

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 255
Week 32
13.08.07
Routine Phase

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LIST OF CONTENTS

1	General.....	3
2	Summary of Activities.....	3
3	Satellite Status.....	3
3.1	Platform.....	3
3.1.1	AOCS.....	3
3.1.2	Power.....	3
3.1.3	Thermal.....	3
3.1.4	OBDH.....	4
3.1.5	RFS.....	4
3.2	Payload.....	4
3.2.1	SPI.....	4
3.2.2	IBIS.....	5
3.2.3	JEM-X.....	6
3.2.4	OMC.....	6
3.2.5	IREM.....	7
4	Ground Facilities.....	7
4.1	Mission Operations Centre.....	7
4.2	Ground Stations & Network.....	7
4.3	Science Ground Segment.....	7
4.3.1	ISOC.....	7
4.3.2	ISDC.....	8
5	Special Events.....	8
6	Anomalies.....	8
7	Future Milestones.....	8
8	Appendix.....	9
8.1	Overview of Revolutions.....	9
8.2	Consumables.....	9
8.2.1	Detailed Fuel Book-keeping.....	9
8.3	Detailed Satellite Information.....	10
8.3.1	AOCS SUMMARY OPERATIONS REPORT, 04/08/2007 – 10/08/2007.....	10
8.3.2	SPI Operations.....	14
8.3.3	IBIS Operations.....	22
8.3.4	JEM-X Operations.....	26
8.3.5	OMC Operations.....	27
8.3.6	IREM Operations.....	29

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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 04.08.07 until 10.08.07 (both dates inclusive) and covers the revolutions 587, 588 and 589.

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 series of Galactic Disk Latitude Scans (RA 14:12:33.60, DEC -63:27:36.0), (RA 14:30:43.20, DEC -62:42:36.0), (RA 14:36:21.60, DEC -58:05:24.0), (RA 14:51:45.60, DEC -57:08:24.0), (RA 14:57:57.60, DEC -61:13:12.0), and (RA 14:25:40.80, DEC -62:56:24.0), a raster dither of the Galactic Plane Region 2 (RA 14:08:36.11, DEC -61:30:20.6) and a raster dither of Orion OB1 (RA 05:17:00.30, DEC +01:47:17.7),

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.

2 slews were missed from TL, during the observation period, due to problem with the IMCS.

The fuel consumption over the period between 03/07/2007 and 10/08/2007 was 0.0715 Kg. The remaining propellant is in the order of 144.9782 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

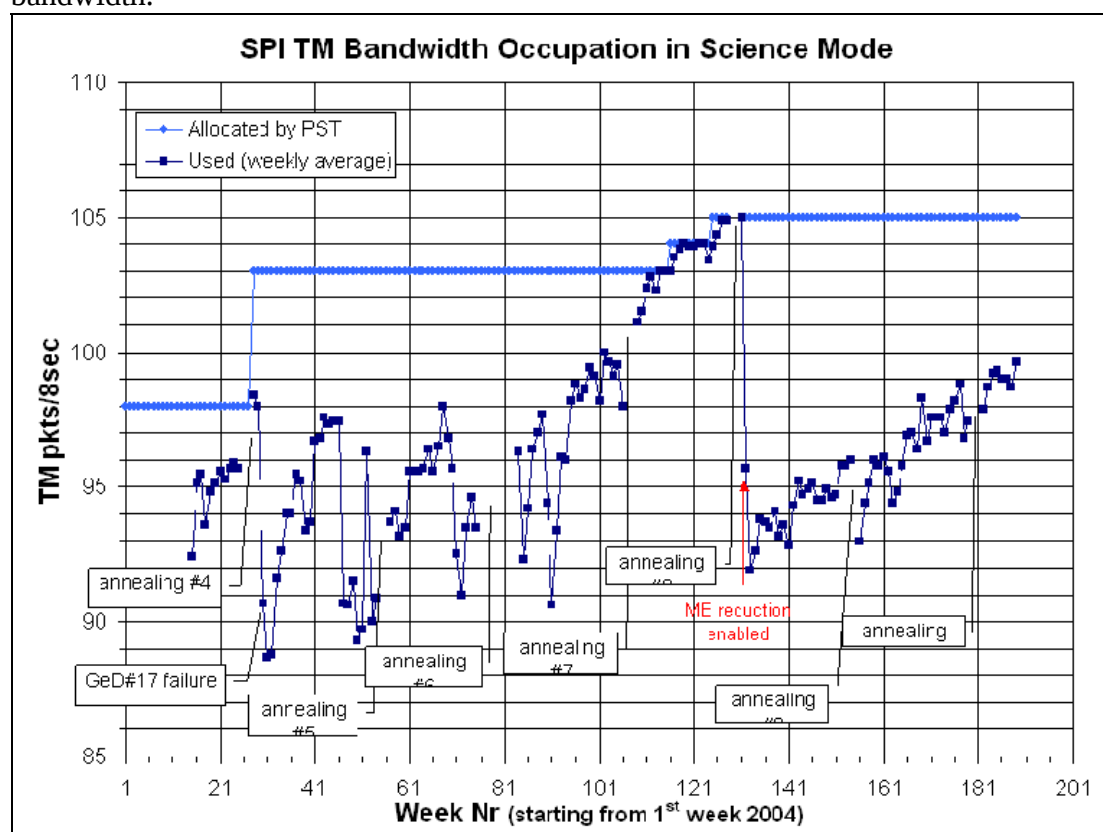
Following the 10th annealing, which ended on 17th June, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #12 which is showing a slightly degraded energy resolution and is therefore operating at a lower HV setting of 3.5kV (instead of 4kV). Detector #2 is failed since 06.12.2003 and detector #17 since 17.07.2004.

The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K.

On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. Details can be found in the Anomaly Report INT_SC-197.

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 99.6 packets/cycle.

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



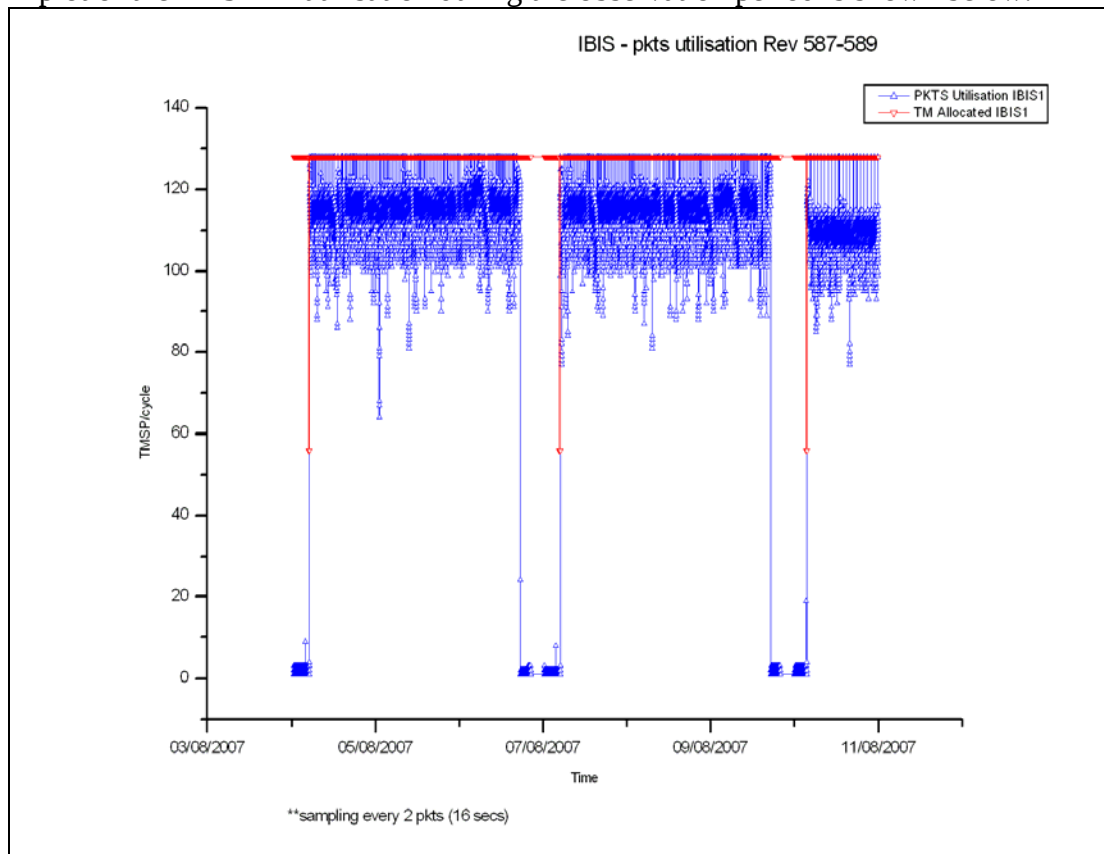
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

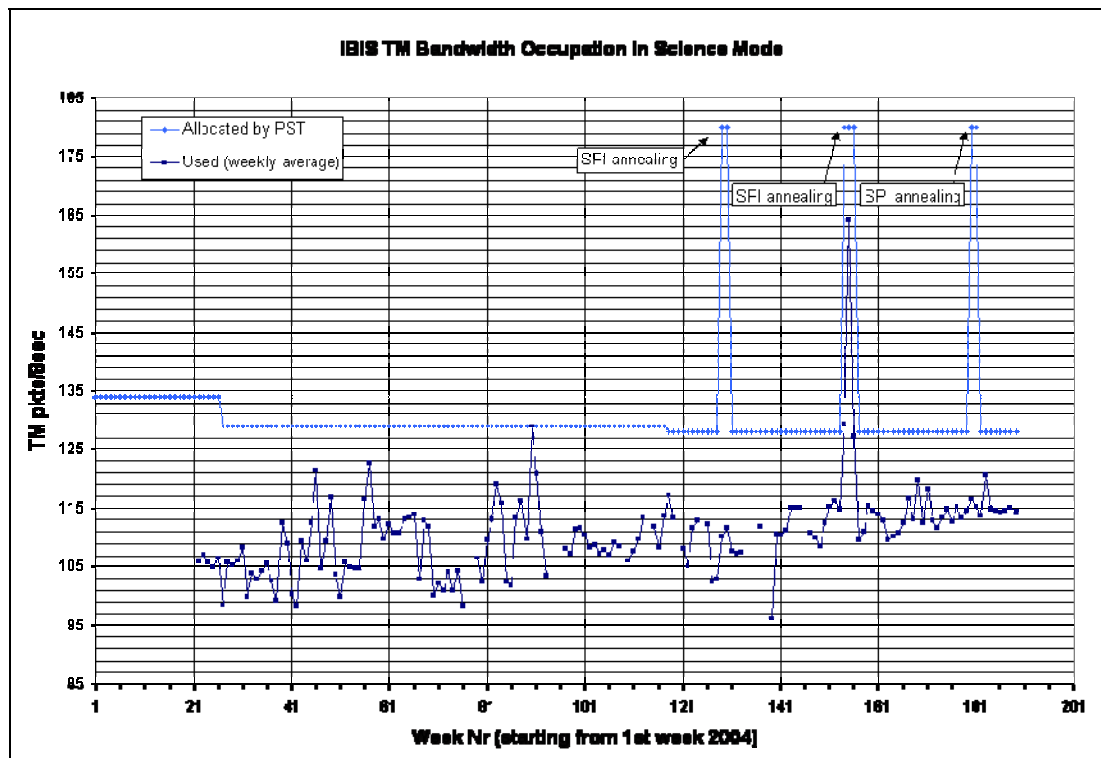
The overall status of the unit is nominal.

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 114.42 TMPS/cycle, down 0.44 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, 208 of the 210 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.

A tiny sunspot 966 poses a potential threat for B- and C-class solar flares but no threat for strong solar flares.

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. Two pointings were lost due to ground problems. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. The FDS had three occurrences of slew updates failing to arrive, and having to be manually sent, all without impact. Within the imcs, the HFA task crashed, which led to further problems and the loss of 2 pointings. The overall performance was well over the 95% requirement.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. There were however 8 occasions of a TM drop from Redu, and 1 from DSS27 all without impact. 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 599. Planned up to 597.

TSFs received up to revolution 592.

2. Observation status

ECS files have been received and processed up to revolution 580.

3. ISOC Science Data Archive

In preparation of future added contents in the archive, a bulk processing of selected Integral data has been set up and started.

4. ISOC system

Version 15.3 is still under testing for a release in the next week. Work is ongoing on V16 to support the next KP AO.

5. Problems

None.

4.3.2 ISDC

Status of ISDC observation processing on 13/08/2007:

- Latest Standard Analysis completed: observation 04200730033 (Galactic disk latitude scans, Revolution 580) on 10/08/2007.
- Latest products archived: observation 04200730033 (Galactic disk latitude scans, Revolution 580) on 10/08/2007.
- Latest observation products sent to the observer: observation 04200730033 (Galactic disk latitude scans, Revolution 580) on 12/08/2007.

5 Special Events

6 Anomalies

The following problem was reported that impacted operations:

- On DoY 220, at 14:21, the HFA task died and was restarted. A minute later, the commands for slew 05880057 fail release. The PDS TM, EV, & TC tasks are then also restarted, but fail to connect properly. At 14:26, the Timeline was reloaded. The imcs was eventually recovered at 14:39. Meanwhile, the Timeline had been stopped, and a recovery was necessary. This was performed, and the Timeline rejoined at 15:19. The impact was the loss of pointings 05880057 & 05880058.

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

AR id	Date Created	Subject	Segment	Status
INT_SC-197	2007-08-08	SPI DPE1 CPU reset	Payload	Open
INT-2943	2007-08-01	REDU TM Delivery Problems	COMMS	Pending
INT-2944	2007-08-09	Application HFA_TM Dies	IMCS	Pending

7 Future Milestones

The following activities are foreseen in the next few weeks.

