

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 330
Week 03
19.01.09
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.....	9
8	Appendix.....	10
8.1	Overview of Revolutions.....	10
8.2	Consumables.....	10
8.2.1	Detailed Fuel Book-keeping.....	10
8.3	Detailed Satellite Information.....	11
8.3.1	AOCS SUMMARY OPERATIONS REPORT, 10/01/2009 – 16/01/2009.....	11
8.3.2	SPI Operations.....	15
8.3.3	IBIS Operations.....	21
8.3.4	JEM-X Operations.....	24
8.3.5	OMC Operations.....	25
8.3.6	IREM Operations.....	26

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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 10.01.09 until 16.01.09 (both dates inclusive) and covers the revolutions 762, 763 and 764.

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 North Ecliptic Pole (RA 18:00:00.00, DEC +66:33:39.0), a staring OMC FF Calibration (RA 13:01:12.00, DEC +06:48:00.0), a hexagonal dither of Loop I-Loop IV Super (RA 13:57:10.00, DEC +07:34:37.0), a Target of Opportunity, a hexagonal dither of the PKS 1510-089 (RA 15:12:50.53, DEC -09:05:59.8) and a hexagonal dither of Centaurus A (RA 13:25:27.61, DEC -43:01:08.9).

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 on TC/TM links at REDU and DSS27 stations.

The fuel consumption over the period between 10/01/2009 and 16/01/2009 was 0.1271 Kg. The remaining propellant is in the order of 136.4853 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

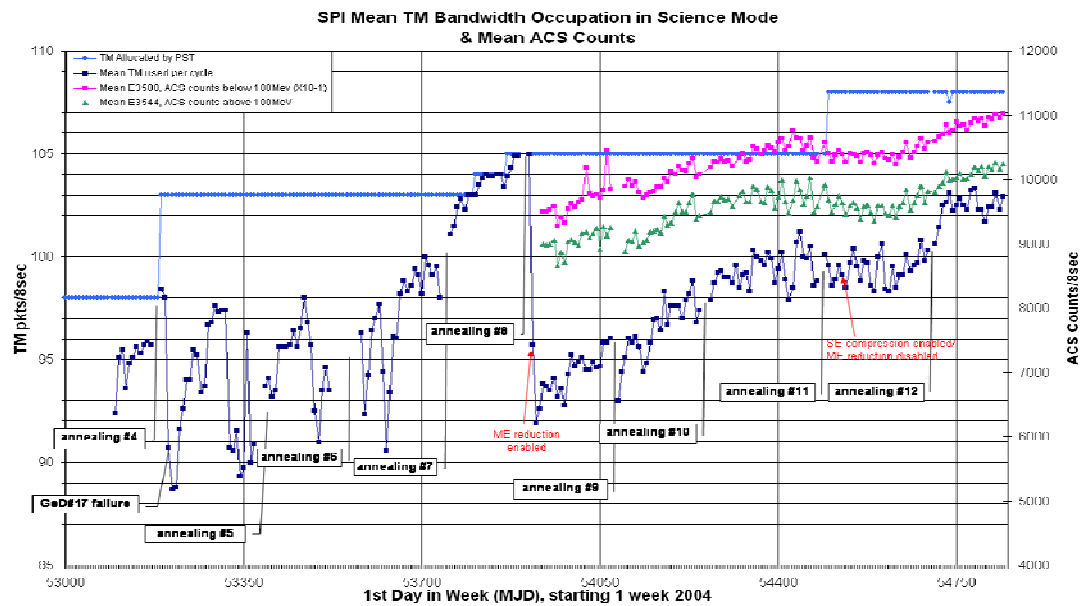
3.2.1 SPI

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 except from 2009-01-10T02:52:03Z to 2009-01-10T06:38:44Z, when it was 88 packets/cycle due to an OMC FFC. The average telemetry occupation when the allocation was 108 packets/cycle was 102.9 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.

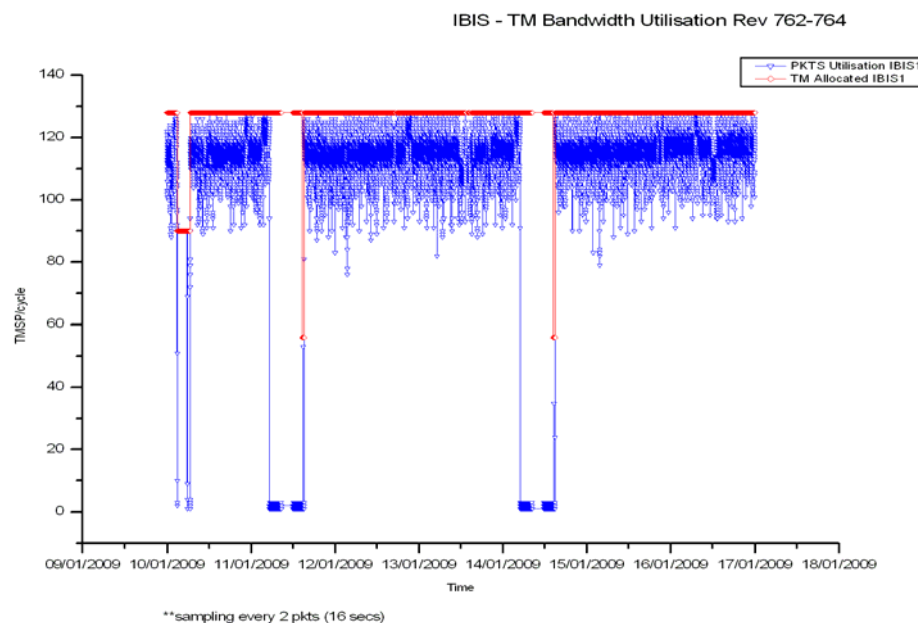
3.2.2 IBIS

The overall status of the unit is nominal.

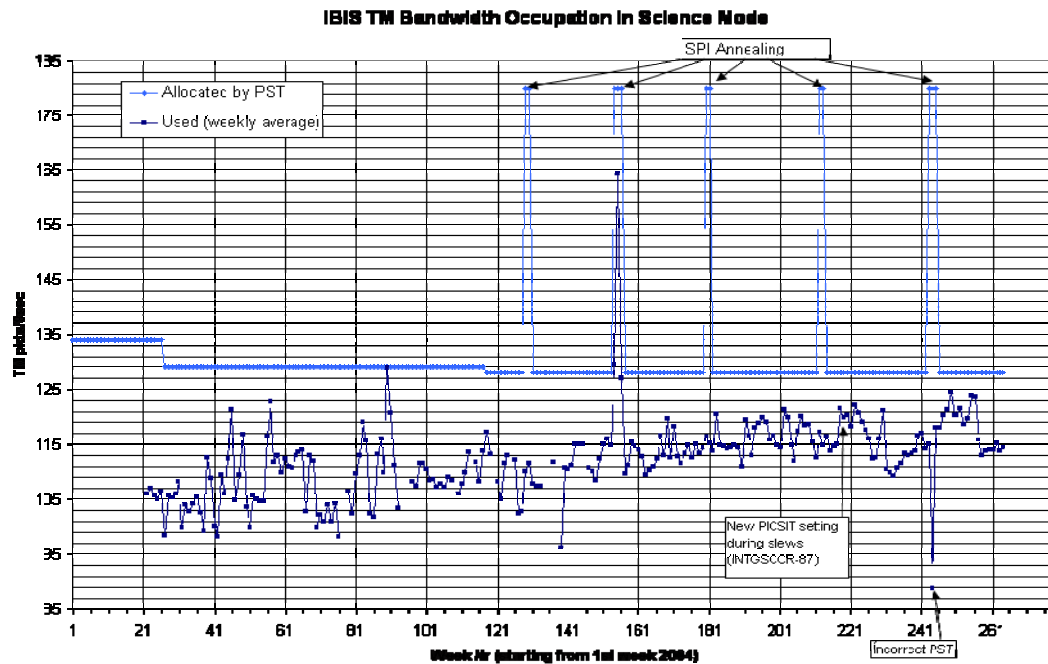
During the reporting period, the TM bandwidth statistics were as follows:

- PST allocation to IBIS above radiation belts: 128 packets/cycle except from 2009-01-10T02:52:03Z to 2009-01-10T06:38:44Z, when it was 90 packets/cycle due to an OMC FFC.
- IBIS mean bandwidth utilisation in science mode: 114.32 packets/cycle (up 0.56 on previous week)
- Percentage of TM cycles in which full bandwidth was used: 1.33%

The plot below shows the IBIS TM utilisation during the reporting 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, except during the calibrations from 2009-01-10T02:52:46Z to 2009-01-10T06:39:27Z, when it was 63 packets/cycle.

During this reporting period, 136 of the 138 planned science pointings were executed nominally, 2 were lost.

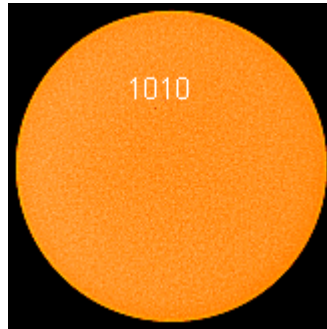
Note: Some more information concerning the OMC operations is provided in the Appendix.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity. A sun spot #1010 was present at the start of the week, but by the 14th had faded away. 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. Four pointings were lost due to ground problems. The overall performance was still above the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. One pointing was lost to MOC related issues. The OTF was not reached during the last part of PID #07620055, due to loss of guide star.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. Three slews were missed from TL, during the observation period, due to problems on TC/TM links at REDU and DSS27 stations. The PID #07620044, PID #07630029 and PID #07630048 were lost.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

New PSFs have been received for revolutions 770 and an update for 769. Revolutions 764 to 766 were replanned due to continued TOO observations of the Blazar B1510-089. Another TOO request was received, but finally not granted.

Updated TSFs have been received for revolutions 764 and 765.

2. Observation status

A new ECS file has been received and processed for revolution 754.

3. ISOC Science Data Archive

No news.

4. ISOC system

ISOC system V20.1 has been released formally on 13 Jan 2009. Work is ongoing on V21.

5. Problems

No new problems.

4.3.2 ISDC

Status of ISDC observation processing on 16/01/2009:

- Latest Standard Analysis completed: observation 06200210009 (GRS 1915+105, Revolution 743) on 12/12/2008.
- Latest products archived: observation 06200520002 (PKS 0208-512, Revolution 746) on 12/12/2008.
- Latest observation products sent to the observer: observation 06200520002 (PKS 0208-512, Revolution 746) on 12/12/2008.

5 Special Events

6 Anomalies

- 2009-01-10 (010):

10:59Z: Lost TM/TC from DSS-27 (antenna stopped). TM and TC links established back at 11:22Z. A manual slew was performed, followed by a mapping and the Timeline was updated. One slew was missed.

22:18Z: Loss of bitlock during ground station handover resulted in Broadcast Packet ED for setting Handover flag to 1 being missed. No recovery required as next ED (after handover) would reset it to zero.

22:44Z: IMU1 on. Manual mapping was performed and the Timeline updated. The PID # 07620055 was lost.

- 2009-01-11 (011):

18:23Z: The TPF update was not received for PID 07630006. FD Spacon tool run to generate TPF and update the Timeline.

- 2009-01-12 (012):

17:21Z: Drop on VC-0 & VC-7 from Redu (Communications problem), back-up ISDN lines did not work.

Doc. Title : INTEGRAL Mission Report #330
Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OAI
Date : 19/01/09

Issue : 1
Rev. : 0
Page : 9

17:47Z: Network did bring VC0 and VC7 link up from VIL2, but no TC because the carrier was still up from Redu (no remote control).

