

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 274
Week 51
24.12.07
Routine Phase

Prepared by: M.J.H. Walker (OPS-OAI) and INTEGRAL FCT

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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 15.12.07 until 21.12.07 (both dates inclusive) and covers the revolutions 632 and 633.

2 Summary of Activities

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

The targets of these revolutions consisted of a raster dither of the Cygnus Region (RA 20:35:53.00, DEC +40:39:49.0), and a raster dither of 3C 273 (RA 12:29:06.70, DEC +02:03:08.6).

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

1 slew was missed from TL, during the observation period, due to a problem at REDU station.

An update of the RCS-A Thruster Torque Reciprocals, PWM look-up table, AMD Thruster On-Times, S/C Inertia and TIMs thresholds was performed at the end of rev 631.

The fuel consumption over the period between 14/12/2007 and 20/12/2007 was 0.1030 Kg. The remaining propellant is in the order of 143.2274 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.

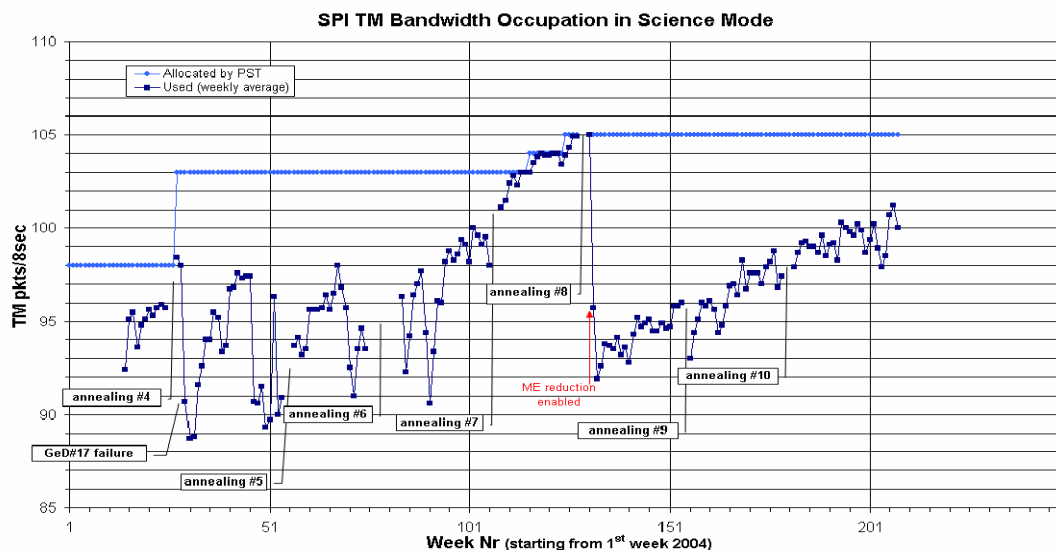
The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K.

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, except:

- on 2007-12-17 from 10:44Z to 18:08Z, when tests of an over-allocated PST were performed and
- from 2007-12-18 at 07:19Z for the rest of the reporting period, when an over-allocated PST with 108 packets/cycle to SPI was used.

The average telemetry occupation in the science observation windows was 100 packets/cycle.

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



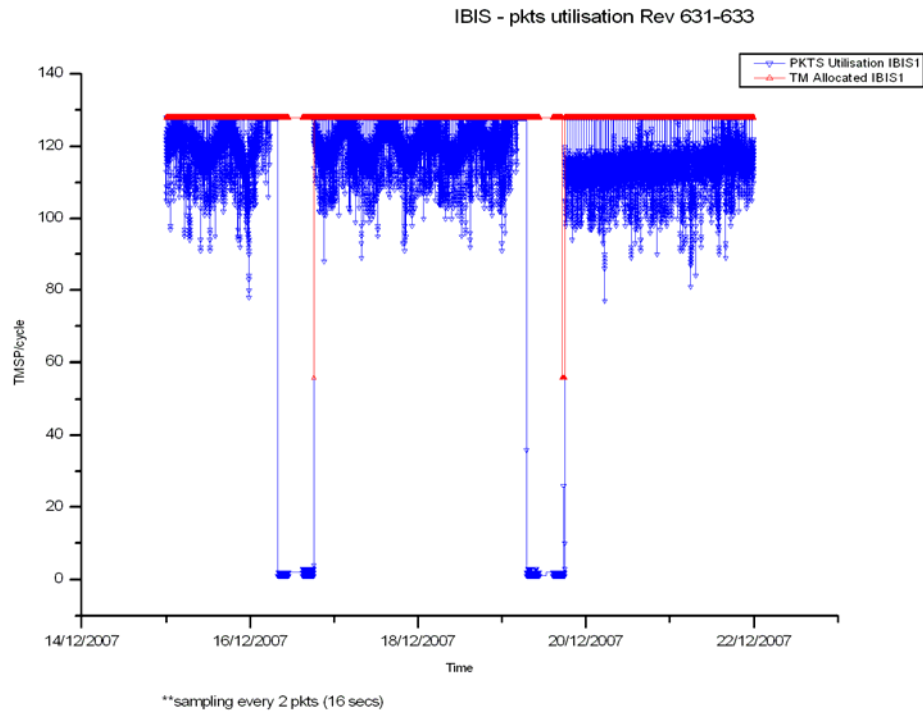
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

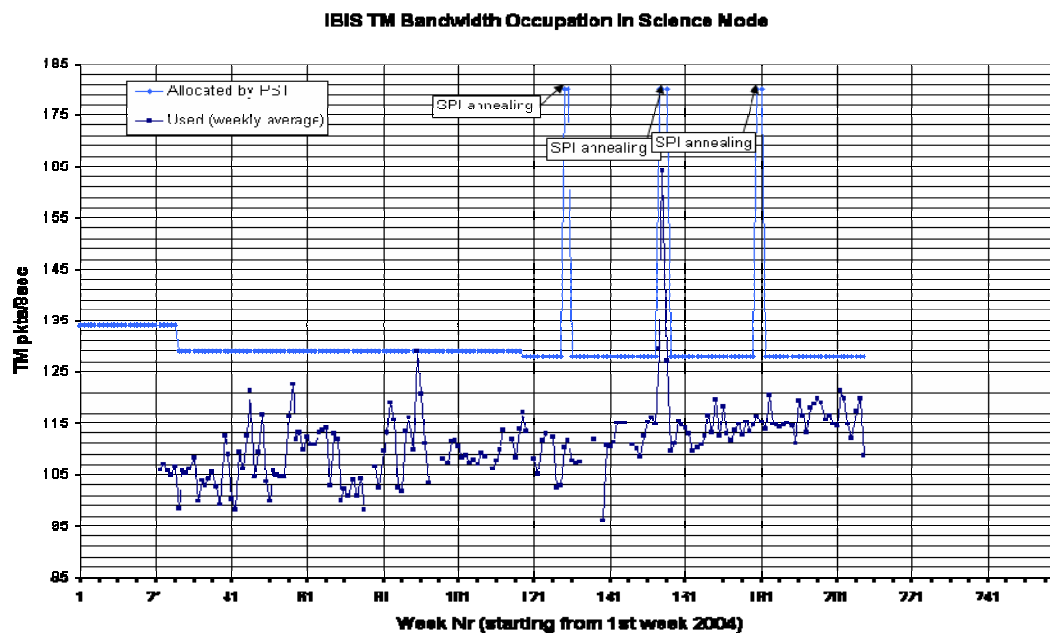
The overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 128 packets/cycle. The IBIS mean bandwidth utilisation during the observation period (when IBIS was in Science mode) was 108.69 packets/cycle, down 11.33 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, 219 of the 220 planned science pointings for OMC were executed nominally, 1 was lost.

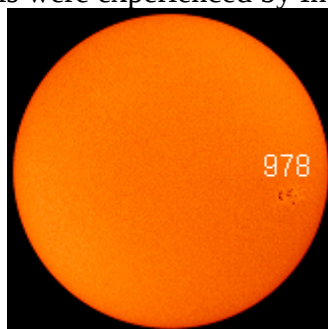
Note: Some more information concerning the OMC operations is provided in the Appendix.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity. Sun spot number 978 (a planet-sized object) began the week breaking up. By the 19th, it had rotated out of view. Only low radiation levels were experienced by Integral.



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 excellent this week. One pointing was 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 excellent this week. The only problem reported concerned the voice loop temporarily not working. 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, 4 occasions of TM drops from Redu, one of which led to the loss of a pointing, and one incidence where the link with ISDC dropped. The overall performance was well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

New PSFs have been received for revolutions 642-644. The PSF for revolution 641 was changed again to accommodate for the removed VILSPA coverage.

Revolutions have been planned up to revolution 643. Revolution 641 was redone again because of the new PSF.

Targets with no specific need for SPI have been planned in 641-643, i.e., during SPI annealing. SPI annealing will continue into 646.

The TSFs for revolution 637-640 have been received.

2. Observation status

New ECSs have been received and processed for Revolutions 619-620.

3. ISOC Science Data Archive

ISDA 2.7.1 has been installed. This minor release includes a new version (v1.2) of the INVITE tool with various new functionalities, e.g. image browsing and OMC VO access has been released.

4. ISOC system

ISOC system 17.0 was released on Wednesday, December 19. It includes a new DBOB and IODB files installation.

5. Problems

The re-plan of Revolution 641, in order to take into account SPI annealing targets and to accommodate for the removed VILSPA coverage, led to a large slew from the perigee passage to the first scientific attitude of the revolution, which MOC could not initially accommodate. The problem was fixed internally by MOC by changing manually the perigee passage attitude affecting Revolutions 640/641; no action from ISOC was needed.

4.3.2 ISDC

Status of ISDC observation processing on 24/12/2007:

- Latest Standard Analysis completed: observation 05200180004 (Gamma Ray Source 1915+105, Revolution 619) on 21/12/2007.
- Latest products archived: observation 05200180004 (Gamma Ray Source 1915+105, Revolution 619) on 21/12/2007.
- Latest observation products sent to the observer: observation 05200260001 (mid-latitude 1 region, Revolution 616-617) on 10/12/2007.

5 Special Events

6 Anomalies

The following problem was reported that impacted operations:

- On DoY 355, at 21:05, a TM drop from Redu forced the suspension of the Timeline. A recovery was performed, and the Timeline rejoined at 21:57. The impact was the loss of pointing 06330066.

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

7 Future Milestones

The following activities are foreseen in the next few weeks.

- A SPI annealing activity is foreseen to be performed during revolution 641..

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 632

The observations in revolution 632 consisted entirely of a raster dither of Cygnus Region (RA 20:35:53.00, DEC +40:39:49.0), lasting ~56.1 hours.