- Lunar eclipse on 11th September 2007, at the end of revolution 599.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 587

The observations in revolution 587 began with a series of Galactic Disk Latitude Scans (RA 14:12:33.60, DEC -63:27:36.0), for ~8.3 hours, then (RA 14:30:43.20, DEC -62:42:36.0), for ~8.8 hours, then (RA 14:36:21.60, DEC -58:05:24.0), for ~17.1 hours, then back to (RA 14:30:43.20, DEC -62:42:36.0), for a further ~8.3 hours, then back to (RA 14:12:33.60, DEC -63:27:36.0), for a further ~8.8 hours. Finally, a raster dither of the Galactic Plane Region 2 (RA 14:08:36.11, DEC -61:30:20.6), which lasted ~1.4 hours was performed, until the end of the revolution.

Revolution 588

The observations in revolution 588 began with a series of Galactic Disk Latitude Scans (RA 14:51:45.60, DEC -57:08:24.0), for ~8.8 hours, then (RA 14:57:57.60, DEC -61:13:12.0), for ~8.8 hours, then (RA 14:25:40.80, DEC -62:56:24.0), for ~17.1 hours, then back to (RA 14:57:57.60, DEC -61:13:12.0), for a further ~8.3 hours, then back to (RA 14:51:45.60, DEC -57:08:24.0), for a further ~8.3 hours. Finally, a raster dither of Orion OB1 (RA 05:17:00.30, DEC +01:47:17.7), which lasted ~1.0 hours was performed, until the end of the revolution.

Revolution 589

The observations in revolution 589 consisted entirely of a raster dither of Orion OB1 (RA 05:17:00.30, DEC +01:47:17.7), which lasted ~57.4 hours.

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

2007-07-20T02:14:35.000Z	145.2964	F	Automatic TM processing.
2007-07-20T15:00:04.000Z	145.2624	F	Automatic TM processing.
2007-07-20T19:56:37.000Z	145.2135	F	Automatic TM processing.
2007-07-23T01:59:30.000Z	145.2022	F	Automatic TM processing.
2007-07-23T11:36:03.000Z	145.1565	F	Automatic TM processing.
2007-07-26T01:48:26.000Z	145.1445	F	Automatic TM processing.
2007-07-27T11:40:54.000Z	145.1059	F	Automatic TM processing.
2007-07-29T01:38:02.000Z	145.0879	F	Automatic TM processing.
2007-07-30T11:09:09.000Z	145.0703	F	Automatic TM processing.
2007-08-01T01:24:49.000Z	145.0600	F	Automatic TM processing.
2007-08-02T11:01:26.000Z	145.0420	F	Automatic TM processing.
2007-08-04T01:16:18.000Z	145.0150	F	Automatic TM processing.
2007-08-07T01:00:58.000Z	145.0070	F	Automatic TM processing.
2007-08-08T10:31:41.000Z	144.9942	F	Automatic TM processing.
2007-08-10T00:46:01.000Z	144.9782	F	Automatic TM processing.

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, 04/08/2007 – 10/08/2007

The AOCS operations were executed from the Automatic Timeline.

During this period, 65 Open Loop Slews, 160 Closed Loop Slews and 4 Momentum Biases were executed.

2 slews (CSL) were missed from TL, during the observation period, due to problem with the HFA (History File Archive) task of the IMCS.

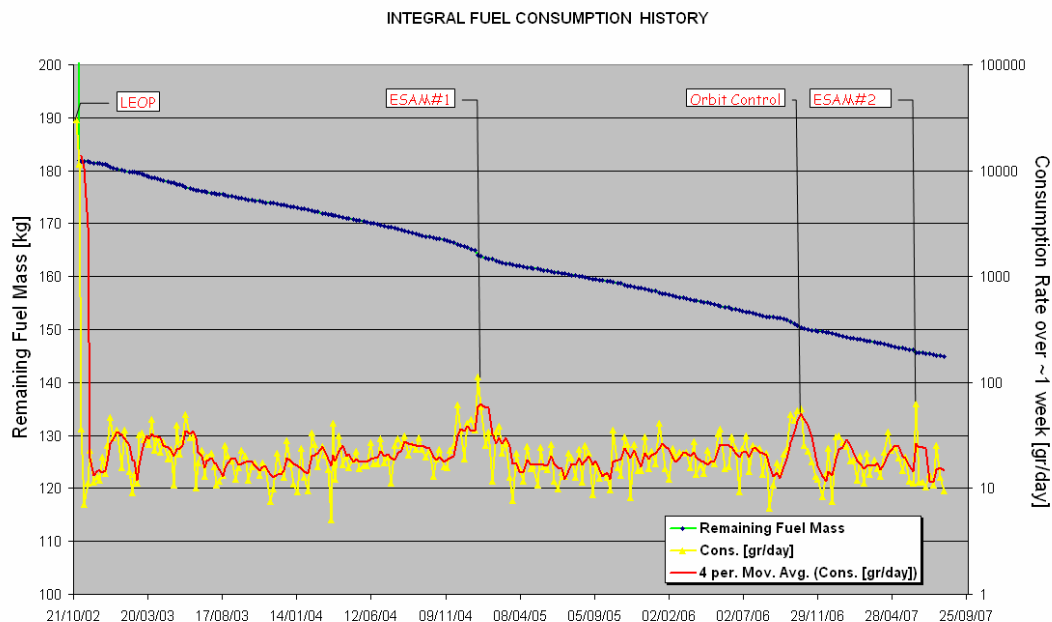
This is equivalent to $\sim 0.9\%$ of the total number of slews planned (226).

Orbit Control

No update.

Fuel consumption

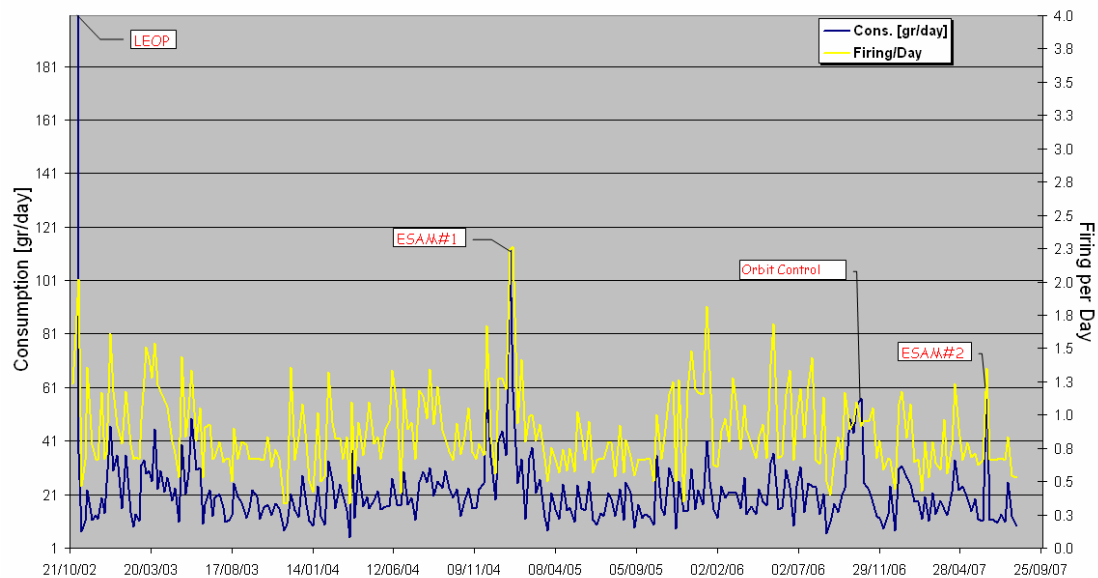
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 10/08/2007 is reported in the plot below.



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

The firing per day over the period between 01/11/2002 and 10/08/2007 is reported in the plot below.

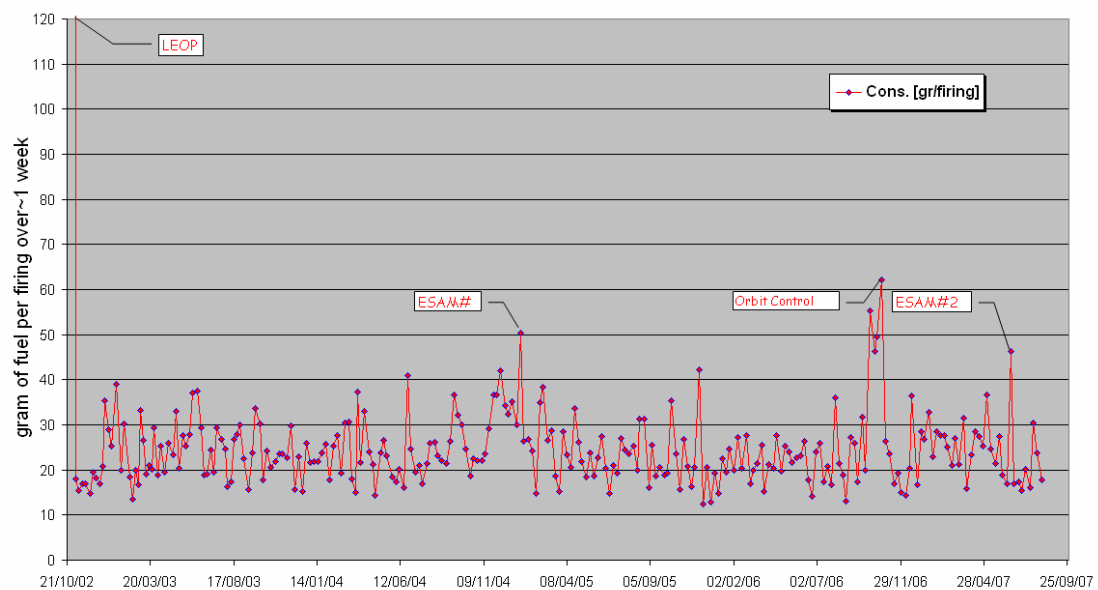
INTEGRAL FIRING PER DAY HISTORY



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

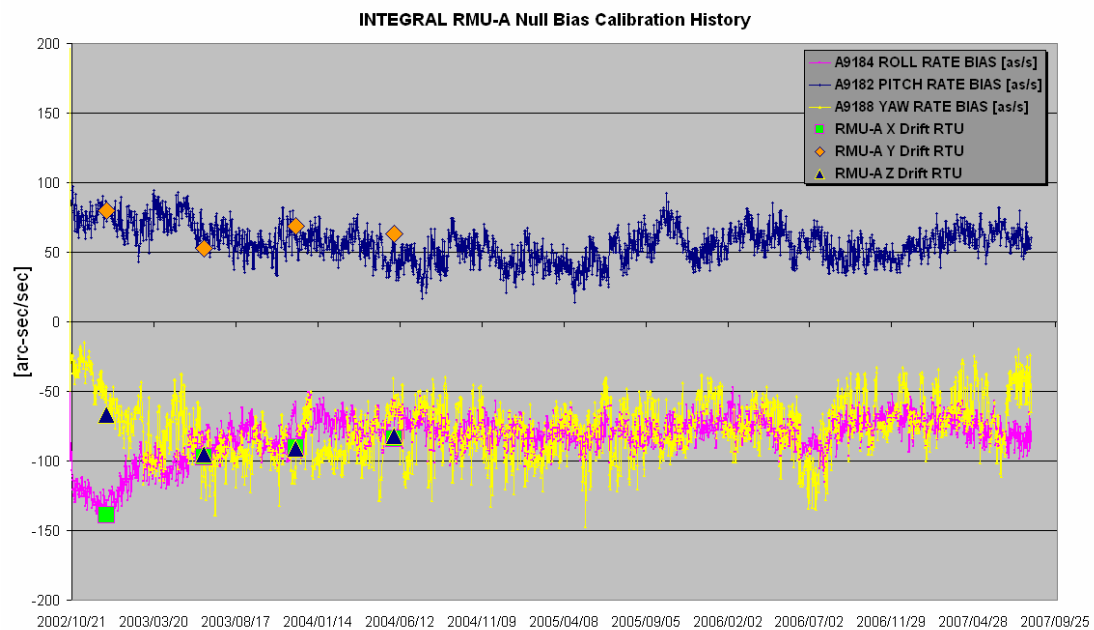
The fuel per firing over the period between 01/11/2002 and 10/08/2007 is reported in the plot below.

INTEGRAL FUEL MASS PER FIRING HISTORY

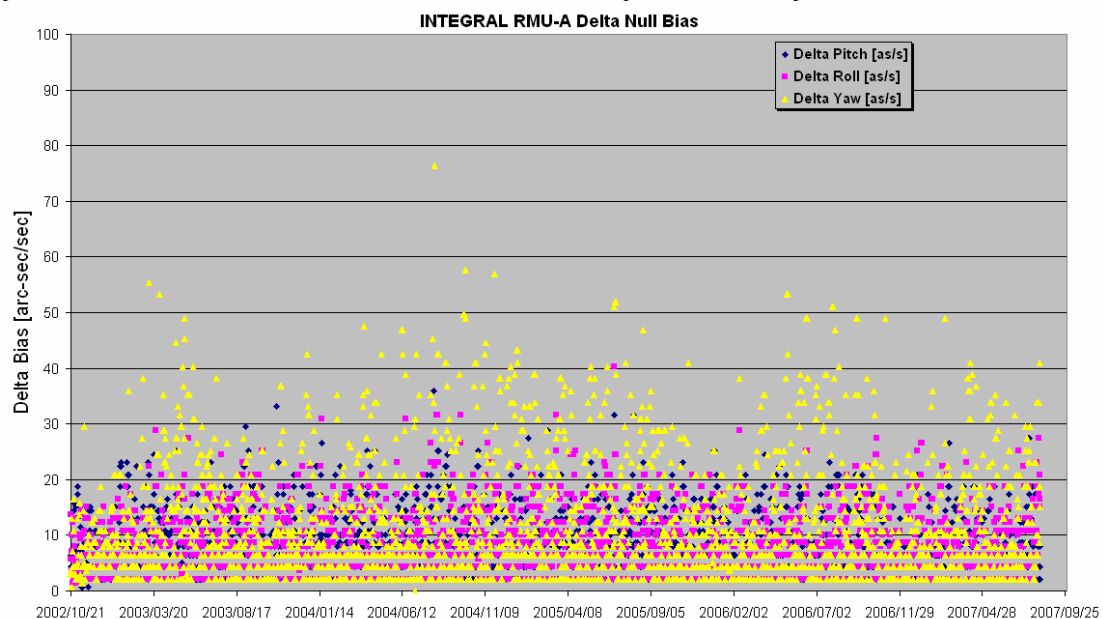


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 10/08/2007 is reported in the plot below.