17:48Z: PID # 07630029 lost

17:51Z: TM and TC link back from Redu.

- 2009-01-13 (013):

13:36Z: Drop on VC-0 & VC-7 from DSS27 (Antenna stopped).

14:08Z: Network established TM and TC link from VIL2.

14:12Z: PID # 07630048 lost

14:17Z: Restart of inctra. Moved operations to B-Chain.

14:30Z: Restart of imca.

14:43Z: TM and TC link back from DSS27.

14:44Z: Operations moved back to A-Chain.

- 2009-01-14 (014):

15:34Z: 392 TCR SPI Coldplate OOL: 80.9853 deg.

15:49Z: FCP_SPI1 _2504 increase of stroke to 42.

- 2009-01-16 (016):

07:19Z: Drop on VC-0 & VC-7 from Redu. Lost commands for OBDH S/S.

07:23Z: ISDN lines to Redu brought up. TM back.

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

AR id	Date Created	Subject	Segment	Status
INT-3053	2009-01-12	ISDN - Backup to REDU no TM flow (DOY 012)	COMMS	Pending
INT-3052	2009-01-12	REDU - COMMS problem (DOY 012)	COMMS	Pending
INT-3051	2009-01-13	IMCS - Command stacks show no TM flow (DOY 013)	IMCS	Pending
INT-3050	2009-01-13	DSS27 - Antenna stopped track (DOY 013)	NASA Station	Pending
INT-3049	2009-01-10	DSS27 - Antenna stopped track (DOY 010)	NASA Station	Pending

7 Future Milestones

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 762

The observations in revolution 762 began with a hexagonal dither of the North Ecliptic Pole (RA 18:00:00.00, DEC +66:33:39.0), lasting ~32.8 hours. They continued with a staring OMC FF Calibration (RA 13:01:12.00, DEC +06:48:00.0), lasting ~3.4 hours. This was followed by a hexagonal dither of Loop I-Loop IV Super (RA 13:57:10.00, DEC +07:34:37.0), lasting ~20.3 hours until the end of the revolution.

Revolution 763

The observation in revolution 763 was a Target of Opportunity, a hexagonal dither of the PKS 1510-089 (RA 15:12:50.53, DEC -09:05:59.8), lasting ~57.0 hours until the end of the revolution.

Revolution 764

The observations in revolution 764 began with a Target of Opportunity, a hexagonal dither of PKS 1510-089 (RA 15:12:50.53, DEC -09:05:59.8), lasting ~28.6 hours. They continued with a hexagonal dither of Centaurus A (RA 13:25:27.61, DEC -43:01:08.9), lasting ~28.6 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.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2008-12-25T23:24:15.000Z	136.8260	F	Automatic TM processing.
2008-12-27T13:42:59.000Z	136.8111	F	Automatic TM processing.
2008-12-28T03:00:12.000Z	136.7601	F	Automatic TM processing.
2008-12-30T13:30:35.000Z	136.7456	F	Automatic TM processing.
2008-12-31T08:09:17.000Z	136.7326	F	Automatic TM processing.
2009-01-02T13:21:29.000Z	136.7199	F	Automatic TM processing.
2009-01-03T22:59:41.000Z	136.6970	F	Automatic TM processing.
2009-01-05T13:07:45.000Z	136.6835	F	Automatic TM processing.
2009-01-06T22:45:50.000Z	136.6669	F	Automatic TM processing.
2009-01-08T12:54:10.000Z	136.6532	F	Automatic TM processing.
2009-01-09T22:31:58.000Z	136.6124	F	Automatic TM processing.
2009-01-11T12:43:54.000Z	136.5808	F	Automatic TM processing.
2009-01-12T22:01:09.000Z	136.5465	F	Automatic TM processing.
2009-01-14T12:32:33.000Z	136.5217	F	Automatic TM processing.
2009-01-15T22:07:01.000Z	136.4853	F	Automatic TM processing.

This report was generated Fri Jan 16 08:00:23 GMT 2009

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, 10/01/2009 – 16/01/2009

The AOCS operations were executed from the Automatic Timeline.

During this period, 89 Open Loop Slews, 59 Closed Loop Slews and 4 Momentum Biases were executed (as reported by ACC OEM).

3 (OSL) slews were missed from TL, during the observation period, due to problems on TC/TM links at REDU and DSS27 stations.

The OTF was not reached during the last part of PID 07620055, due to loss of guide star.

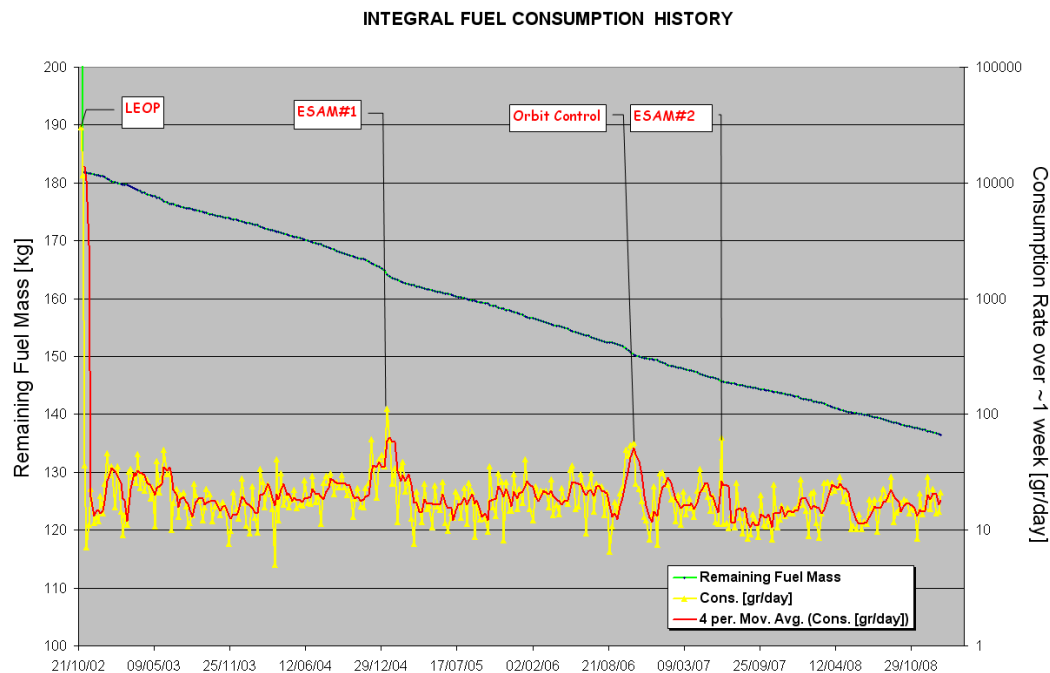
This is equivalent to $\sim 2\%$ of the total number of slews planned (148).

Orbit Control

No update

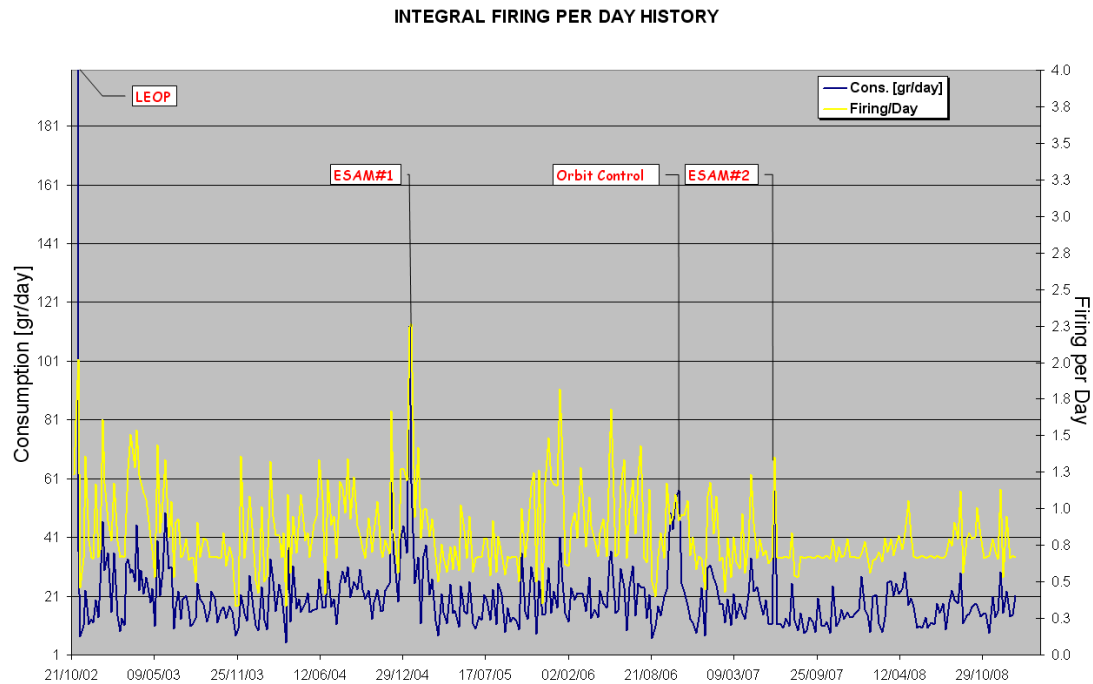
Fuel consumption

The fuel consumption (total, grams per day) over the period between 01/11/2002 and 16/01/2009 is reported in the plot below.



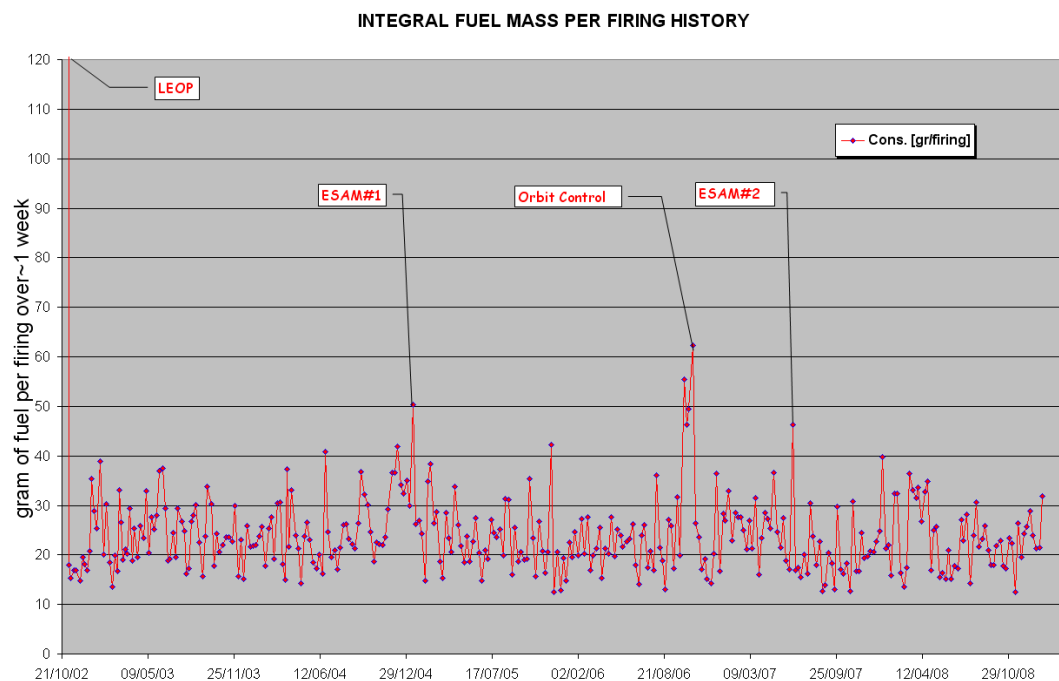
The above plot considers the ESAM fuel consumption spread over period of ~ 1 week.

