

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 326
Week 51
22.12.08
Routine Phase

Prepared by: F.Schmidt (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 13.12.08 until 19.12.08 (both dates inclusive) and covers the revolutions 753, 754 and 755.

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 hexagonal dither of the Galaxy Cluster 47 Tuc and Small Cloud of Magellan SMC (RA 00:53:55.20, DEC -72:26:42.0), a hexagonal dither of the Virgo Cluster (RA 12:26:32.10, DEC +12:43:24.0) and a hexagonal dither of the Quasar PKS 0208-512 (RA 02:10:46.20, DEC -51:01:01.9).

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

Three slews were missed from TL, during the observation period, due to problems at DSS and REDU stations and on FDS.

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 754.

The fuel consumption over the period between 13/12/2008 and 19/12/2008 was 0.1156 Kg. The remaining propellant is in the order of 136.9941 Kg.

Note: Some more information concerning the AOCS operations and the fuel budget is provided in the Appendix.

3.1.2 Power

All the other units of EPS are 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.

The PST was over-subscribed by 3 packets, which were allocated to SPI during the Instrument window for the entire reporting period.

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

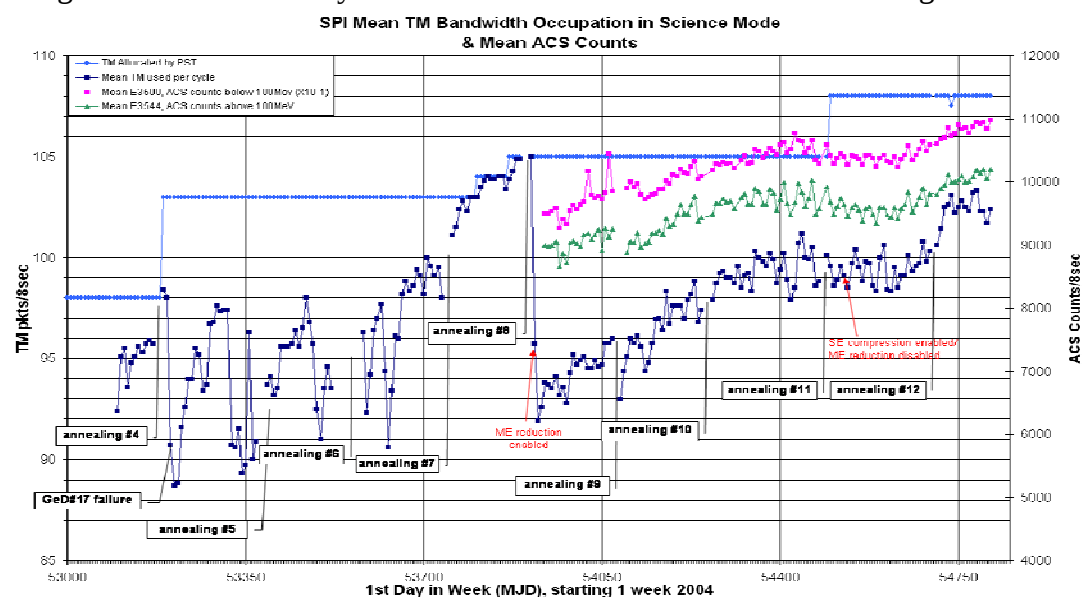
3.2.1 SPI

Following the 12th annealing, ended on 04/09/2008 at 23:50Z, the overall status of the gamma-ray spectrometer is nominal, except for detector #2 (failed since 06/12/2003) and detector #17 (failed since 17/07/2004). The energy resolution of the previously degraded GeD#12 has improved following this annealing and the bias of this detector is now set to 4kV as for the other detectors.

The Stirling compressors are working nominally. The Germanium detectors temperature was kept in the range 80K $\pm$ 1K throughout the week.

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 108 packets/cycle and the average telemetry occupation was 102.4 packets/cycle.

The following plot shows the evolution of the assigned and the average occupation of the SPI TM bandwidth along with the mean ACS count rate evolution (since July 2006). As can be seen, there is a strong correlation between the evolution of the background as measured by the ACS and the overall TM bandwidth usage.



Note: Some more information concerning the SPI operations is provided in the Appendix 8.3.2.

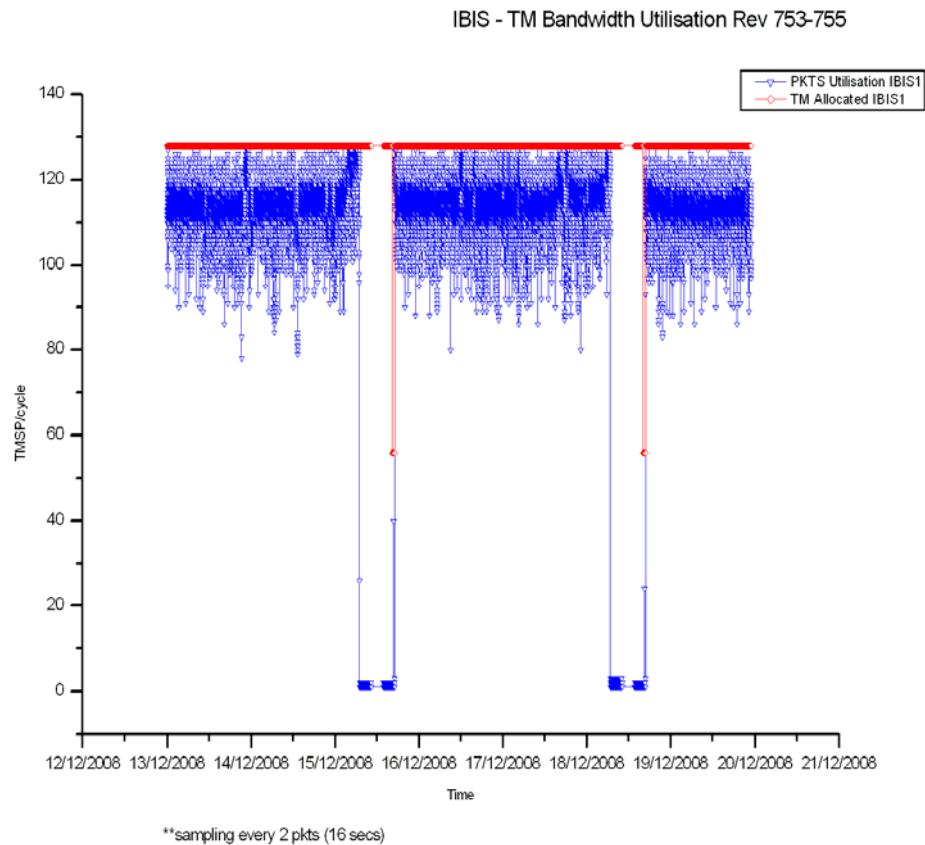
3.2.2 IBIS

The overall status of the unit is nominal.

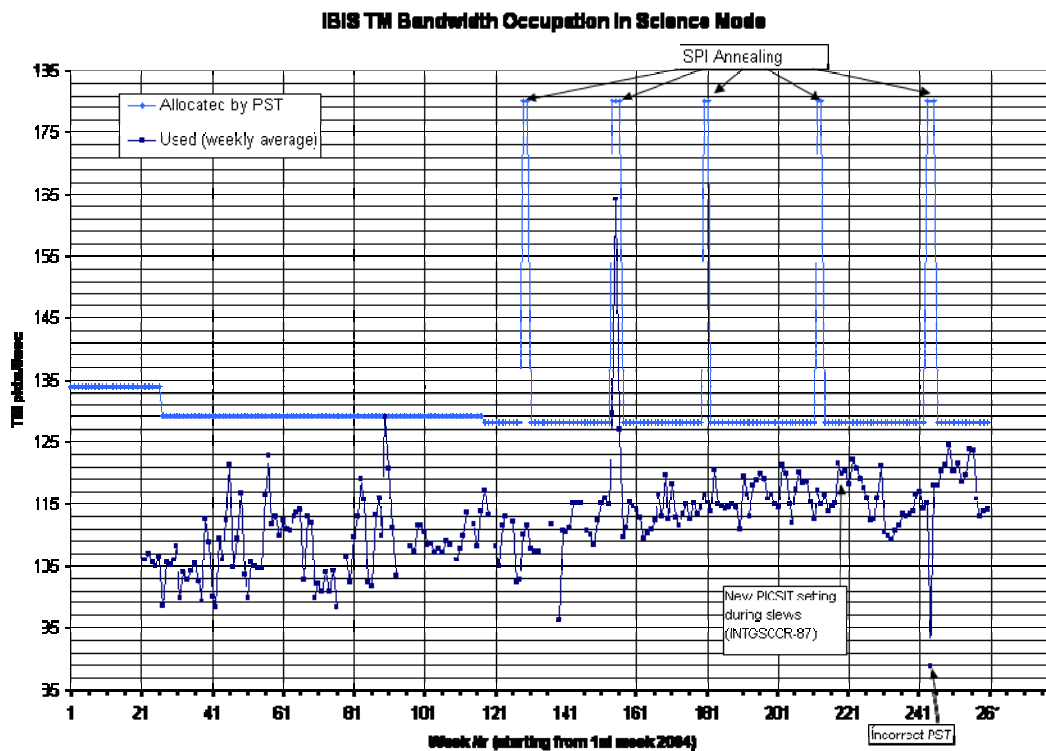
During the reporting period, the TM bandwidth statistics were as follows:

- PST allocation to IBIS above radiation belts: 128 packets/cycle.
- IBIS mean bandwidth utilisation in science mode: 114.05 packets/cycle (up 0.37 on previous week)
- Percentage of TM cycles in which full bandwidth was used: 1%

The plot below shows the IBIS TM utilisation during the observation period.



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 Section 8.3.4.

3.2.4 OMC

The status of OMC is nominal.

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

During this reporting period, 139 of the 141 planned science pointings were executed nominally, 2 were lost.

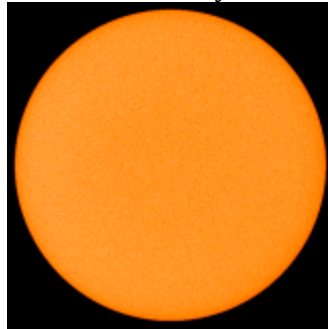
Note: Some more information concerning the OMC operations is provided in the Appendix.

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 remained blank all week. The risk of solar flares was very low.



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 though was above the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was very good this week. One pointing was lost to MOC related issues. Due to problems with the FDS, the pointing 07530022 was not executed.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. There was one link drop reported from Redu on DoY 348 and one incident on DOY 349 at 21:52: During DSS-27 support. Due to TM drops, the pointings 07530030 and 07530053 were not executed.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

No new PSFs have been received, as foreseen. Observations have been planned up to revolution 764 covering the time until mid January. New TSFs have been received for revolutions 754 to 763.

2. Observation status

A new ECS files has been received for revolution 747, they have been processed up to 746.

3. ISOC Science Data Archive

No news.

4. ISOC system

Work is continuing on ISOC system V20.1.

5. Problems

The duty scientist phone still does not receive TOO alerts by SMS.

4.3.2 ISDC

Status of ISDC observation processing on 19/12/2008:

- Latest Standard Analysis completed: observation 06200210009 (GRS 1915+105, Revolution 743) on 12/12/2008.
- Latest products archived: observation 06200210009 (GRS 1915+105, Revolution 743) on 12/12/2008.
- Latest observation products sent to the observer: observation 05297000004 (Perseus OB2 Cloud, Revolutions 706-710) on 13/09/2008.

5 Special Events

2008-12-15 (350): New Database installed on A and B-chains

2008-12-17 14:46:00Z (352): PSS Test with Redu TMTCS's on B-Chain. Test Commands verified at G/S level. Test successful

6 Anomalies

The following problem was reported this week that impacted operations:

Incident on DOY 348 at 11:17: TC bind to Redu-1 was disconnected from TMTCS-1 at Spacon request, due to problem with commanding. TMTCS-1 then hung up, so TMTCS-2 was made prime for TM and TC while TMTCS-1 was restarted. On DoY 351 the faulty TMTCS1 has been replaced by the spare TMTCS3 - renamed as TMTCS1.

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

AR id	Date Created	Subject	Segment	Status
INT-3048	2008-12-13	REDU - TMTCS1 crashed	ESA Stations	Pending
INT-3046	2008-12-13	FDS problem during slew update FDS	FDS	Pending

7 Future Milestones

Appendix

The appendix includes various detailed information.