The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over period between 01/11/2002 and 10/08/2007 is reported in the plot below.



04/08/2007 (Day of Year 216, Revolution 586-587)

FDS failed slew update: at 11:41z the FDS failed the update of slew ID 05870014. FDS reported an error during the update process: the TPF update software spotted a slew constraint violation on the initial attitude of pointing 05870013 at 2007-08-04T12:14:03Z (STR occultation by earth). That is about one minute before starting the slew at 2007-08-04T12:14:38Z to attitude 05870014. The TPF generation was aborted. The TPF could be produced by running Recover Schedule some time later.

A manual recovery was performed at 11:49z and the slew 05870014 manually updated in TL.

At 12:22z the FDS failed again the update of slew ID 05870015. FDS reported an error during the update process: the TPF update software spotted a slew constraint violation on the initial attitude of pointing 05870014 at 2007-08-04T13:13:57Z (STR occultation by earth). That is about two minutes before starting the slew at 2007-08-04T13:16:11Z to attitude 05870015. The TPF generation was aborted. The TPF could be produced by running Recover Schedule some time later.

A manual recovery was performed at 12:31z and the slew 05870015 manually updated in TL.

No impact on TL.

Remark: the slew constraint check during TPF update starts at the command release time unlike for mission planning at EPOS level and manual recovery using the Recover Schedule tool. The latter two applications start the constraint check with the manoeuvre execution time which is some minutes after the command release time. In case pointing are placed just at the edge of an allowed region (so that the constraint moves away with time) the TPF update could spot a violation while EPOS planning and Recover Schedule do not.

05/08/2007 (Day of Year 217, Revolution 587)

Nothing to report.

06/08/2007 (Day of Year 218, Revolution 587)

Nothing to report.

07/08/2007 (Day of Year 219, Revolution 587-588)

Problem on IMCS-A connection to NCTRS-A: at AOS Redu, 00:24z, was not possible to connect the TM link (MANSTACK and AUTOSTACK reported <<NO TM FLOW>>), through NCTRS-A, with the IMCS-A chain. This required temporarily a swap of the operations on the NCTRS+IMCS B-chain and a complete restart of all the application on the IMCS-A server and NCTRS-A.

The problem with the MCS caused no TM received by FDS, therefore no mapping was available for attitude determination such that the update job was aborted.

Once the problem on IMCS+NCTRS A-chain was cleared, the TM link was established again on A-chain and the operations swap to the A-chain. The FDS GTPs TM processors were connected to receive live TM from the MCS. A manual recovery was then performed to update the first slew of the rev 05880001 in TL.

No impact on TL.

Problem on IMCS segmentation server: at 06:50z due to a problem on segmentation server, few applications of the MCS were restarted (together with the

HFA TM task) in order to fix the problem. The FDS reported not update TM and this caused the GTPs processors on the FDS to stop working. The mapping after slew 05880005 was not transferred to the FDS in time before the update job for slew 05880006 was kicked off and the update job was aborted.

A manual recovery was performed to update the 05880006 in TL.

No impact on TL.

08/08/2007 (Day of Year 220, Revolution 588)

IMCS HFA task problem: at 14:21z the HFA (History File Archive) task on IMCS-A stopped, causing no TM distribution to the FDS and the failing of update process for the next coming activities: the mapping after slew 05880057 was not transferred to the FDS in time before the update job for slew 05880058 was kicked off. The HFA task was restarted and the FD on call verified the reception of live TM on FDS.

A manual recovery was performed at 14:49z from attitude of PID 05880056 to the attitude of PID 05880058. The next slew 05880059 was manually updated in TL.

The following slews were missed in TL: 05880057(CSL)-58(CSL).

09/08/2007 (Day of Year 221, Revolution 588)

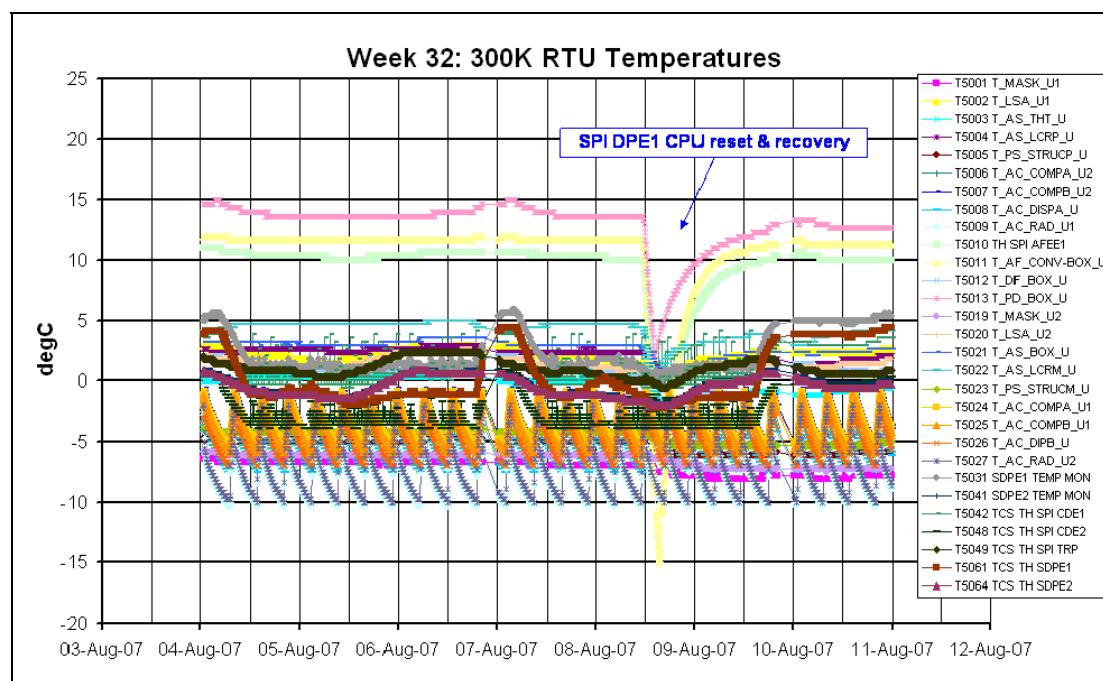
Nothing to report.

10/08/2007 (Day of Year 222, Revolution 588-589)

Nothing to report.

8.3.2 SPI Operations

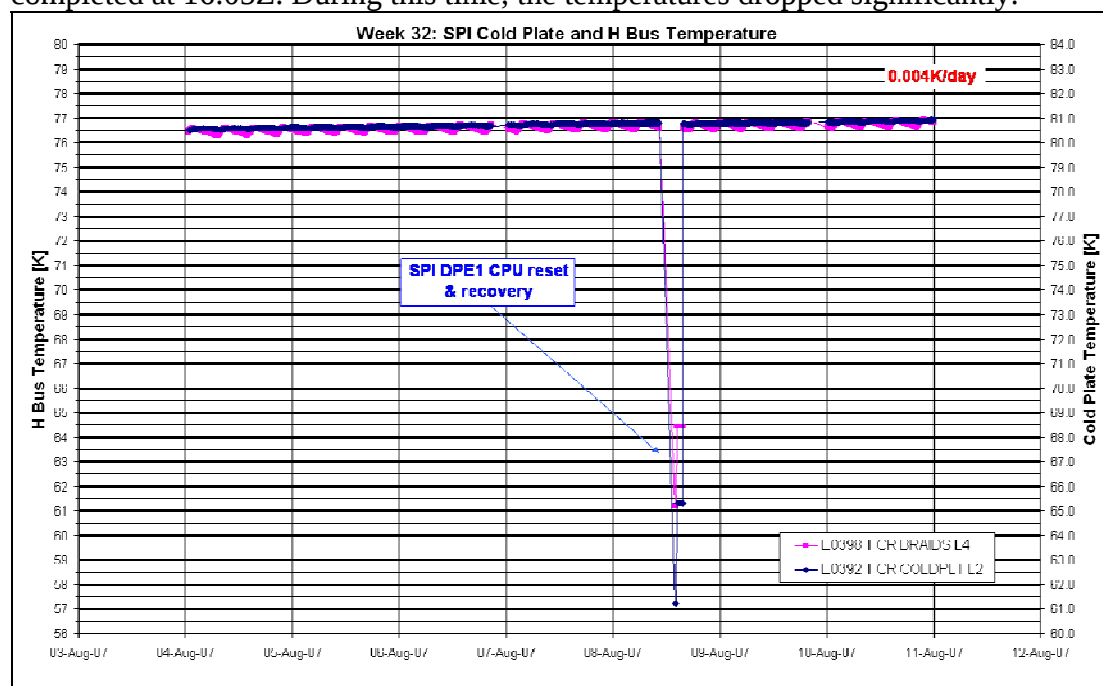
Unit Temperatures: All the equipment temperatures are inside the operational limits. The following plot shows their evolution during the reporting period.



Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K with a positive drift of 0.052K/day.

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

On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, the temperatures dropped significantly.

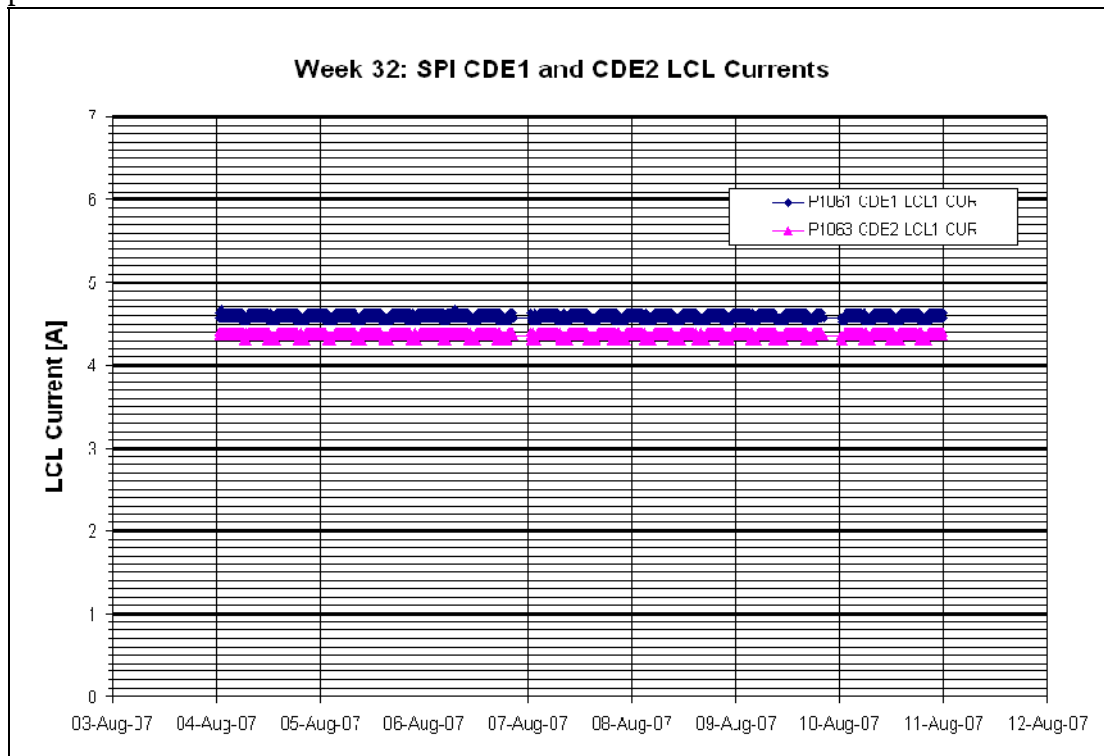


The stroke of all four compressors remained at 39 throughout the week. It was changed to 40 on 11/08/2007 (outside the observation period of this weekly report). The average CDE LCL currents over the week were:

- CDE1 LCL current = 4.59A

- CDE2 LCL current = 4.36A

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

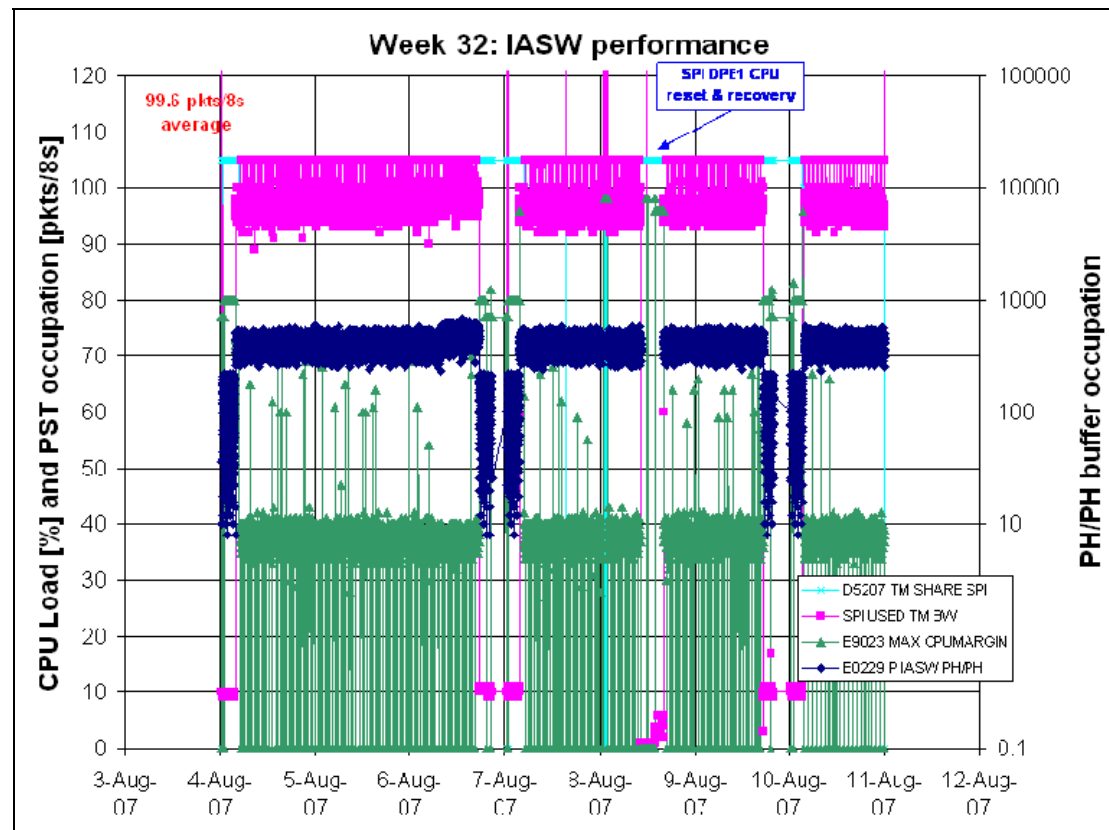


DPE & IASW: The DPE health and IASW performance is nominal. The IASW version installed is v433 patch #1 with the spectra scaling factor set to 9/19 SE. The average TM bandwidth occupation of SPI was 99.6 packets/cycle over the science window, when the TM allocation was 105 packets/cycle.