The firing per day over the period between 01/11/2002 and 16/01/2009 is reported in the plot below.



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

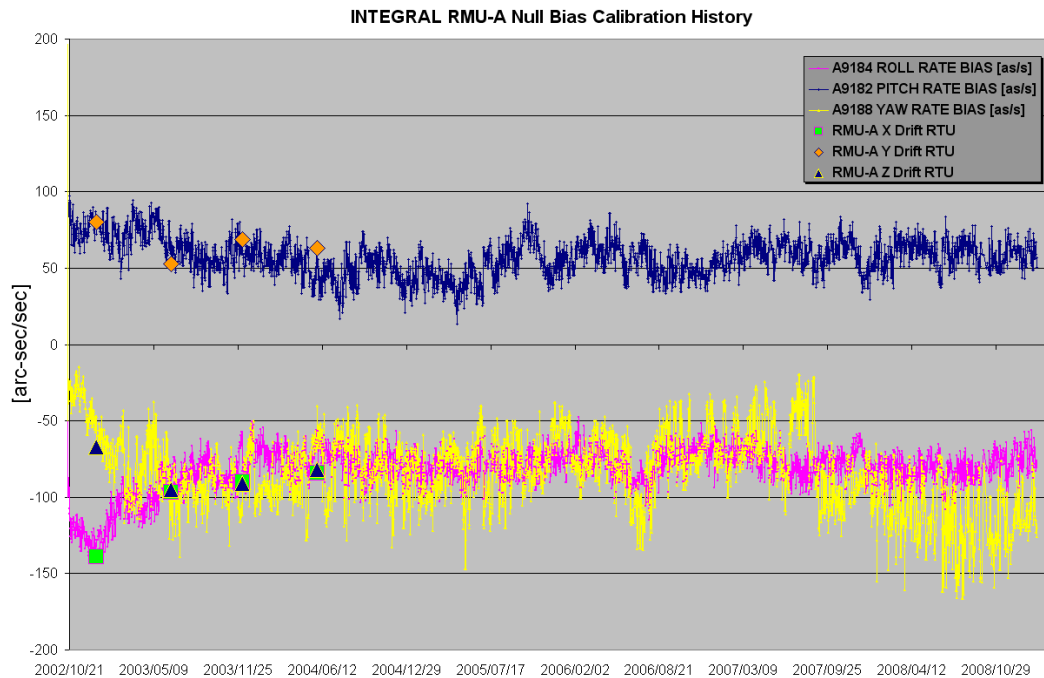
The fuel per firing over the period between 01/11/2002 and 16/01/2009 is shown in the plot below.



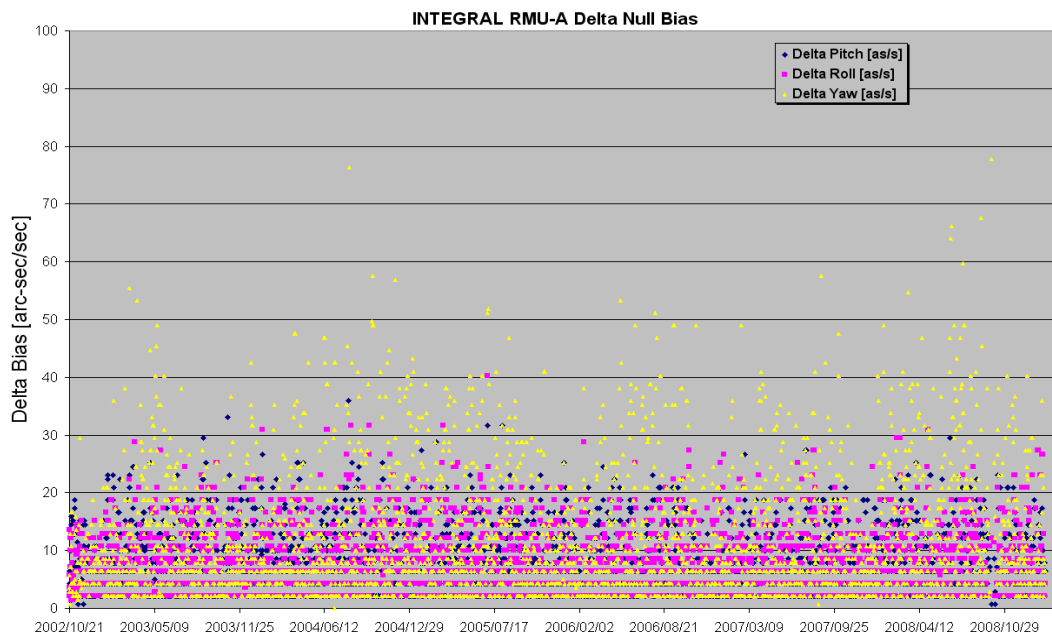
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 16/01/2009 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 the 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 16/01/2009 is reported in the plot below.



10/01/2009 (Day of Year 010, Revolution 762)

Problem at DSS station: at 10:59z due to a TM/TC links drop at DSS27 station the slew commanding fail for slew ID 07620044.

A manual recovery was then performed from the attitude of PID 07620043 to the attitude of PID 07620044 and the next slew ID 07620045 updated in TL.

The following slew was not executed in TL: PID 07620044(OSL)

Loss of guide star: at 22:44:38z a loss of the selected guide star occurred during PID 07620055. The origin of the event is not clear, likely due to SEU affecting the STR.

As foreseen by the IPS logic, the ACC switched ON the IMU 1, a new automatic mapping was commanded and a new guide star picked. The next slew 07620056 was manually updated in TL.

No impact on TL.

The OTF was not reached during the last part of PID 07620055.

11/01/2009 (Day of Year 011, Revolution 762-763)

FDS problem during slew update: at 18:23z a problem (automatic job was not scheduled) on FDS caused the slew update to fail for slew ID 07630006.

A quick manual recovery by SPACON Recovery Schedule Tool was then performed and the slew ID 07630006 updated in TL.

No impact on TL.

12/01/2009 (Day of Year 012, Revolution 763)

Problem at REDU station: at 17:21z due to a TM/TC links drop at REDU station the slew commanding fail for slew ID 07630029.

A manual recovery was then performed from the attitude of PID 07630028 to the attitude of PID 07630029 and the next slew ID 07630030 updated in TL.

The following slew was not executed in TL: PID 07630029 (OSL)

13/01/2009 (Day of Year 013, Revolution 763)

Problem at DSS station: at 13:33z due to antenna problems at DSS27 station the slew commanding fail for slew ID 07630048.

A manual recovery was then performed from the attitude of PID 07630047 to the attitude of PID 07630049 and the next slew ID 07630049 updated in TL.

The following slew was not executed in TL: PID 07630048(OSL)

14/01/2009 (Day of Year 014, Revolution 763-764)

Nothing to report.

15/01/2009 (Day of Year 015, Revolution 764)

Nothing to report.

16/01/2009 (Day of Year 016, Revolution 764)

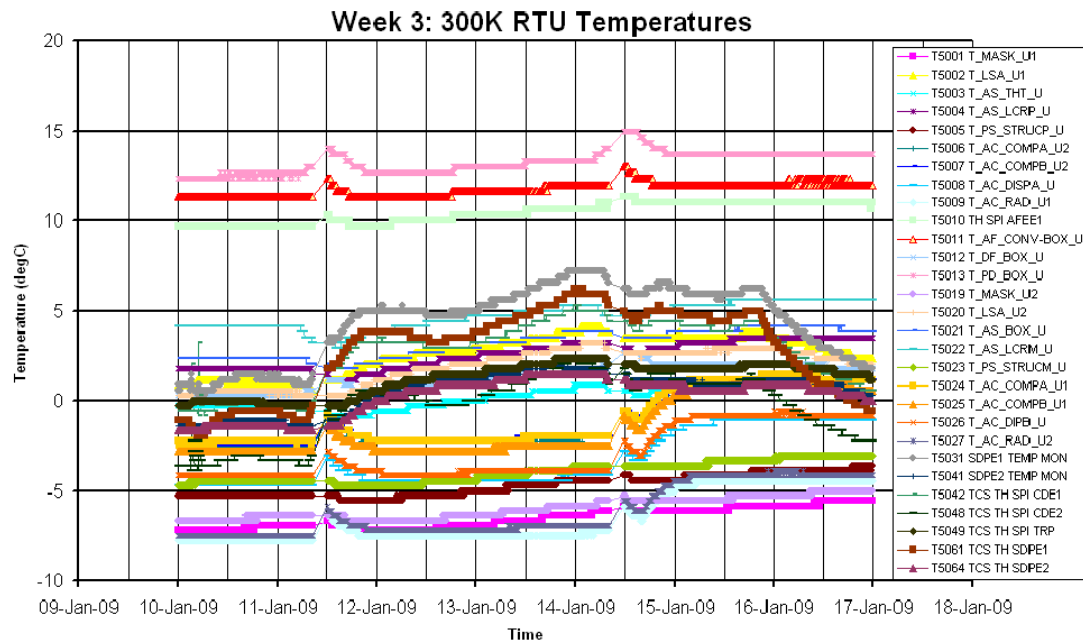
Problem at REDU station: at 17:19z due to a TM/TC links drop at REDU station the last commands (mapping) for slew ID 07640043 failed. This caused that FDS could not perform the attitude reconstruction and following next slew update.

A manual recovery was then performed and the next slew ID 07640044 updated in TL.

No impact on TL.

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.

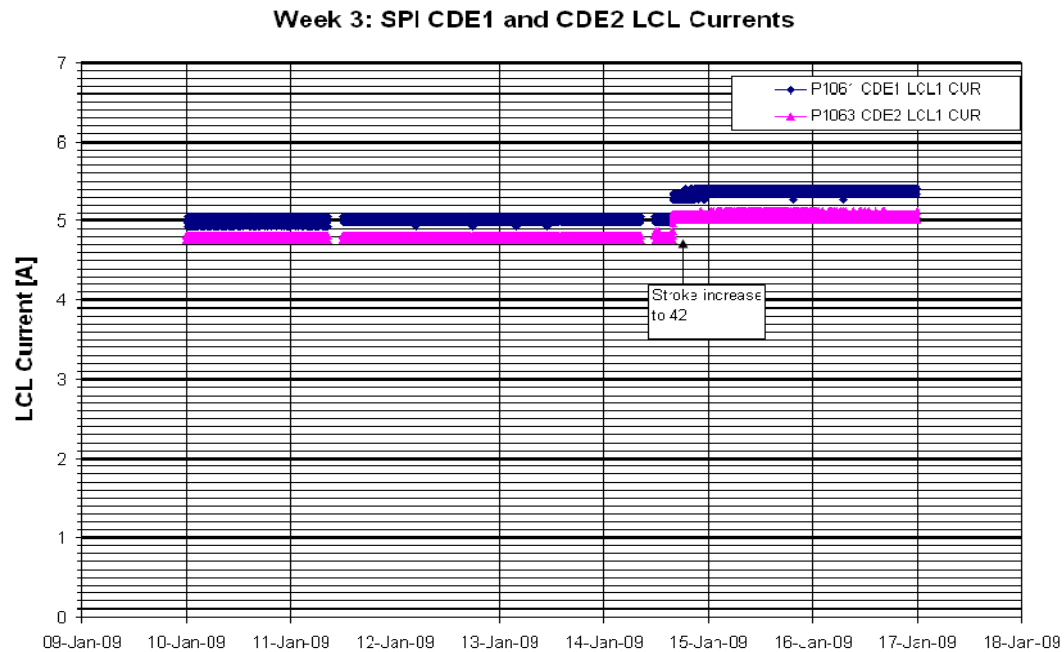


Stirling Compressors and Cryostat: The performance of the compressors is nominal.