Revolution 633

The observations in revolution 633 consisted entirely of a raster dither of 3C 273 (RA 12:29:06.70, DEC +02:03:08.6), lasting ~56.3 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

2007-12-01T16:37:29.000Z	143.5174	F	Automatic TM processing.
2007-12-03T02:26:05.000Z	143.5051	F	Automatic TM processing.
2007-12-05T08:28:03.000Z	143.4804	F	Automatic TM processing.
2007-12-05T13:00:00.000Z	143.4593	F	After thruster torque calibration
2007-12-05T13:33:07.000Z	143.4298	F	Automatic TM processing.
2007-12-07T16:09:13.000Z	143.4135	F	Automatic TM processing.
2007-12-09T01:42:28.000Z	143.3920	F	Automatic TM processing.
2007-12-10T15:57:53.000Z	143.3795	F	Automatic TM processing.
2007-12-11T04:05:14.000Z	143.3505	F	Automatic TM processing.
2007-12-13T15:47:29.000Z	143.3304	F	Automatic TM processing.
2007-12-15T01:20:13.000Z	143.3054	F	Automatic TM processing.
2007-12-16T15:35:53.000Z	143.3004	F	Automatic TM processing.
2007-12-18T01:12:12.000Z	143.2567	F	Automatic TM processing.
2007-12-19T15:22:57.000Z	143.2454	F	Automatic TM processing.
2007-12-21T01:11:56.000Z	143.2274	F	Automatic TM processing.

This report was generated Fri Dec 21 08:00:20 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, 15/12/2007 – 21/12/2007

The AOCS operations were executed from the Automatic Timeline.

During this period, 61 Open Loop Slews, 161 Closed Loop Slews and 5 Momentum Biases were executed.

1 slew (CSL) was missed from TL, during the observation period, due to a problem with the TM links on REDU station.

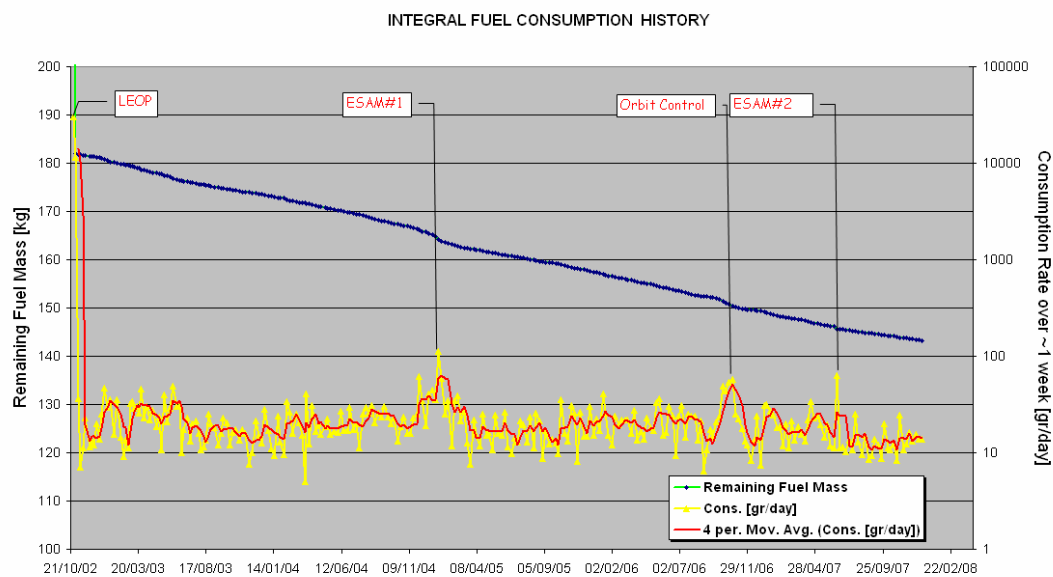
This is equivalent to $\sim 0.4\%$ of the total number of slews planned (222).

Orbit Control

No update.

Fuel consumption

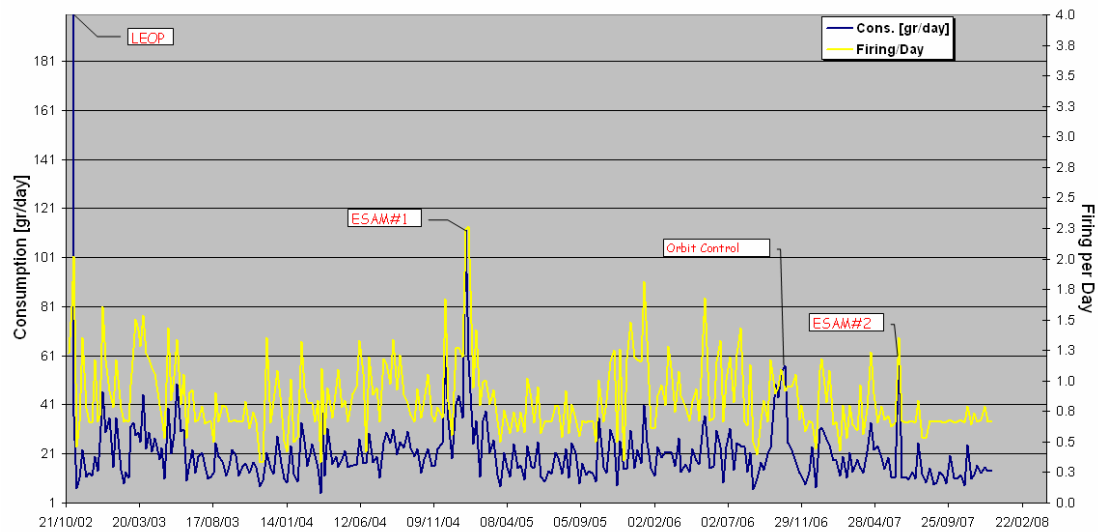
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 21/12/2007 is reported in the plot below.



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

The firing per day over the period between 01/11/2002 and 21/12/2007 is reported in the plot below.

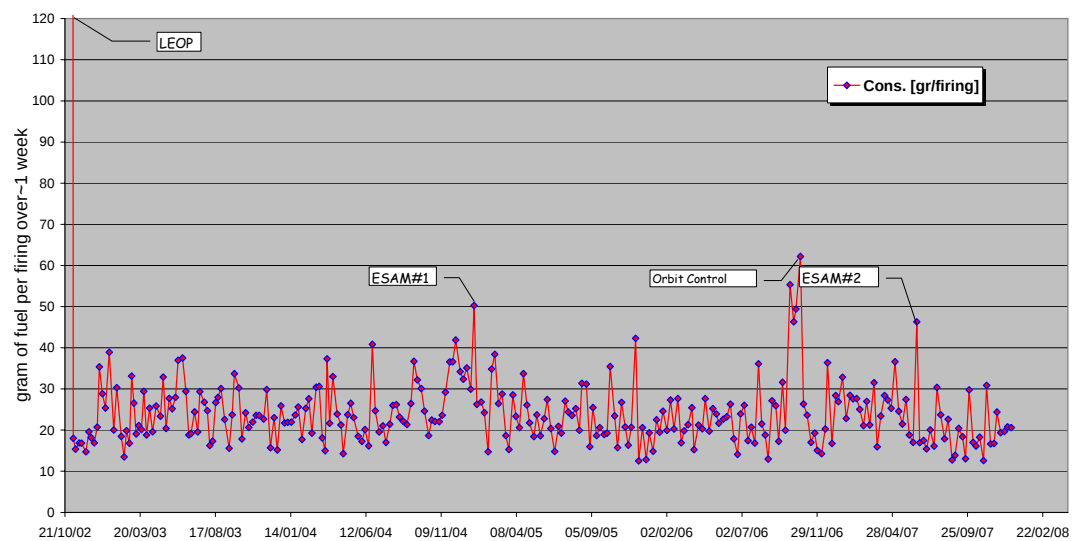
INTEGRAL FIRING PER DAY HISTORY



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

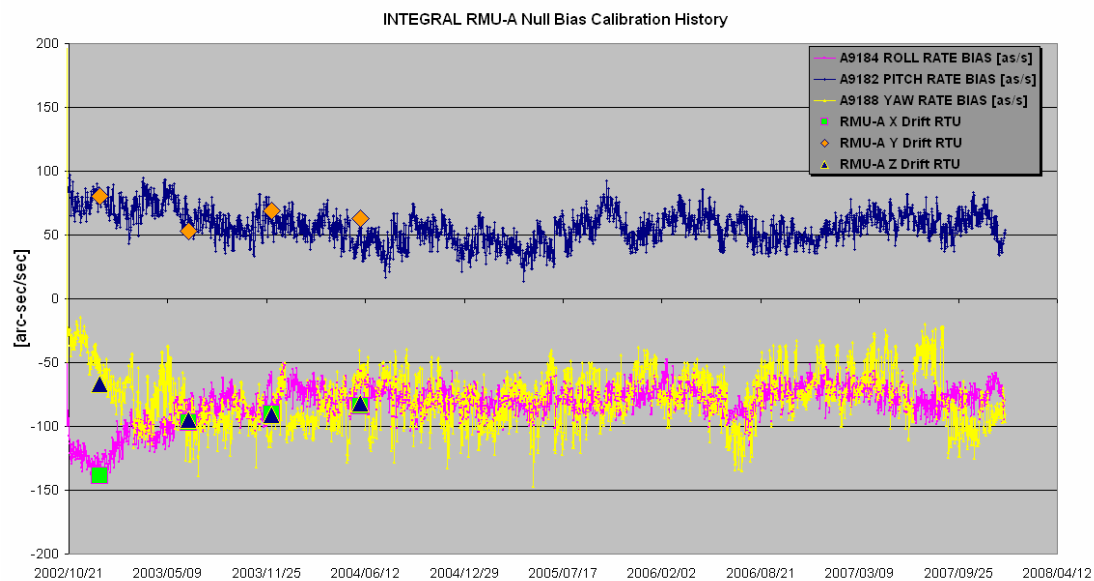
The fuel per firing over the period between 01/11/2002 and 21/12/2007 is reported in the plot below.