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

On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, the TM bandwidth was low, and other IASW performances were affected.

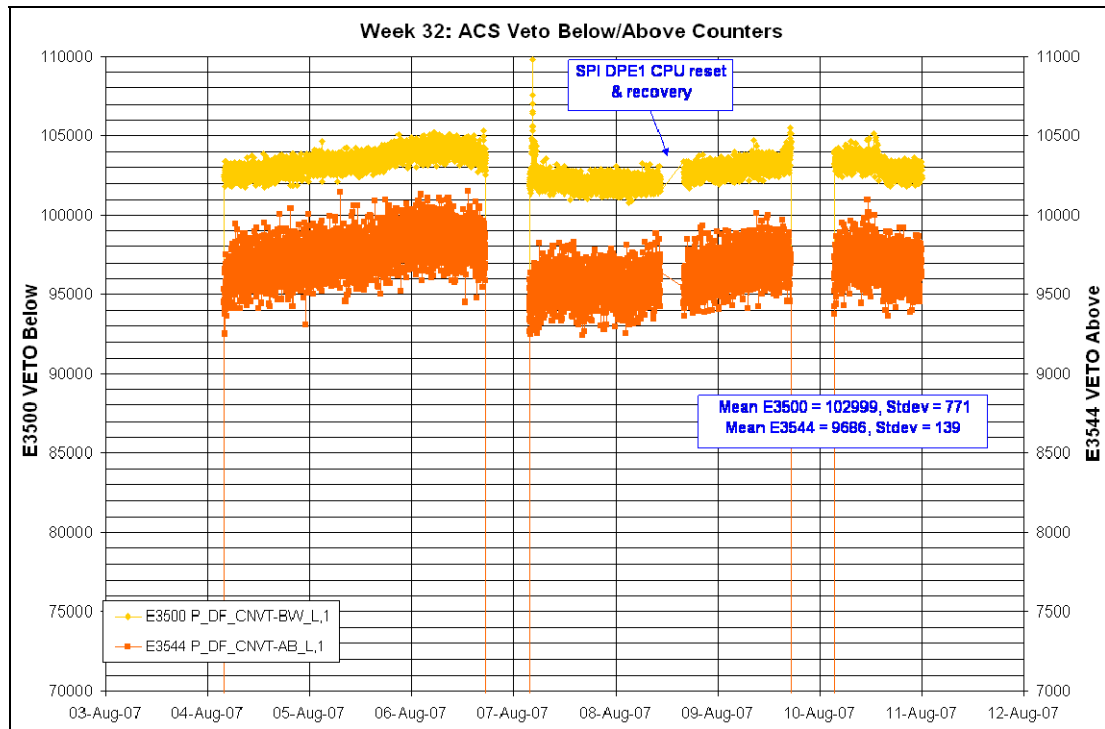
On 08/08/2007 between 00:58Z and 02:06Z, data should be disregarded because they were in fact issued during the DPE recovery but due to a time synchronisation problem, their corresponding packets were wrongly read by the IMCS.



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.

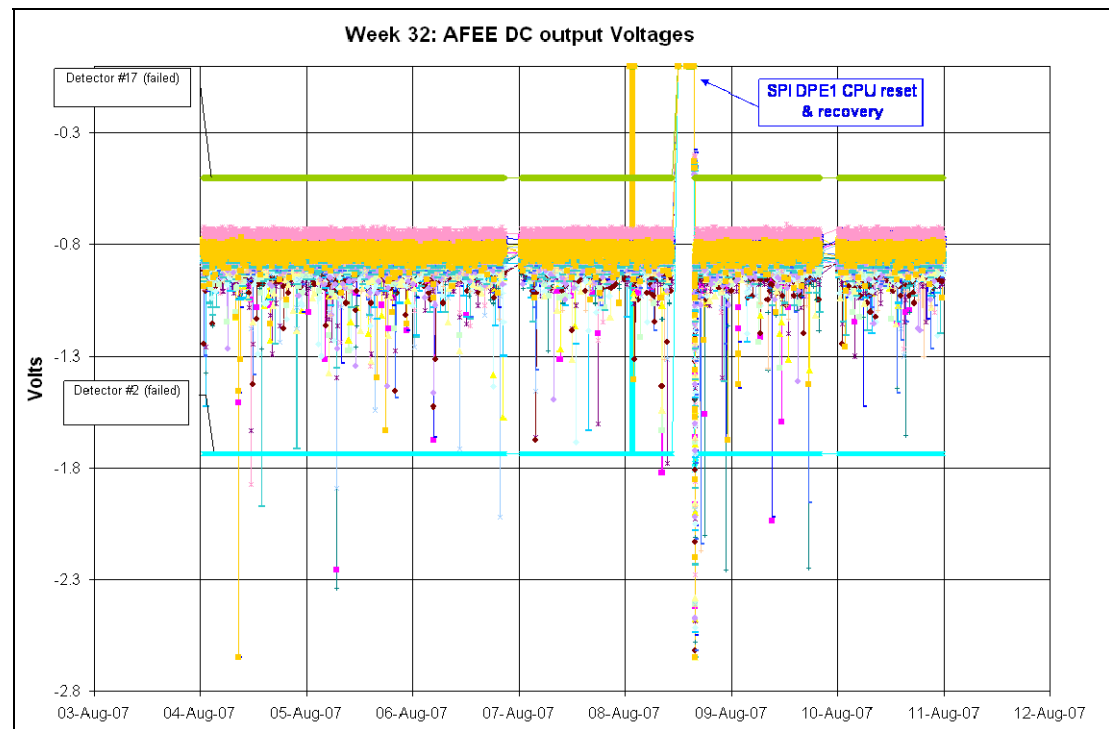
On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, no ACS counts were reported.



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).

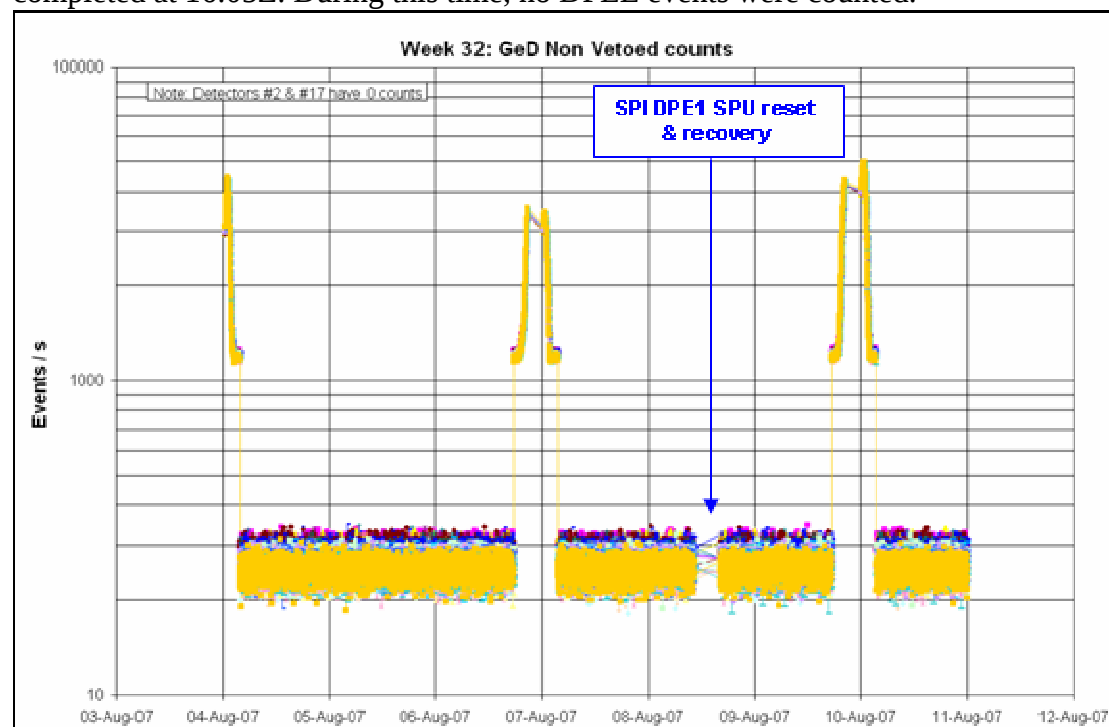
The following plot shows the DC voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06.12.2003 and detector #17 is failed since 17.07.2004.

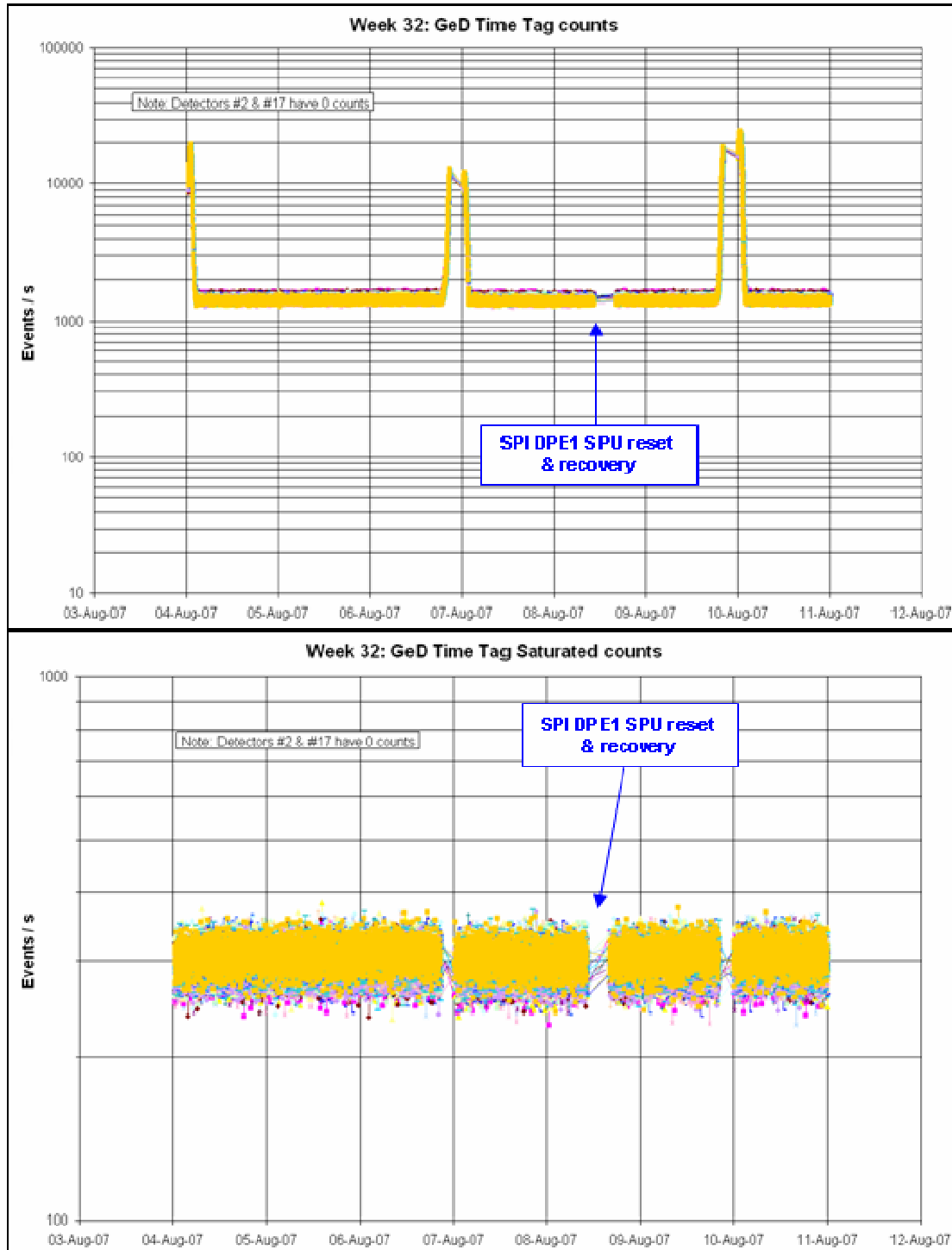
On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, the DC voltage of all detectors was 0. On 08/08/2007 between 00:58Z and 01:08Z, data should be disregarded because they were in fact issued during the DPE recovery but due to a time synchronisation problem, their corresponding packets were wrongly read by the IMCS.