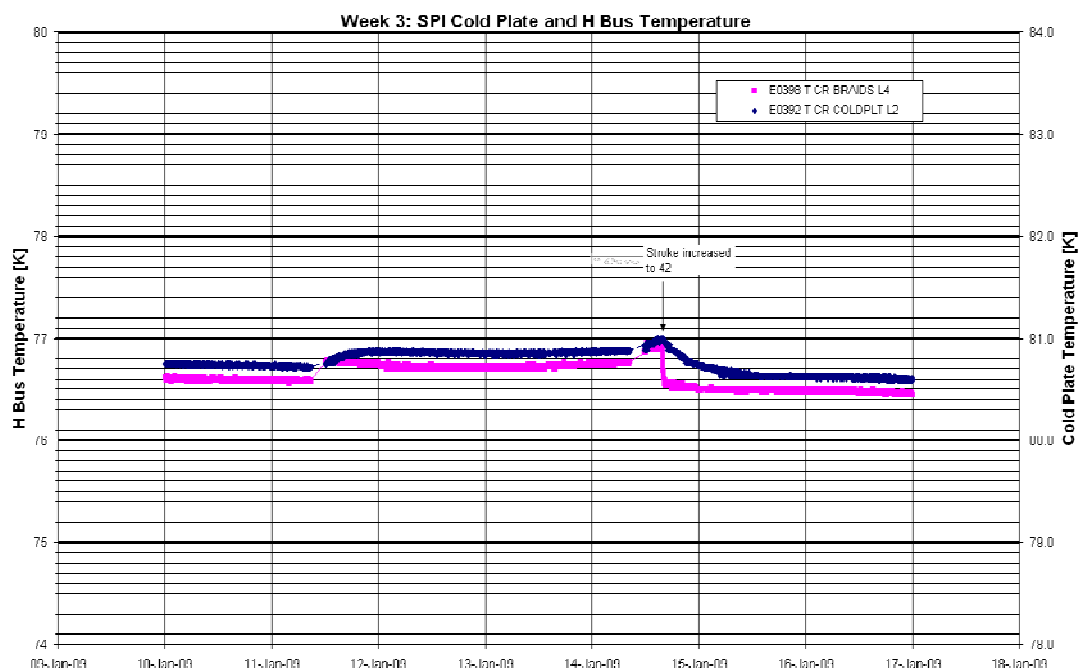
The cold plate temperature was maintained in the range 80K +/-1K.

The stroke of all four compressors was set to 41 until 14-01-2009 at 15:49Z, when it was increased to 42 on all four compressors as the Cold Plate temperature had reached 80.9K.

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



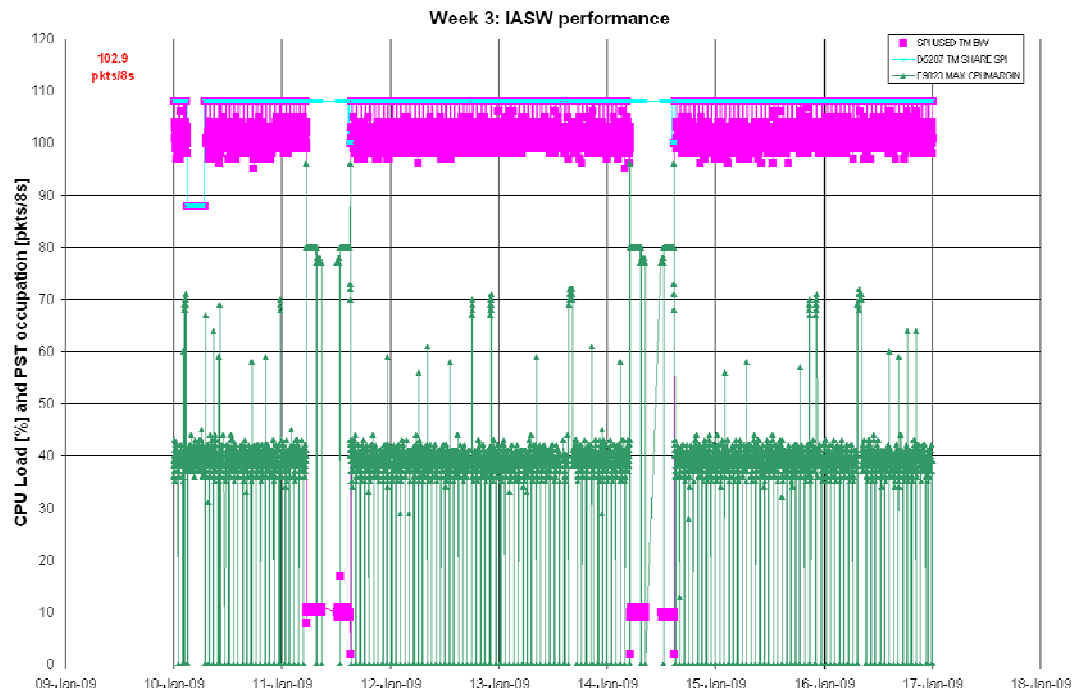
The following plot shows the evolution of the cold plate and H bus temperatures during the reporting period.



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

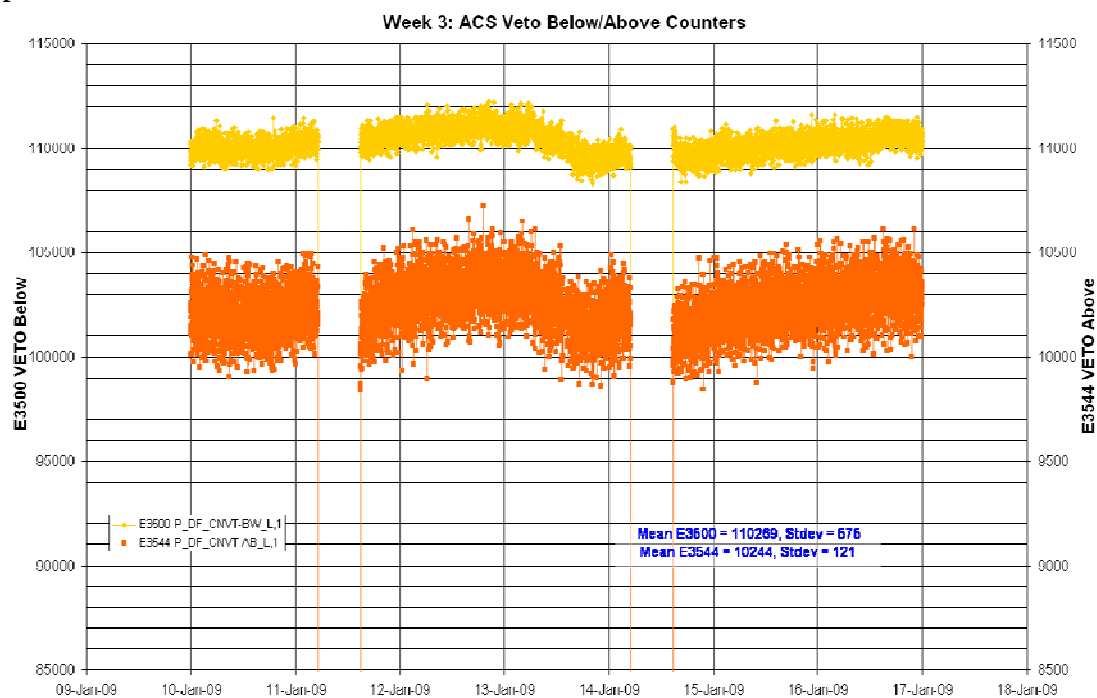
The IASW version installed is v4.3.4 with SE compression only enabled and the spectra scaling factor set to 8/19 SE. The average TM bandwidth occupation of SPI was 102.9 packets/cycle over the science window when the TM allocation was 108 packets/cycle.

The following plot shows the IASW performance in terms of TM bandwidth occupation and DPE CPU load during the reporting period. Note that from 2009-01-10T02:52:03Z to 2009-01-10T06:38:44Z the TM allocation was 88 packets/cycle due to an OMC FFC.

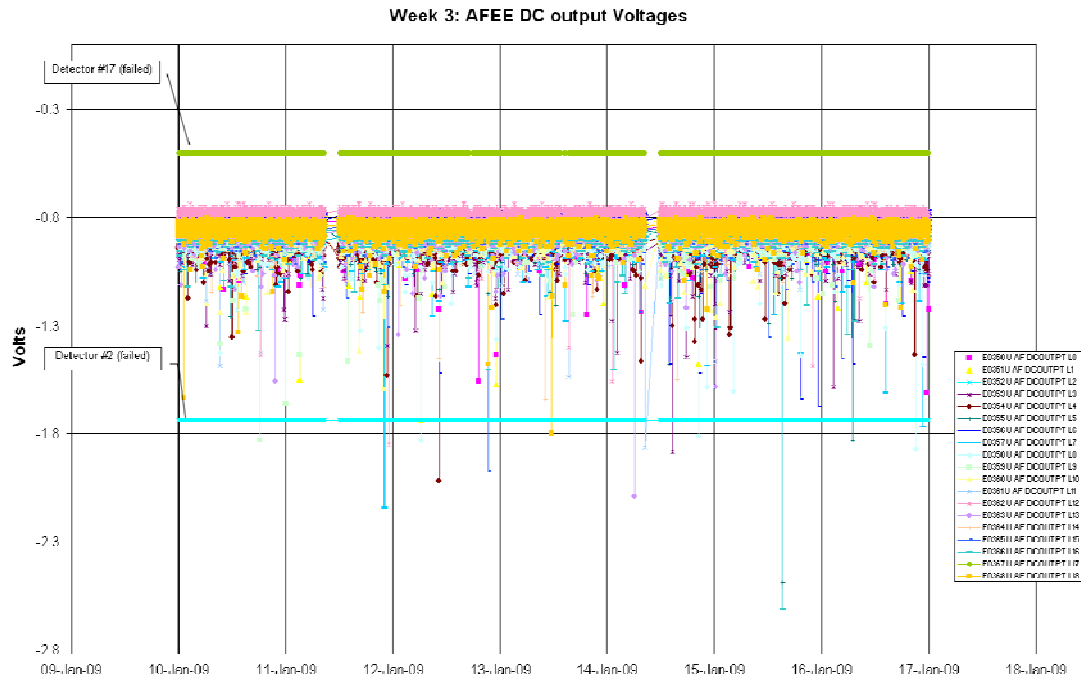


ACS: The performance of the ACS is nominal, except for FEE #81 which remains nominally switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is nominally OFF due to the anomaly on 5/8/2003 (INT_SC-61).