INTEGRAL FUEL MASS PER FIRING HISTORY



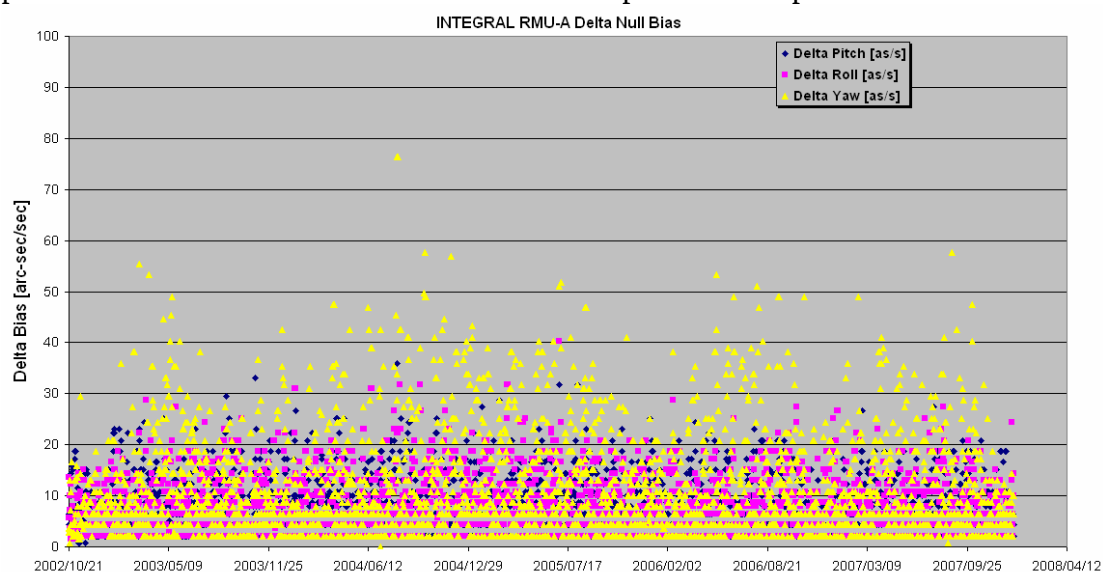
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 28/12/2007 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 28/12/2007 is reported in the plot below.



15/12/2007 (Day of Year 349, Revolution 631)

Update of RCS-A Thruster Torque Reciprocals, TIM Thresholds, S/C Inertia and AMD On Times: An update was performed at the end of rev 631, based on the results of the RCS-A Thruster Calibration (executed on 05/12/2007) and the estimations of the thrust level and remaining fuel mass. The new values for AMD On-Times, Thrusters torques reciprocals and S/C Inertia are consistent with the past values.

The PWM look up table (ESA mode gain) did not change wrt the past value.

THRUSTER-ON TIME

Doc. Title : INTEGRAL Mission Report #274
Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OAI
Date : 24/12/07

Issue : 1
Rev. : 0
Page : 13

Average Force Mag: 9.439 [N]
Fuel content: 143.379 [kg]
Tank pressure: 6.674 [bar]

Thruster on-time: 1.3/9.439 = 0.1377266 s

Rounded down by 0.244ms LSB: 564 (raw) = 0.137616 s

THRUSTERS IMPULSE MONITORS

Were updated only TTIM, YTIM wrt the last thrusters re-scaling exercise.

RTIM: 6.625s [53] raw

PTIM: 2.250s [18] raw

YTIM: 34.750s [1112] raw

TTIM: 432.0 [27] raw

RCS-A THRUSTERS TORQUES RECIPROCAL

AERCA_00 S

M F 4

2007-12-13T13:22:00Z

2007-12-13T13:22:00Z

A

TORQ_X_A R 0.2664557E+00 1/Nm D Reciprocal Roll Torque (A)

TORQ_Y_A R 0.8719038E-01 1/Nm D Reciprocal Pitch Torque (A)

TORQ_Z_A R 0.7258591E-01 1/Nm D Reciprocal Yaw Torque (A)

PWM_TORQ R 7 D PWM Look Up Table

SPACECRAFT INERTIA MATRIX

AESCI_00 S

M F 6

2007-12-13T13:22:00Z

2007-12-13T13:22:00Z

AAAA1

IXX R 0.6196400E+04 Kgm2 D S/C inertia Ixx

IYY R 0.8159750E+04 Kgm2 D S/C inertia Iyy

IZZ R 0.8307810E+04 Kgm2 D S/C inertia Izz

IXY R 0.3664040E+02 Kgm2 D S/C inertia Ixy

IXZ R -0.1628210E+03 Kgm2 D S/C inertia Ixz

IYZ R 0.1333840E+02 Kgm2 D S/C inertia Iyz

AMD ON-TIMES

AEOTA_00 S

M F 32

2007-12-13T13:22:00Z

2007-12-13T13:22:00Z

A

MON_W1T1 R 0.6466000E-01 sec D AMD decrease on-time (W1,Th1)

MON_W1T2 R 0.2283840E+00 sec D AMD decrease on-time (W1,Th2)

MON_W1T3	R	0.0000000E+00	sec	D	AMD	decrease	on-time	(W1,Th3)
MON_W1T4	R	0.2947520E+00	sec	D	AMD	decrease	on-time	(W1,Th4)
MON_W2T1	R	0.6246400E-01	sec	D	AMD	decrease	on-time	(W2,Th1)
MON_W2T2	R	0.1420080E+00	sec	D	AMD	decrease	on-time	(W2,Th2)
MON_W2T3	R	0.7881200E-01	sec	D	AMD	decrease	on-time	(W2,Th3)
MON_W2T4	R	0.0000000E+00	sec	D	AMD	decrease	on-time	(W2,Th4)
MON_W3T1	R	0.3020720E+00	sec	D	AMD	decrease	on-time	(W3,Th1)
MON_W3T2	R	0.0000000E+00	sec	D	AMD	decrease	on-time	(W3,Th2)
MON_W3T3	R	0.2327760E+00	sec	D	AMD	decrease	on-time	(W3,Th3)
MON_W3T4	R	0.6832000E-01	sec	D	AMD	decrease	on-time	(W3,Th4)
MON_W4T1	R	0.1351760E+00	sec	D	AMD	decrease	on-time	(W4,Th1)
MON_W4T2	R	0.6148800E-01	sec	D	AMD	decrease	on-time	(W4,Th2)
MON_W4T3	R	0.0000000E+00	sec	D	AMD	decrease	on-time	(W4,Th3)
MON_W4T4	R	0.7076000E-01	sec	D	AMD	decrease	on-time	(W4,Th4)
MOFFW1T1	R	0.2315560E+00	sec	D	AMD	increase	on-time	(W1,Th1)
MOFFW1T2	R	0.8296000E-01	sec	D	AMD	increase	on-time	(W1,Th2)
MOFFW1T3	R	0.3142720E+00	sec	D	AMD	increase	on-time	(W1,Th3)
MOFFW1T4	R	0.0000000E+00	sec	D	AMD	increase	on-time	(W1,Th4)
MOFFW2T1	R	0.7271200E-01	sec	D	AMD	increase	on-time	(W2,Th1)
MOFFW2T2	R	0.0000000E+00	sec	D	AMD	increase	on-time	(W2,Th2)
MOFFW2T3	R	0.6441600E-01	sec	D	AMD	increase	on-time	(W2,Th3)
MOFFW2T4	R	0.1344440E+00	sec	D	AMD	increase	on-time	(W2,Th4)
MOFFW3T1	R	0.0000000E+00	sec	D	AMD	increase	on-time	(W3,Th1)
MOFFW3T2	R	0.3176880E+00	sec	D	AMD	increase	on-time	(W3,Th2)
MOFFW3T3	R	0.8759600E-01	sec	D	AMD	increase	on-time	(W3,Th3)
MOFFW3T4	R	0.2322880E+00	sec	D	AMD	increase	on-time	(W3,Th4)
MOFFW4T1	R	0.0000000E+00	sec	D	AMD	increase	on-time	(W4,Th1)
MOFFW4T2	R	0.8076400E-01	sec	D	AMD	increase	on-time	(W4,Th2)
MOFFW4T3	R	0.1434720E+00	sec	D	AMD	increase	on-time	(W4,Th3)
MOFFW4T4	R	0.6392800E-01	sec	D	AMD	increase	on-time	(W4,Th4)

16/12/2007 (Day of Year 350, Revolution 631-632)

Nothing to report.

17/12/2007 (Day of Year 351, Revolution 632)

Nothing to report.

18/12/2007 (Day of Year 352, Revolution 632)

Nothing to report.

19/12/2007 (Day of Year 353, Revolution 632-633)

Nothing to report.

20/12/2007 (Day of Year 354, Revolution 633)

Nothing to report.

21/12/2007 (Day of Year 355, Revolution 633)

TM links problem at REDU: at 21:05z the slew ID 06330066 failed release. The problem was caused by a drop on TM links at REDU station.

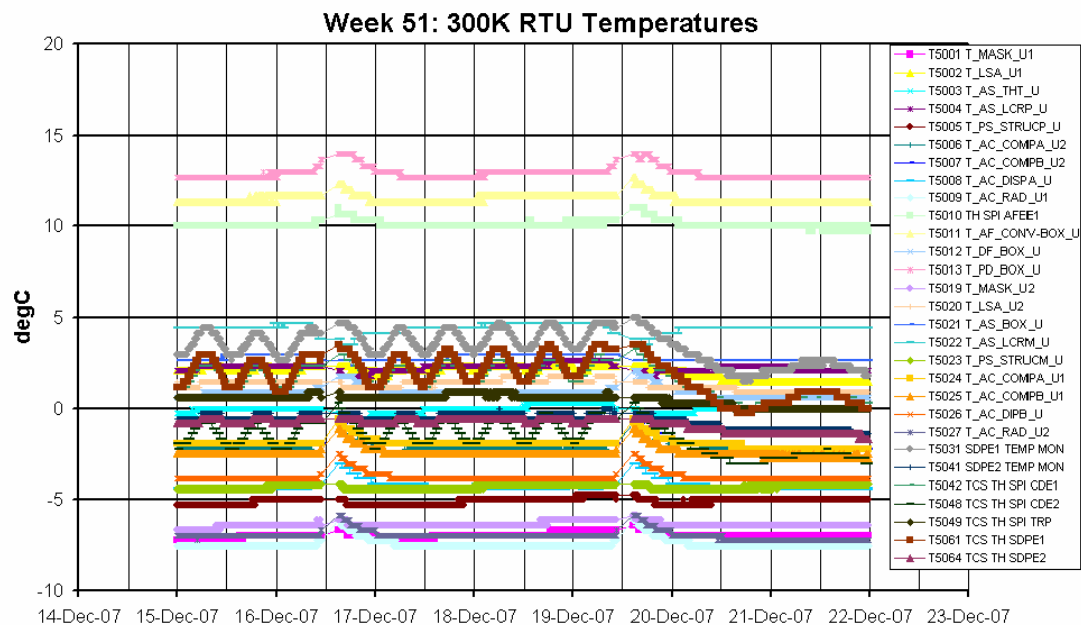
The slew was then manually recovered from attitude of PID 06330065 to the attitude of PID 06330067. The next slew ID 06330067 was manually updated in TL.

At 21:57z the AOCS s/s was enabled in TL.

The following slew was missed in TL: 06330066(CSL).

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.