7.1 Overview of Revolutions

Revolution 753

The observations in revolution 753 began with a hexagonal dither of the Galaxy Cluster 47 Tuc and Small Cloud of Magellan SMC (RA 00:53:55.20, DEC - 72:26:42.0), lasting ~28.0 hours. They continued with a hexagonal dither of the Virgo Cluster (RA 12:26:32.10, DEC +12:43:24.0), lasting ~28.0 hours until the end of the revolution.

Revolution 754

The observations in revolution 754 began with a hexagonal dither of the Galaxy Cluster 47 Tuc and Small Cloud of Magellan SMC (RA 00:53:55.20, DEC - 72:26:42.0), lasting ~21.3 hours. They continued with a hexagonal dither of the Quasar PKS 0208-512 (RA 02:10:46.20, DEC -51:01:01.9), lasting ~22.9 hours. This was followed by a hexagonal dither of the Virgo Cluster (RA 12:26:32.10, DEC +12:43:24.0), lasting ~10.6 hours until the end of the revolution.

Revolution 755

The observations in revolution 755 began with a hexagonal dither of the Galaxy Cluster 47 Tuc and Small Cloud of Magellan SMC (RA 00:53:55.20, DEC - 72:26:42.0), lasting ~28.0 hours. They continued with a hexagonal dither of the Quasar PKS 0208-512 (RA 02:10:46.20, DEC -51:01:01.9), lasting ~29.5 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 108; JEM-X1 8; JEM-X2 0; OMC 5.

7.2 Consumables

7.2.1 Detailed Fuel Book-keeping

2008-12-06T15:10:19.000Z	137.2803	F	Automatic TM processing.
2008-12-08T00:31:59.000Z	137.2381	F	Automatic TM processing.
2008-12-09T14:58:03.000Z	137.2259	F	Automatic TM processing.
2008-12-10T08:22:05.000Z	137.1865	F	Automatic TM processing.
2008-12-10T12:30:00.000Z	137.1654	F	After thruster torque calibration
2008-12-10T13:42:46.000Z	137.1275	F	Automatic TM processing.
2008-12-11T00:24:39.000Z	137.1097	F	Automatic TM processing.
2008-12-13T22:25:34.000Z	137.0620	F	Automatic TM processing.
2008-12-15T14:31:07.000Z	137.0540	F	Automatic TM processing.
2008-12-17T00:30:30.000Z	137.0135	F	Automatic TM processing.
2008-12-18T14:19:15.000Z	136.9941	F	Automatic TM processing.

This report was generated Fri Dec 19 08:00:22 GMT 2008

7.3 Detailed Satellite Information

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

7.3.1 AOCS SUMMARY OPERATIONS REPORT, 13/12/2008 – 19/12/2008

The AOCS operations were executed from the Automatic Timeline.

During this period, 87 Open Loop Slews, 64 Closed Loop Slews and 4 Momentum Biases were executed (as reported by ACC OEM).

3 slews (2 CSL, 1 OSL) were missed from TL, during the observation period, due to problem on TM/TC links at DSS and REDU stations and on FDS during slew update.

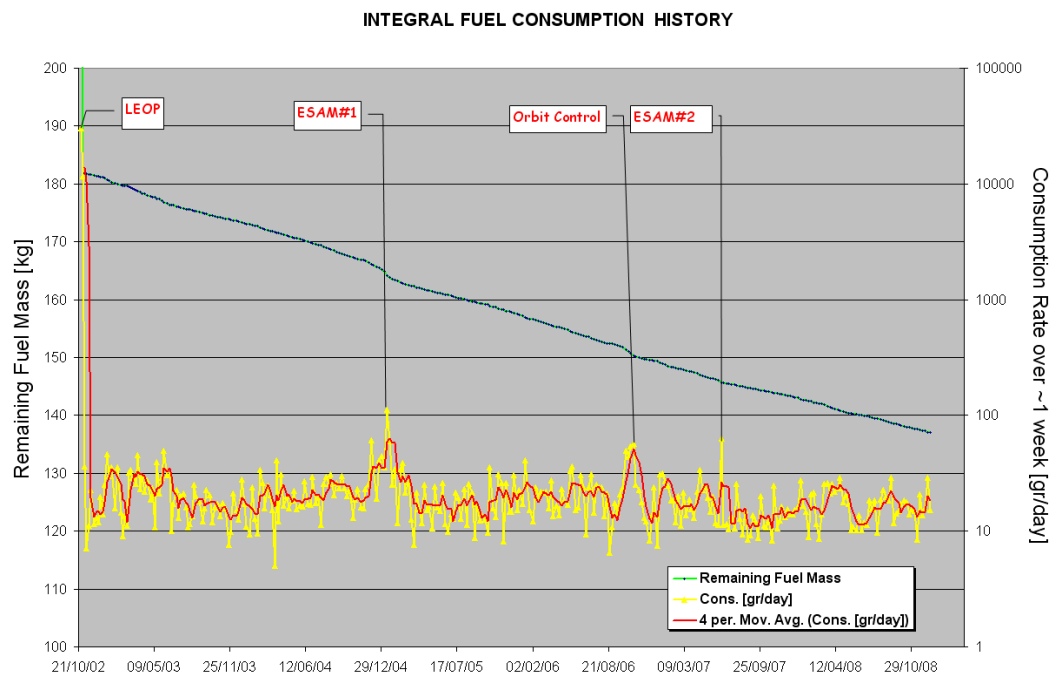
This is equivalent to $\sim 2\%$ of the total number of slews planned (151).

Orbit Control

No update

Fuel consumption

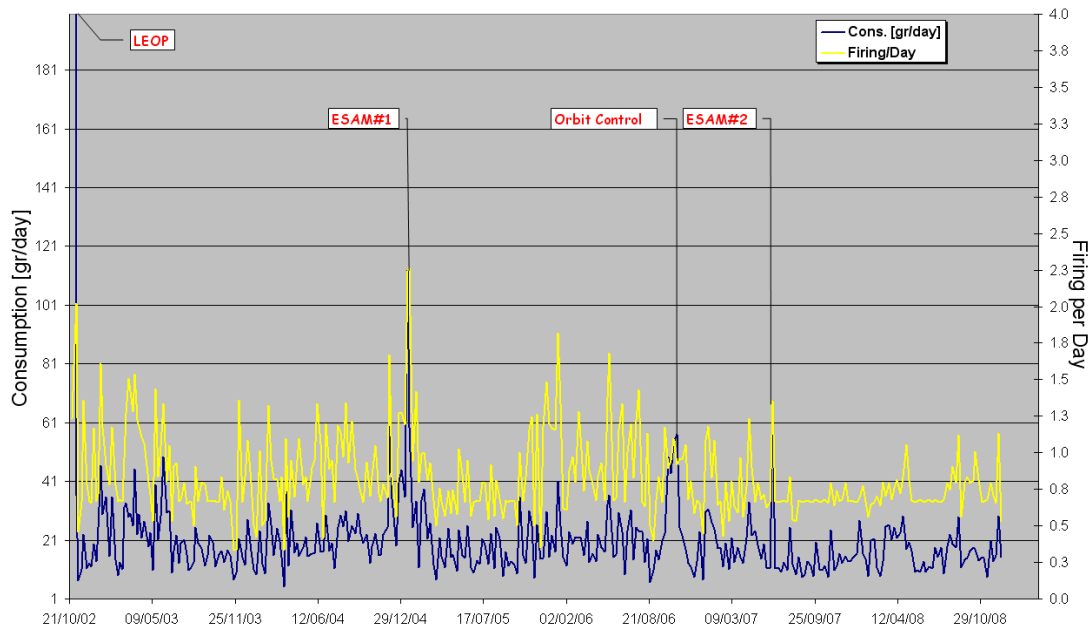
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 19/12/2008 is reported in the plot below.



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 19/12/2008 is reported in the plot below.

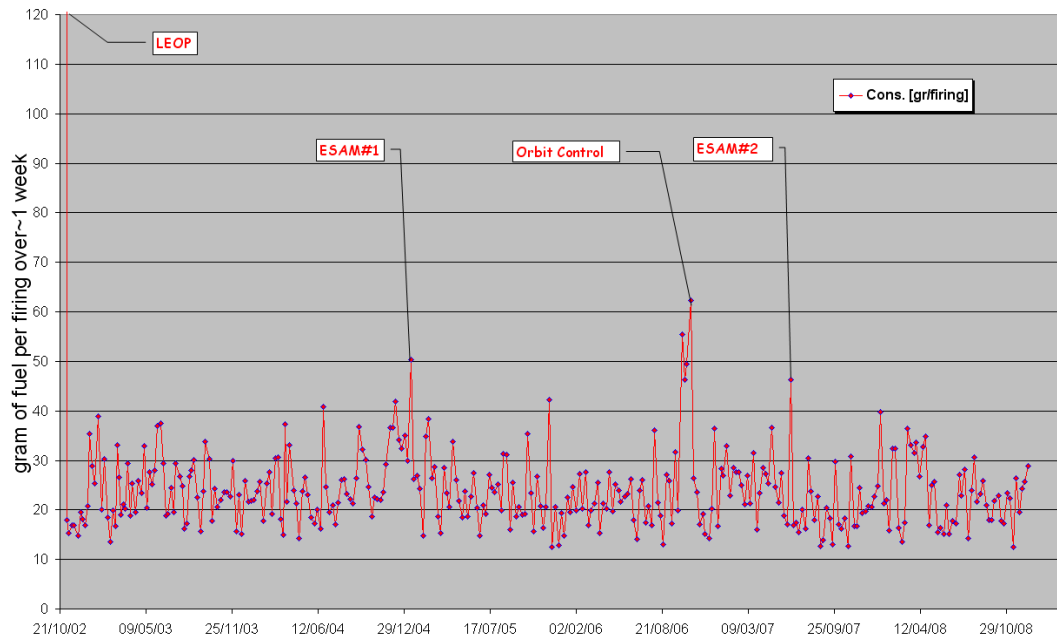
INTEGRAL FIRING PER DAY HISTORY



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

The fuel per firing over the period between 01/11/2002 and 19/12/2008 is shown in the plot below.