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.

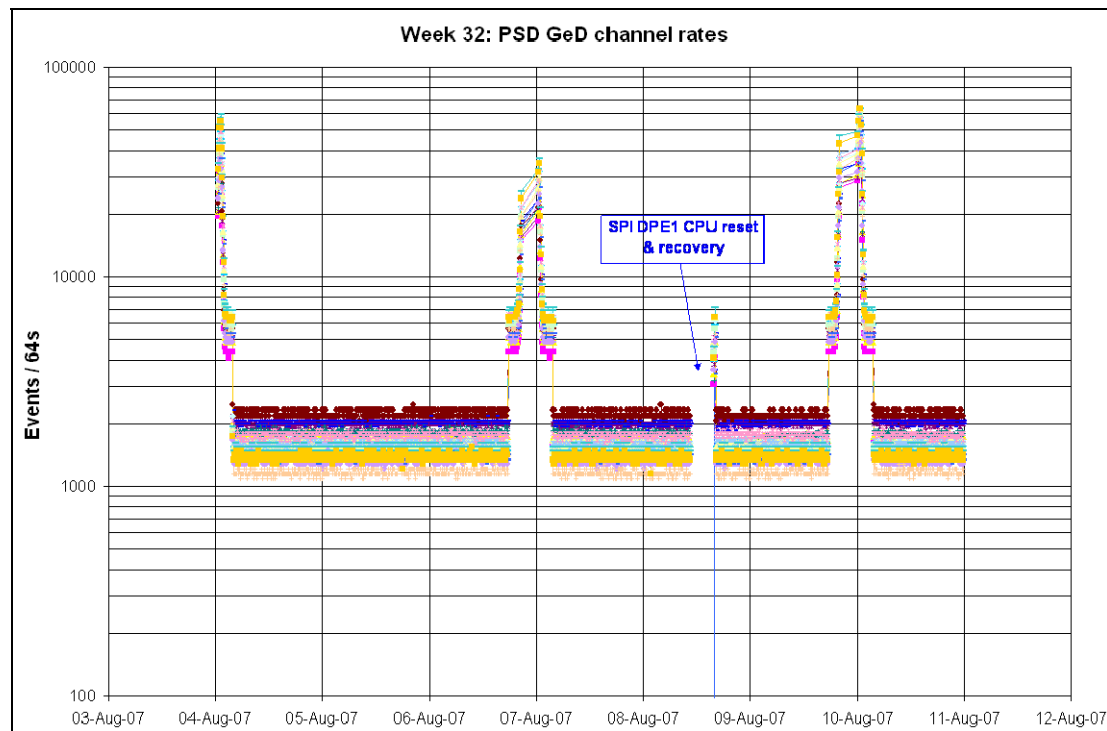
On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, no DFEE events were counted.





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

On 08/08/2007 at 10:32Z a SPI DPE1 CPU reset occurred. The recovery was completed at 16:05Z. During this time, no PSD rates were reported.



Event Log:

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

- On 2007-08-08, at 10:32Z, an anomaly occurred on the SPI DPE1 resulting in an autonomous CPU reset (recorded in Anomaly Report INT_SC-197).

At 10:32Z, the following OEM was received:

```
2007.220.10.32.20.431 2007.220.10.32.29.264 129 RealTime 82 EXCEPTION
EX OBIH TM ST11 WRONG RBI STATUS
FIX6 0
D0006 MESS CLASS NON-FATAL
D0008 MESS ID 82EX
FIX8 0
D0009 PT ADDRESS SPI1
D0077 RESET STATE RESET
D0078 WAIT STATE NOT
D0079 DMA BUSY DMA
D0080 RUNNING STATE NOT
D0081 PARITY ERROR NO
D0082 INV LITTON CODE VALID
FIX1 0
D0083 WRONG INTER WRONG
D0084 TM TRANS NO
D0085 ANOMALY IND NO
D0086 TC RECEIPT NOT
D0087 SW INDIC TBDBYACC/ICU
```

>> Indicating that the RBI protocol communication with the SPI DPE1 was correct but the DPE delivered an RBI status which was not correct with respect to the checks performed by the RBI S/W, in this case that the DPE had reset and is in NOT RUNNING state.

In the next TM cycle (at 2007-08-08T10:32:37Z) the following OEM was received:

```
2007.211.16.43.44.083 2007.220.10.32.37.347 1024 RealTime 0 EVENT
SPI1 CAUSE OF CPU RESET
E9072 CAUSE CPU RESET POWER
E9079 MESS CLASS 0
E9080 MESS ID 0
FIX16 0
FIX16 0
E9077 ICB ID IASW
```

Doc. Title : INTEGRAL Mission Report #255
 Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OAI
 Date : 13/08/07

Issue : 1
 Rev. : 0
 Page : 22

>> Indicating a SPI DPE1 CPU reset.

The following two OEMs were then received at 2007-08-08T10:33:41Z:

2007.211.16.44.48.208	2007.220.10.33.41.487	1024	RealTime	3	TC REJECT
SPI1 TC REP TC					
FIX6		0			
E9079	MESS CLASS	3			
E9080	MESS ID	3			
FIX8		0			
E9068	LSBIT APID	1			
FIX2		0			
E9069	TCP SS COUNT	8195			

>> Indicating a rejected/failed TC due to the sub-buffer being full.

2007.211.16.44.48.208	2007.220.10.33.41.480	1024	RealTime	4	ANOMALY
SPI1 CSSW INT ER BUF OVER					
FIX6		0			
E9079	MESS CLASS	2			
E9080	MESS ID	4			
E9074	TASK ID 16	24			
E9077	ICB ID	IASW			

>> Indicating a SDPE1 CSSW internal error - buffer overflow

These last two OEMs indicate the rejection of the Broadcast Packet onboard TC due to the CSSW TC buffer being full, the CSSW TC buffer having filled up due to the fact that TCs were not being processed by the DPE as a result of the reset. These OEMs continued to be received every TM cycle (8 seconds).

The IASW mode, TM parameter E0049 was INIT and the status TM from the subassemblies was invalid. In addition, the (calculated) generation time of the above APID 1024 OEMs (2007.211.16.43Z) corresponds to the time of the last OBT wraparound, i.e. the time field in the TM packets coming from the SDPE1 were set to zero, which is consistent with a DPE CPU reset.

After investigations, the recovery then started at 11:04Z and was completed at 16:05Z. More details can be found in the Anomaly Report INT_SC-197.

- Several occurrences of OEM APID 1024 ID 243 EXCEPTION SPI1 SPECTRA BUILDING NOT COMPLETED were reported:

2007.08.05 at 01:34Z, during Pointing 05870036,

2007.08.06 at 11:37Z, during Pointing 05870092,

2007.08.06 at 15:00Z, during Pointing 05870098,

2007.08.08 at 16:56Z, during Pointing 05880052,

2007.08.09 at 08:24Z, during Pointing 05880086,

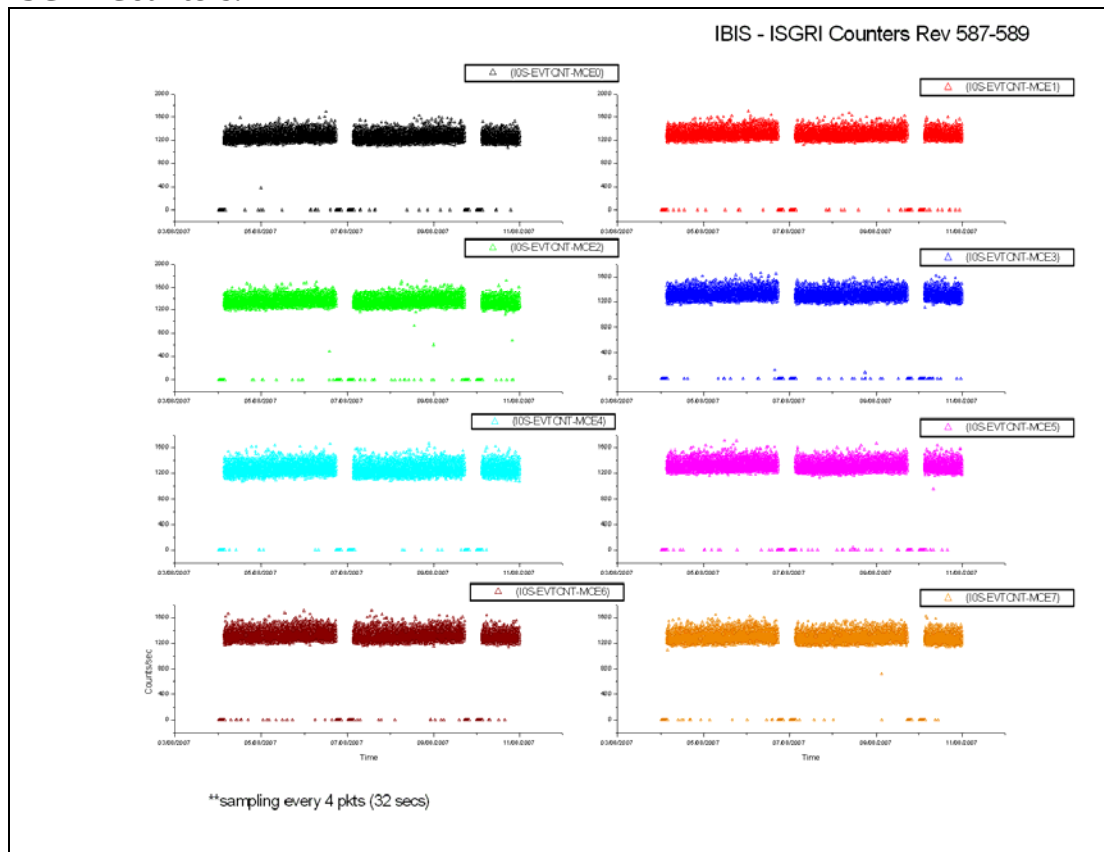
As every time, it was a single occurrence, no action was taken.

- On 2007-08-09 at 19:49Z the TM parameter E3826 PSD -5V ANALOG was reported OOL Low. It went back at the next TM cycle, therefore no action was taken.
- On 2007-08-10 at 22:54Z the TM parameter E0392, Cold plate operating temp#2 (operational mode), started toggling OOL High. At 13:38Z the next day (11/08/2007) the compressor stroke was increased from 39 to 40.

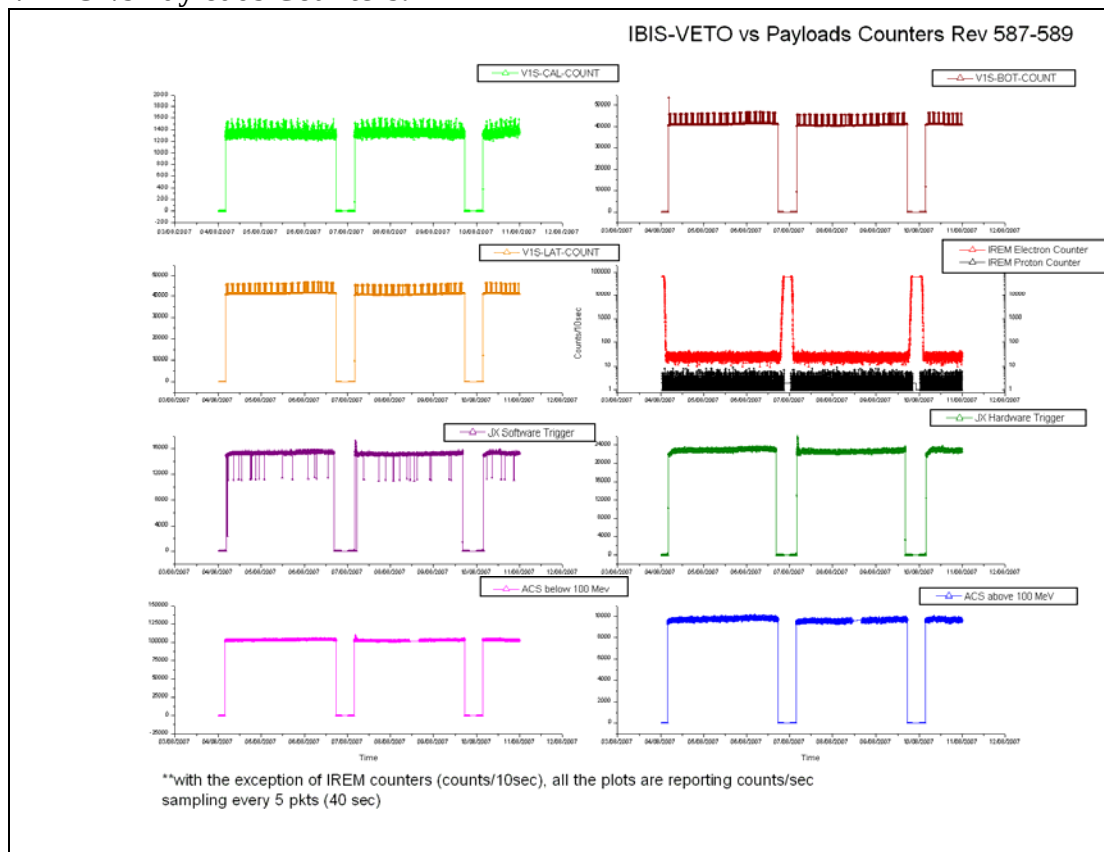
8.3.3 IBIS Operations

IBIS Event Counters Plots

ISGRI Counters:

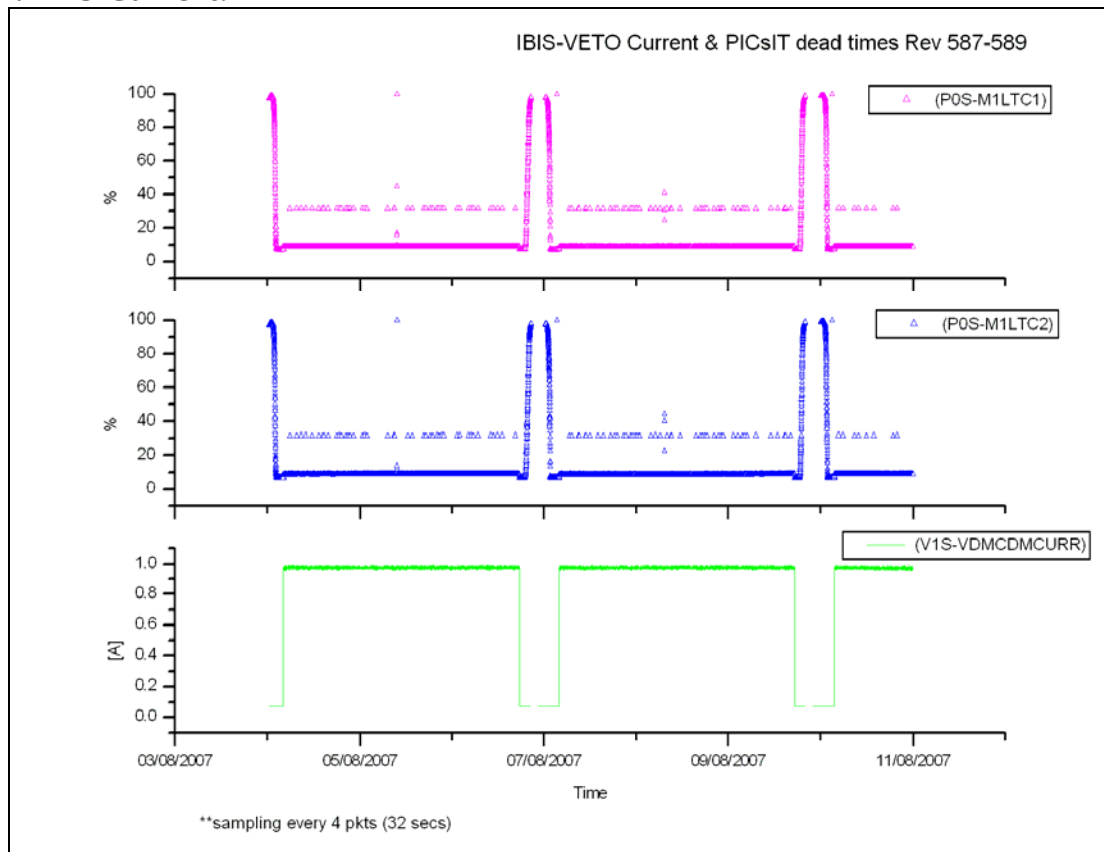


VETO vs Payloads Counters:

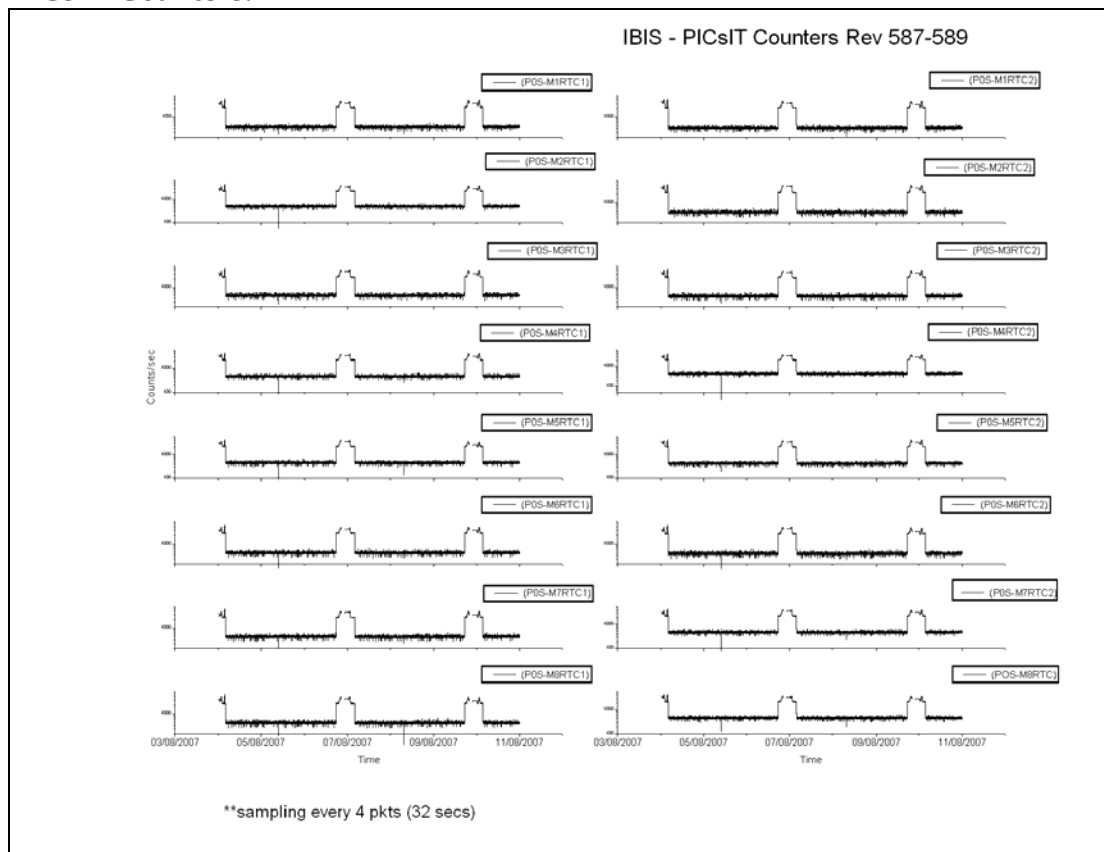


The week was characterised by low radiation as reported by the payload.

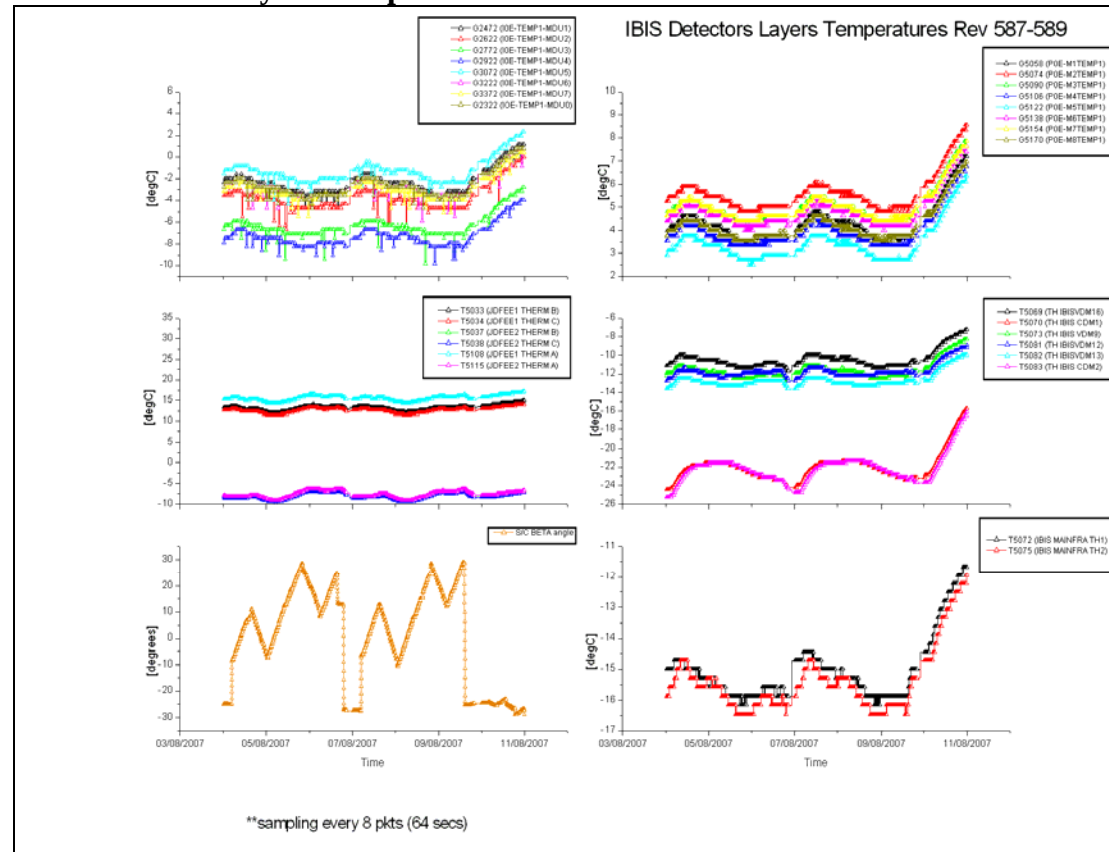
VETO Current:



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 (IOE-OVFWPXADD-Mi) were reported at Radiation Belts passage.

DoY 2007.216 (04/08/2007):

At 02:12Z, TM parameter G5079 (P0E-M2ASICLINE) was reported OOL High and back. According to P-VLT-2, no action was required.

DoY 2007.217 (05/08/2007):

At 09:38Z, TM parameters from families G5068 and G5072 (P0S-MiF1 & 2ERRF) failed SCC with the value TRUE. About 1 minute later, TM parameters from families G5002 and G5003 (P0S-MiRTC1 & 2) were reported OOL Low-low with the value 0. This usually leads to an HEPI resynchronisation but this time the unit fixed the problem itself and no further action was required.

DoY 2007.220 (08/08/2007):

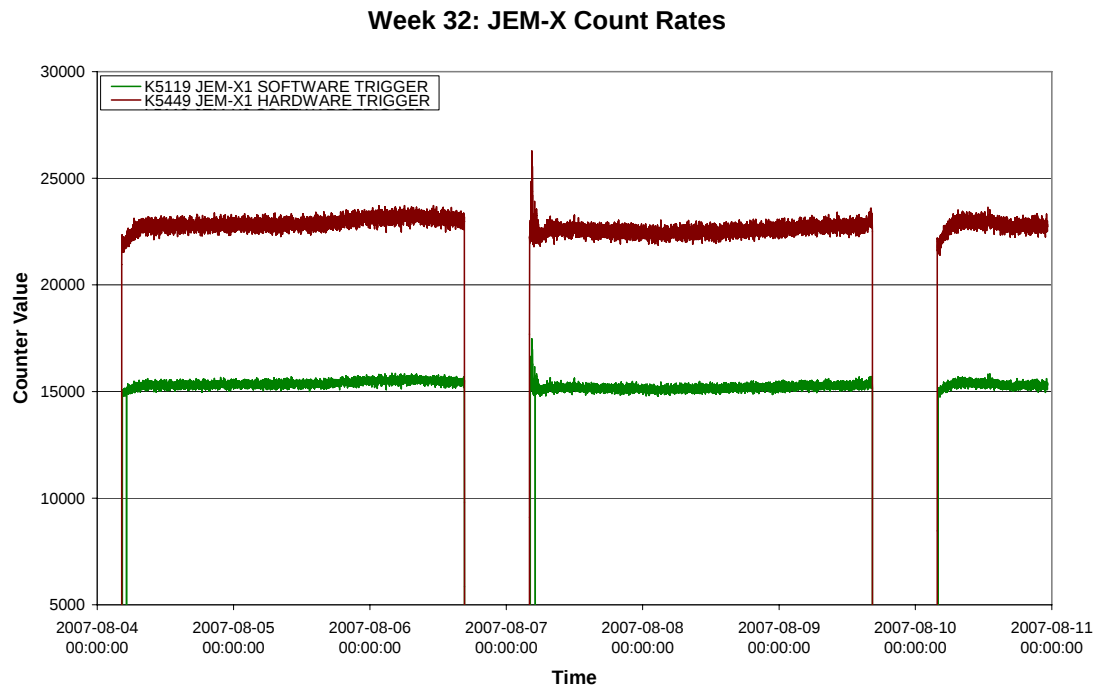
At 07:24Z, TM parameters from families G5068 and G5072 (P0S-MiF1 & 2ERRF) failed SCC with the value TRUE. About 1 minute later, TM parameters from families G5002 and G5003 (P0S-MiRTC1 & 2) were reported OOL Low-low with the value 0.

This usually leads to an HEPI resynchronisation but this time the unit fixed the problem itself and no further action was required.

8.3.4 JEM-X Operations

JEM-X Count Rates

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



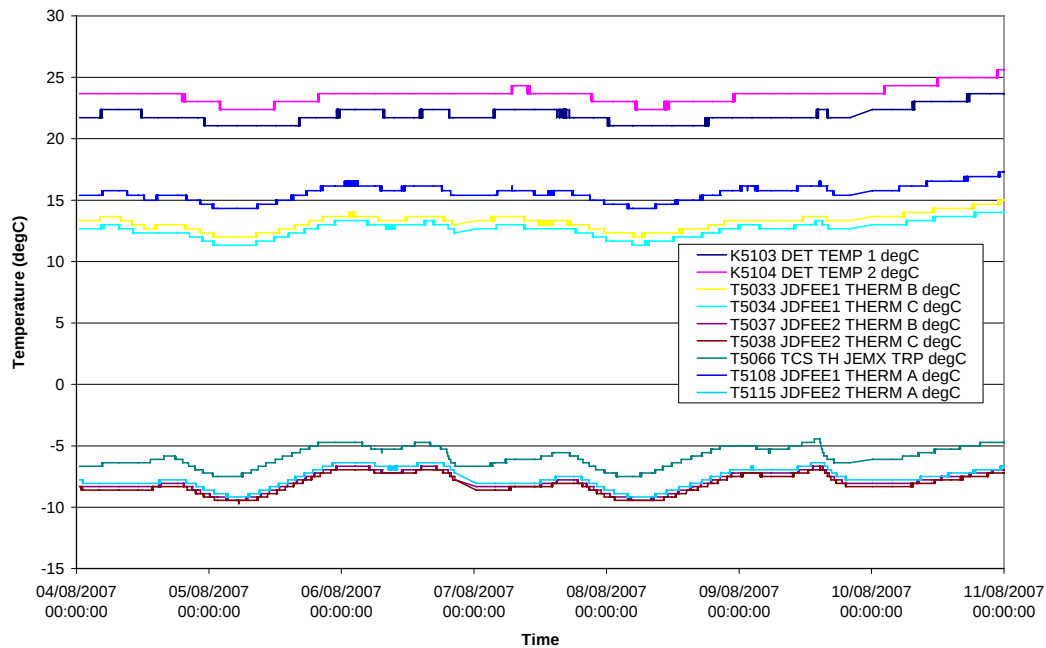
JEM-X Temperatures

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.