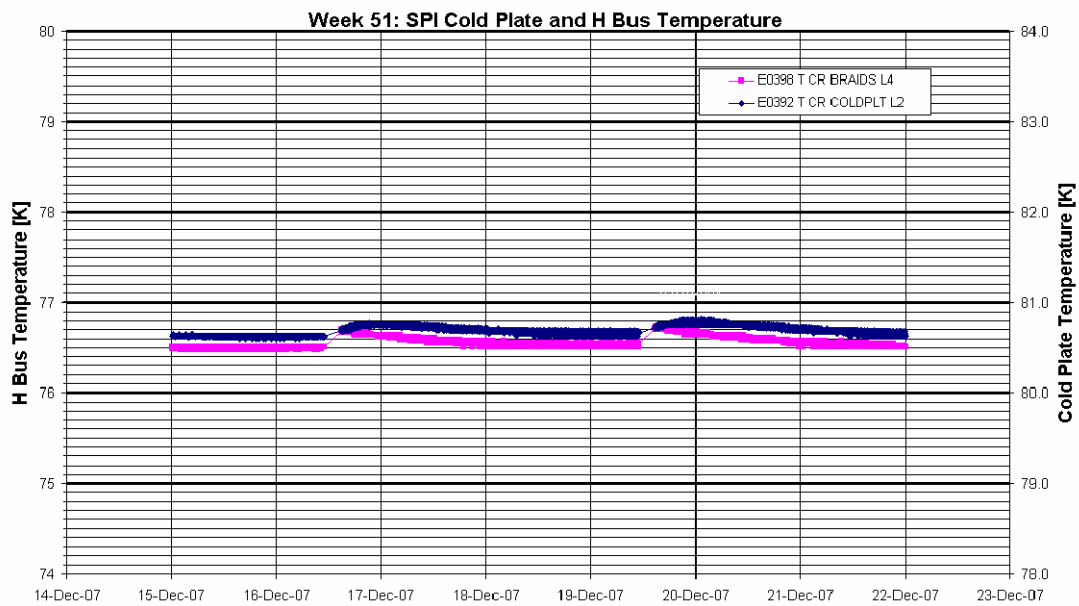


Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K.

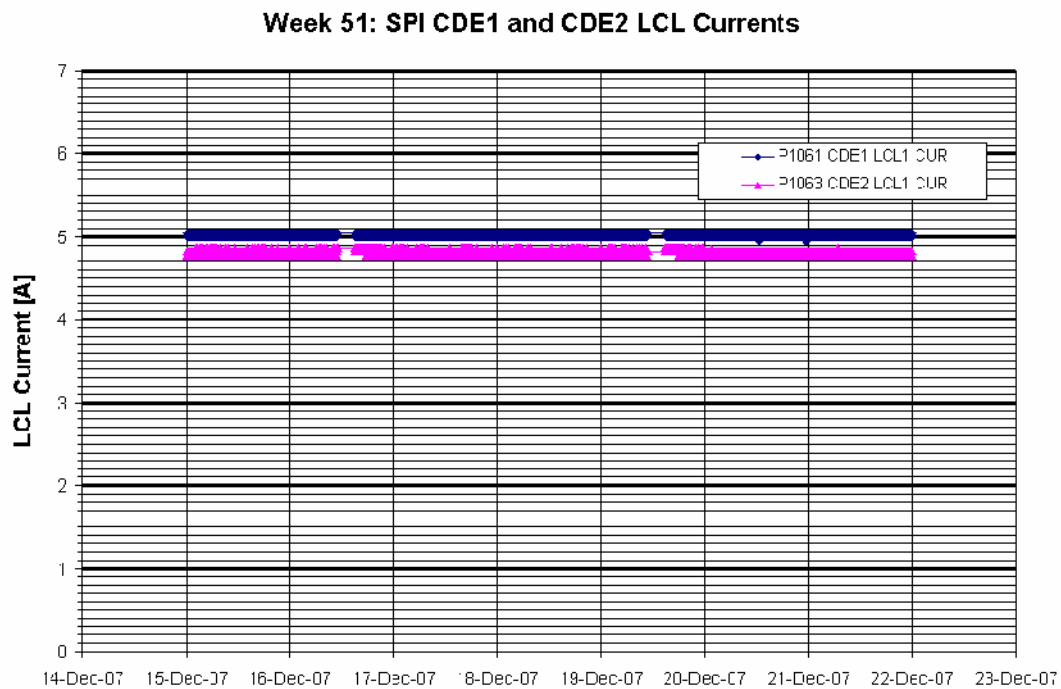
The stroke of all four compressors was set to 41 throughout the week. The average CDE LCL currents over the week were as follows:

- CDE1 LCL Current = 5.01A
- CDE2 LCL Current = 4.81A

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.

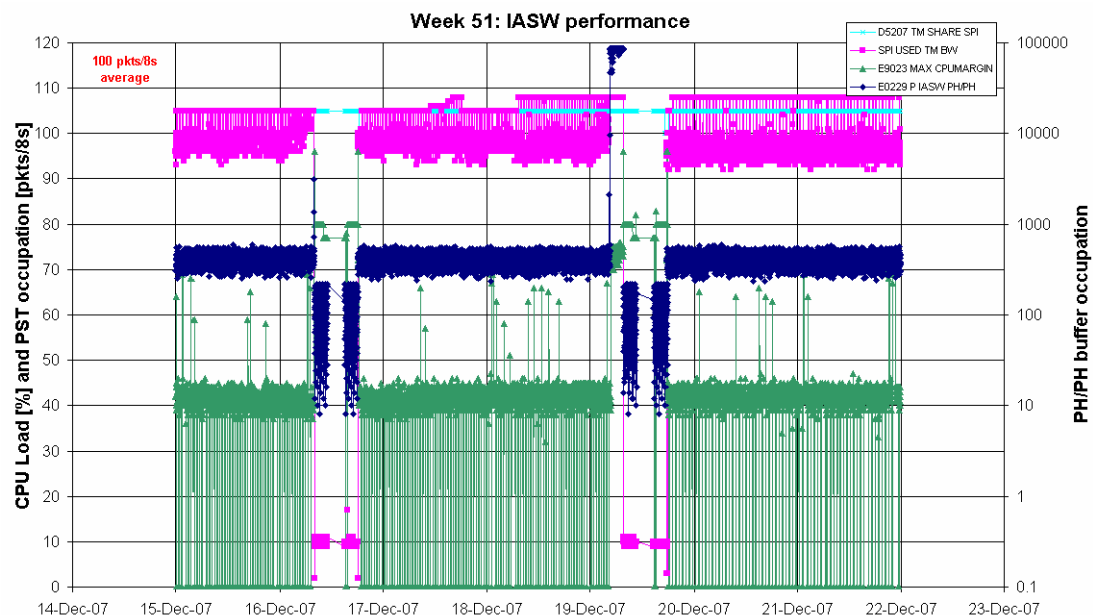


DPE & IASW: The DPE health and IASW performance is nominal. The IASW version installed is v433 patch #1 with the spectra scaling factor set to 8/19 SE.

The average TM bandwidth occupation of SPI was 100 packets/cycle over the science window, when the allocation was 105 packets/cycle except in the periods in which the tests of an over-allocated PST were performed. This was on 2007-12-17 from 10:44Z to 18:08Z, during which time the PST allocation to SPI was increased by 1 packet, 2 packets and 3 packets sequentially in line with OCR-229. The TM allocation in the broadcast packet was not updated. As expected SPI used the additional allocation

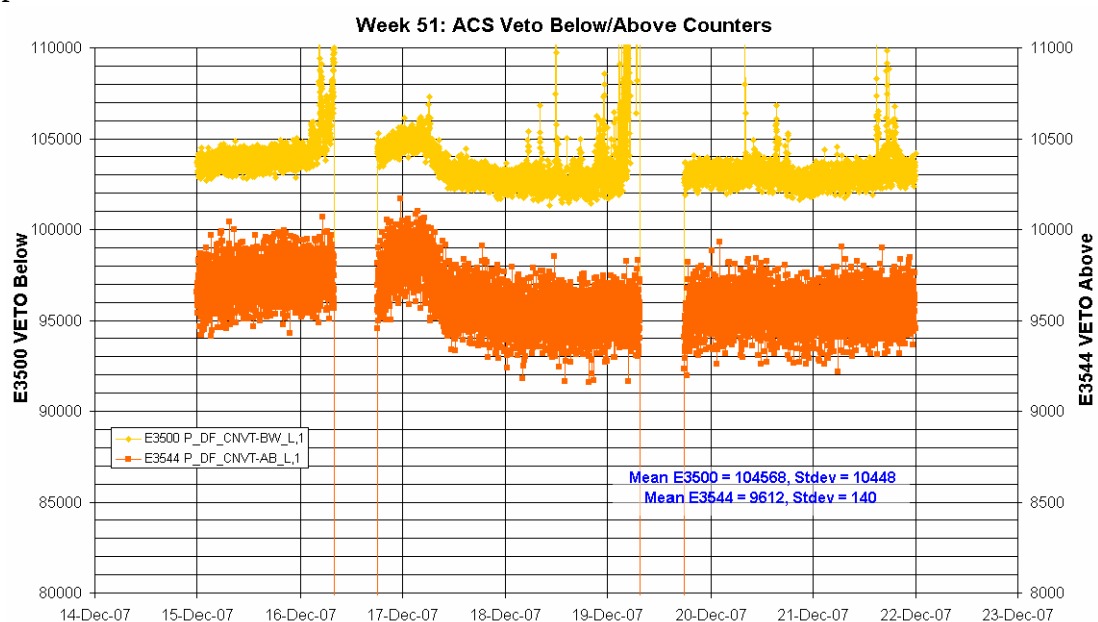
during spectra transmission and no problems were encountered. Following this test, on 2007-12-18 at 07:19Z an over-allocated PST was uplinked again with an allocation of 108 packets/cycle to SPI. The remained in use for the rest of the reporting period (the rest of revolution 632 and all of revolution 633).

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).

