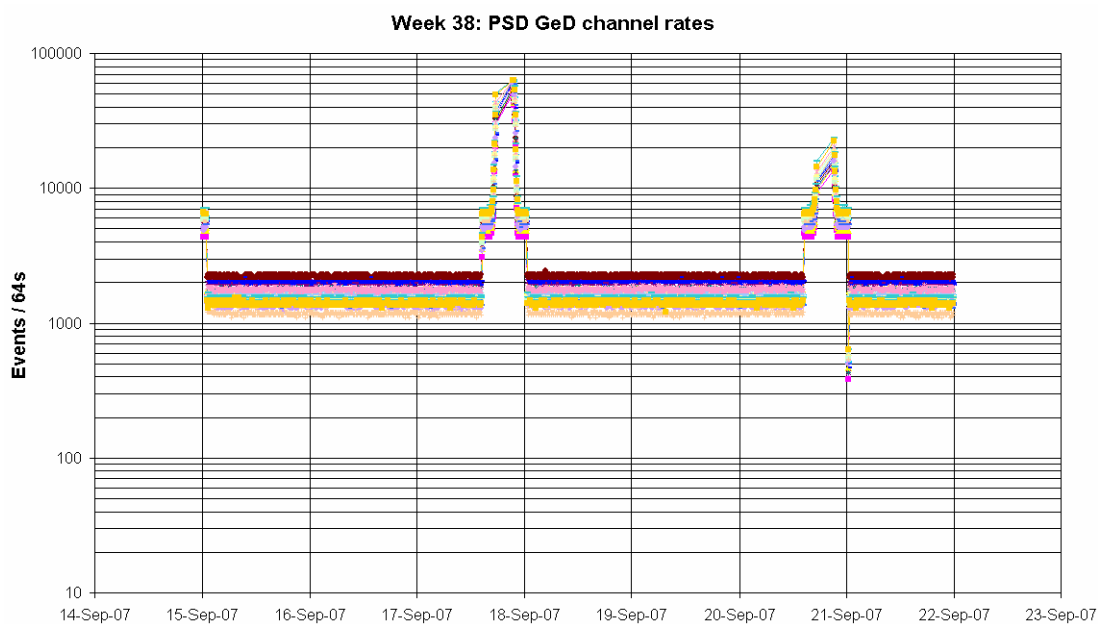


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period.





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:

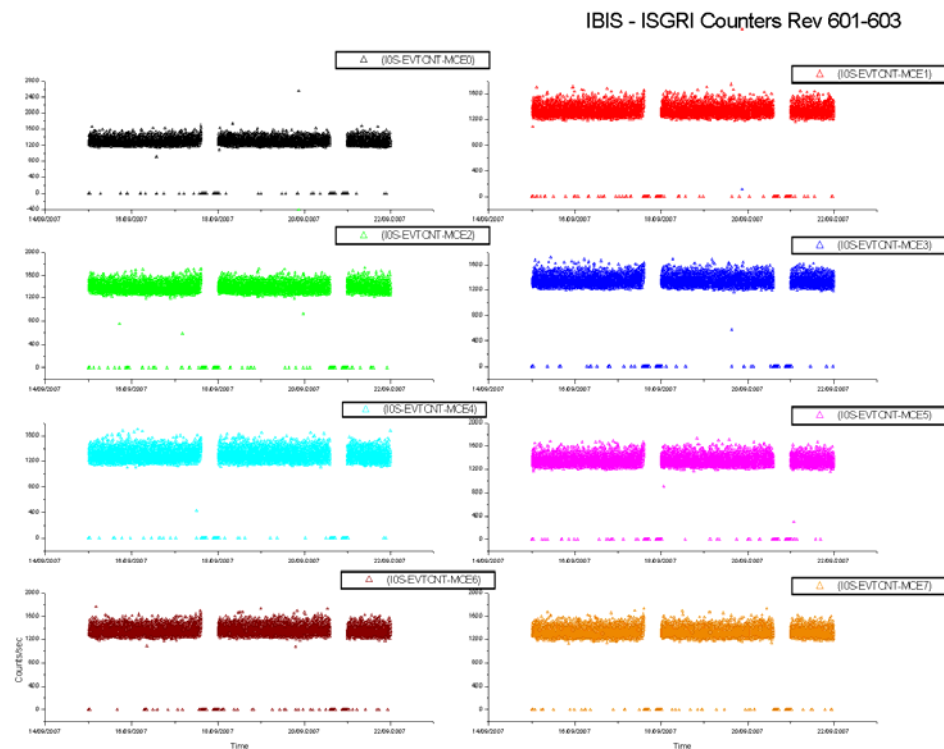
- 45 occurrences of OEM APID 1024 ID 243 EXCEPTION SPI1 SPECTRA BUILDING NOT COMPLETED were received during revolution 601. Following consultation with the PI, the spectra scaling factor was reduced from 9/19SE to 8/19SE after radiation belt entry of revolution 601. Following this, the occurrence of this OEM was greatly reduced, with only 3 being received throughout the remainder of the week.