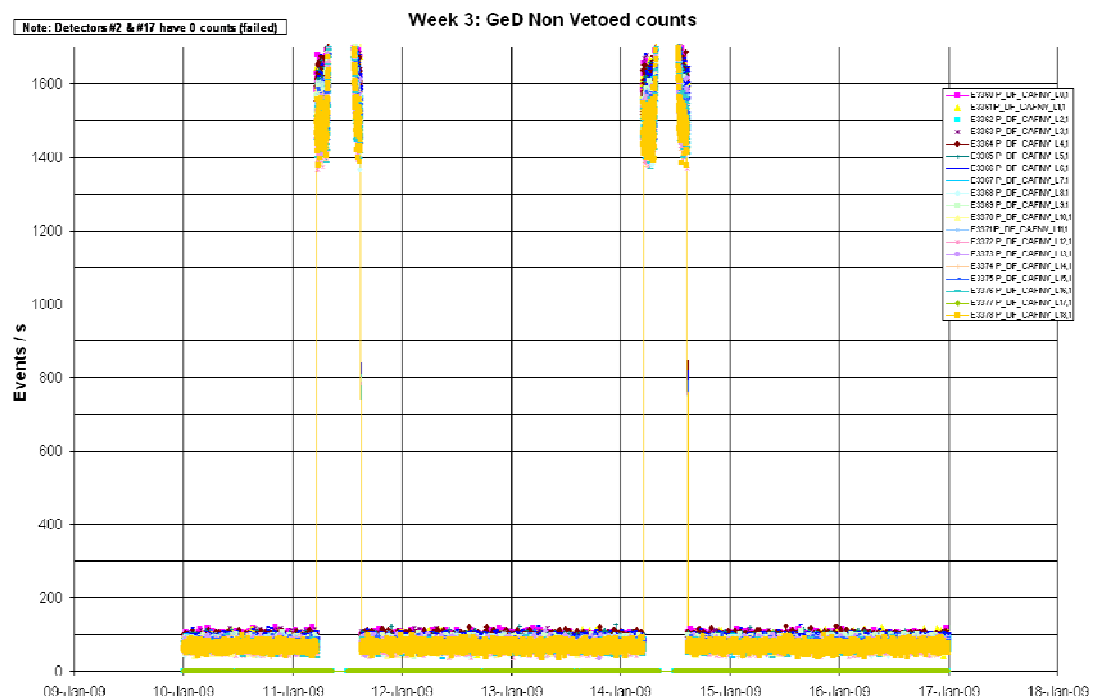
The following plot shows the ACS overall count rate evolution during the reporting period:

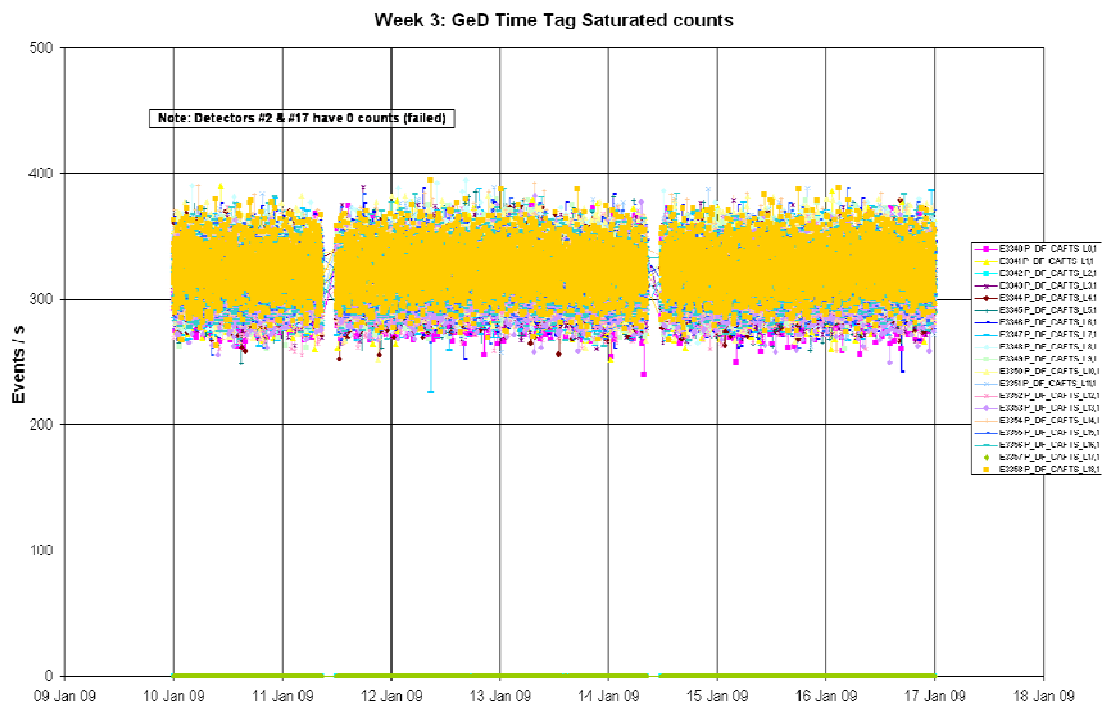
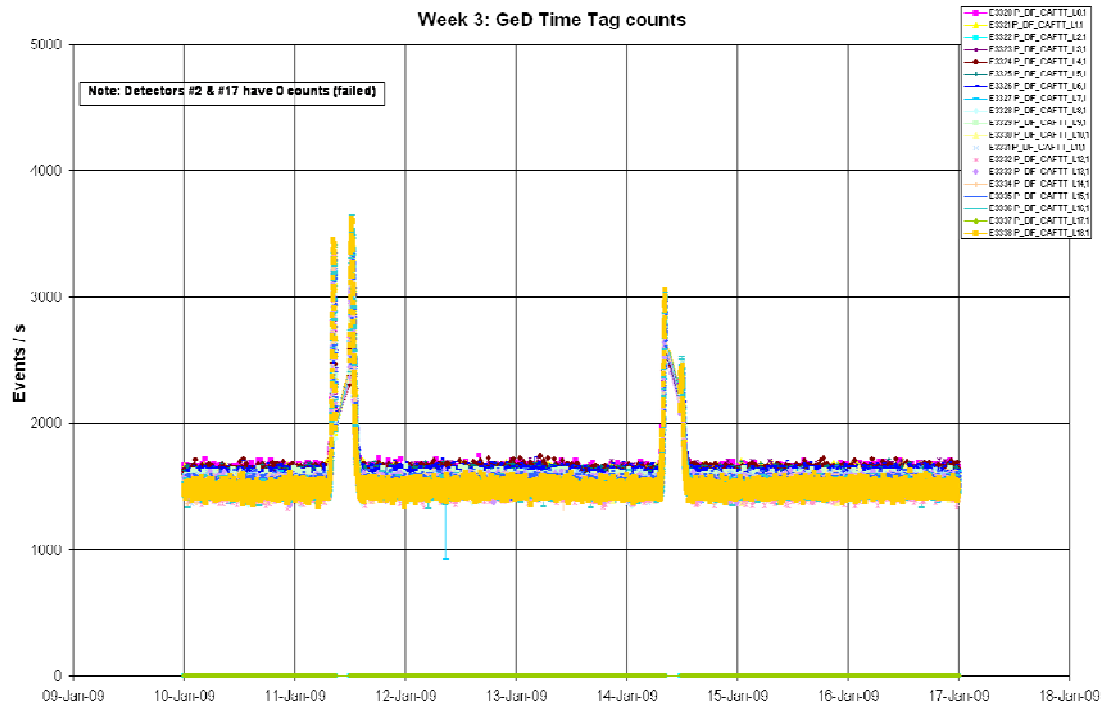


AFEE: The health of the AFEE is nominal. The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.

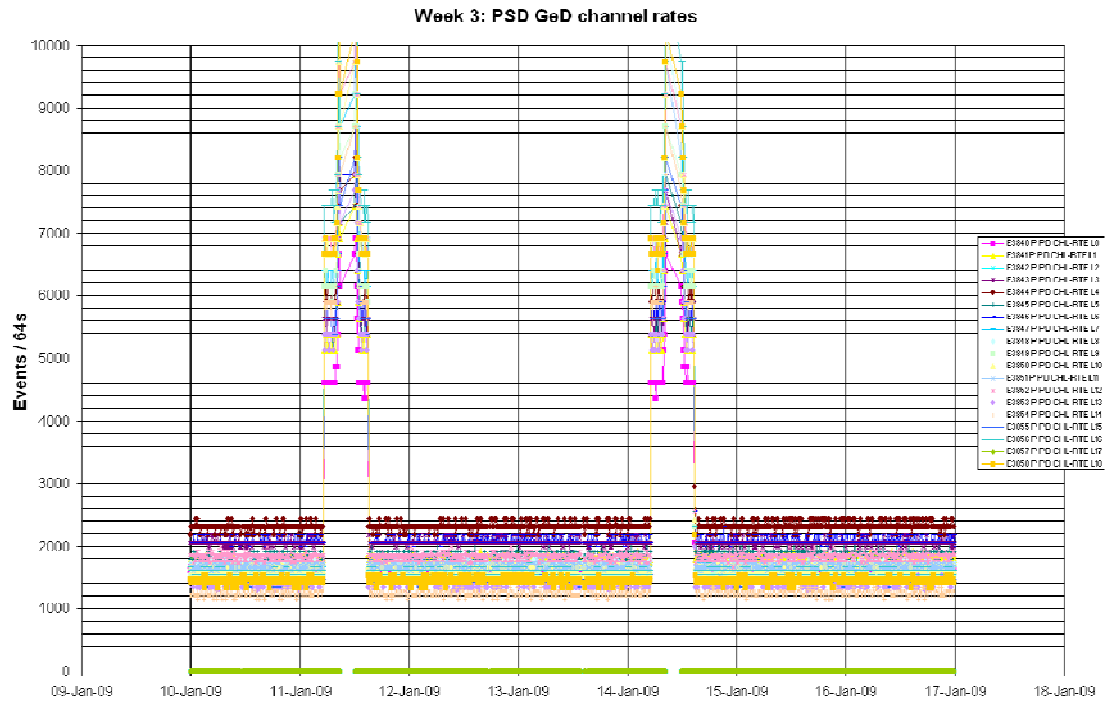


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoes, Time Tag and Time Tag Saturated Event count rates during the reporting period.