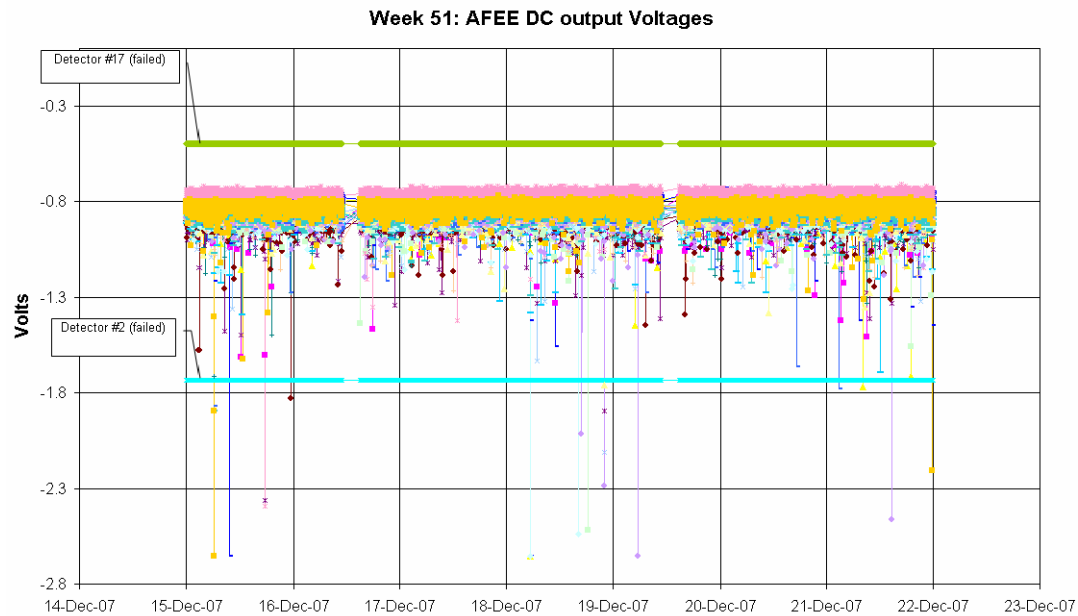
The following plot shows the ACS overall count rate evolution during the reporting period:



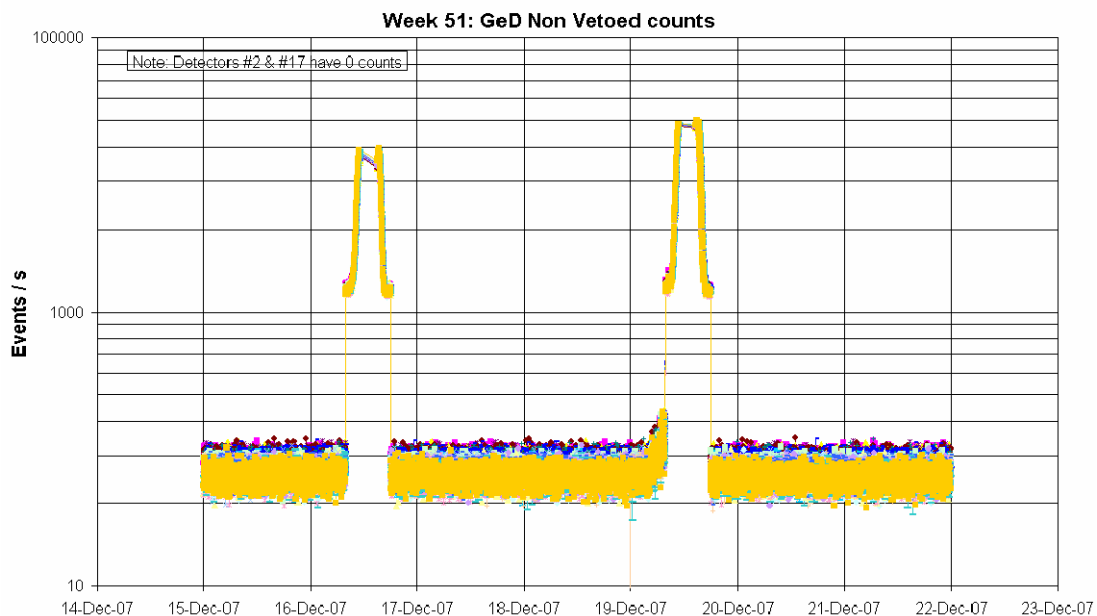
AFEE: The health of the AFEE is nominal. The performance of the AFEE and the detectors is nominal, except for the Ge detector #12 which is showing a slightly

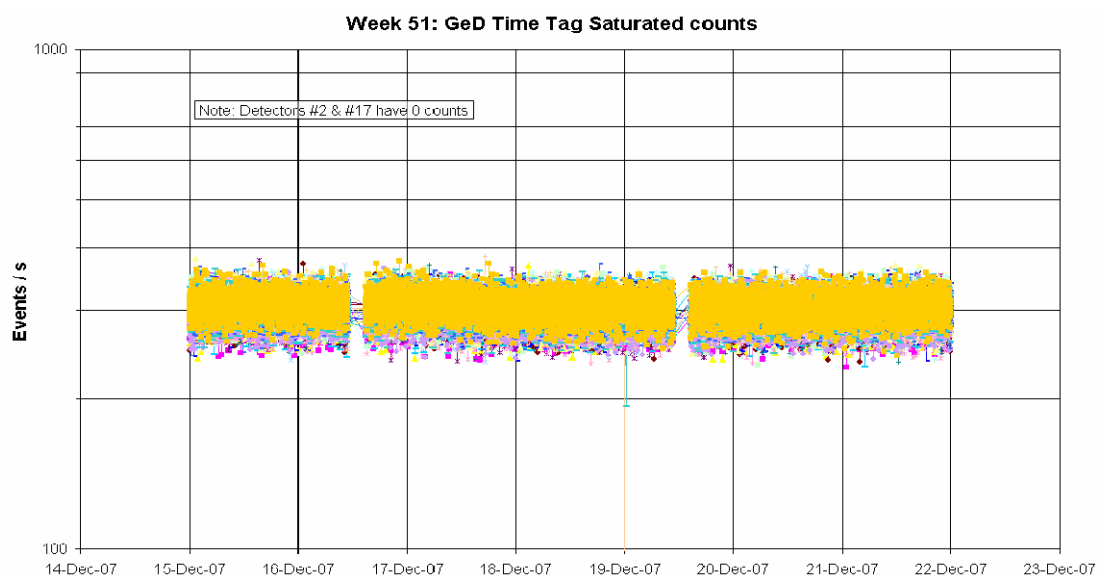
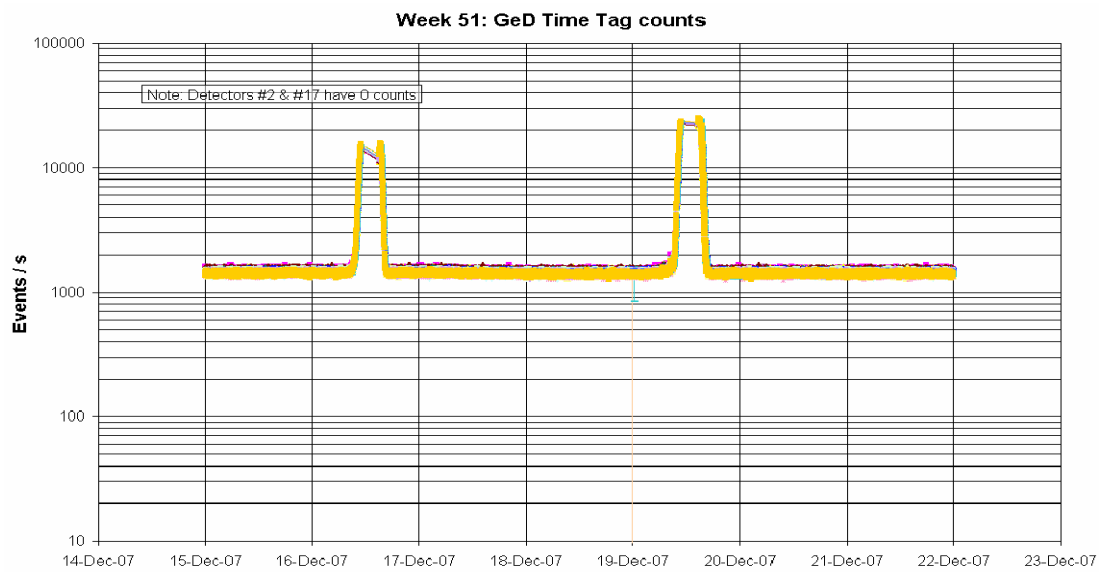
degraded energy resolution and is therefore operated at a lower HV setting of 3.5kV (instead of 4kV).

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.

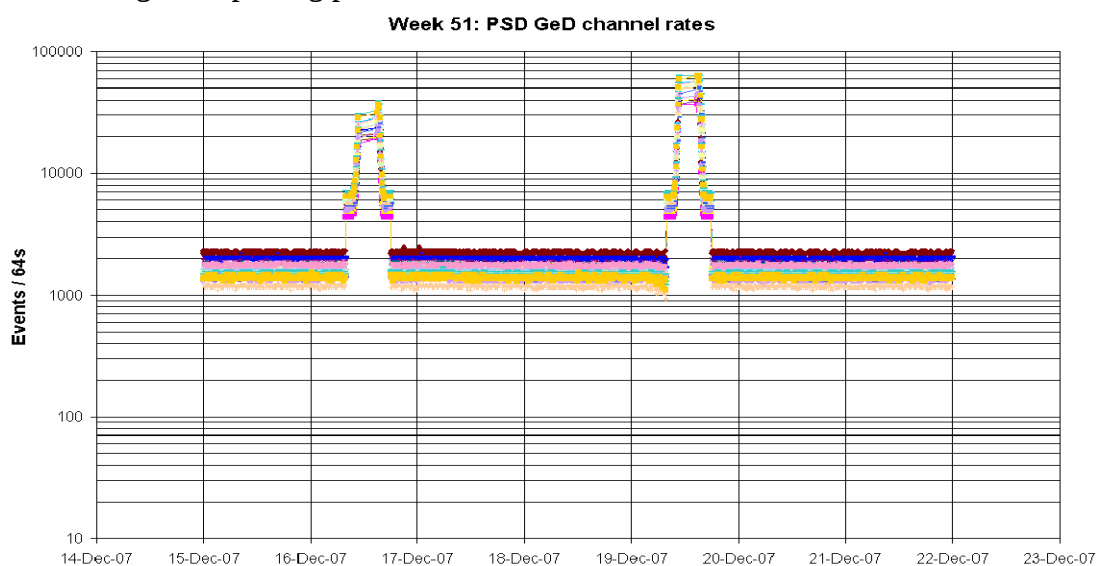


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period.





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



Event Log:

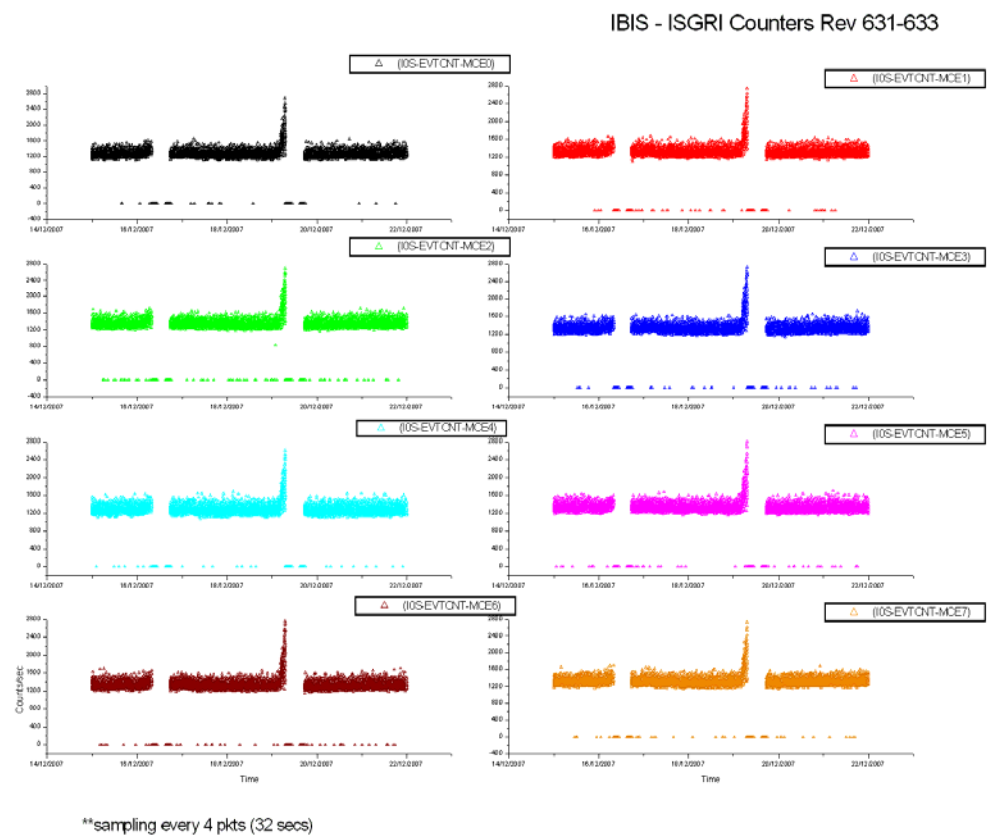
The following non-nominal events occurred on SPI during the reporting period:

- 9 occurrences of OEM APID 1024 ID 243 EXCEPTION SPI1 SPECTRA BUILDING NOT COMPLETED were received during the week. As they were all single occurrences, no action was taken.
- Due to high background radiation conditions before the expected radiation belt entry of revolution 632, on 2007-12-19 at 04:43:32Z TM parameter E3500 went OOL High, toggling OOL until radiation belt entry, at 07:44:49Z.