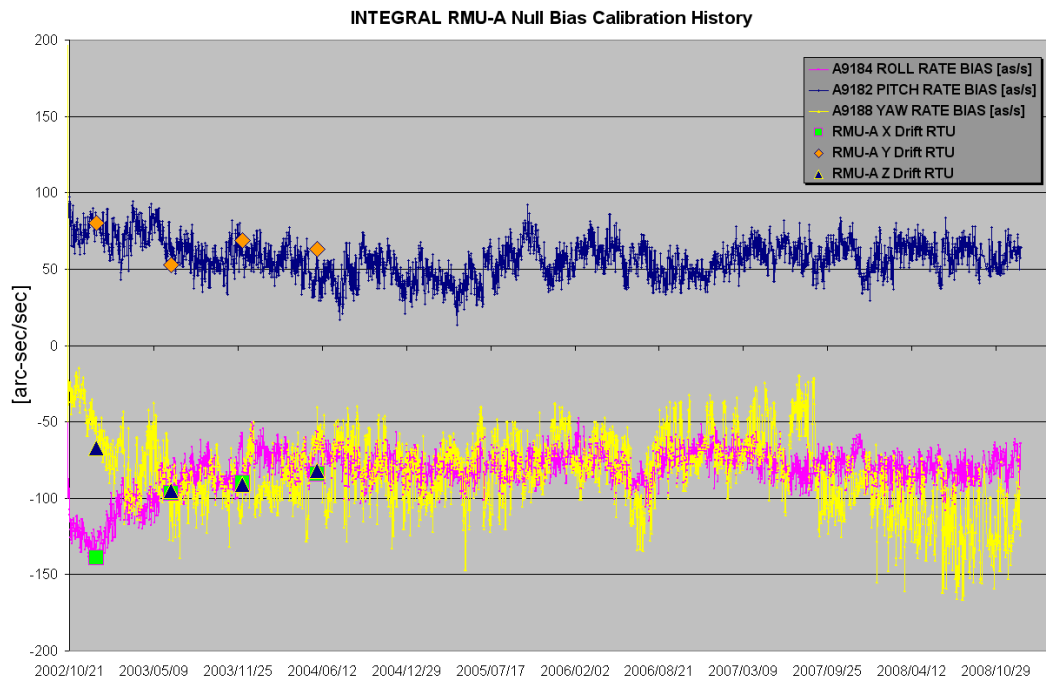
INTEGRAL FUEL MASS PER FIRING HISTORY



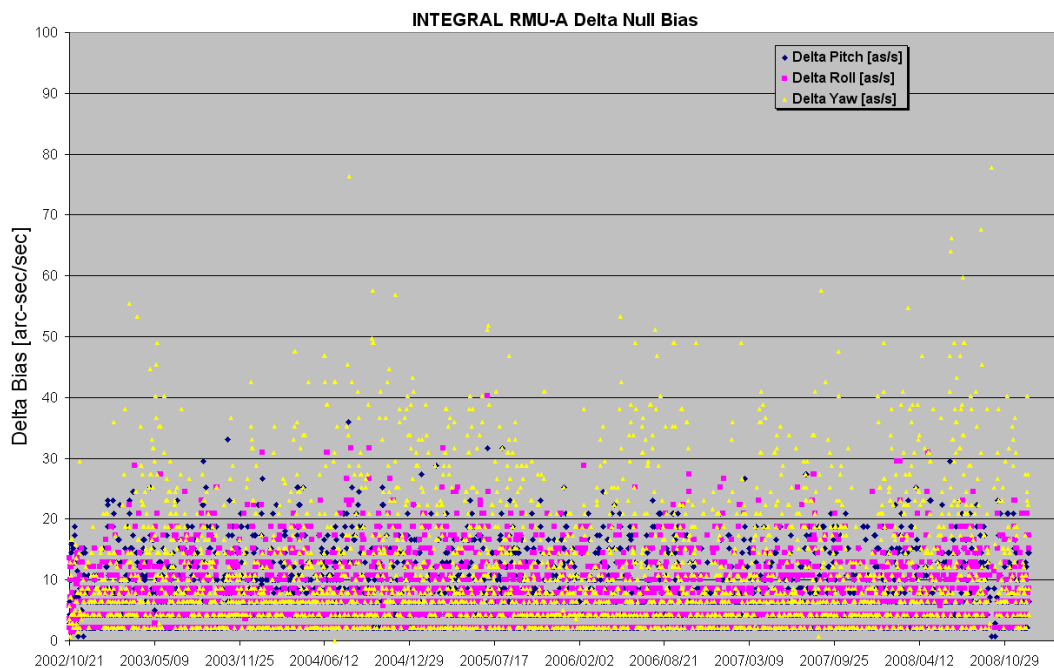
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 26/12/2008 is reported in the plot below.

The evolution of the drift on yaw channel is under constant monitoring but the values are still well within the specs. At moment the current constraints (for drift update generation) on the FDS have been relaxed to cope with the current situation.



The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over period between 01/11/2002 and 26/12/2008 is reported in the plot below.



13/11/2008 (Day of Year 348, Revolution 753)

Problem at REDU station: at 11:15z due to a TC link drop at REDU station the slew commanding fail for slew ID 07530020.

A manual recovery was then performed from the attitude of PID 07530019 to the attitude of PID 07530020 and the next slew ID 07530021 updated in TL.

The following slew was not executed in TL: PID 07530020(CSL)

FDS problem during slew update: at 12:23z a problem on FDS caused the slew update to fail for slew ID 07530022. Due to on-going activities on XMM-Newton satellite, the FD support was requested and the AOCS recovery set in stand-by (with AOCS s/s disabled in TL).

At 13:39z a manual recovery was then performed from the attitude of PID 07530021 to the attitude of PID 07530022 and the next slew ID 07530023 updated in TL.

The following slew was not executed in TL: PID 07530022(CSL)

14/11/2008 (Day of Year 349, Revolution 753)

Problem at DSS station: at 21:51z due to a TM links drop at DSS station the slew commanding fail for slew ID 07530053.

A manual recovery was then performed from the attitude of PID 07530052 to the attitude of PID 07530053 and the next slew ID 07530054 updated in TL.

The following slew was not executed in TL: PID 07530053(OSL)

15/12/2008 (Day of Year 350, Revolution 753-754)

Nothing to report.

16/12/2008 (Day of Year 351, Revolution 754)

FDS problem during slew update: at 12:15z a problem on FDS caused the slew update to fail for slew ID 07540022.

A manual recovery was then performed and the slew ID 07540022 updated in TL.

No slew missed in TL.

17/12/2008 (Day of Year 352, Revolution 754)

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 754, based on the results of the RCS-A Thruster Calibration (executed on 10/12/2008) and the estimations of the thrust level and remaining fuel mass. The new values for AMD On-

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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

Fuel content: 0.1371280E+03 [kg]
Tank pressure: 0.6659383E+01 [bar]
Mean Thruster Force: 0.9421730E+01 [N]

Extrapolated average Force Mag: 9.4220 N

On-time on the basis of this force-mag, rounded down to nearest 0.000244s LSb:

$$1.3/9.4220 = 0.137975 \rightarrow 565 \text{ (raw)} = 0.137860 \text{ s}$$

THRUSTERS IMPULSE MONITORS

TIM results rounded-up to nearest LSb -

RTIM rounded-up to nearest 0.125s LSb = 6.75 [54 raw]

PTIM rounded-up to nearest 0.125s LSb = 2.25 [18 raw]

YTIM rounded-up to nearest 0.03125s LSb = 35.34375 [1131 raw]

TTIM rounded-up to nearest 16s LSb = 432s [27 raw]

RCS-A THRUSTERS TORQUES RECIPROCAL

AERCA_00 S

M F 4

2008-12-18T11:53:00Z

2008-12-18T11:53:00Z

A

TORQ_X_A R 0.2710840E+00 1/Nm D Reciprocal Roll Torque (A)

TORQ_Y_A R 0.8865956E-01 1/Nm D Reciprocal Pitch Torque (A)

TORQ_Z_A R 0.7384044E-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

2008-12-18T11:53:00Z

2008-12-18T11:53:00Z

AAAA1

IXX R 0.6181300E+04 Kgm2 D S/C inertia Ixx

IYY R 0.8140490E+04 Kgm2 D S/C inertia Iyy

IZZ R 0.8290610E+04 Kgm2 D S/C inertia Izz

IXY R 0.3667160E+02 Kgm2 D S/C inertia Ixy

IXZ R -0.1626970E+03 Kgm2 D S/C inertia Ixz

IYZ R 0.1333880E+02 Kgm2 D S/C inertia Iyz

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AMD ON-TIMES

AEOTA_00 S

M F 32

2008-12-18T11:53:00Z

2008-12-18T11:53:00Z

A

MON_W1T1	R	0.6539200E-01	sec	D	AMD decrease on-time	(W1,Th1)
MON_W1T2	R	0.2320440E+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	0.2993880E+00	sec	D	AMD decrease on-time	(W1,Th4)
MON_W2T1	R	0.6368400E-01	sec	D	AMD decrease on-time	(W2,Th1)
MON_W2T2	R	0.1442040E+00	sec	D	AMD decrease on-time	(W2,Th2)
MON_W2T3	R	0.8027600E-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	0.3079280E+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	0.2364360E+00	sec	D	AMD decrease on-time	(W3,Th3)
MON_W3T4	R	0.6929600E-01	sec	D	AMD decrease on-time	(W3,Th4)
MON_W4T1	R	0.1378600E+00	sec	D	AMD decrease on-time	(W4,Th1)
MON_W4T2	R	0.6222000E-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	0.7173600E-01	sec	D	AMD decrease on-time	(W4,Th4)
MOFFW1T1	R	0.2361920E+00	sec	D	AMD increase on-time	(W1,Th1)
MOFFW1T2	R	0.8442400E-01	sec	D	AMD increase on-time	(W1,Th2)
MOFFW1T3	R	0.3193960E+00	sec	D	AMD increase on-time	(W1,Th3)
MOFFW1T4	R	0.0000000E+00	sec	D	AMD increase on-time	(W1,Th4)
MOFFW2T1	R	0.7393200E-01	sec	D	AMD increase on-time	(W2,Th1)
MOFFW2T2	R	0.0000000E+00	sec	D	AMD increase on-time	(W2,Th2)
MOFFW2T3	R	0.6539200E-01	sec	D	AMD increase on-time	(W2,Th3)
MOFFW2T4	R	0.1363960E+00	sec	D	AMD increase on-time	(W2,Th4)
MOFFW3T1	R	0.0000000E+00	sec	D	AMD increase on-time	(W3,Th1)
MOFFW3T2	R	0.3230560E+00	sec	D	AMD increase on-time	(W3,Th2)
MOFFW3T3	R	0.8954800E-01	sec	D	AMD increase on-time	(W3,Th3)
MOFFW3T4	R	0.2361920E+00	sec	D	AMD increase on-time	(W3,Th4)
MOFFW4T1	R	0.0000000E+00	sec	D	AMD increase on-time	(W4,Th1)
MOFFW4T2	R	0.8222800E-01	sec	D	AMD increase on-time	(W4,Th2)
MOFFW4T3	R	0.1459120E+00	sec	D	AMD increase on-time	(W4,Th3)
MOFFW4T4	R	0.6490400E-01	sec	D	AMD increase on-time	(W4,Th4)

18/12/2008 (Day of Year 353, Revolution 754-755)

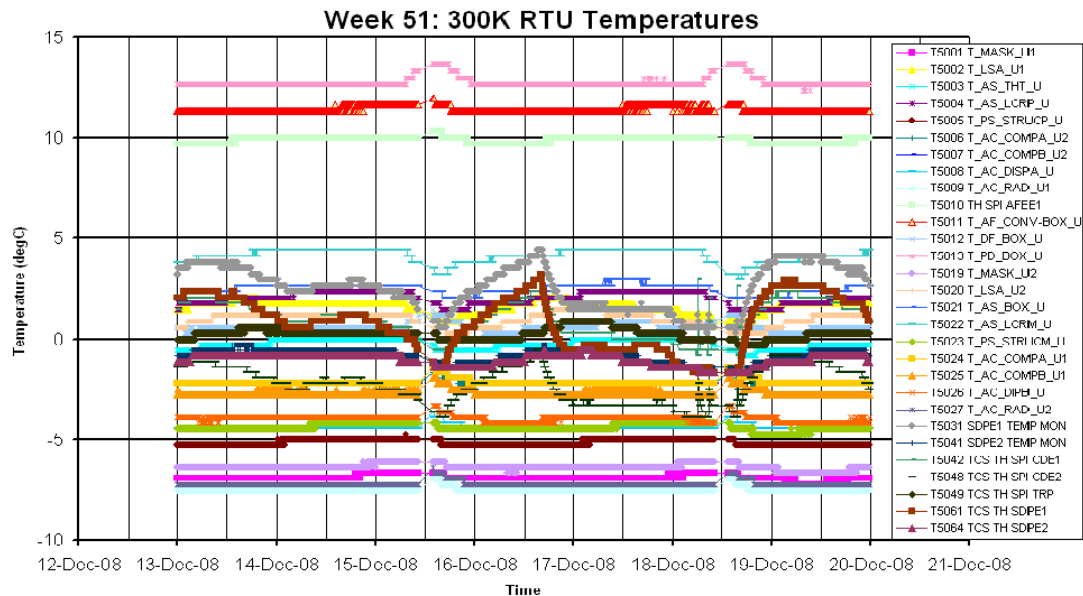
Nothing to report.

19/12/2008 (Day of Year 354, Revolution 755)

Nothing to report.

7.3.2 SPI Operations

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



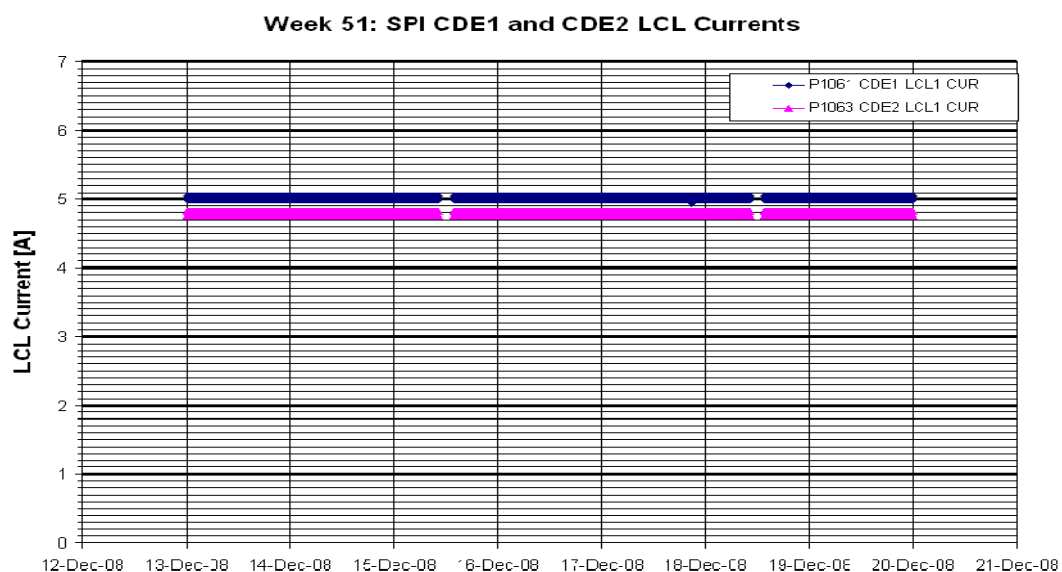
Stirling Compressors and Cryostat: The performance of the compressors is nominal.