- On 2007-09-17 at 14:02:56Z TM parameter E3500 (ACS Veto Below Counter) went OOL High. This was ~30 minutes before the expected radiation belt entry of revolution 601 and therefore no action was taken.
- On 2007-09-17 at 21:40:04Z, just after AOS of revolution 602, TM parameter E3824 went OOL High (value = 5.1254V). This is the PSD + 5V digital. As it returned within limits at 21:41:08Z, no action was taken.
- On 2007-09-18 at 00:40:25Z, at radiation belt exit of revolution 602, the TM parameters E3154 and E3247 went OOL (value = PARAM > SPEC). These are the FEE analogue status -5 V #83 and the FEE temperature status #83 respectively. They returned within limits when the next (mode change) packet was received at 00:42:17Z and no action was taken.
- On 2007-09-18 at 00:43:29Z, just after radiation belt exit of revolution 602, TM parameters E3981-E3984; E3986; E3988; E3991-E3992 and E3995-E3996 all went OOL with value = 0. These are the Coldbox temperatures; DFEE and PSD box temperatures; VCU temperature; Heat pipe temperatures and the AFEE power supply board temperature and are all in SPID 60602. This was the first mode-change packet received after radiation belt exit and the parameters returned within limits when the second mode-change packet was received at 00:46:21Z. This is a re-occurrence of the anomaly INT_SC-205.

8.3.3 IBIS Operations

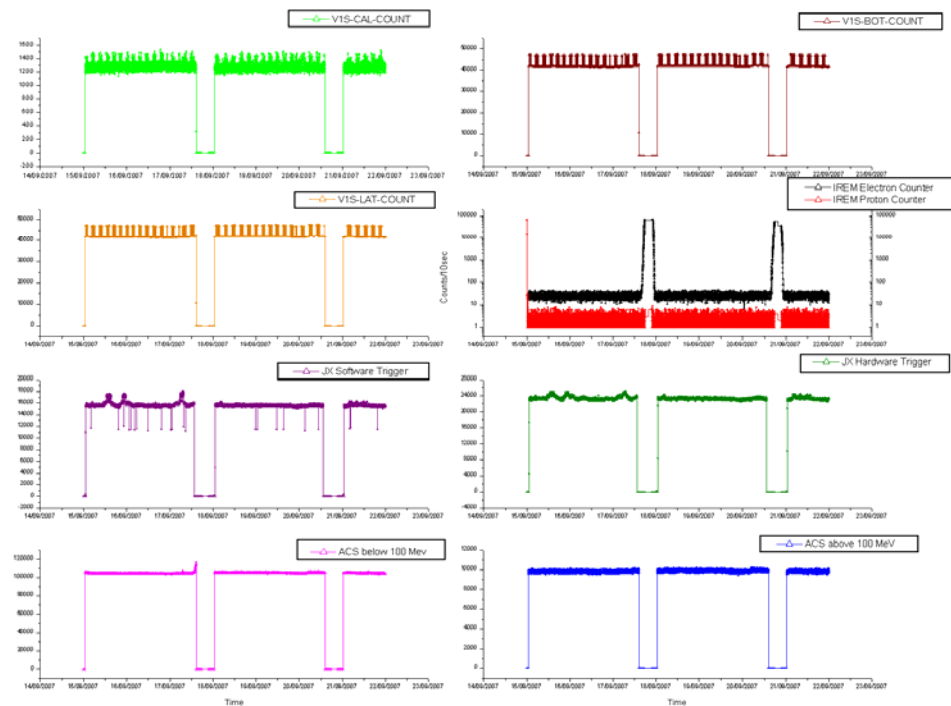
IBIS Event Counters Plots

ISGRI Counters:



VETO vs Payloads Counters:

IBIS-VETO vs Payloads Counters Rev 601-603

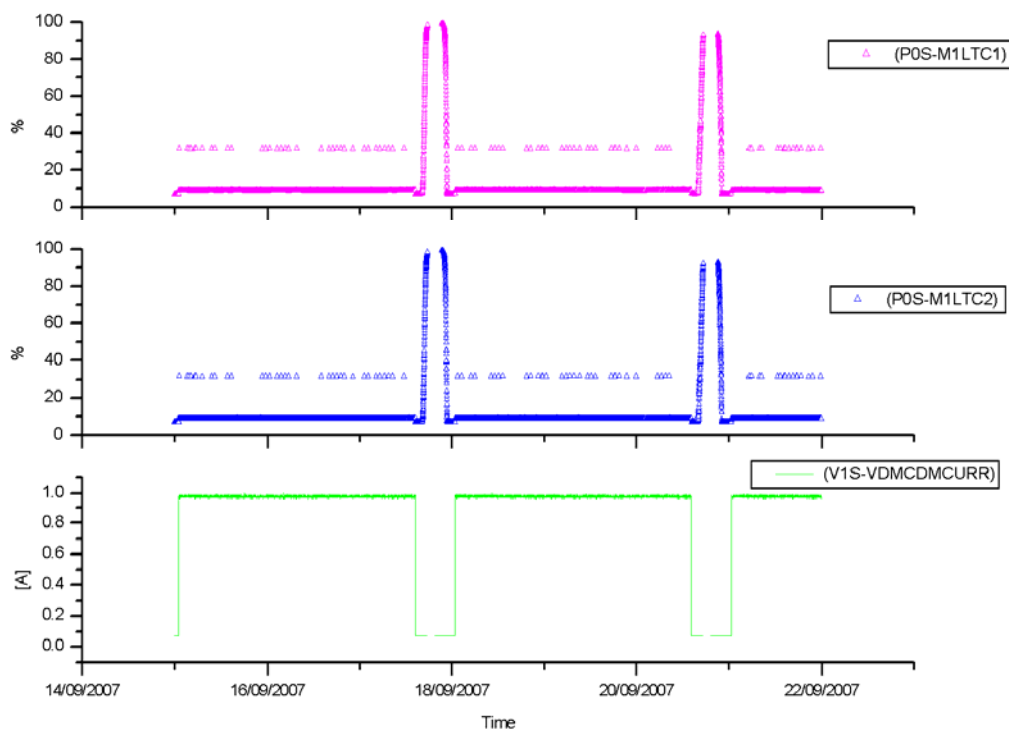


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

The week was characterised by low radiation as reported by the payload.

VETO Current:

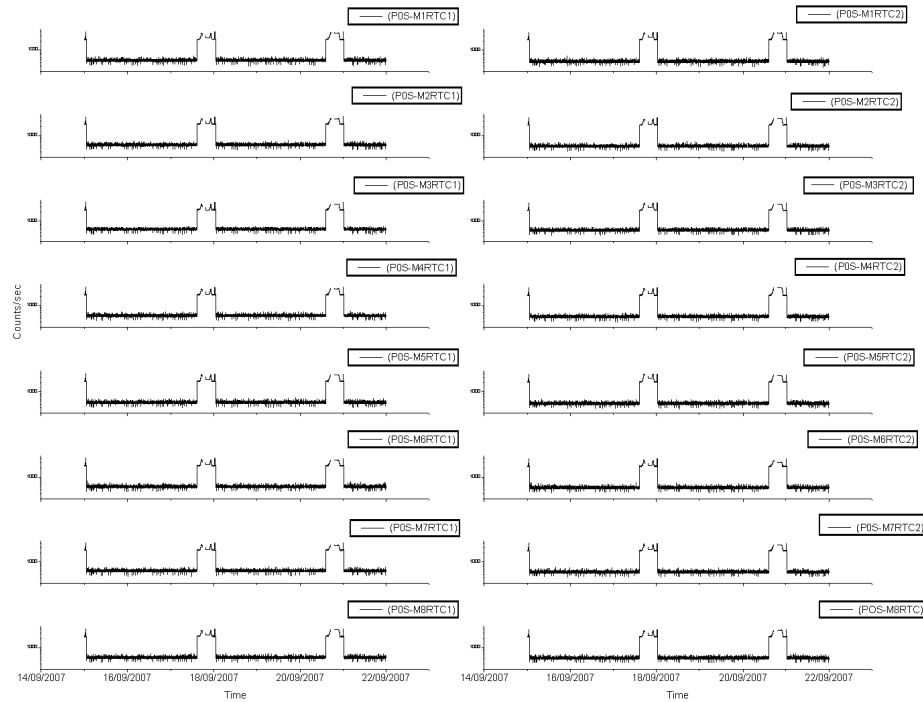
IBIS-VETO Current & PICsIT dead times Rev 601-603



**sampling every 4 pkts (32 secs)

PICsIT Counters:

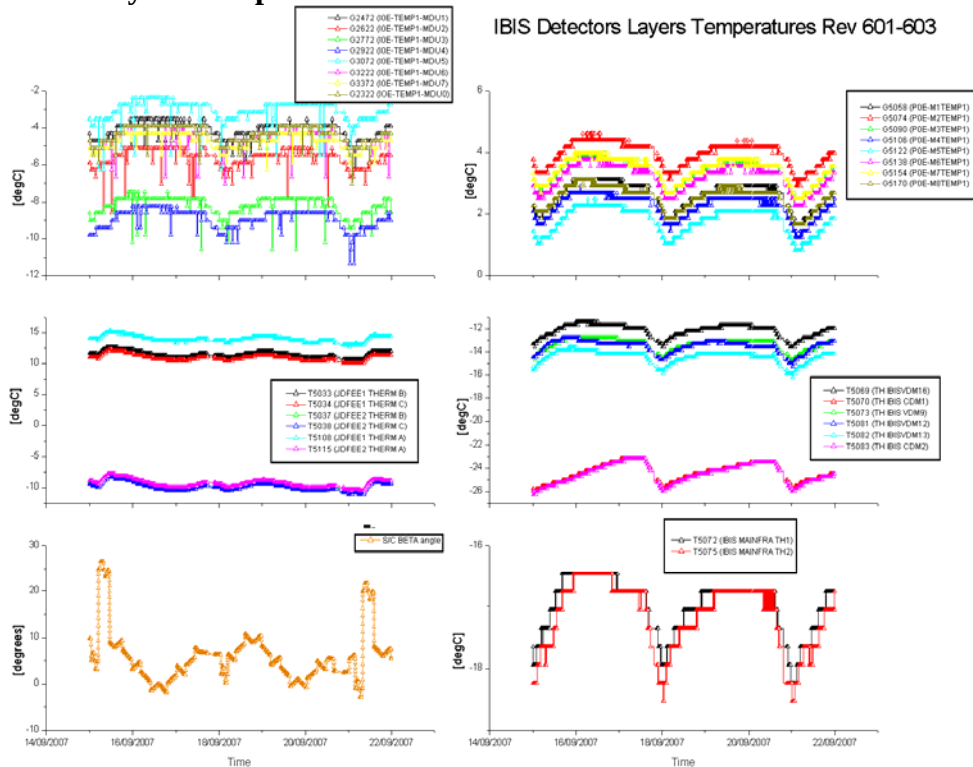
IBIS - PICsIT Counters Rev 601-603



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:

IBIS Detectors Layers Temperatures Rev 601-603



**sampling every 8 pkts (64 secs)

IBIS daily report:

The usual Out Of Limits on TM parameter G8015 (S1E-A2_PMT_V), G5002 (P0S-Mi_RTC1) and G5003 (P0S-Mi_RTC2) families and G2000 family (I0E-OVFWPXADD-Mi) were received during the radiation belt passages.

In addition, throughout the week the TM parameter G6061 (Veto calibration source counter) toggled OOL Warning Low. In each case it only remained OOL for one or two cycles and no action was taken. As this parameter increasingly continues to toggle OOL, due to the nominal radioactive decay of the calibration source, the limits for this parameter will be updated in the next IODB release.

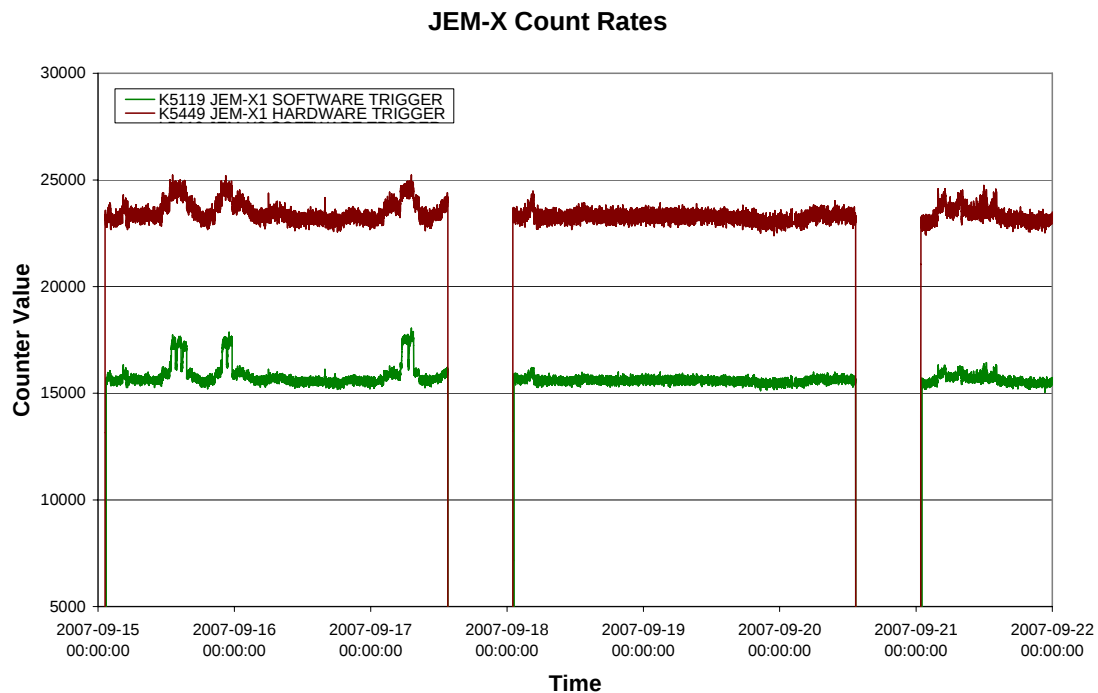
2007-09-15 (DOY 258, Rev 601) to 2007-09-21 (DOY 264, Rev 603)

IBIS operations executed nominally.