8.3.3 IBIS Operations

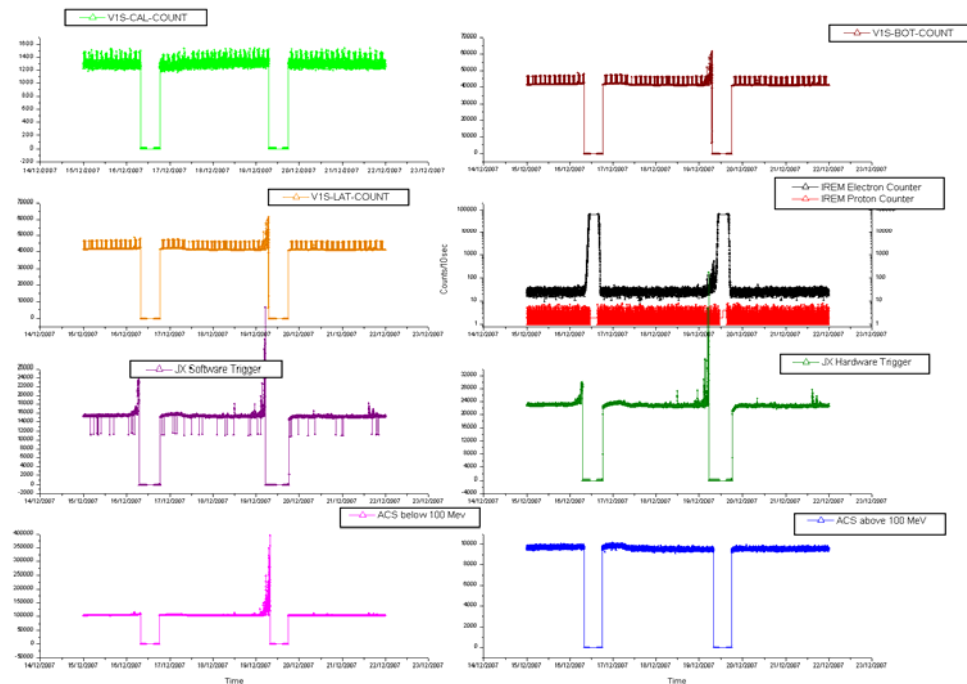
IBIS Event Counters Plots

ISGRI Counters:



VETO vs Payloads Counters:

IBIS-VETO vs Payloads Counters Rev 631-633

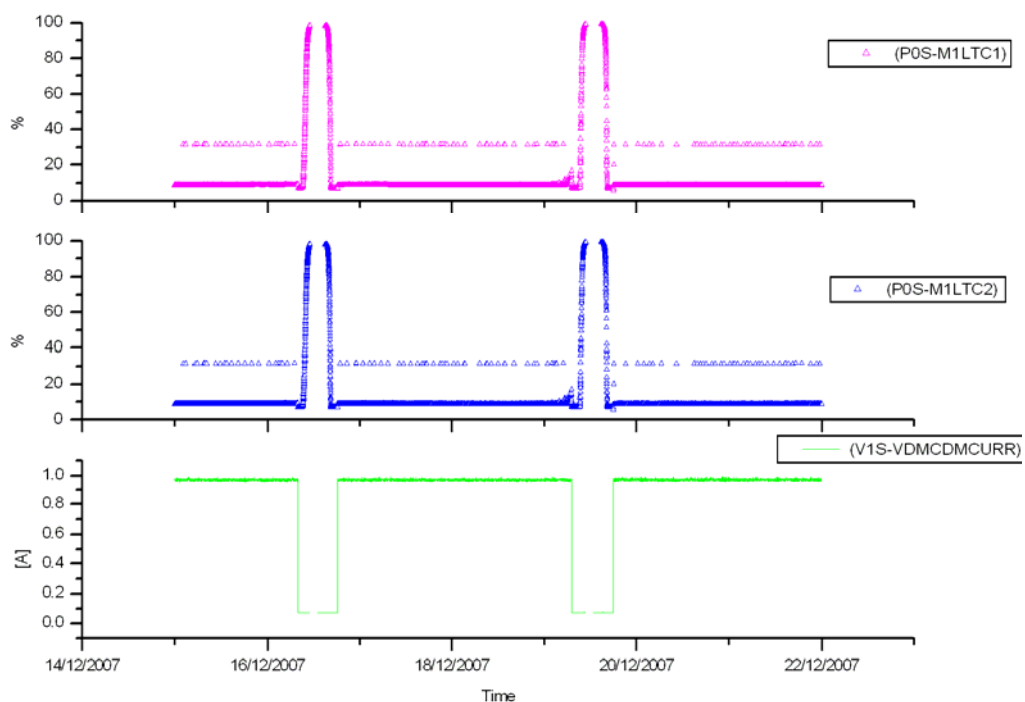


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

The week was characterised by high radiation before the expected radiation belt entry of revolution 632 as reported by the payload.

VETO Current:

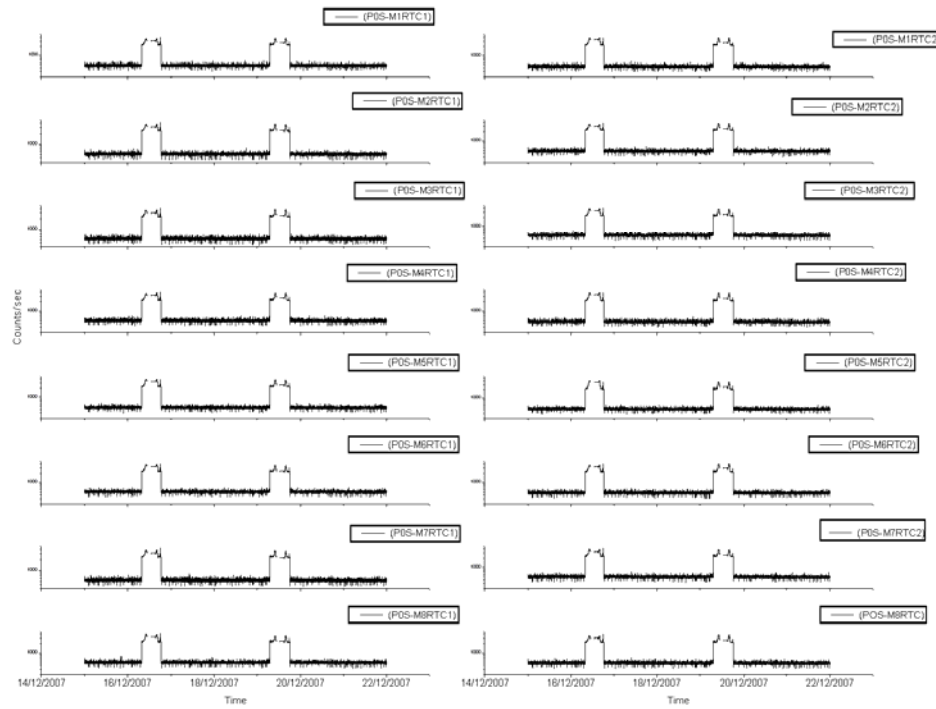
IBIS-VETO Current & PICsIT dead times Rev 631-633



**sampling every 4 pkts (32 secs)

PICsIT Counters:

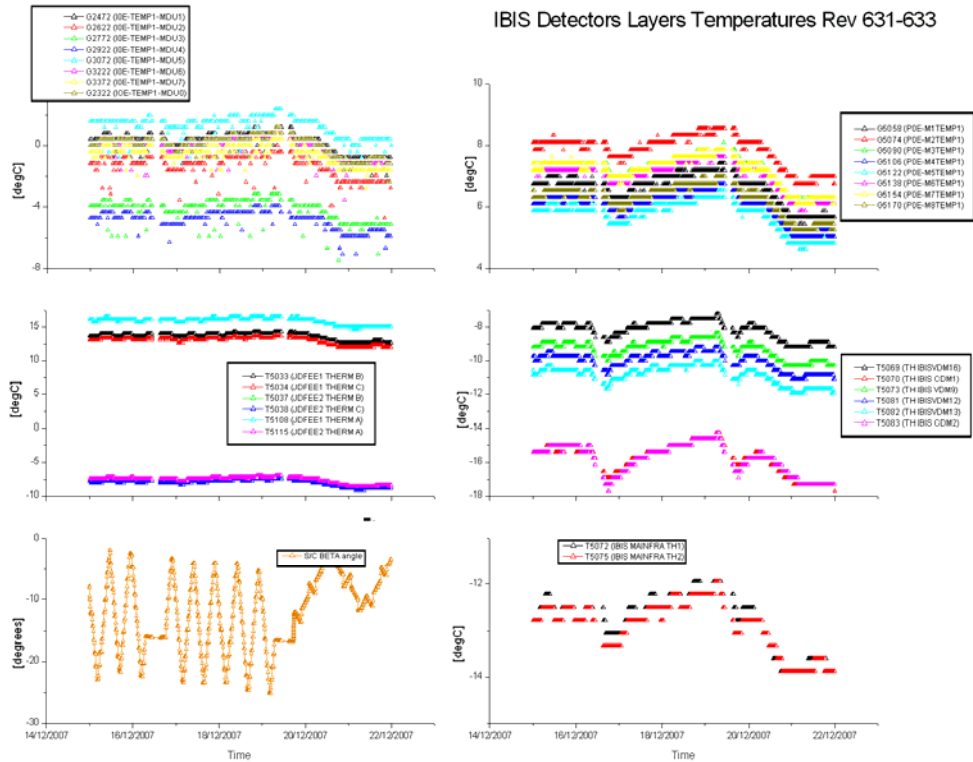
IBIS - PICsIT Counters Rev 631-633



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:

IBIS Detectors Layers Temperatures Rev 631-633



**sampling every 8 pkts (64 secs)

IBIS daily report:

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

In addition, throughout the week, TM parameter G8080 went OOL Warning High several times. This is the Valid event rate on HBRA. As at each occurrence it remained OOL for only 1 TM cycle, no action was taken. This indicates an overflow in the counters and affects only the quality of the scientific data but not the safety of the instrument.