The cold plate temperature was maintained in the range 80K +/-1K.

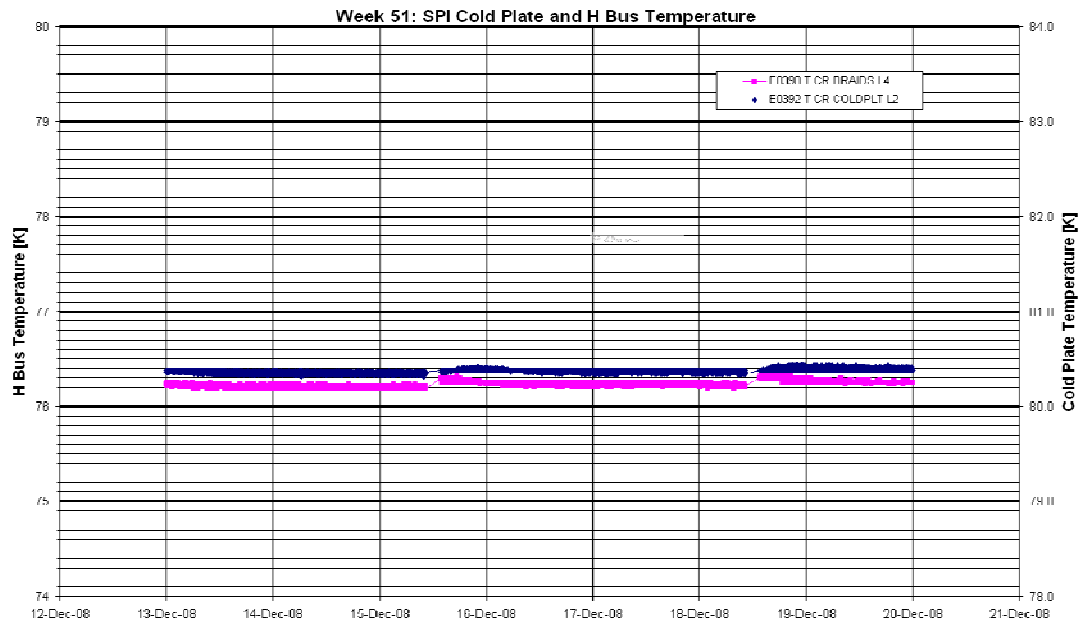
The stroke of all four compressors was set to 41 throughout the week and the average CDE LCL currents were as follows:

- CDE1 LCL Current = 5.01A
- CDE2 LCL Current = 4.80A

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



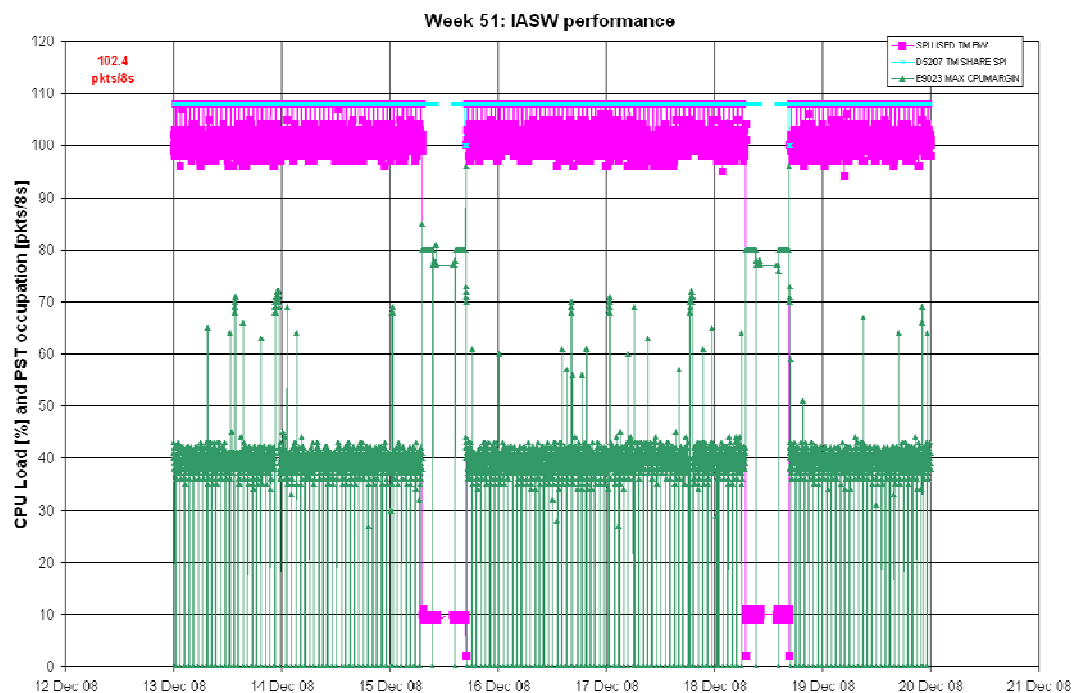
The following plot shows the evolution of the cold plate and H bus temperatures during the reporting period.



DPE & IASW: The DPE health and IASW performance are nominal.

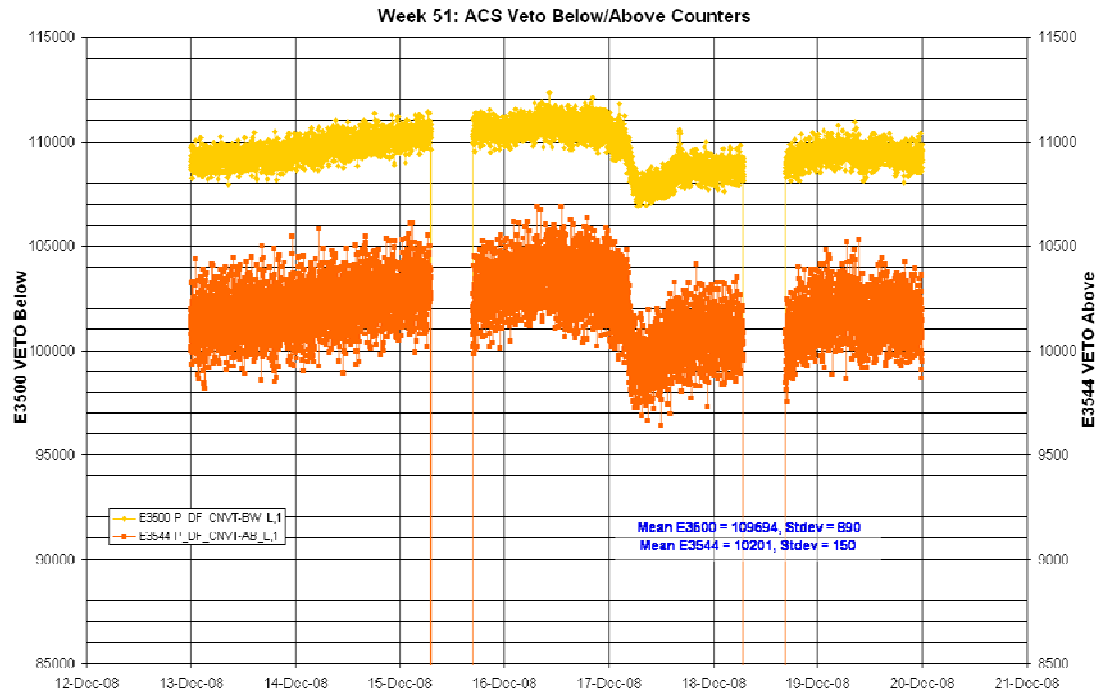
The IASW version installed is v4.3.4 with SE compression only enabled and the spectra scaling factor set to 8/19 SE. The average TM bandwidth occupation of SPI was 102.4 packets/cycle over the science window when the TM allocation was 108 packets/cycle.

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

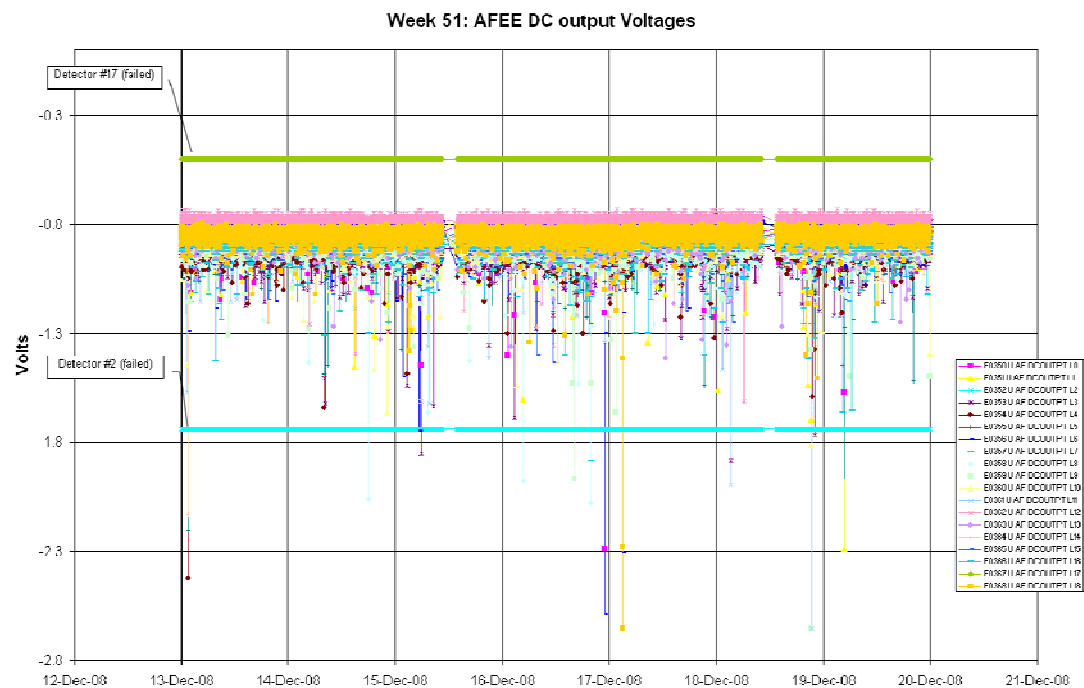


ACS: The performance of the ACS is nominal, except for FEE #81 which remains nominally switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is nominally OFF due to the anomaly on 5/8/2003 (INT_SC-61).