8.3.4 JEM-X Operations

JEM-X Count Rates

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

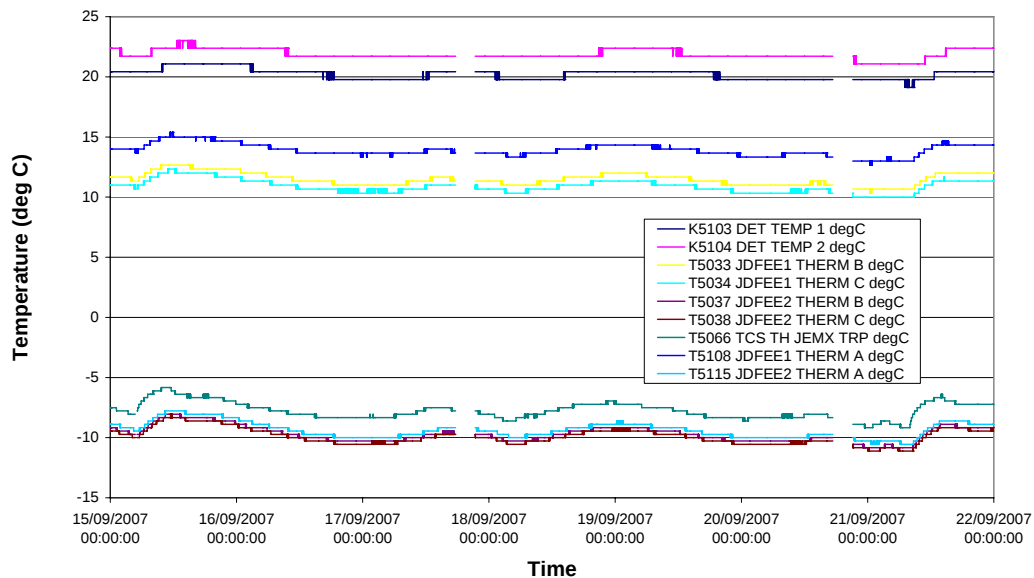


JEM-X Temperatures

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.

JEMX Detector and DFEE Temperatures



JEM-X Daily Report

2007-09-15 (DoY 258, Rev 601)

On this day, the following two anomalous OEMs were received:

2007.258.02.18.01.898	2007.258.02.18.06.234	1536	RealTime	5	EXCEPTION	
JEM-X1 EXC IACS INTERF EXID			0	0	65535 PR	N
E						
FIX6			0			
K9079	MESS CLASS		1			
K9080	MESS ID		5			
K9065	CSSW OPERAT ID		START			
K9066	TASK ID 8		IASW			
K9067	LOGICAL ADDRESS		4989			
2007.258.02.18.01.898	2007.258.02.18.06.305	1536	RealTime	6	EXCEPTION	
JEM-X1 EXC IACS INTERF CULP			0	0	65535 PR	N
E						
FIX6			0			
K9079	MESS CLASS		1			
K9080	MESS ID		6			
K9065	CSSW OPERAT ID		START			
K9066	TASK ID 8		IASW			
K9067	LOGICAL ADDRESS		19726			

No action was taken and there was no impact.

2007-09-16 (DoY 259, Rev 601) to 2007-09-21 (DoY 264, Rev 603)

JEM-X1 operations executed nominally

8.3.5 OMC Operations

2007-09-15 (DoY 258, Rev 601) to 2007-09-17 (DoY 260, Rev 601)

Nothing to report.

² Data sampled (1 frame in 8)

2007-09-18 (DoY 261, Rev 602)

At 01:18, the FD slew update failed to arrive. The Timeline was stopped, and a manual recovery performed. The Timeline was rejoined at about 02:14. The impact was the loss of pointing 06020002. It was at this time the following OEMs were received:

2007.261.01.27.58.670	2007.261.01.28.06.494	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535 PR N
E E					
2007.261.01.28.04.795	2007.261.01.28.16.227	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.

At 02:46, the FD slew update failed to arrive. The Timeline was stopped, and a manual recovery performed. The Timeline was rejoined at about 03:28. The impact was the loss of pointing 06020005. It was at this time the following OEMs were received:

2007.261.03.03.46.673	2007.261.03.03.50.361	1792	RealTime	131	TC REJECT
REJECTED TC1			0	0	65535 PR N
E E					
2007.261.03.03.52.798	2007.261.03.03.58.502	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.

2007-09-19 (DoY 262, Rev 602) to 2007-09-21 (DoY 264, Rev 603)

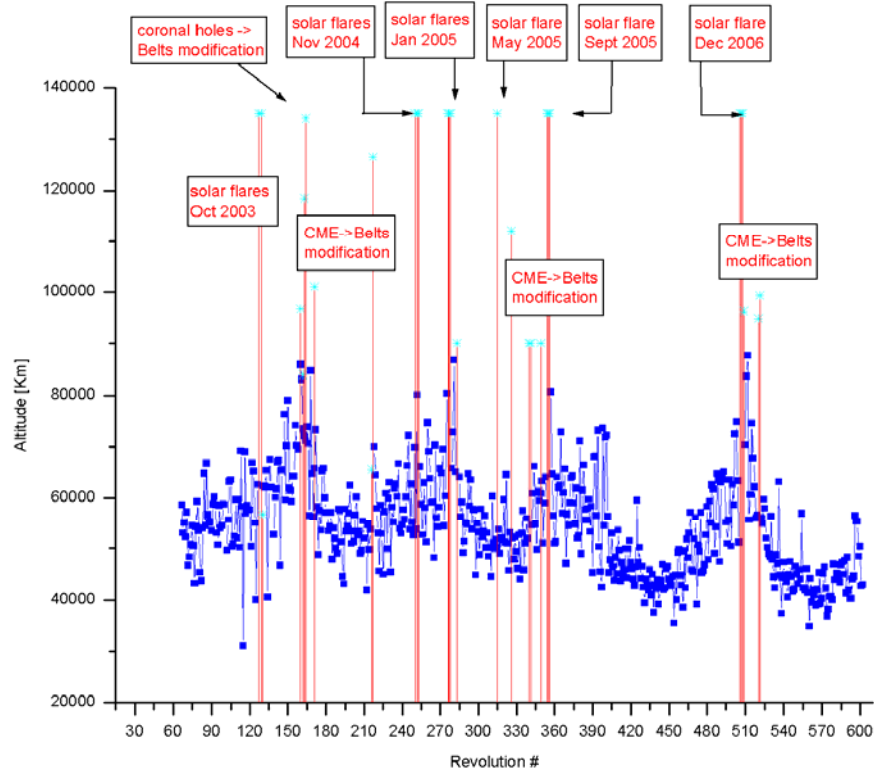
Nothing to report.