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



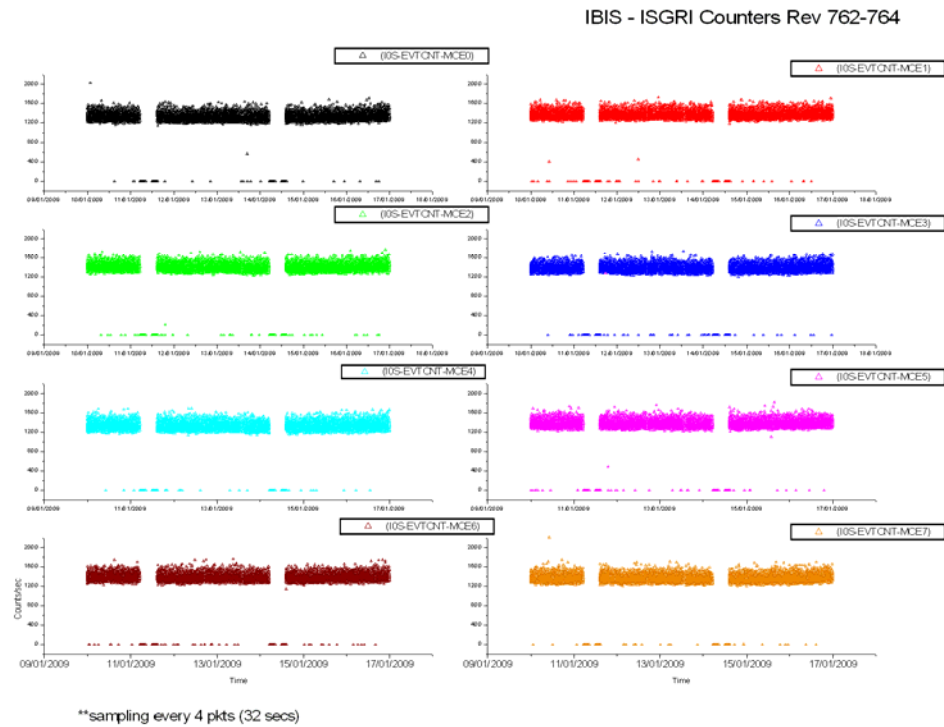
Event Log:

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

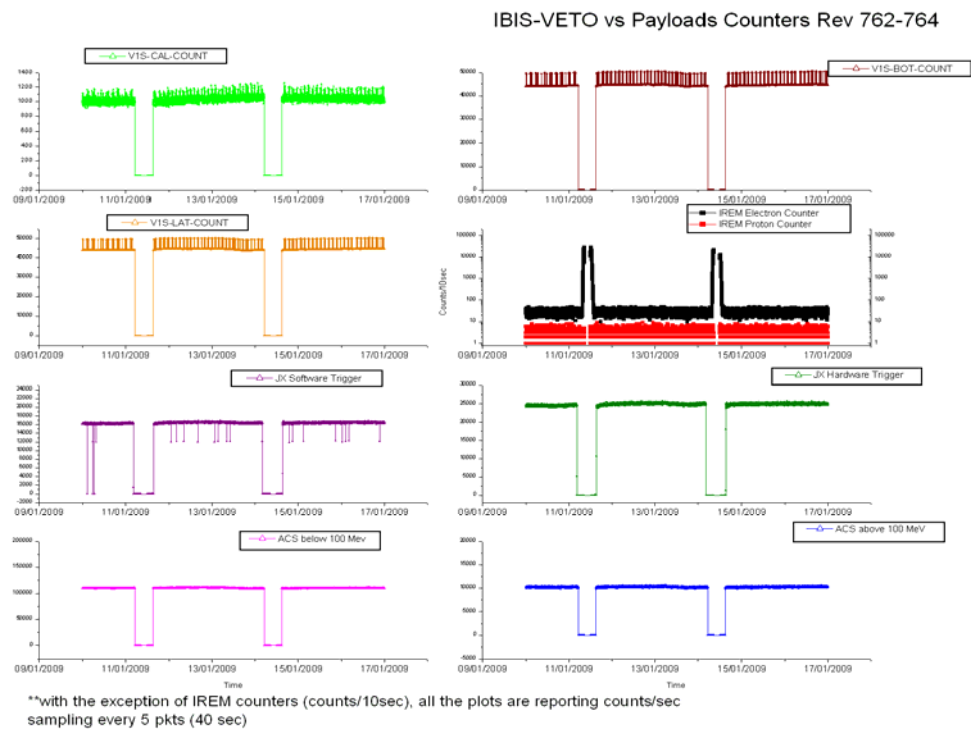
8.3.3 IBIS Operations

IBIS Event Counters Plots

ISGRI Counters:

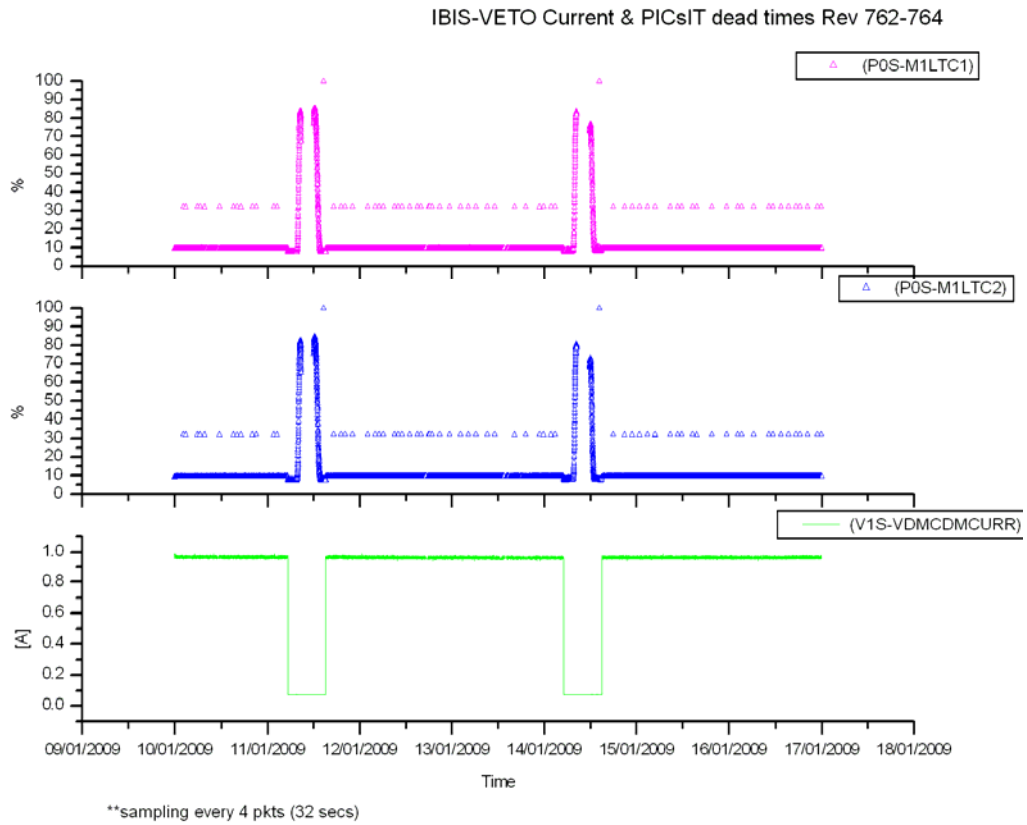


VETO vs Payload Counters:

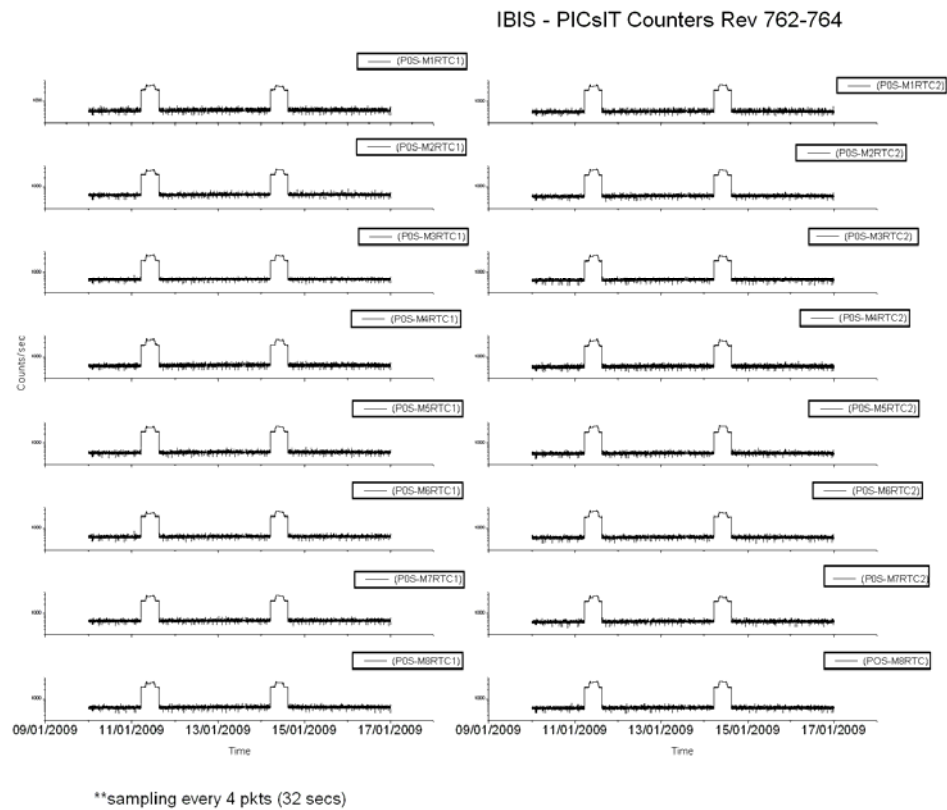


The week was characterised by low radiation as reported by the payload.

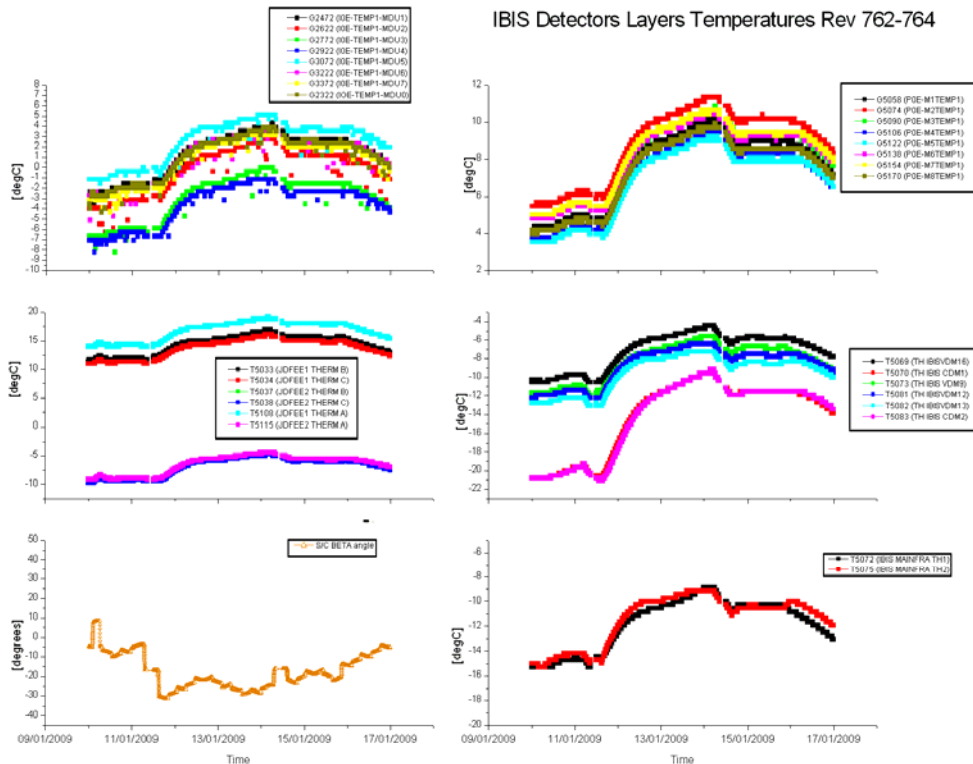
VETO Current:



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 (P0S-Mi_RTC1) and G5003 (P0S-Mi_RTC2) families and G2000 family (IOE-OVFWPXADD-Mi) were received during the radiation belt passages.

2009-01-10 (DOY 010, Rev 762)

At 19:10:43Z TM parameter G2098 went OOL, indicating an overflow of the noisy pixel address buffer in MCE7. As it returned within limits of its own accord at 19:10:51Z, no action was taken.

2009-01-11 (DOY 011, Rev 762-763) to 2009-01-13 (DOY 013, Rev 763)

IBIS operations executed nominally.

2009-01-14 (DOY 014, Rev 763-764)

At 14:49:39Z TM parameter G2013 went OOL (value = 0). This is the number of events triggering the MCE0 per second. As it returned within limits of its own accord at 14:50:51Z, no action was taken.