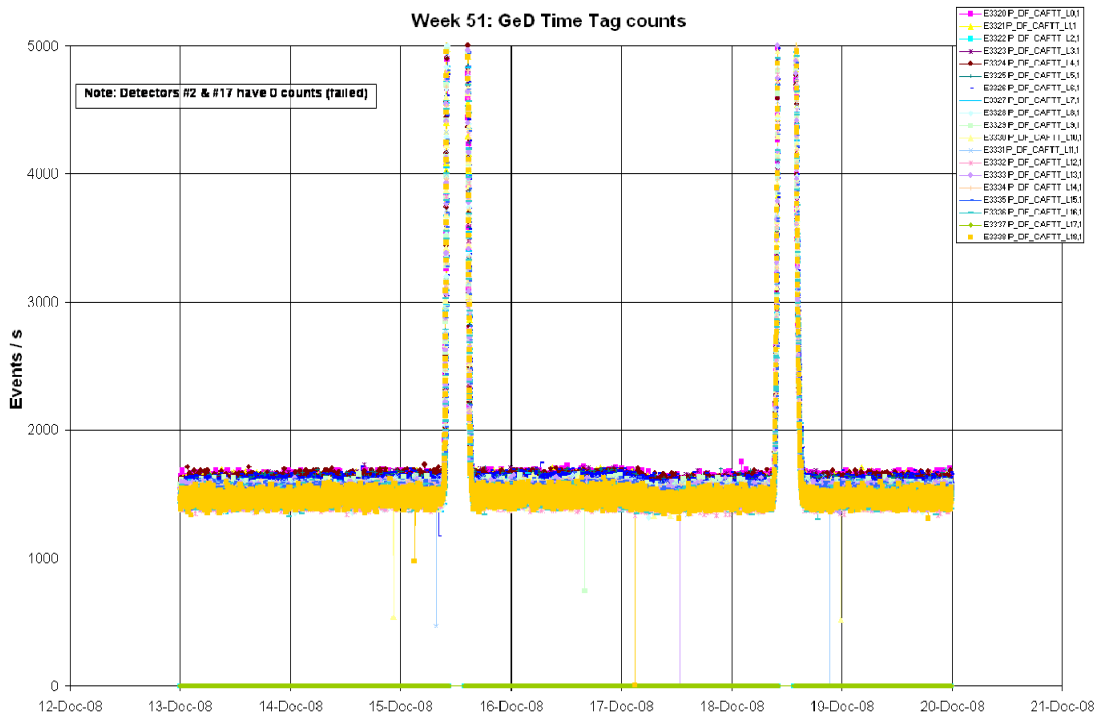
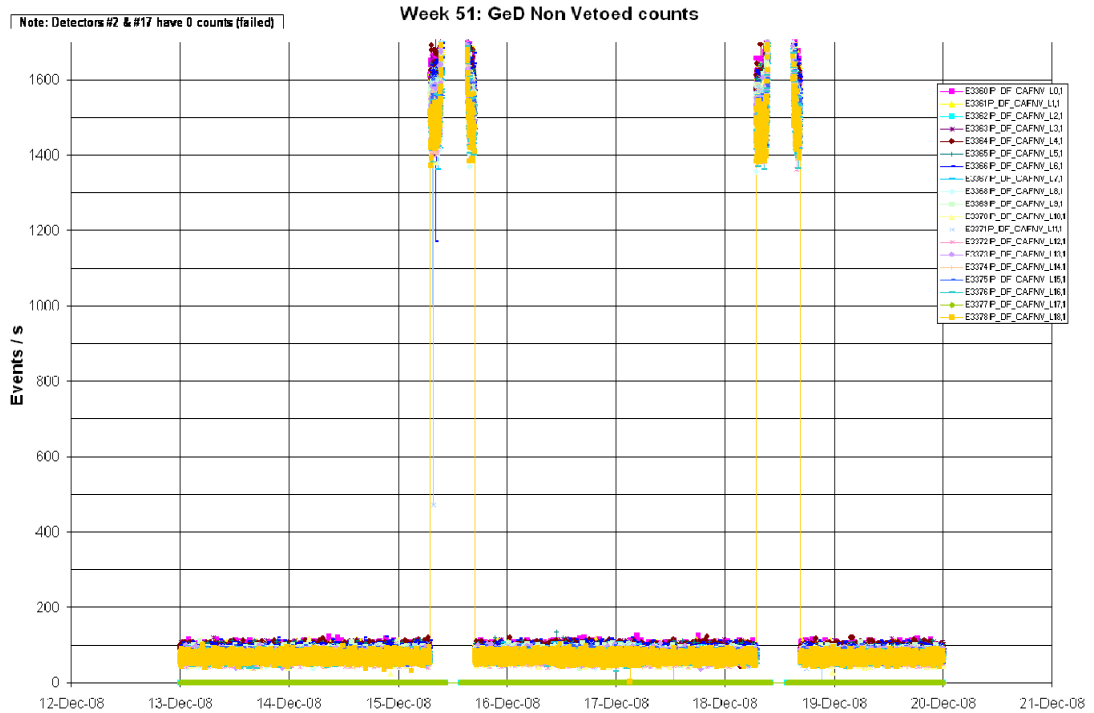
The following plot shows the ACS overall count rate evolution during the reporting period:

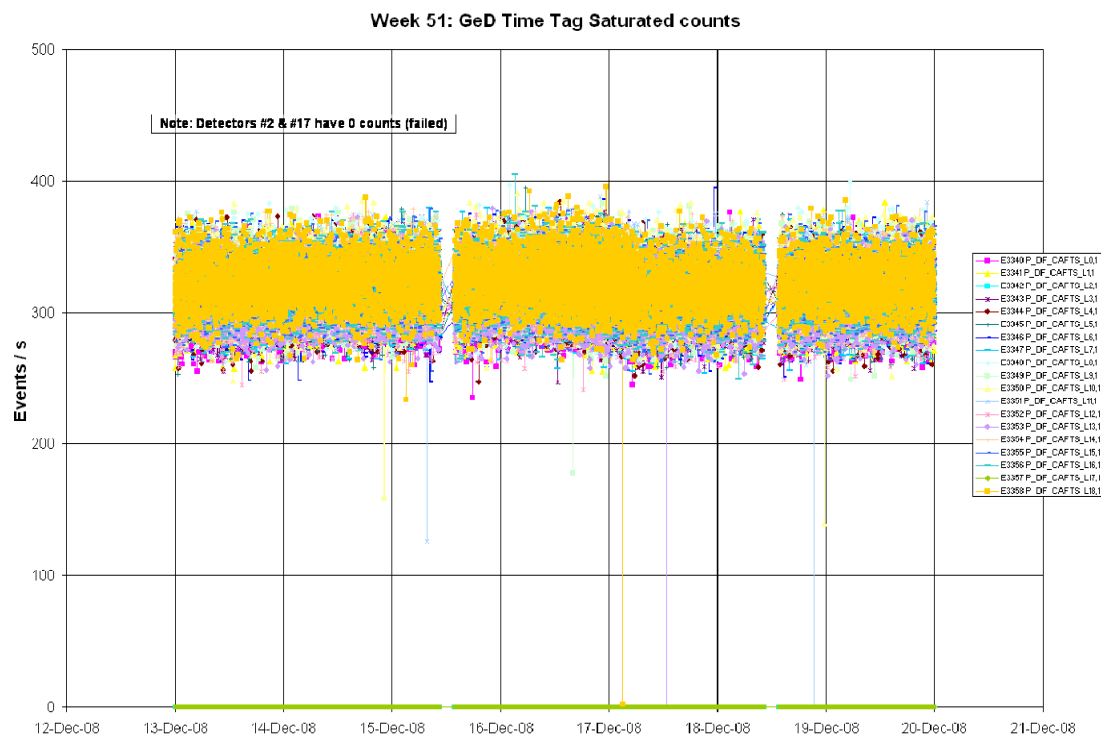


AFEE: The health of the AFEE is nominal. The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.

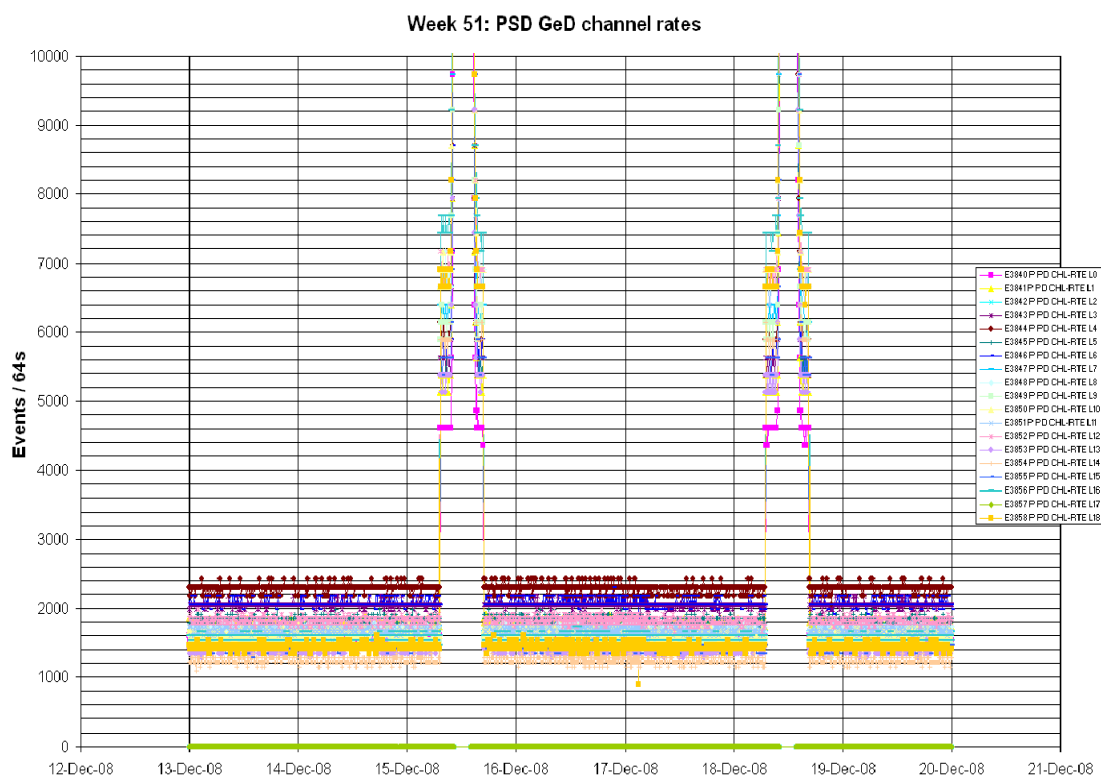


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event count rates during the reporting period.





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



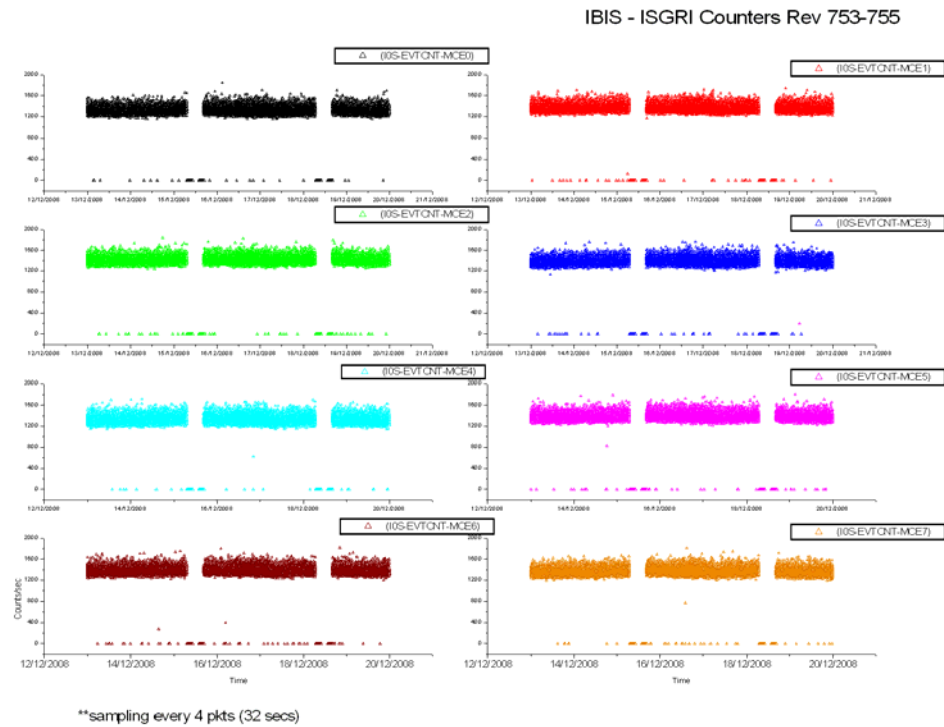
Event Log:

No non-nominal events occurred with SPI during the reporting period.