On DoY 260 at 14:29:25 and DoY 263 at 14:17:41 OMC went to SAFE mode nominally, at the radiation belt entry time as set in the Broadcast Packet.

8.3.6 IREM Operations

Radiation Belts Entry

Evolution of Radiation Belt Entry 2003-2007



IREM daily report

DoY 2007.257 (14/09/2007):

At 22:47Z, a local reset of the IREM CSCI S/W (SEU #54) occurred. The status of the unit, before the local reset of the IREM CSCI S/W, was nominal, here is a summary:

- 1) The temperatures were nominal;
- 2) The LCL current was nominal;
- 3) The last HK before the anomaly showed HV, 5V and 6V voltages inside limits;
- 4) The anomaly occurred at 2007.257.22.47Z at 31423.7 km. The unit had performed an automatic transition to Standard Mode (ie. no block counter increasing, all the TM words= FFFF hex); just before the anomaly, radiation counters reported nominal values considering the position of the S/C along the orbit;
- 5) The recovery of the unit started at 22:50Z using procedure CRP_SYS_2570. The first dump of the status word after the anomaly reported a value of BCC0 HEX = 48320 DEC = 1011110011000000, i.e the Checksum Failure Flag ON. The unit was still reporting the status as if it was in Integral mode with counting ON and accumulation ON. This value of the status word is assumed to be an old one written by the S/W at the moment of the anomaly.
- 6) A dump of all the registers gave a status word BC80 HEX = 48256 DEC = 1011110011000000, ie. the unit was still reporting the status as if it was in Integral

mode but the Checksum Failure flag was this time OFF and the checksum counter in the register number 3 incremented by 1 unit.

7) The patch was performed successfully with the correct re-starting of the S/W following procedure FCP_RM_0081. The operation was completed at 00:33Z.

The IREM automatic transition to Standard Mode did not affect the instruments this time, as it occurred inside the belts, when the instruments were in safe mode anyway..

The cause of these S/W resets is apparently due to the unit's memory device that is sensitive to high energy radiation, as proved during test campaign on-ground.

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]
601	RAD_EXIT R 2007-09-15T00:53:01Z	No data	No data	14-Sep-2007 23:42:55	43031.88
601	RAD_ENTR R 2007-09-17T14:29:18Z	17/09/2007 16:02:53	42724.8	17-Sep-2007 15:41:26	45426.76
602	RAD_EXIT R 2007-09-18T00:40:06Z	17/09/2007 23:07:57	>>31430.3	17-Sep-2007 23:31:26	43852.19
602	RAD_ENTR R 2007-09-20T14:17:36Z	20/09/2007 15:50:21	42981.4	20-Sep-2007 13:50:01	47059.88
603	RAD_EXIT R 2007-09-21T00:27:59Z	20/09/2007 22:29:57	>>31439.3	20-Sep-2007 22:00:01	44684.68