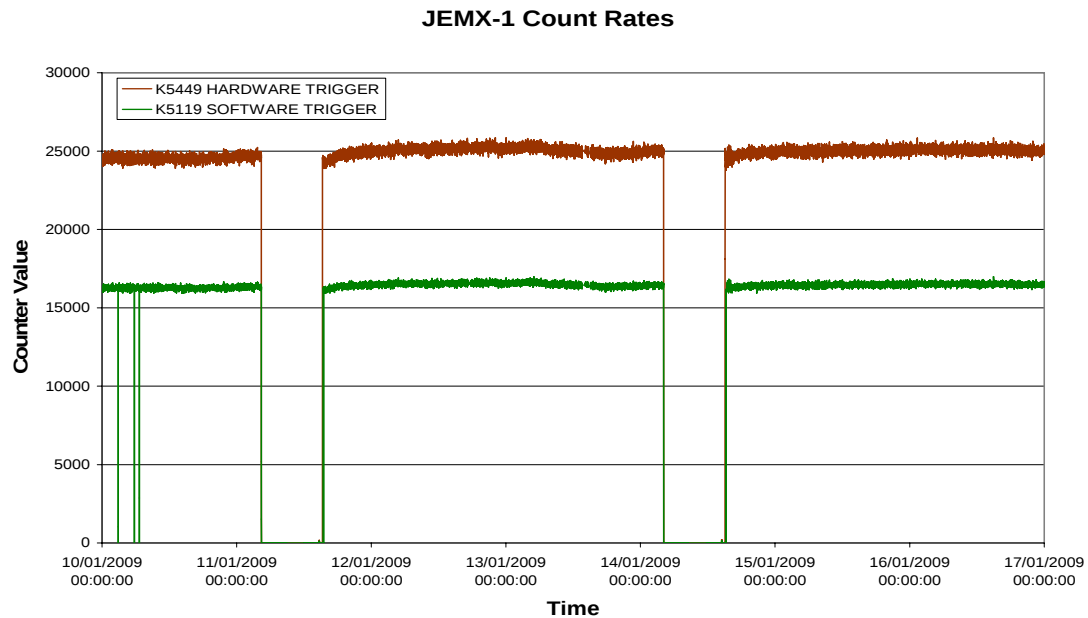
2009-01-15 (DOY 015, Rev 764) to 2009-01-16 (DOY 016, Rev 764)

IBIS operations executed nominally.

8.3.4 JEM-X Operations

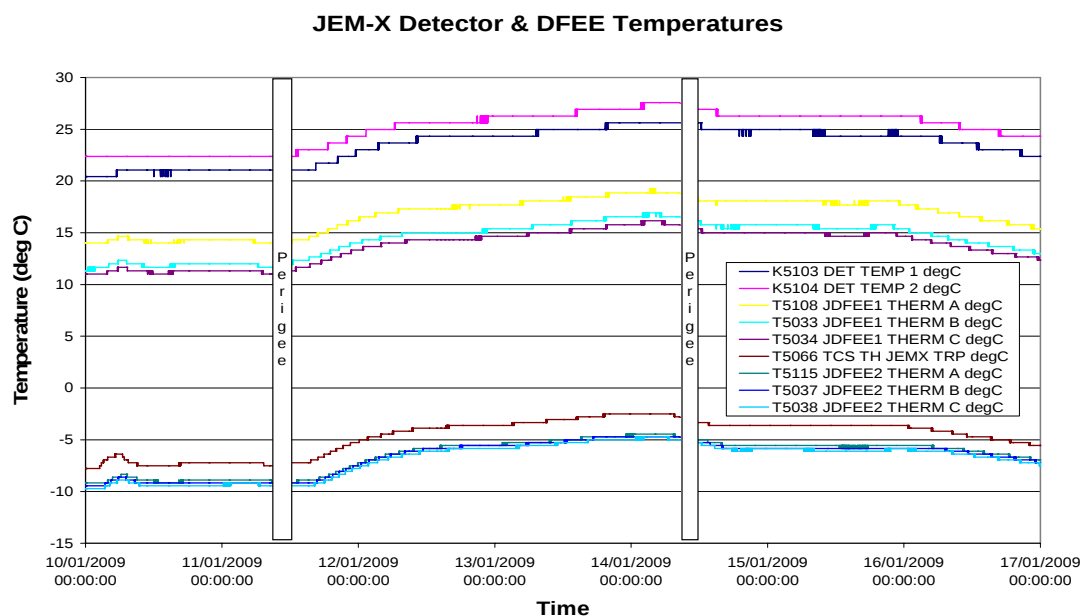
JEM-X Count Rates

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



JEM-X Temperatures

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



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

² Data sampled (1 frame in 8)

JEM-X Daily Report

2009-01-10 (DoY 010, Rev 762) to 2009-01-16 (DoY 016, Rev 764)

JEM-X 1 operations executed nominally.

8.3.5 OMC Operations

2009-01-10 (DoY 010, Rev 762)

At 02:52:19, a Flat Field calibration was commenced. This continued until 05:45:18, and was followed by a Dark Current calibration from 05:45:47, which terminated at 06:17:28. Both were executed nominally.

2009-01-11 (DoY 011, Rev 762) to 2009-01-12 (DoY 012, Rev 763)

Nothing to report.

2009-01-13 (DoY 013, Rev 763)

At 13:36, a problem with DSS-27 forced the suspension of the Timeline. Subsequent problems with the imcs prevented a link being established using VIL2. The Timeline was eventually recovered at 15:23:06, after contact had been restored through DSS-27. The impact was the loss of pointing 07630048.

2009-01-14 (DoY 014, Rev 763) to 2009-01-15 (DoY 015, Rev 764)

Nothing to report.

2009-01-16 (DoY 016, Rev 764)

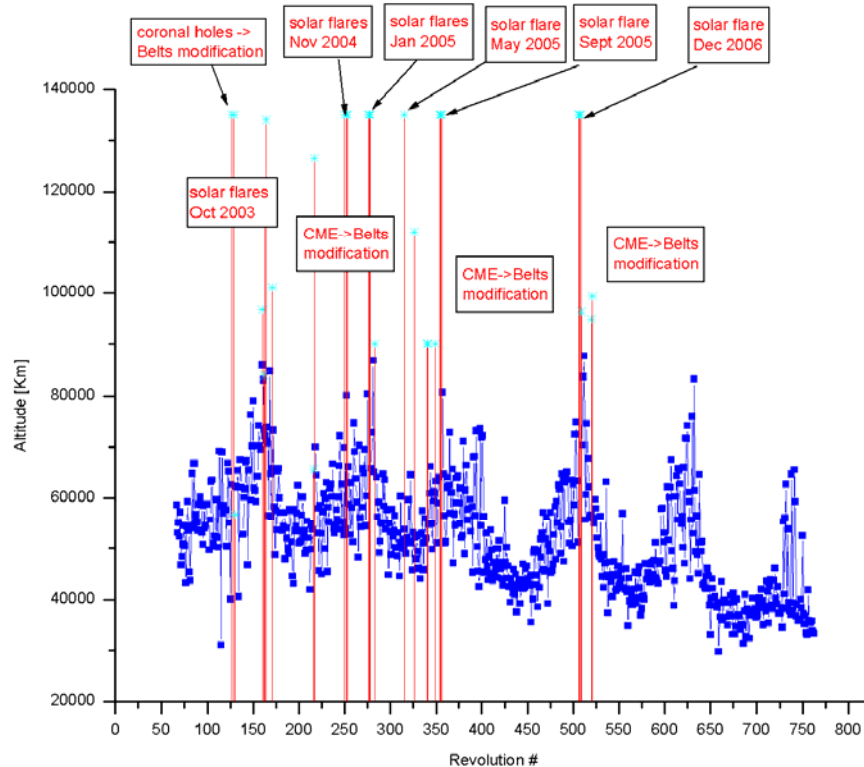
At 07:19, a drop in TM from Redu forced the suspension of the Timeline. Contact was restored at 07:23 using the ISDN line, and a recovery performed. The impact was the loss of pointing 07630048.

On DoY 011 at 05:16:38 and DoY 014 at 05:00:38 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 2003-2008



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]
762	RAD_ENTR R 2009-01-11T05:16:32Z	11/01/2009 07:42:45	33503.9	11-Jan-2009 07:31:29	34517.08
763	RAD_EXIT R 2009-01-11T14:57:31Z	11/01/2009 13:44:29	>>34012.5	11-Jan-2009 14:11:29	46627.63
763	RAD_ENTR R 2009-01-14T05:00:30Z	14/01/2009 07:32:37	33305.9	14-Jan-2009 07:15:47	34969.13
764	RAD_EXIT R 2009-01-14T14:41:53Z	14/01/2009 13:10:29	33998.2	14-Jan-2009 13:55:47	46163.44

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)

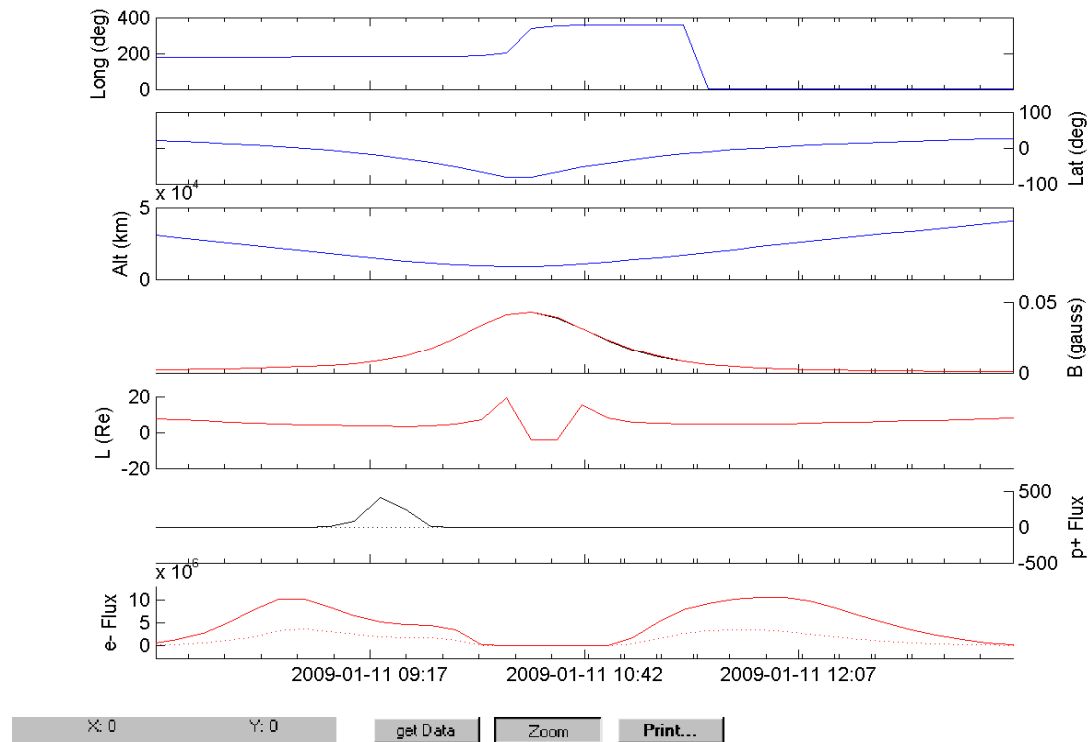
* Rad belt entry time ignoring previous threshold crossings where a gap of more than 30 minutes is present.