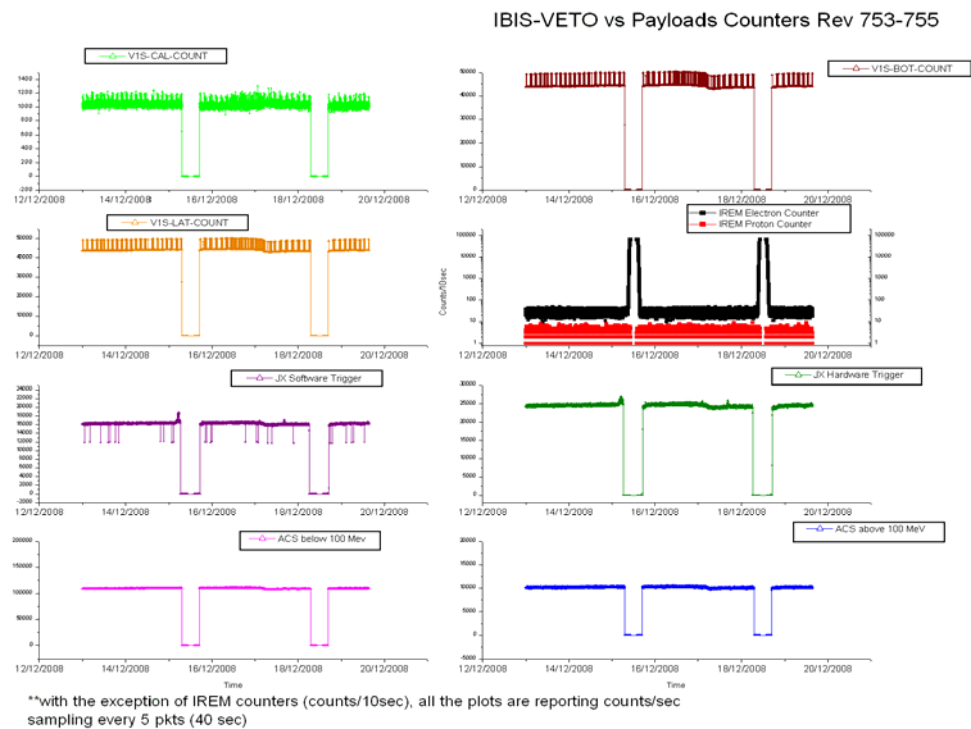
7.3.3 IBIS Operations

IBIS Event Counters Plots

ISGRI Counters:

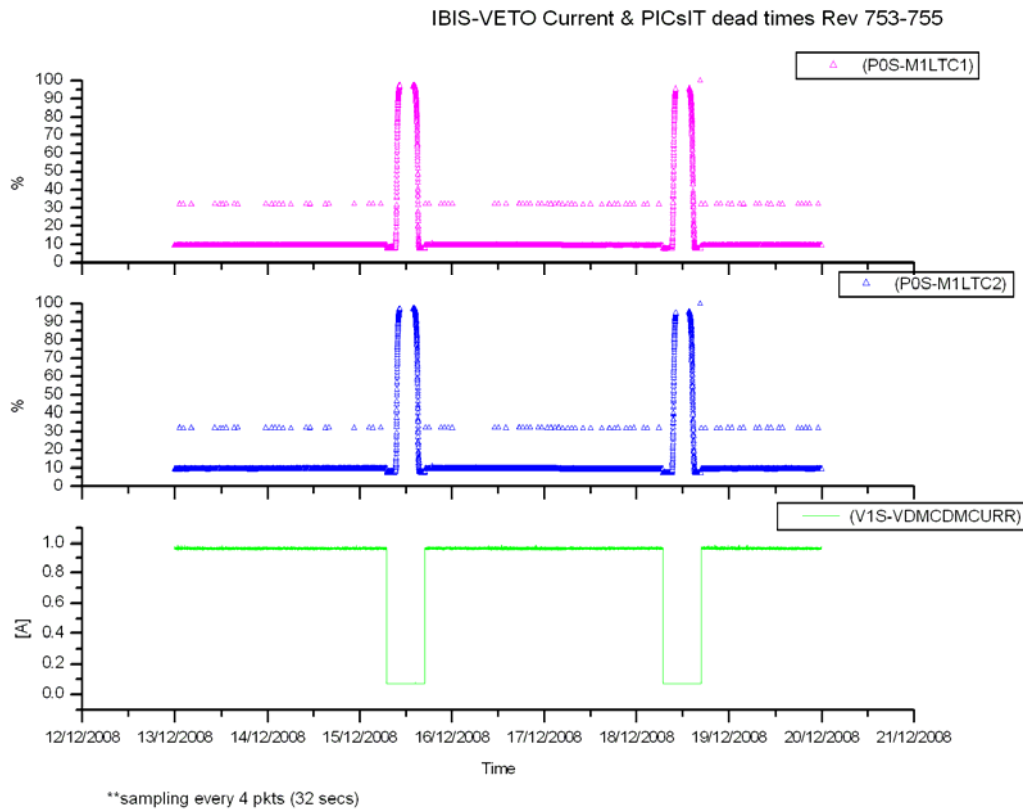


VETO vs Payload Counters:

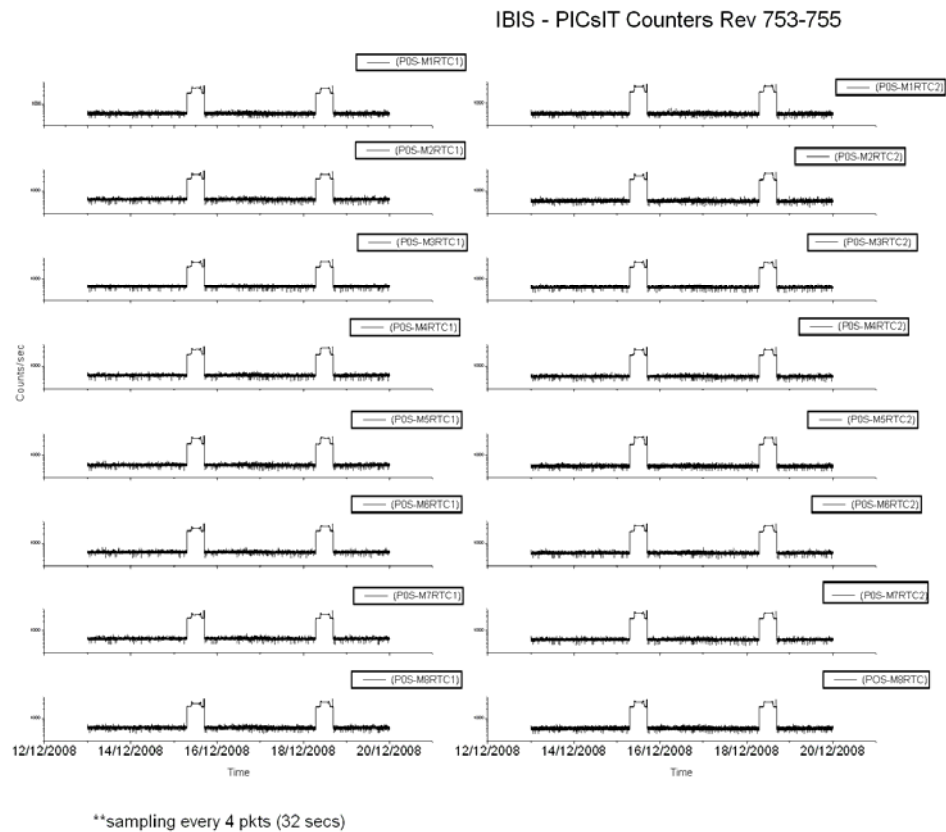


The week was characterised by low radiation as reported by the payload.

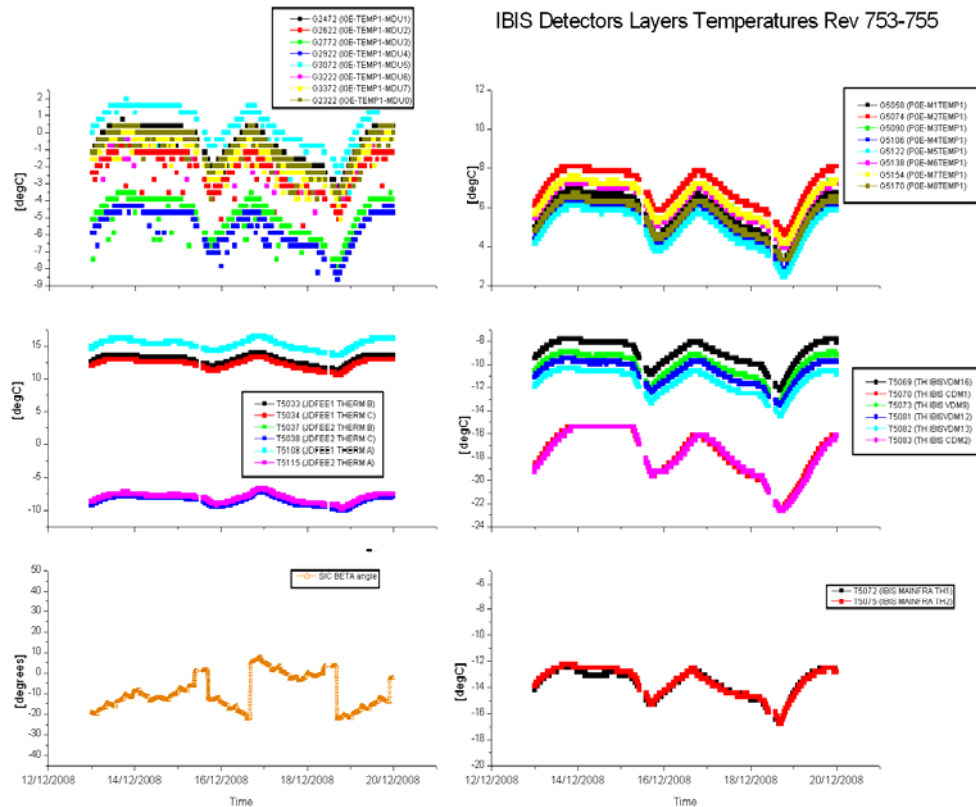
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



**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.

2008-12-13 (DOY 348, Rev 753)

At 06:23:23Z TM parameter G2070 went OOL, indicating an overflow of the noisy pixel address buffer in MCE5. As it returned within limits of its own accord at 06:23:31Z, no action was taken.

2008-12-14 (DOY 349, Rev 753)

At 21:12:19Z TM parameter G2097 went OOL (value = 0). This is the number of events triggering the MCE6 per second. As it returned within limits of its own accord at 21:15:55Z, no action was taken.

2008-12-15 (DOY 350, Rev 753-754)

At 09:38:40Z, during the radiation belt passage, TM parameter G5079 went OOL (value = 2.60509804V). This is the PDM2 +2.5V. As it returned within limits of its own accord at 09:39:12Z, no action was taken.

2008-12-16 (DOY 351, Rev 754)

At 22:54:19Z TM parameter G2070 went OOL, indicating an overflow of the noisy pixel address buffer in MCE5. As it returned within limits of its own accord at 22:54:27Z, no action was taken.

2008-12-17 (DOY 352, Rev 754) to 2008-12-19 (DOY 354, Rev 755)

IBIS operations executed nominally.

7.3.4 JEM-X Operations

JEM-X Count Rates

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



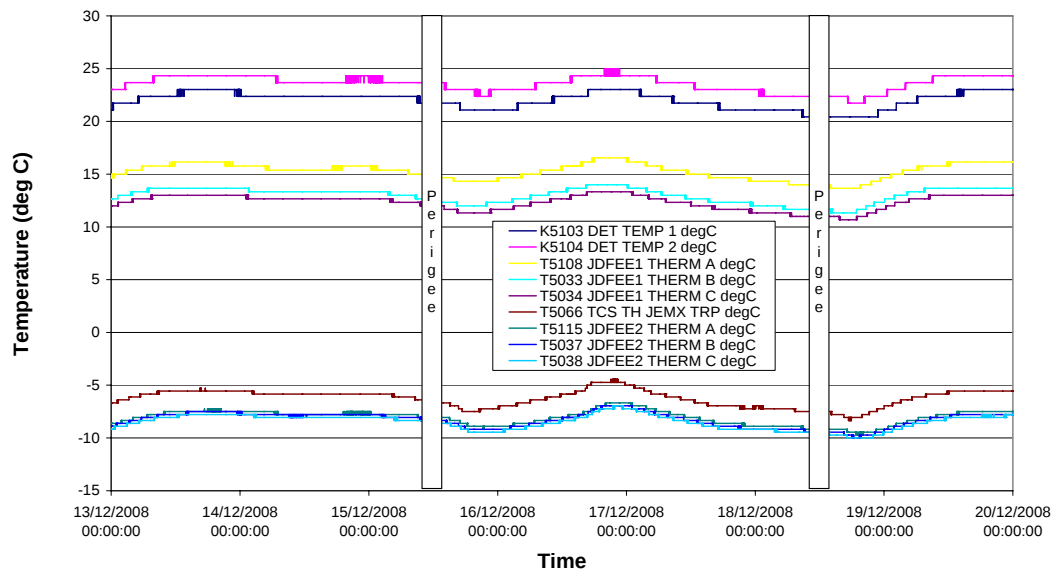
JEM-X Temperatures

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

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

² Data sampled (1 frame in 8)

JEMX Detector & DFEE Temperatures



JEM-X Daily Report

2008-12-13 (DoY 348, Rev 753) to 2008-12-19 (DoY 354, Rev 755)

JEM-X 1 operations executed nominally.