Reference

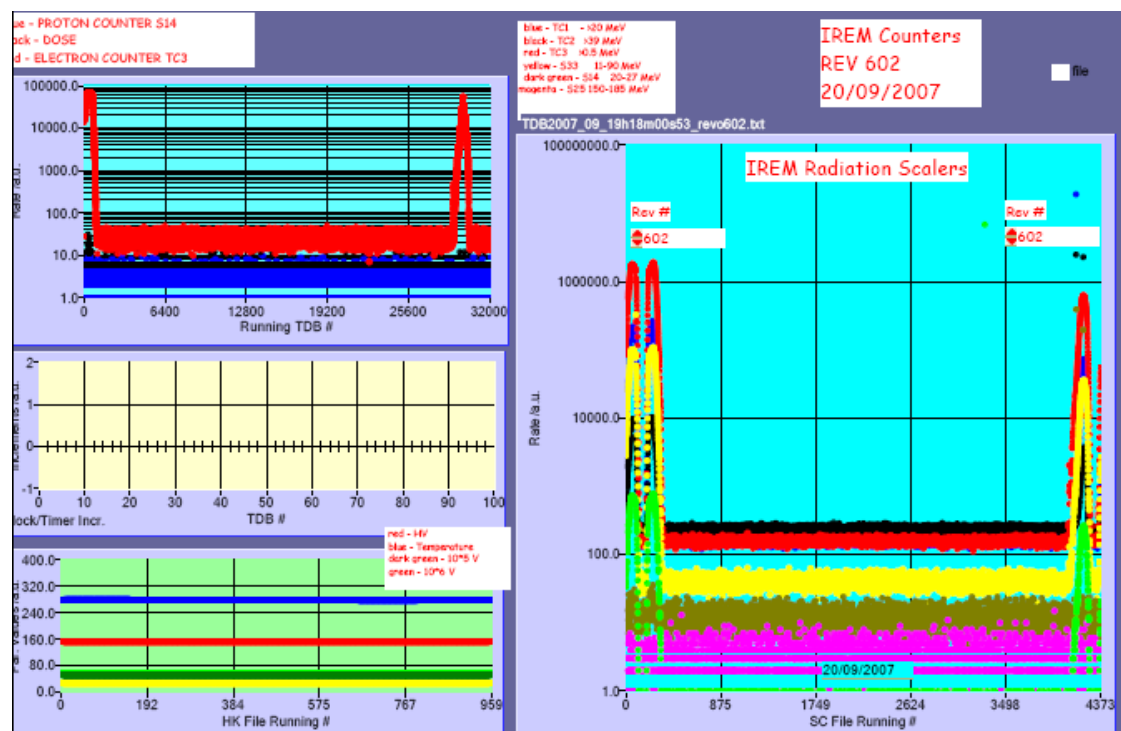
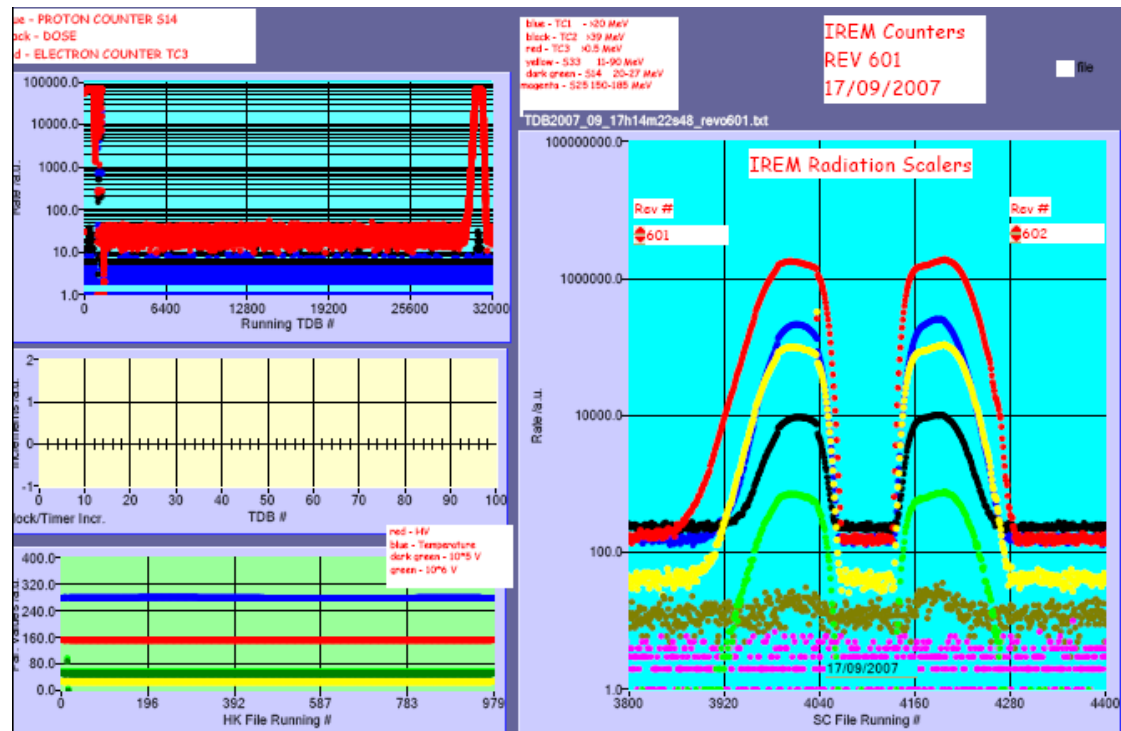
High radiation

Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

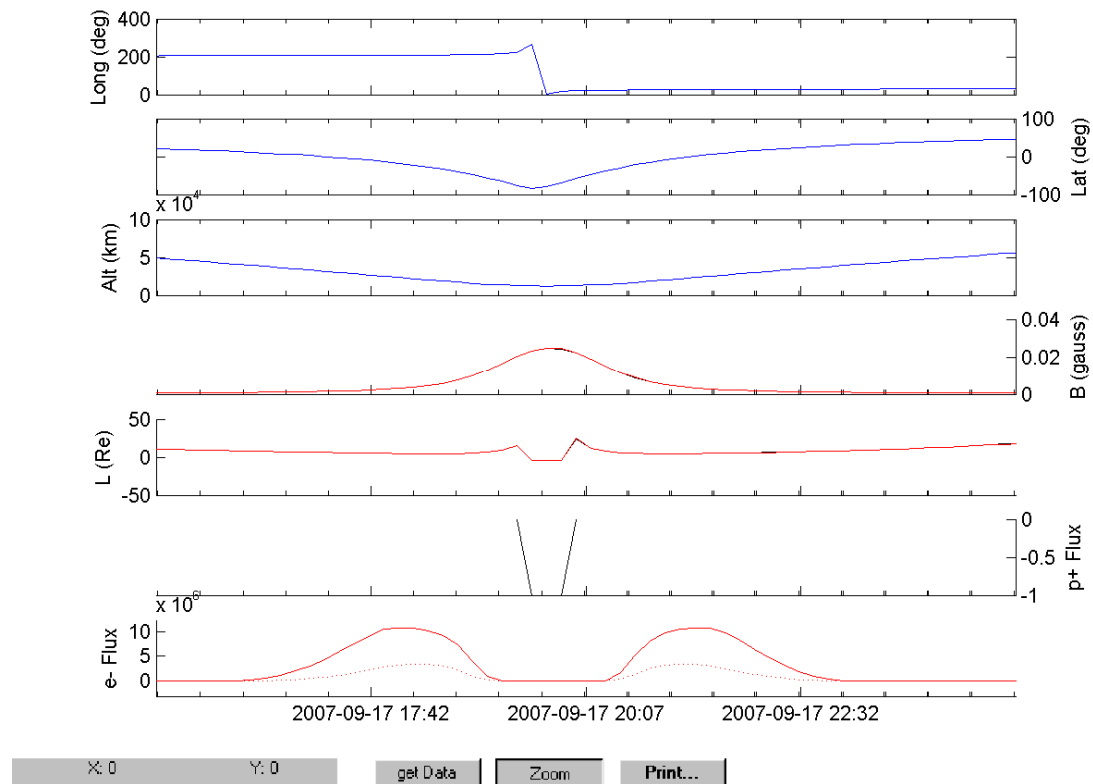
Large error vs reference (more than 30 minutes)

IREM radiation counters:

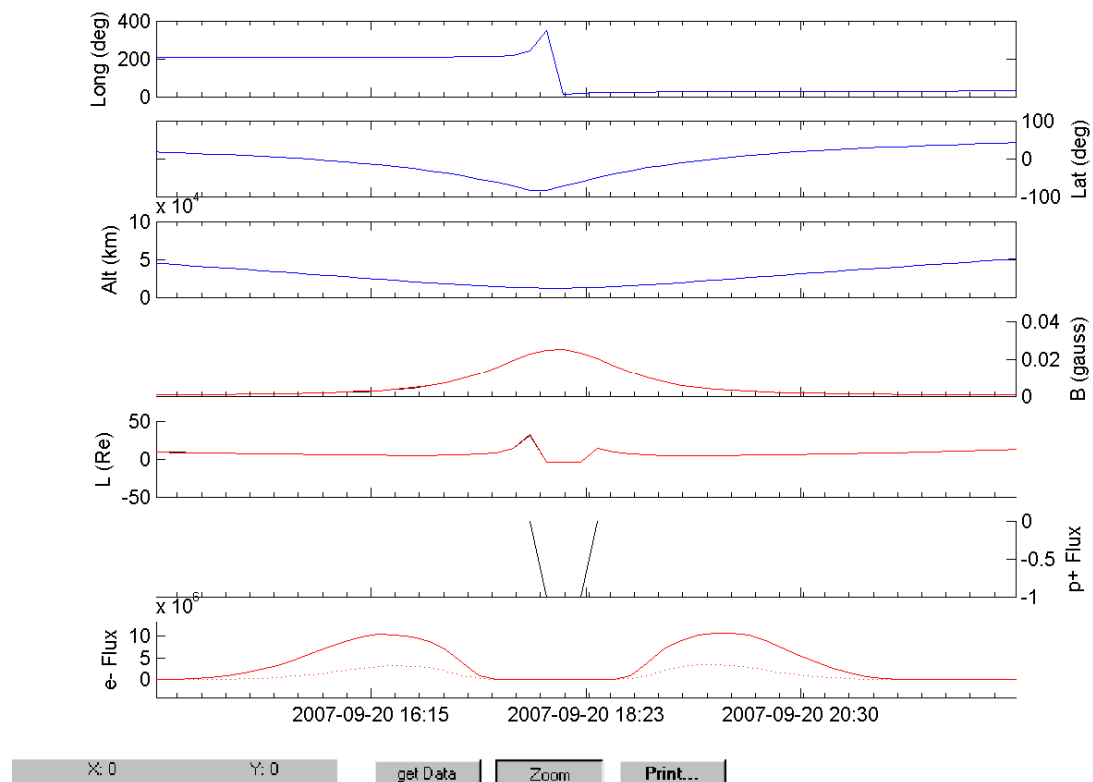


IREM Predicted Radiation Belt Passages

Rev 601



Rev 602



Doc. Title : INTEGRAL Mission Report #261
Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OAI
Date : 24/09/07

Issue : 1
Rev. : 0
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SEC-GOES Observed Particles Fluxes (using SEIS/RAT tool):

Due to a problem on the SEISOP server, no data are available this week. However, the week was very quiet and no radiation was reported.