² Data sampled (1 frame in 8)

Week 32: JEMX Detector and DFEE Temperatures



JEM-X Daily Report

2007-08-04 (DOY 216, Rev 587) to 2007-08-10 (DOY 222, Rev 589)

JEM-X1 operations executed nominally.

8.3.5 OMC Operations

2007-08-04 (DoY 216, Rev 587)

Nothing to report.

2007-08-05 (DoY 217, Rev 587)

At 20:08, OMC pointing commands failed release due to the Static PTV. These were then sent manually at 20:09. There was no impact.

2007-08-06 (DoY 218, Rev 587) to 2007-08-07 (DoY 219, Rev 588)

Nothing to report.

2007-08-08 (DoY 220, Rev 588)

At 14:21, imcs problems caused a suspension of the Timeline. The imcs was recovered at 14:39, and a recovery then performed. The Timeline was rejoined at 15:19. The impact was the loss of pointings 05880057 & 05880058. It was at this time the following OEMs were received:

```
2007.220.14.58.37.218 2007.220.14.58.45.419 1792 RealTime 131 TC REJECT
REJECTED TC1 0 0 65535 PR N
E E
```

Doc. Title	: INTEGRAL Mission Report #255	Issue	: 1
Doc. Ref.	: INT-MOC-SYS-RP-1001-OPS-OAI	Rev.	: 0
Date	: 13/08/07	Page	: 28

2007.220.14.58.43.218	2007.220.14.58.53.381	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 the latter pointing.

2007-08-09 (DoY 221, Rev 588) to 2007-08-10 (DoY 222, Rev 589)

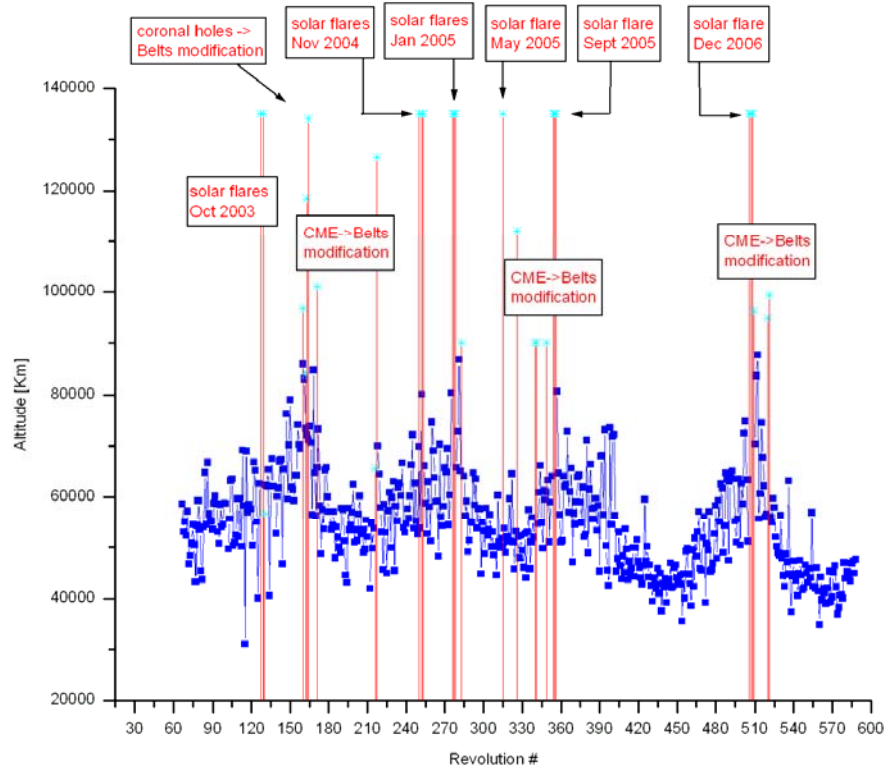
Nothing to report.

On DoY 218 at 17:33:15, and DoY 221 at 17:20:03 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

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]
587	RAD_EXIT R 2007-08-04T03:57:37Z	4/8/2007 02:37:54	>>29815	04-Aug-2007 02:44:08	42729
587	RAD_ENTR R 2007-08-06T17:33:12Z	6/8/2007 18:52:34	44973	06-Aug-2007 18:54:54	44583
588	RAD_EXIT R 2007-08-07T03:43:14Z	7/8/2007 01:47:14	>>29813	07-Aug-2007 02:34:54	43218
588	RAD_ENTR R 2007-08-09T17:19:55Z	9/8/2007 18:16:34	47627	09-Aug-2007 18:34:54	45571
589	RAD_EXIT R 2007-08-10T03:29:24Z	10/8/2007 01:59:38	>>29819	10-Aug-2007 02:24:54	43572

Reference

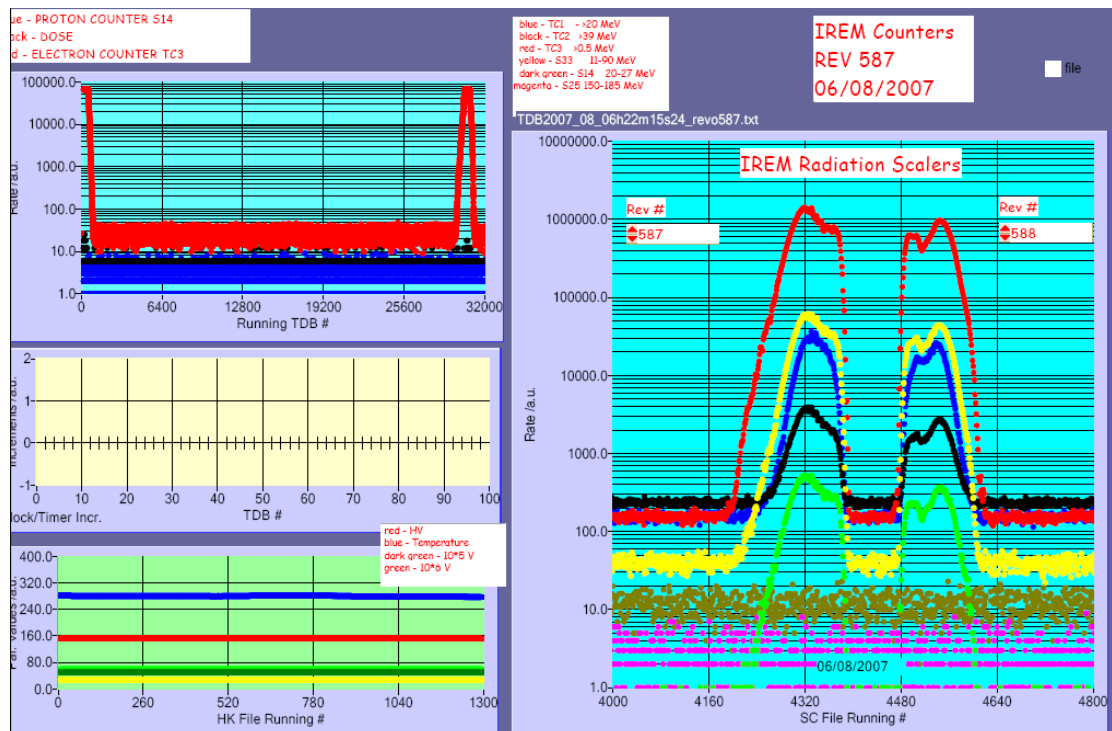
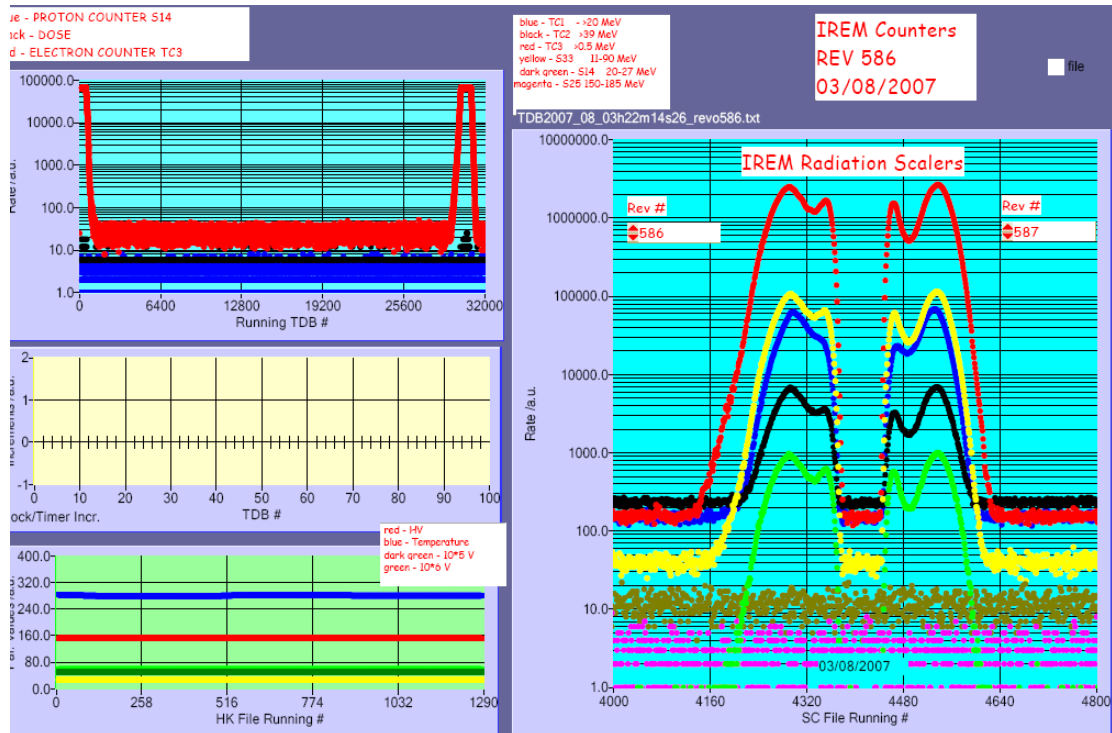
High radiation

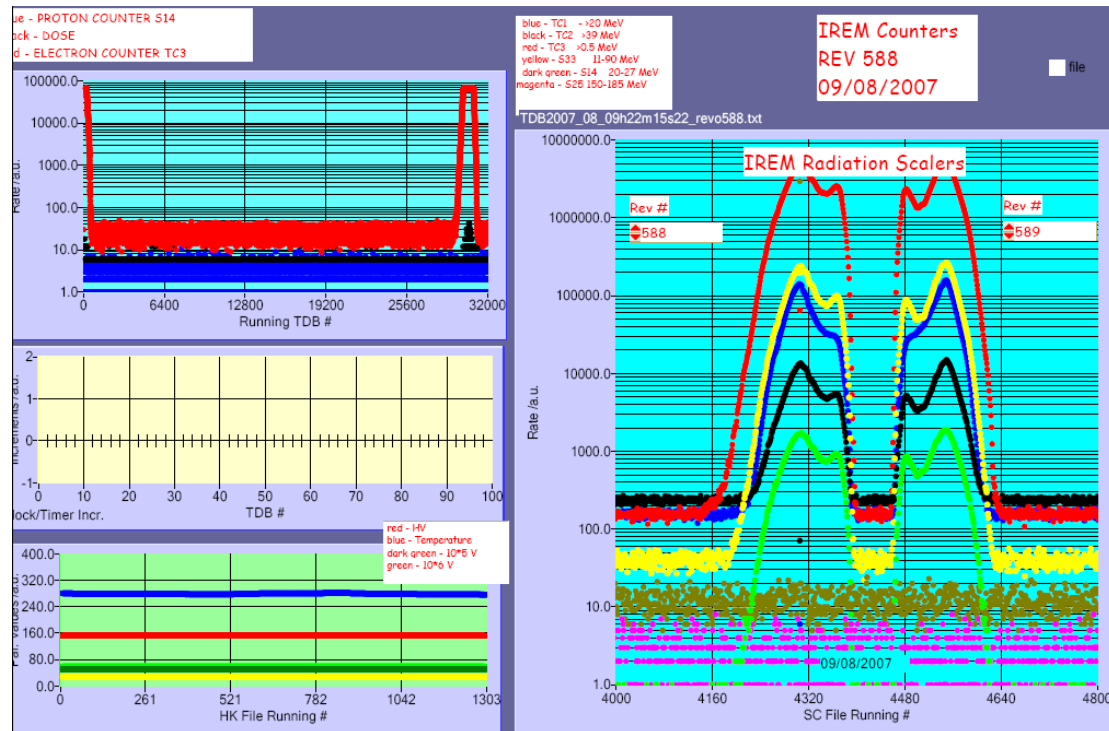
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