7.3.5 OMC Operations

2008-12-13 (DoY 348, Rev 753)

At 12:23, an AOCS problem prevents the update of slew 07530022. A recovery was performed, and the timeline rejoined at 13:56. The impact was the loss of pointing 07530022. It was at this time that the following pair of commands was rejected:

```
2008.348.13.18.20.683 2008.348.13.18.35.057 1792 RealTime 131 TC REJECT
REJECTED TC1 0 0 65535 PR N
E E
2008.348.13.18.13.870 2008.348.13.18.22.333 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 that pointing.

2008-12-14 (DoY 349, Rev 753)

At 21:51, a TM drop from DSS27 forced a suspension of the Timeline. A recovery was performed and the timeline rejoined at 22:42. The impact was the loss of pointing 07530053.

2008-12-15 (DoY 350, Rev 753) to 2008-12-19 (DoY 354, Rev 755)

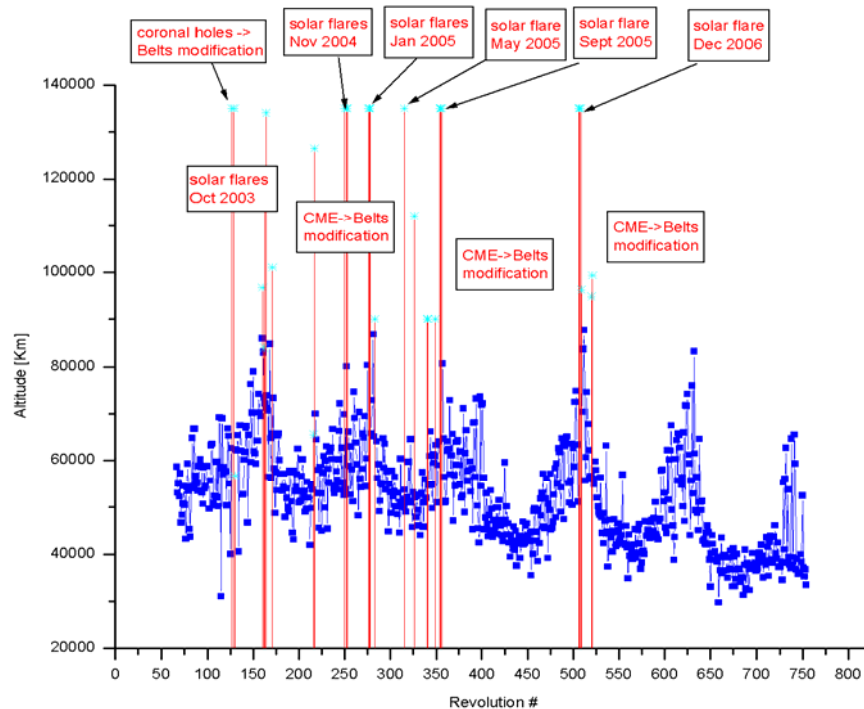
Nothing to report.

On DoY 350 at 07:05:25 and DoY 353 at 06:51:34 OMC went to SAFE mode nominally, at the radiation belt entry time as set in the Broadcast Packet.

7.3.6 IREM Operations

Radiation Belts Entry

Evolution of Radiation Belt Entry 2003-2008



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]
753	RAD_ENTR R 2008-12-15T07:05:22Z	15/12/2008 09:10:28	36738.9	15-Dec-2008 09:23:48	35862.16
754	RAD_EXIT R 2008-12-15T16:47:54Z	15/12/2008 15:37:08	>>33950.6	15-Dec-2008 16:13:48	46812.87
754	RAD_ENTR R 2008-12-18T06:51:33Z	18/12/2008 09:13:25	33478.1	18-Dec-2008 09:19:22	34723.49
755	RAD_EXIT R 2008-12-18T16:34:07Z	18/12/2008 15:19:57	>>33950.6	18-Dec-2008 15:59:22	46281.01

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)

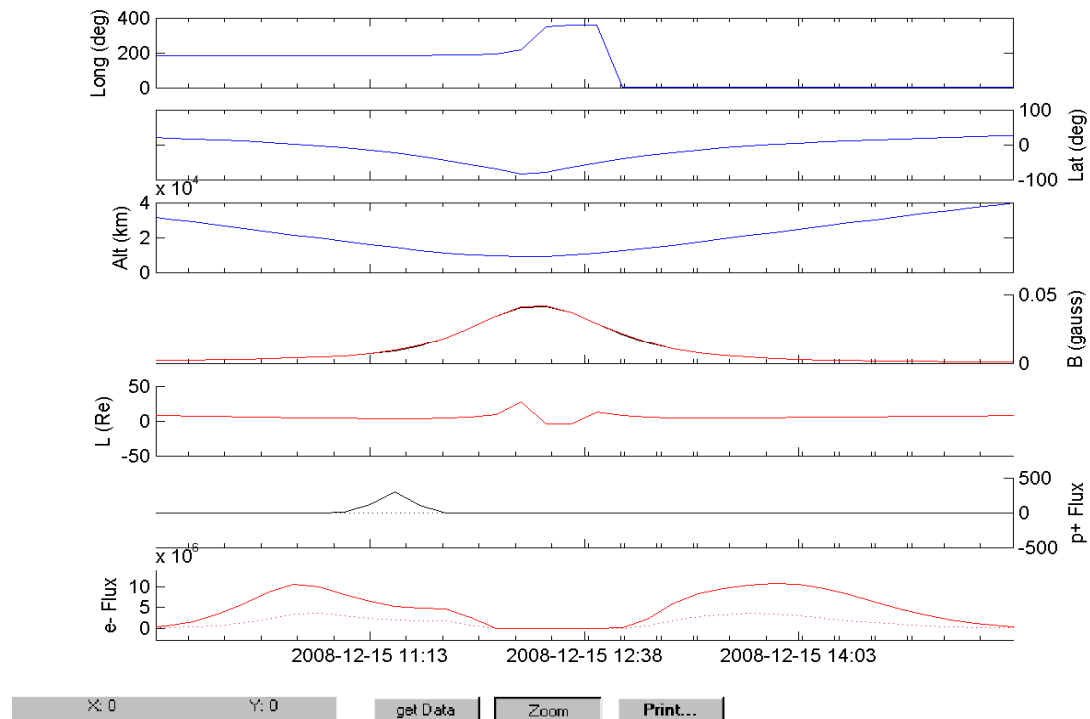
* Rad belt entry time ignoring previous threshold crossings where a gap of more than 30 minutes is present.

IREM radiation counters:

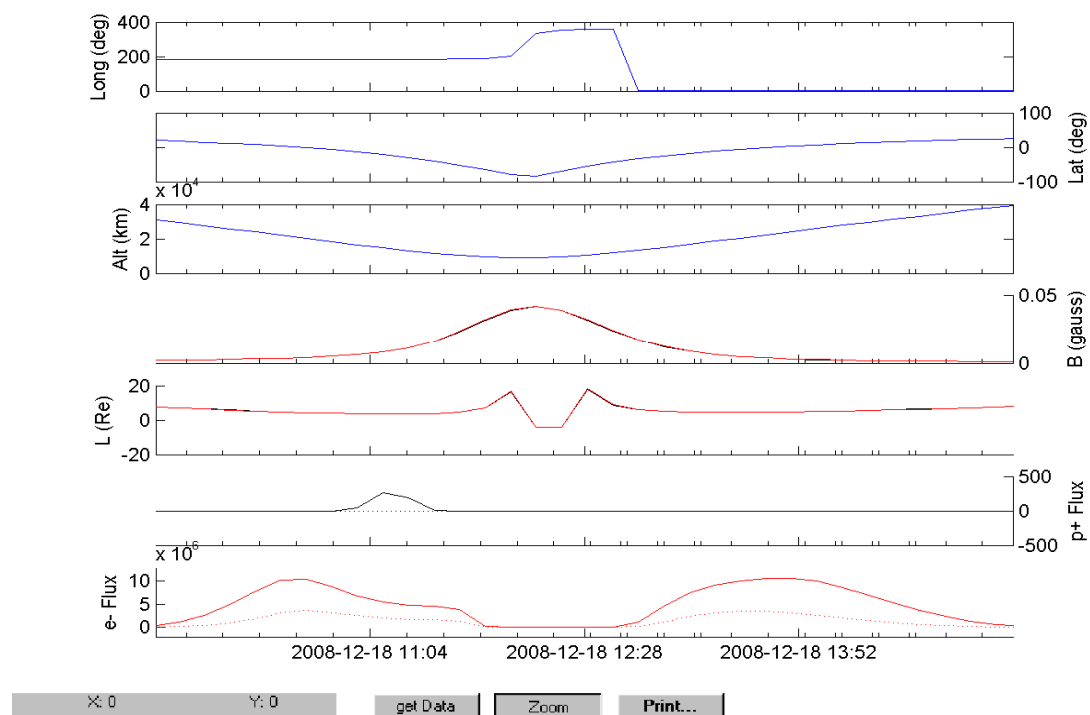
The IREM radiation counter plots are not available this week.

IREM Predicted Radiation Belt Passages

Rev 753