2007-12-15 (DOY 349, Rev 631)

At 11:15:11Z TM parameter G2056 went OOL (Status Consistency Check). This is the Overflow of the noisy pixel address buffer in MCE4. It returned within limits at 11:15:19Z and no action was taken.

2007-12-16 (DOY 350, Rev 631-632) to 2007-12-18 (DOY 352, Rev 632)

IBIS operations executed nominally.

2007-12-19 (DOY 353, Rev 632-633)

Due to high background radiation, at 04:00:39Z, ~3 hours 45 minutes before the expected radiation belt entry of revolution 632, TM parameters G6062 and G6063 started toggling OOL High. These are the VETO bottom and lateral counters respectively. In addition, starting at 06:33:27Z the G2013 family (Number of events triggering the MCEi per second) also started toggling OOL High. These parameters continued to toggle OOL until IBIS made an autonomous transition to Safe mode due to high radiation at 07:07:23Z, ~40 minutes earlier than planned in the Broadcast Packet.

2007-12-20 (DOY 354, Rev 633) to 2007-12-21 (DOY 355, Rev 633)

IBIS operations executed nominally.

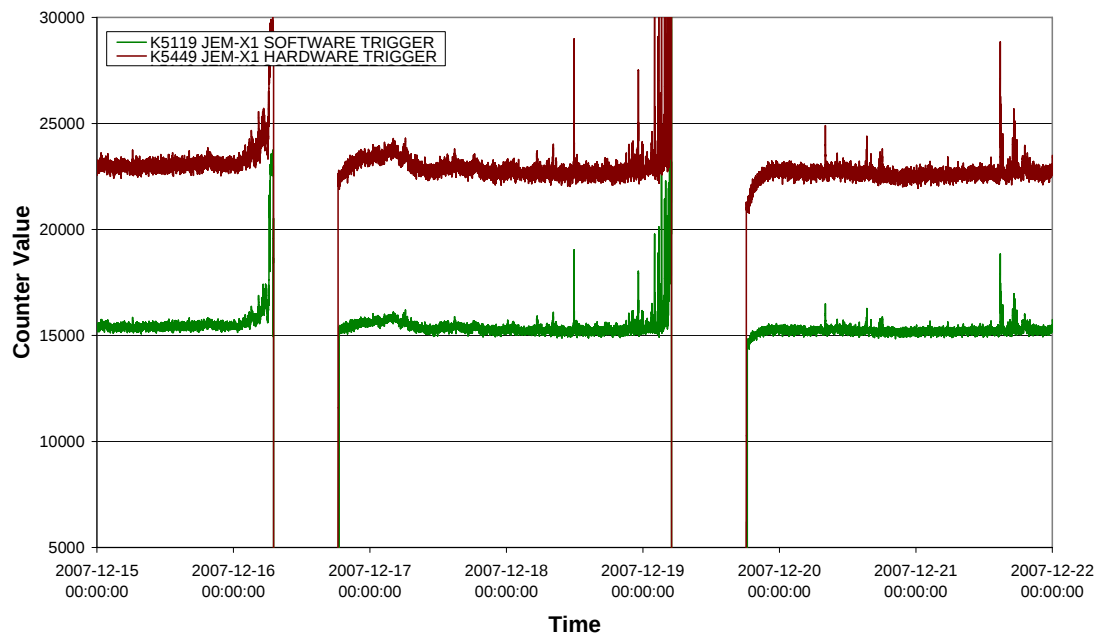
8.3.4 JEM-X Operations

JEM-X Count Rates

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

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

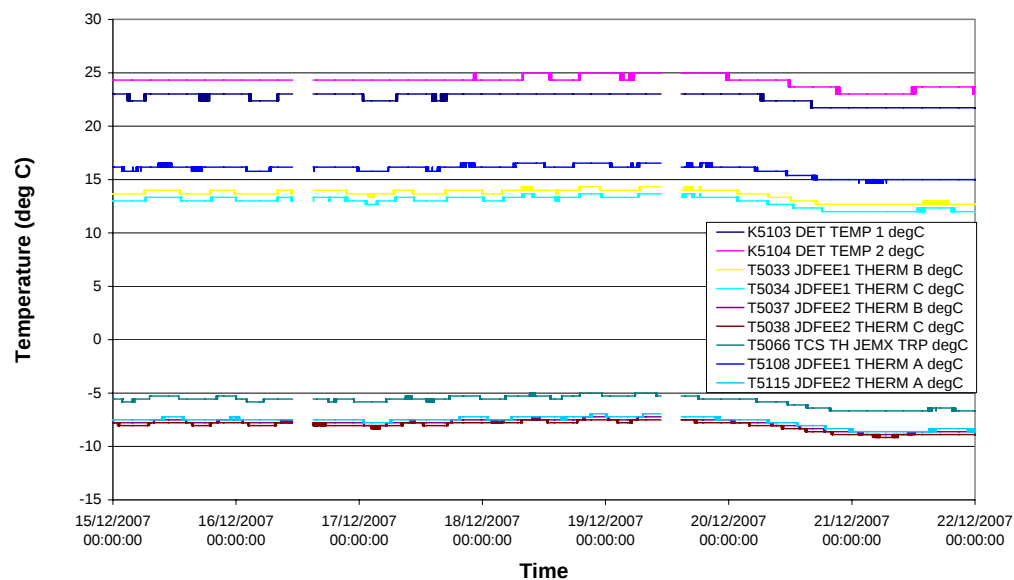
JEM-X Count Rates



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.

JEMX Detector & DFEE Temperatures



JEM-X Daily Report

2007-12-15 (DoY 349, Rev 631)

² Data sampled (1 frame in 8)

JEM-X1 operations executed nominally

2007-12-16 (DoY 350, Rev 631-632)

At 06:26:35, 07:00:27 and 07:01:39 K5136 exceeded soft limits, and at 06:54:35, K5449 also exceeded its soft limit. No action was taken and there was no impact.

2007-12-17 (DoY 351, Rev 632)

On this day, the following group of anomalous OEMs were received, at the indicated times:

2007.351.15.08.54.811	2007.351.15.09.00.329	1536	RealTime	5	EXCEPTION
JEM-X1 EXC IACS INTERF EXID			0	0	65535 PR N
E 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		
2007.351.15.08.54.811	2007.351.15.09.00.375	1536	RealTime	6	EXCEPTION
JEM-X1 EXC IACS INTERF CULP			0	0	65535 PR N
E 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 the messages did not reappear. There was no impact.

2007-12-18 (DoY 352, Rev 632)

JEM-X1 operations executed nominally

2007-12-19 (DoY 353, Rev 632-633)

From 02:03:00 to 06:51:16, in the run-up to the belt entry, there were repeated warnings about parameters K5449, K5119, K5136, K9104, K5317 & KD5020D being out of hard and/or soft limit. No action was taken and there was no impact.

2007-12-20 (DoY 354, Rev 633) to 2007-12-21 (DoY 355, Rev 633)

JEM-X1 operations executed nominally

8.3.5 OMC Operations

2007-12-15 (DoY 349, Rev 631) to 2007-12-20 (DoY 354, Rev 633)

Nothing to Report.

2007-12-21 (DoY 355, Rev 633)

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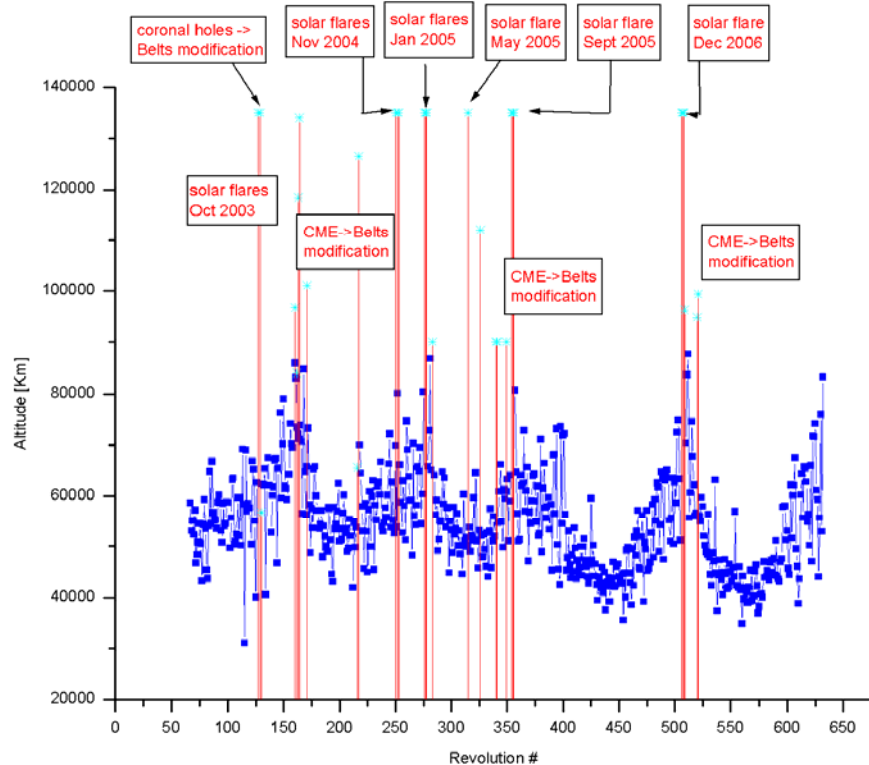
At 21:05, a TM interruption from Redu forced the suspension of the Timeline. A recovery was performed, and the Timeline rejoined at 21:57. The impact was the loss of pointing 06330066.