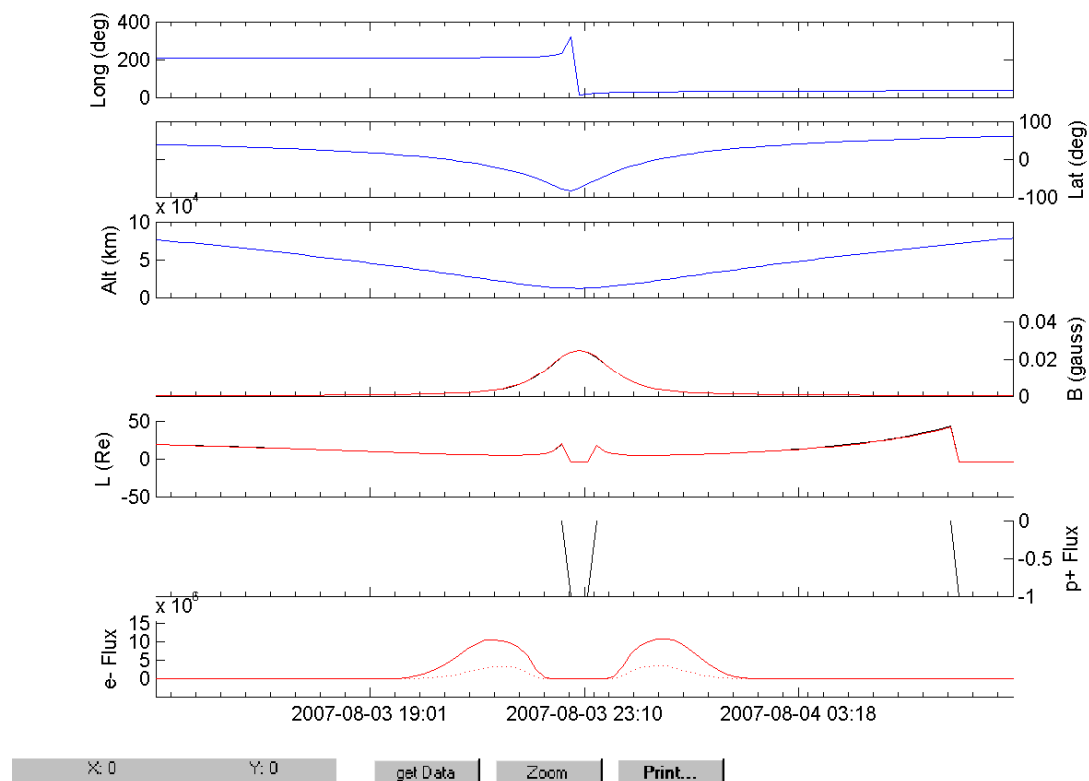
IREM radiation counters:



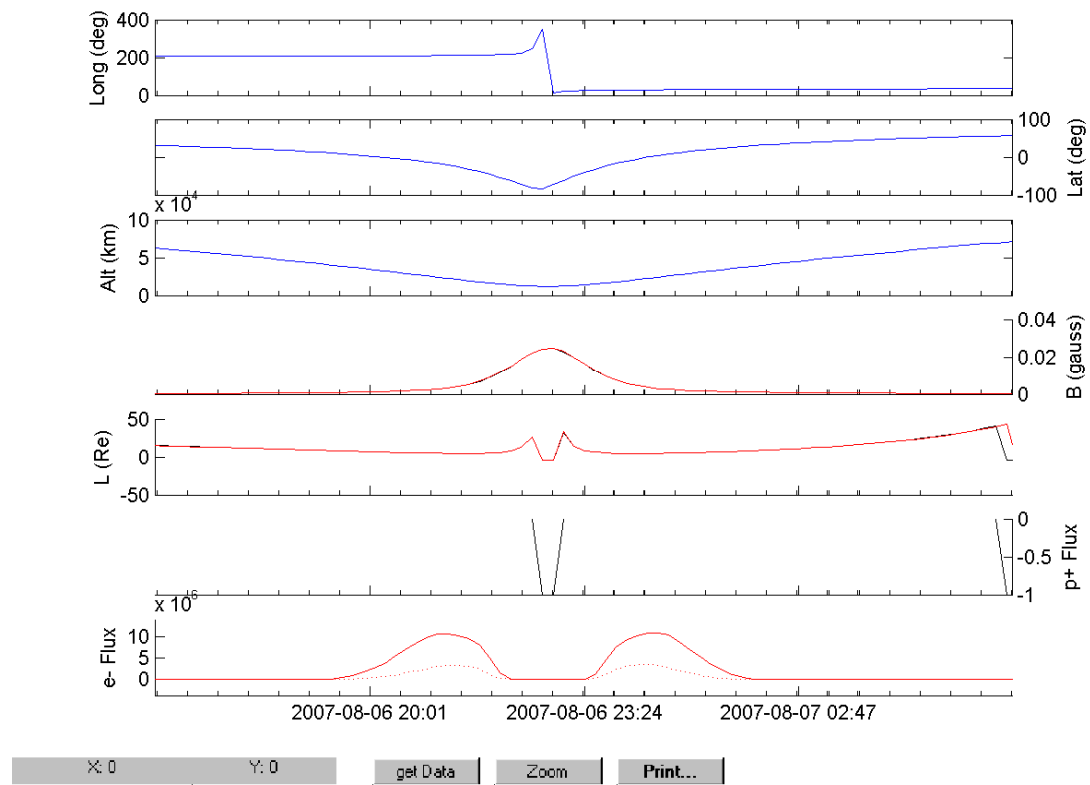


IREM Predicted Radiation Belt Passages

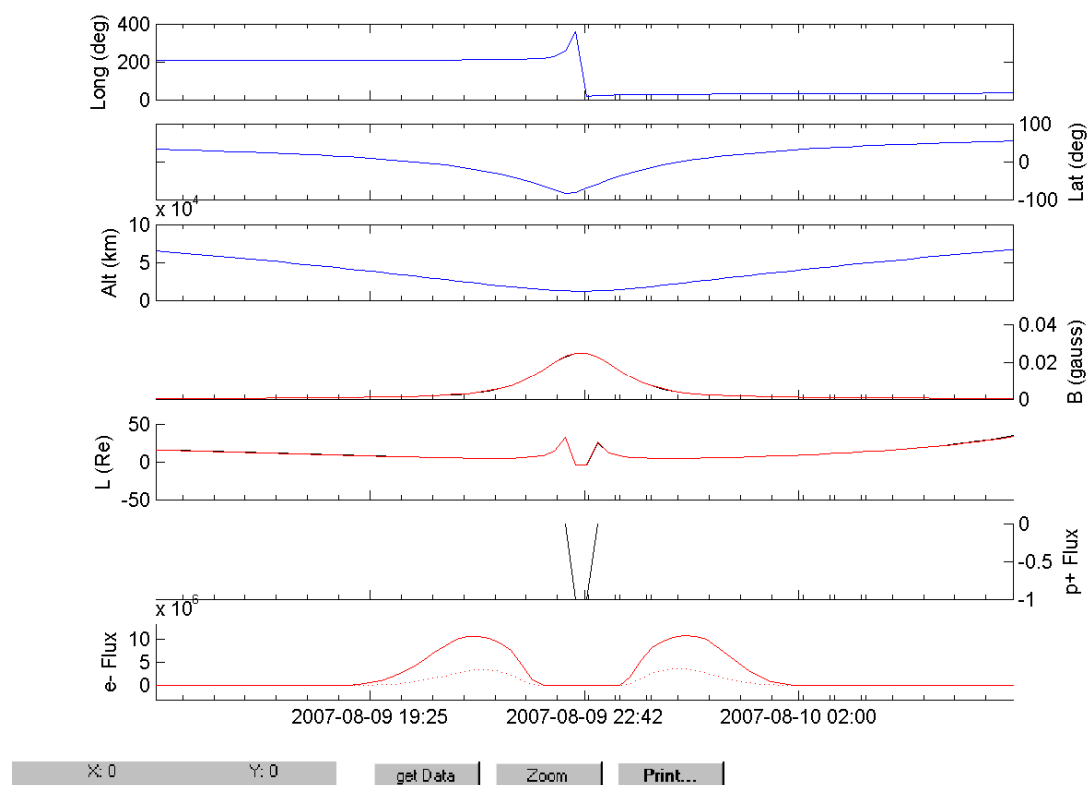
Rev 586



Rev 587

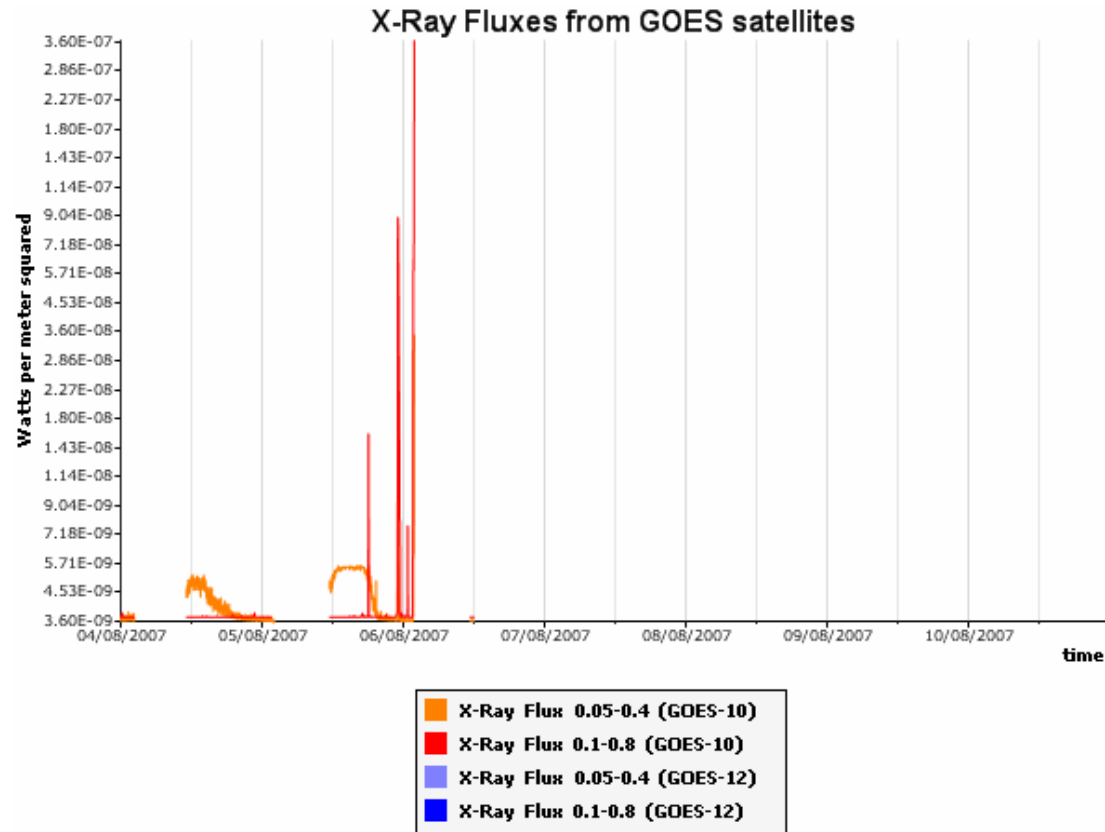


Rev 588

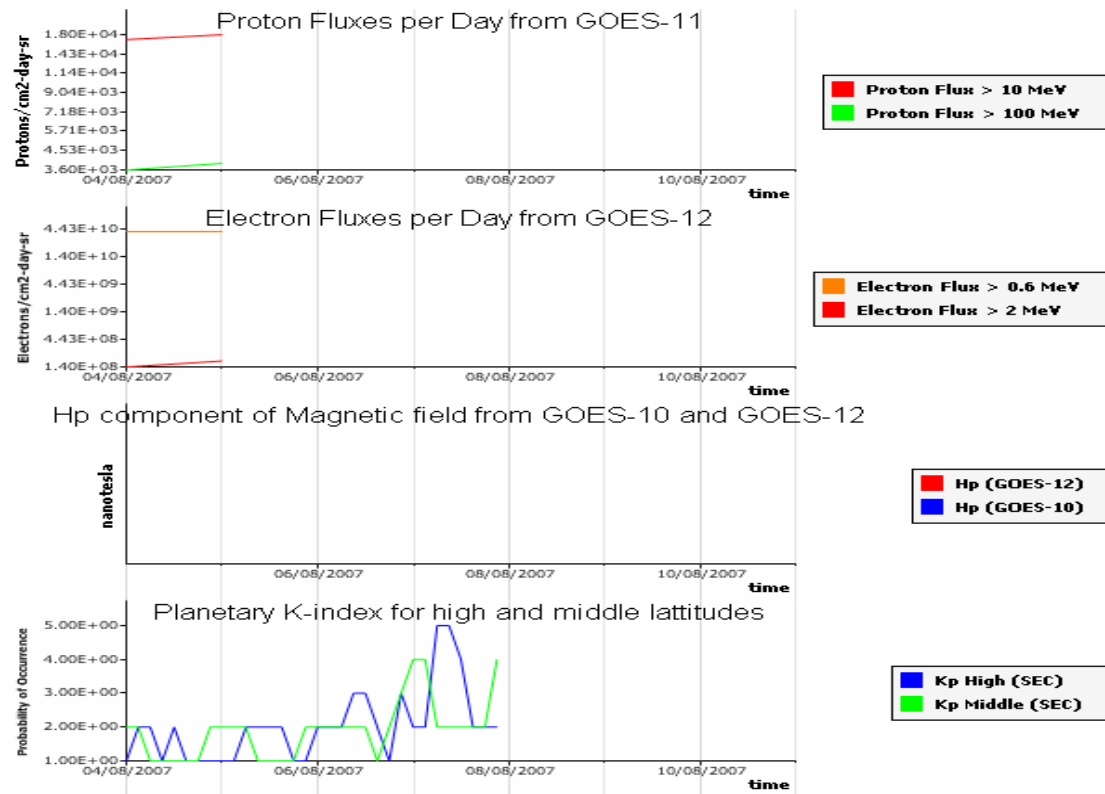


SEC-GOES Observed Particles Fluxes (using SEIS/RAT tool):

The plots are incomplete due to problems on the I/F SEIS-MCS during the observation period.



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.
 Kp index is based on ground magnetometers. Kp ≥ 5 features storm-level geomagnetic activity.