Rev 754



Radiation Assessment

Generated with SEIS Report and Analysis tool.

INTRODUCTION

This note summarises the space weather status during the observation period

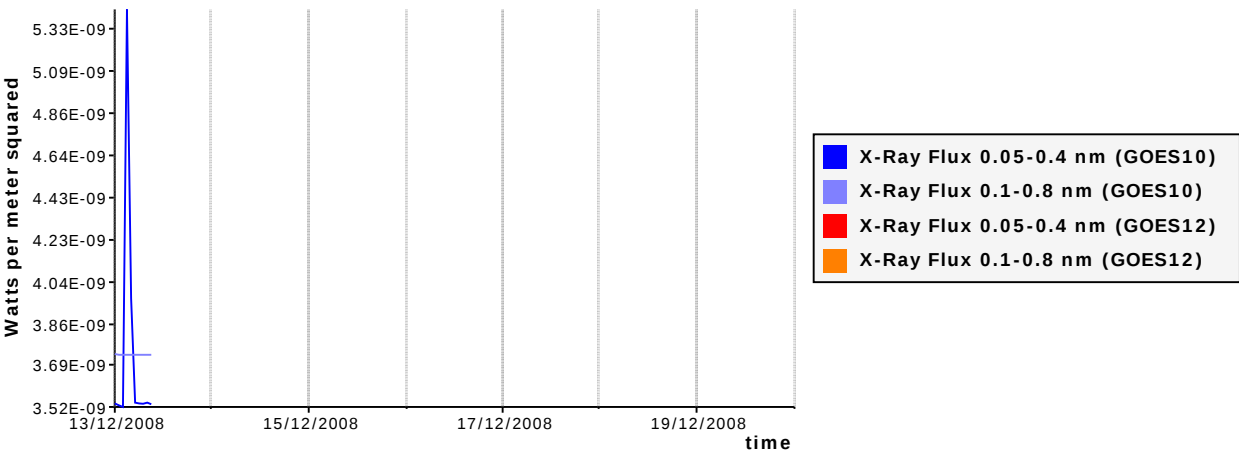
DAILY SUN

see in sections before

RADIATION FLUXES

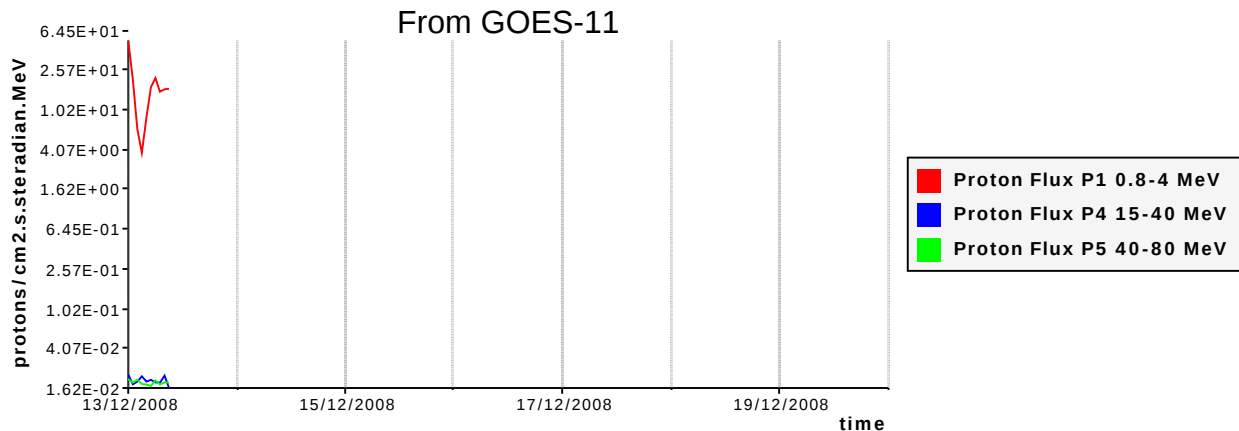
X-ray fluxes

X-ray fluxes for different energies are presented below as reported by GOES satellites. From $1\text{E-}5$ W/m², they start featuring significant radiation activity corresponding to M-class solar flares from $1\text{E-}5$ to $1\text{E-}4$ W/m², and to X-class solar flares from $1\text{E-}4$ and onwards.



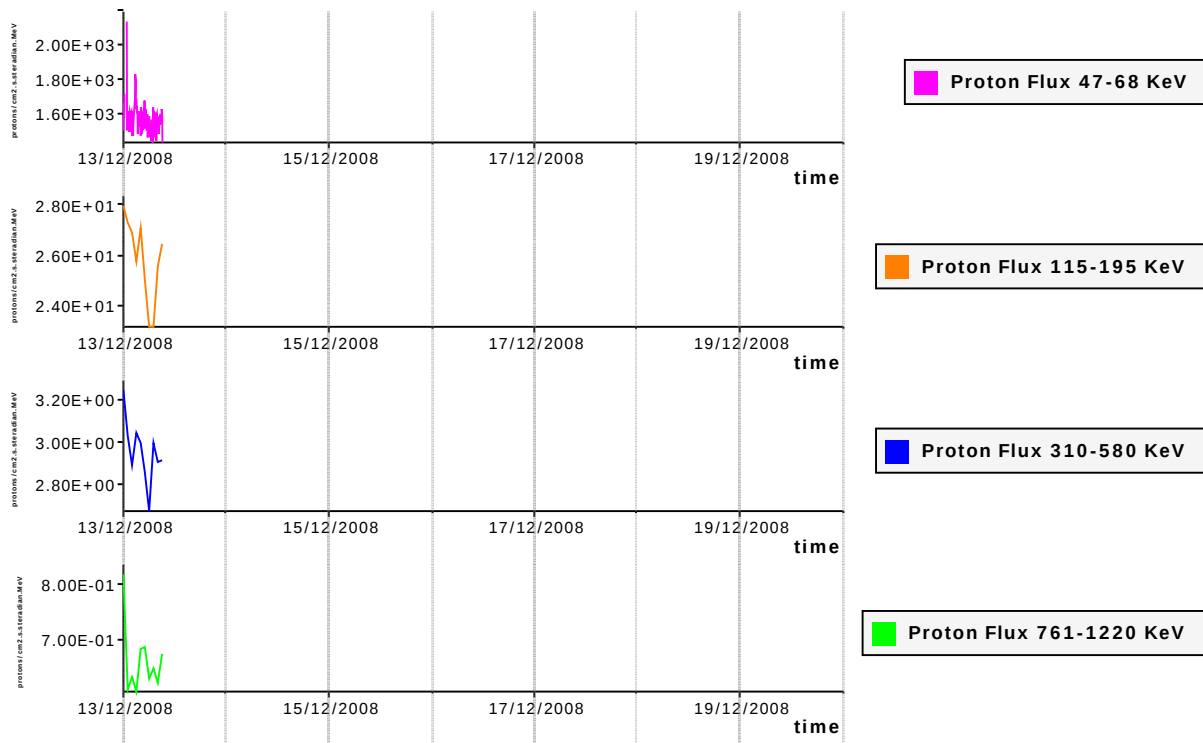
Proton fluxes (GOES-11)

Proton fluxes as measured by GOES satellites are presented in the following plot. Usually P1 oscillates between $1\text{E}+1$ and $1\text{E}+2$, while P2 and P3 evolve around $1\text{E-}2$.



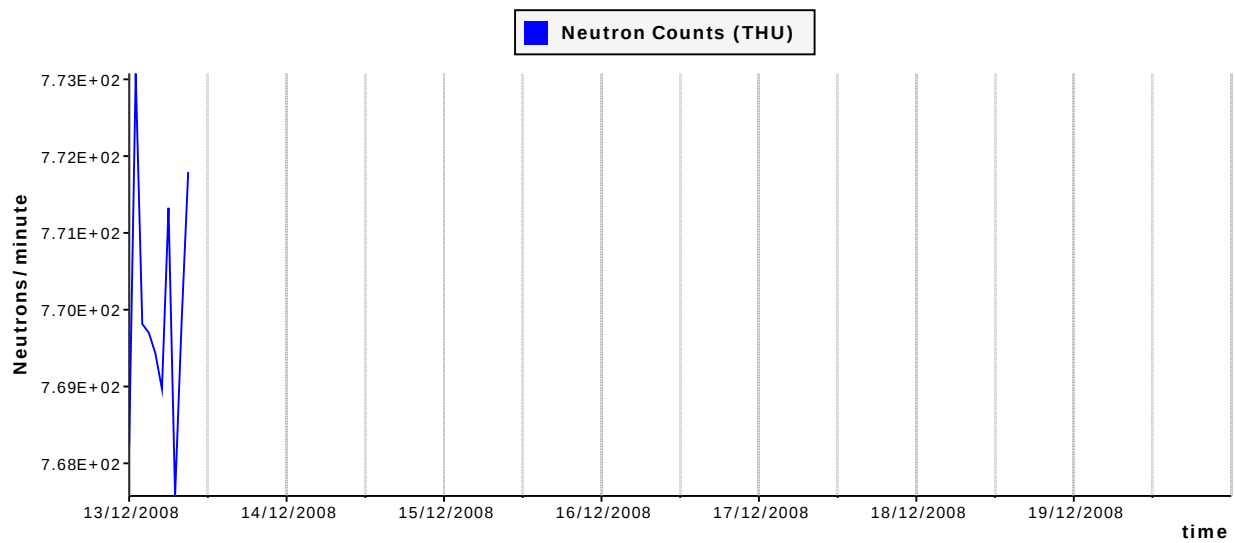
Proton fluxes (ACE)

Proton fluxes as measured by ACE satellite are presented in the following plot.



Neutron counts

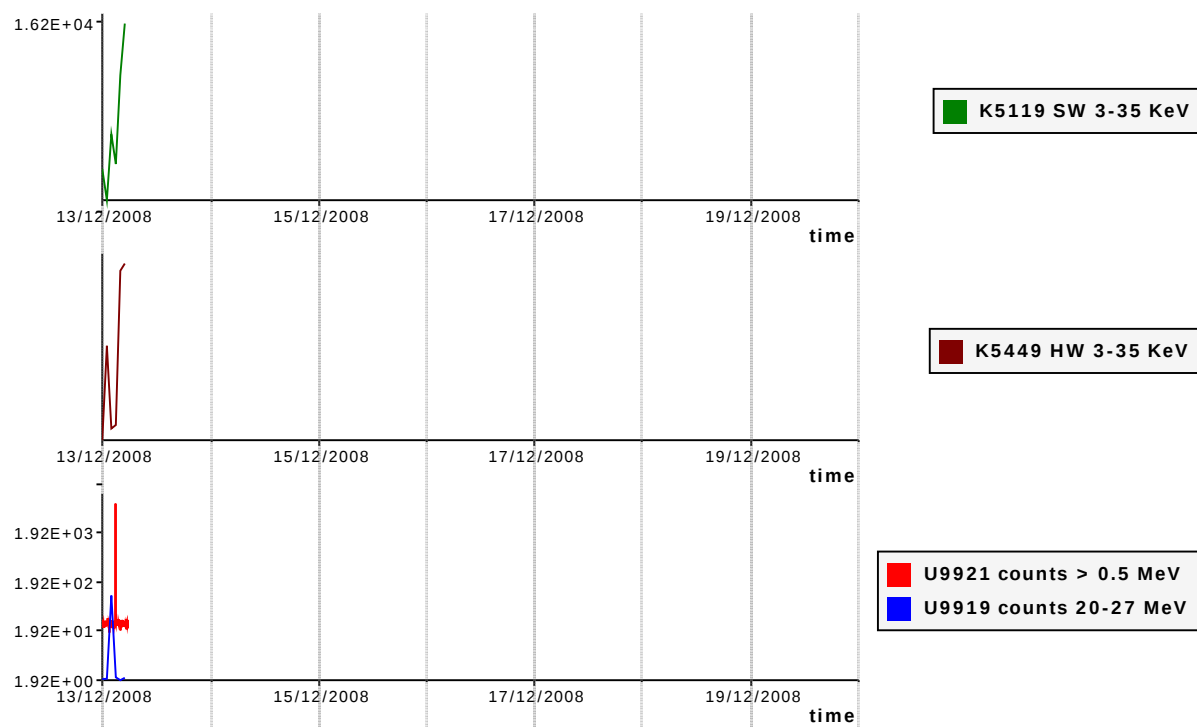
The neutron counts for the last 3 days are presented in the following plot. Nominally they remain stable around 7.2E+2.



IREM and JEM-X (INTEGRAL)

IREM proton and electron fluxes as well as JEM-X1 software and hardware triggers are presented in the following plots.

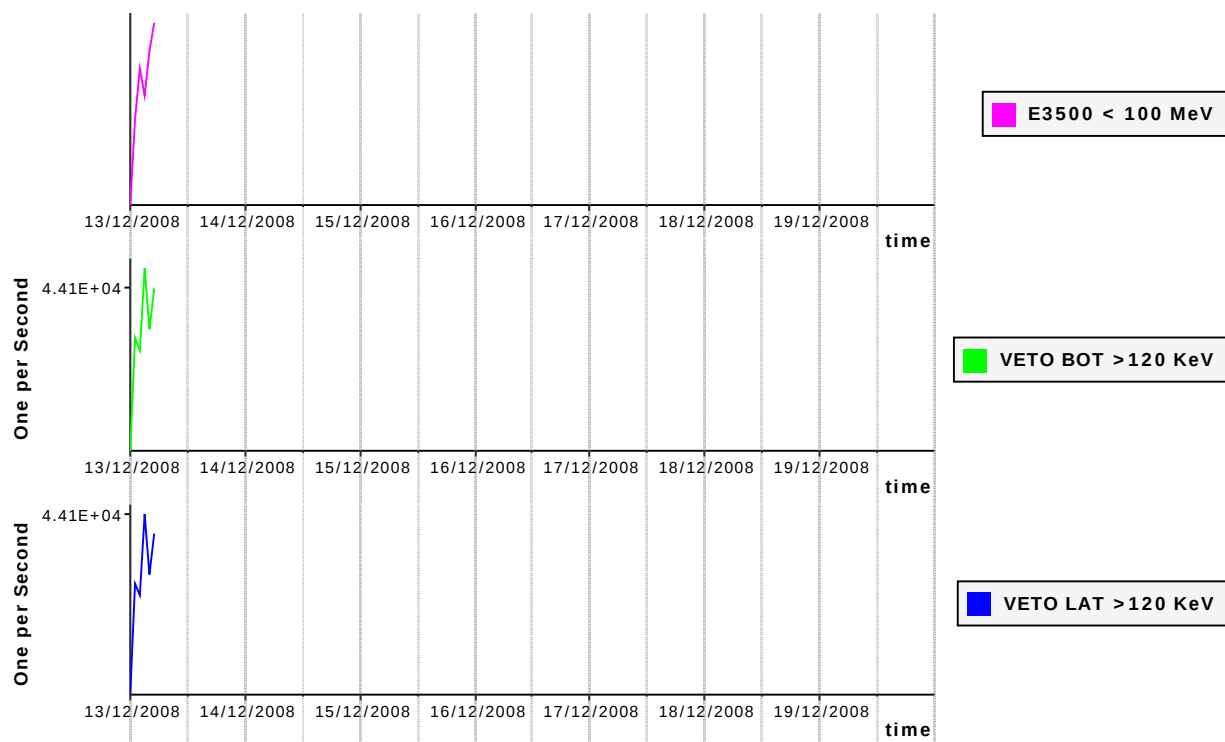
Nominal values are respectively about 1 and 18 for IREM counts, and, 13000 and 19000 for JEM-X ones.



SPI and IBIS (INTEGRAL)

SPI-ACS counters below 100MeV as well as IBIS-VETO bottom and lateral counters are presented in the following plots.

Nominal values are respectively about 90000 for SPI counts, and 36000 for IBIS ones.



SOLAR FLARES FORECAST

The probabilities of M and X-class solar flares during the last month are presented below. Chances of solar flare start to be meaningful from 15%.