On DoY 350 at 07:57:22 and DoY 353 at 07:44:42 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]
631	RAD_ENTR R 2007-12-16T07:57:16Z	16/12/2007 08:24:41	52940.1	16-Dec-2007 09:24:22	43662.4
632	RAD_EXIT R 2007-12-16T18:02:13Z	16/12/2007 16:38:09	>>33196.0	16-Dec-2007 17:04:22	44676.85
632	RAD_ENTR R 2007-12-19T07:44:40Z	19/12/2007 03:48:41	83238.5	19-Dec-2007 09:10:35	43815.97
633	RAD_EXIT R 2007-12-19T17:49:56Z	19/12/2007 16:38:33	>>33186.2	19-Dec-2007 16:50:35	44477.83

Reference

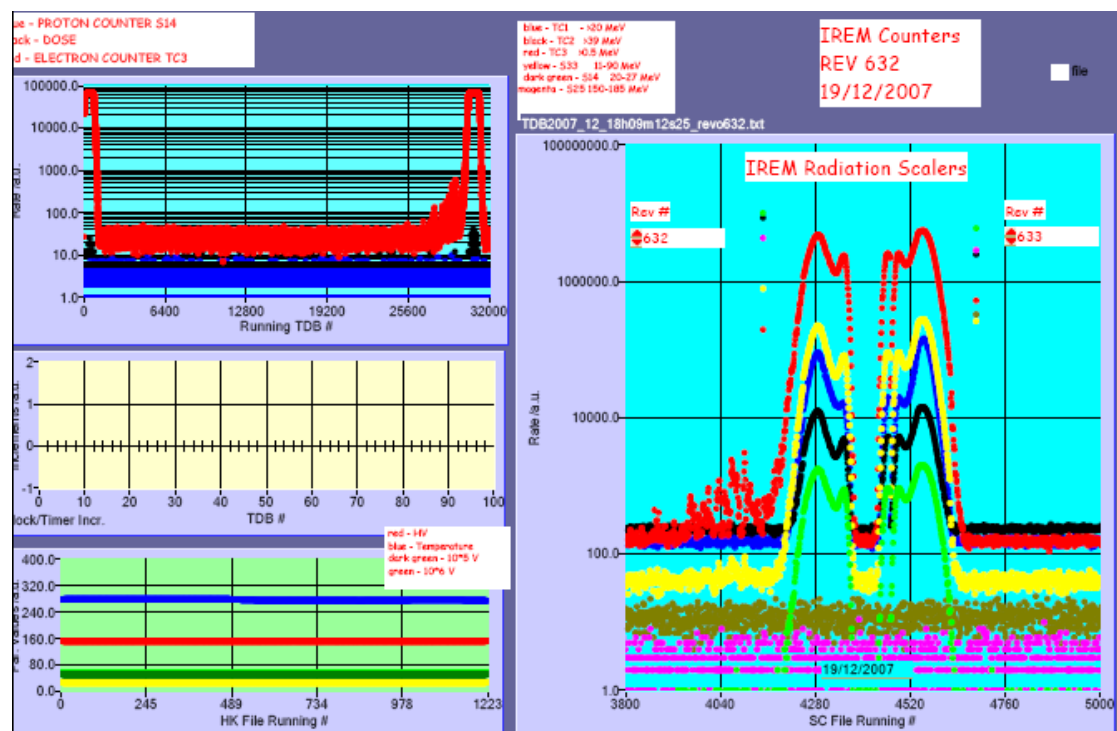
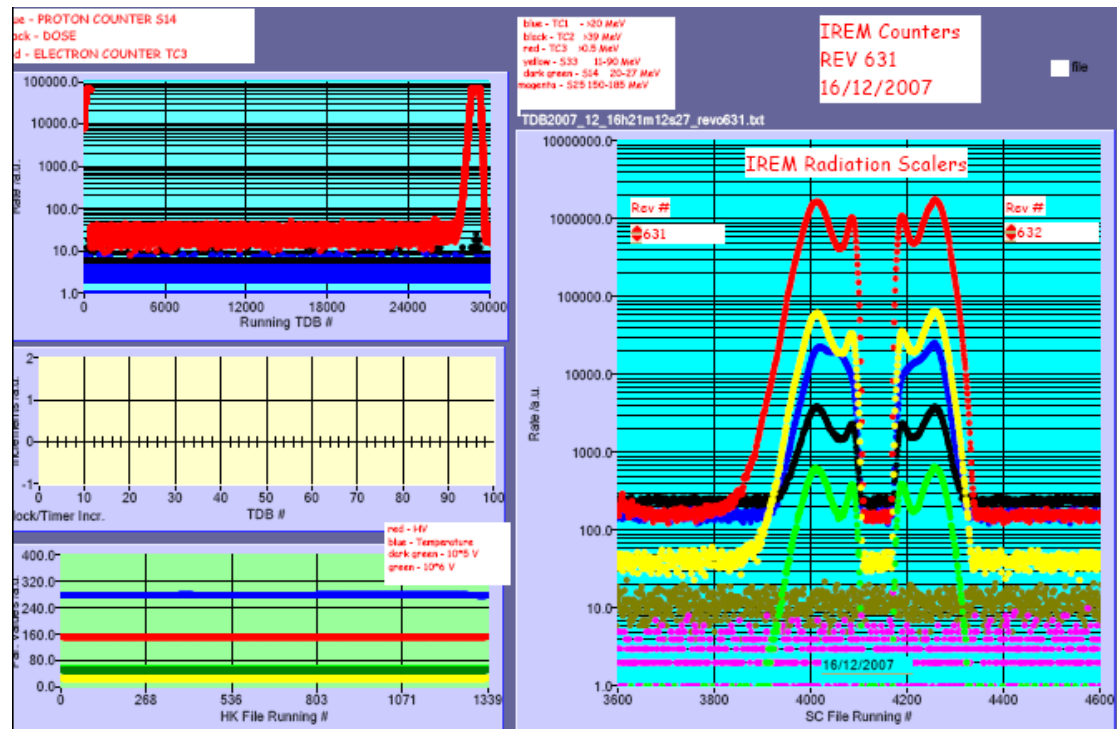
High radiation

Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

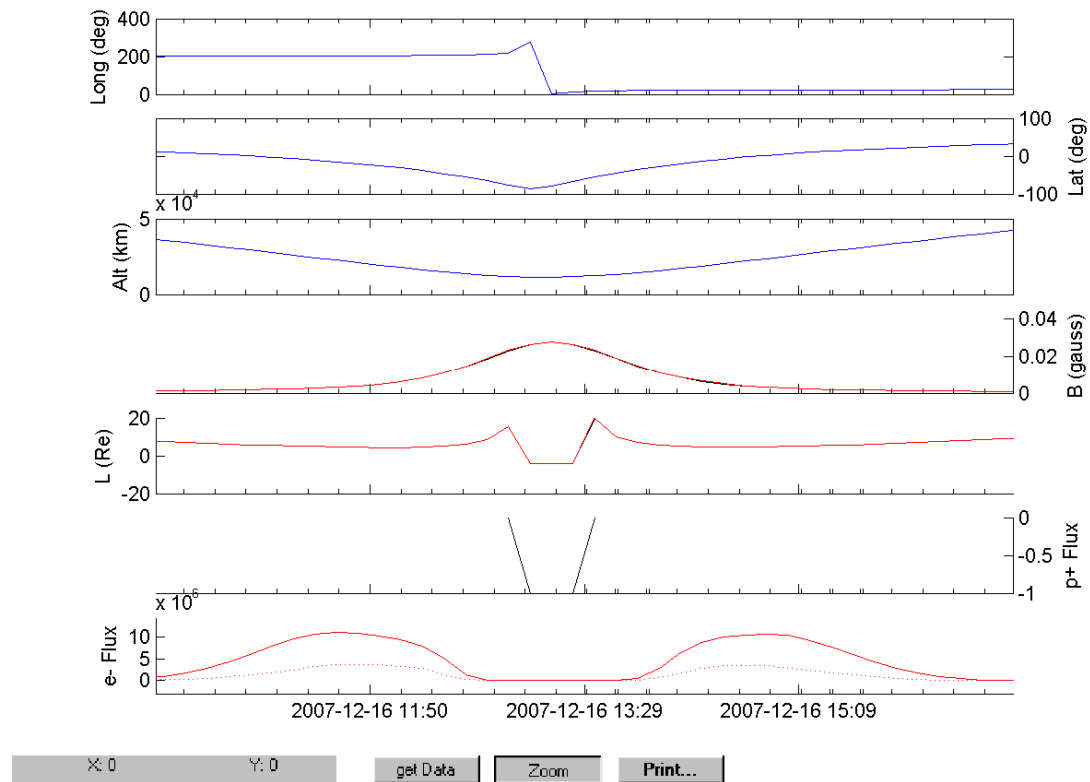
Large error vs reference (more than 30 minutes)

IREM radiation counters:

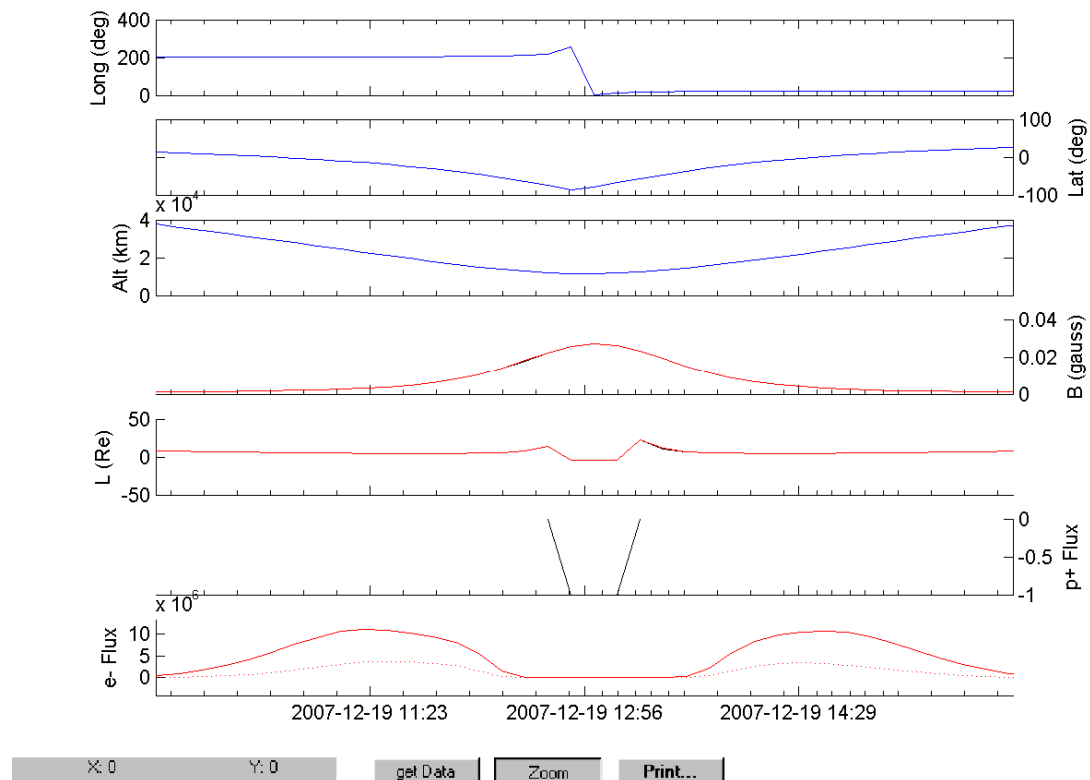


IREM Predicted Radiation Belt Passages

Rev 631



Rev 632



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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.