IREM radiation counters:

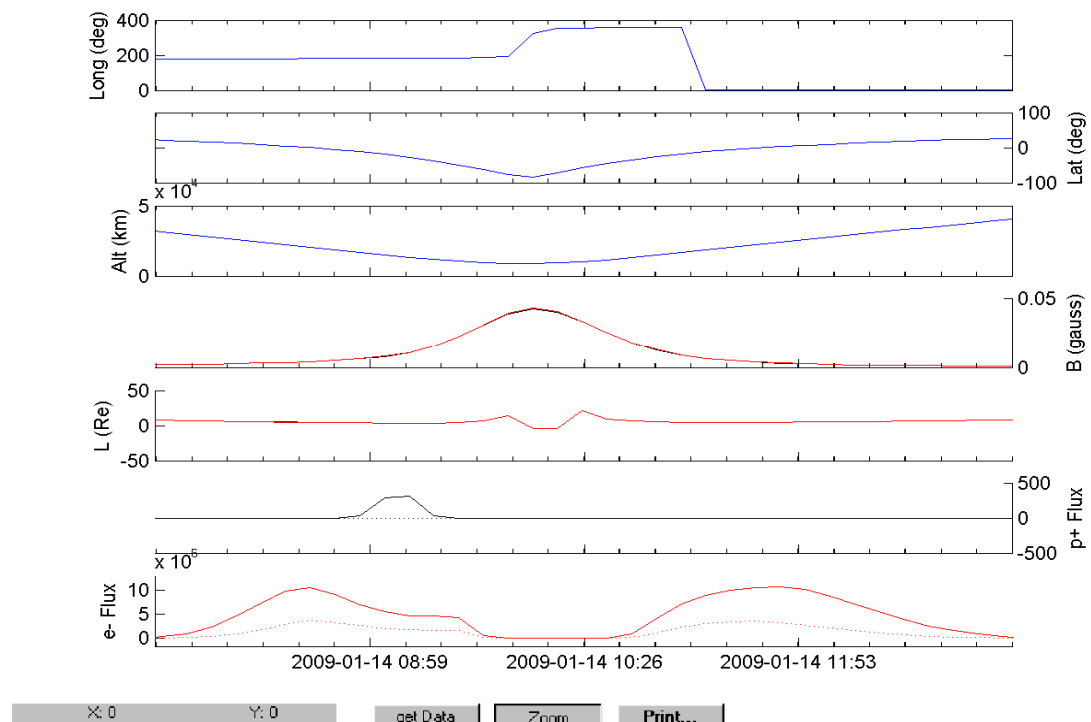
The IREM radiation counter plots are not available this week.

IREM Predicted Radiation Belt Passages

Rev 762



Rev 763



Radiation Assessment

Generated with SEIS Report and Analysis tool.

INTRODUCTION

This note summarises the space weather status over the observation period

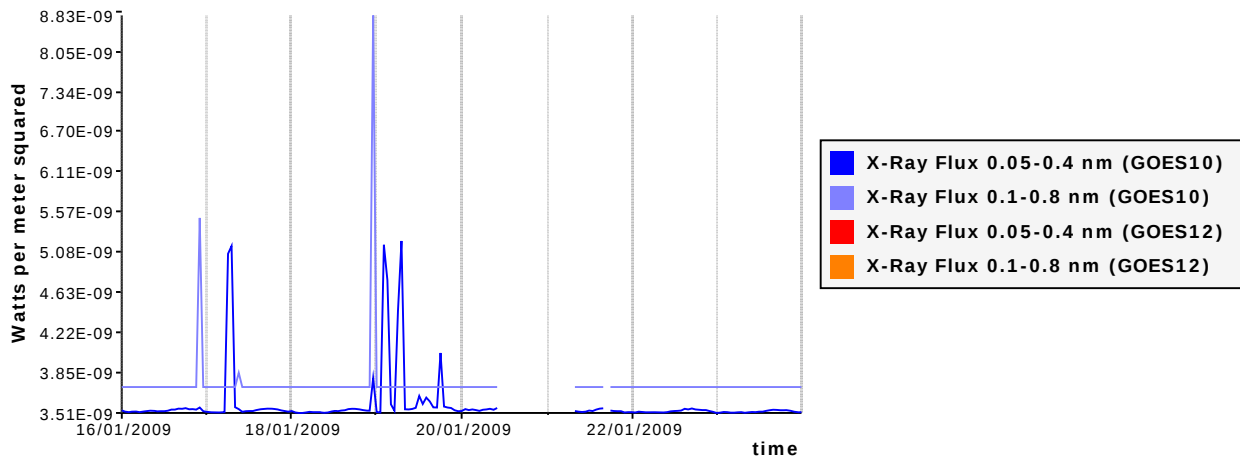
DAILY SUN

see in WR section 3.2.5

RADIATION FLUXES

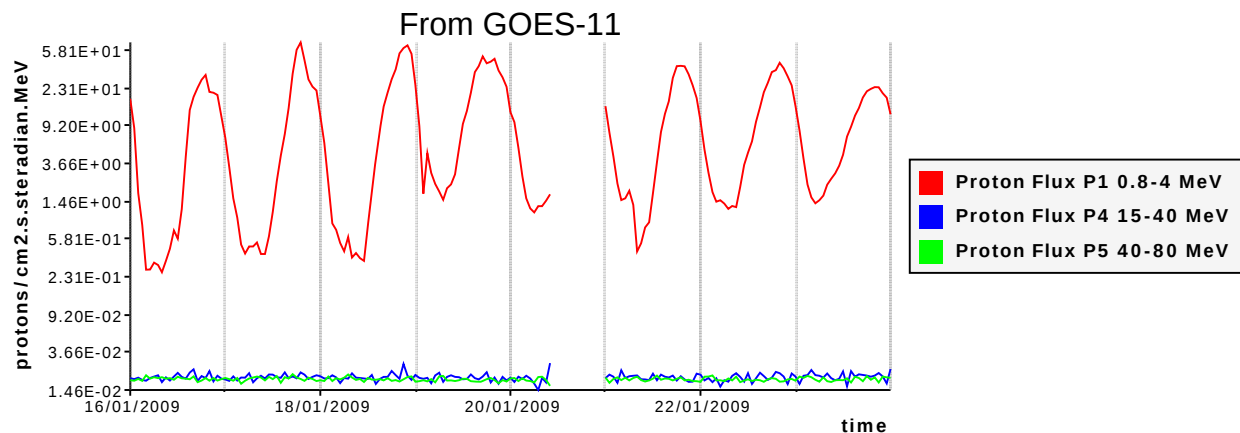
X-ray fluxes

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.



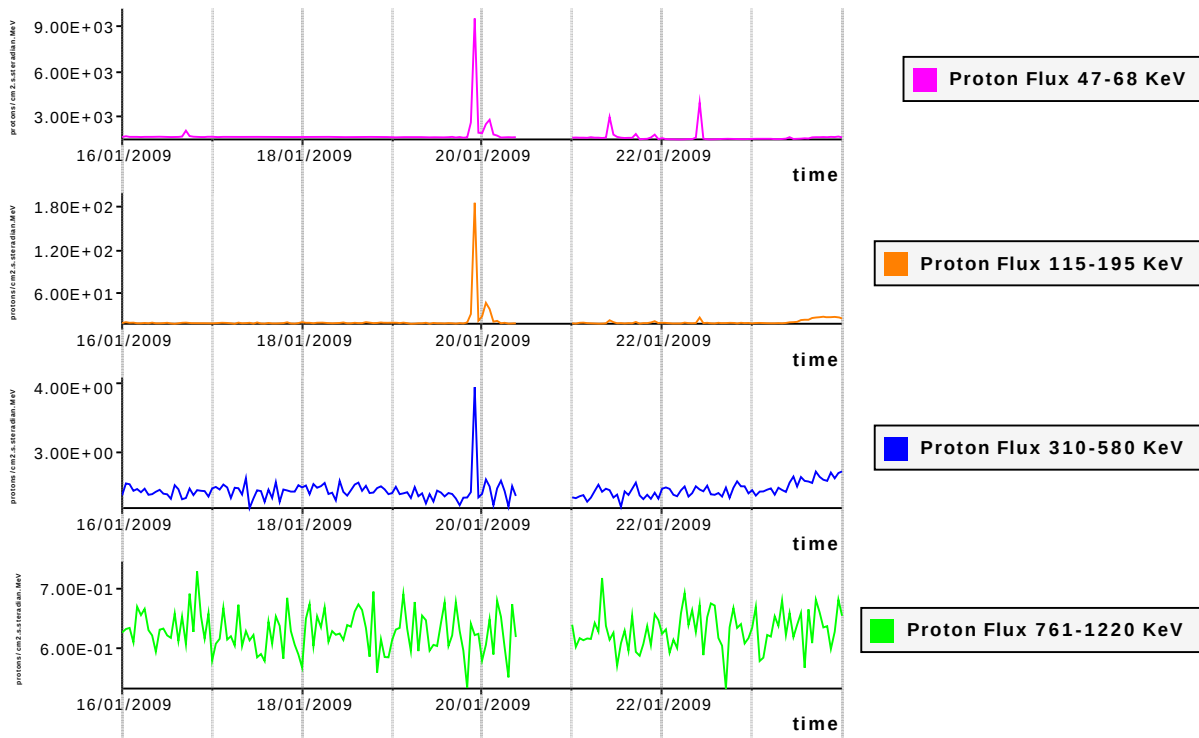
Proton fluxes (GOES-11)

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 $1\text{E-}2$.



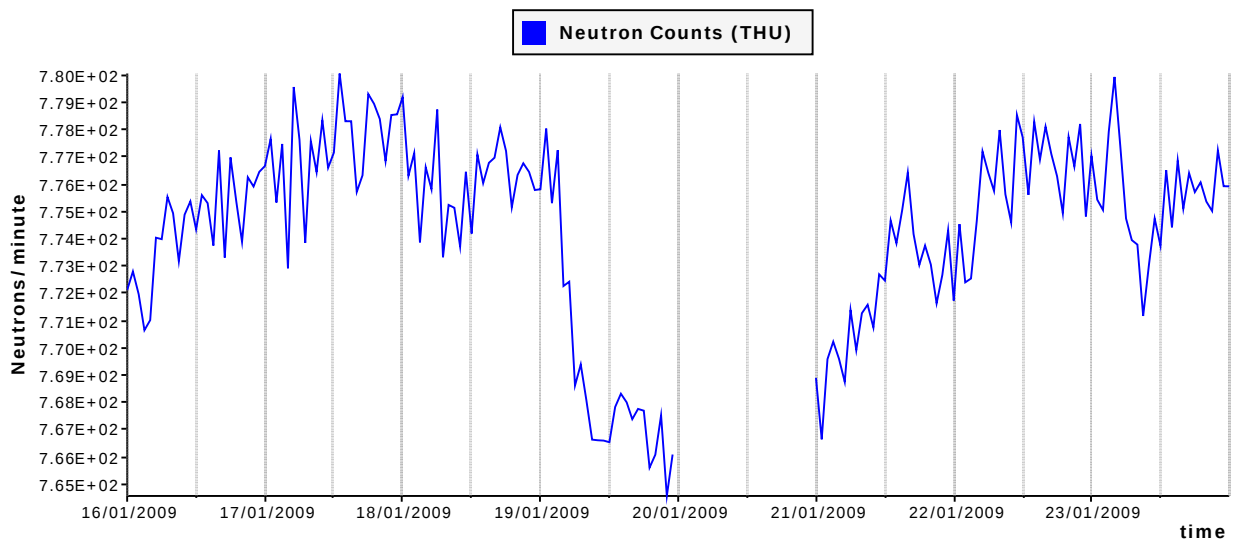
Proton fluxes (ACE)

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



Neutron counts

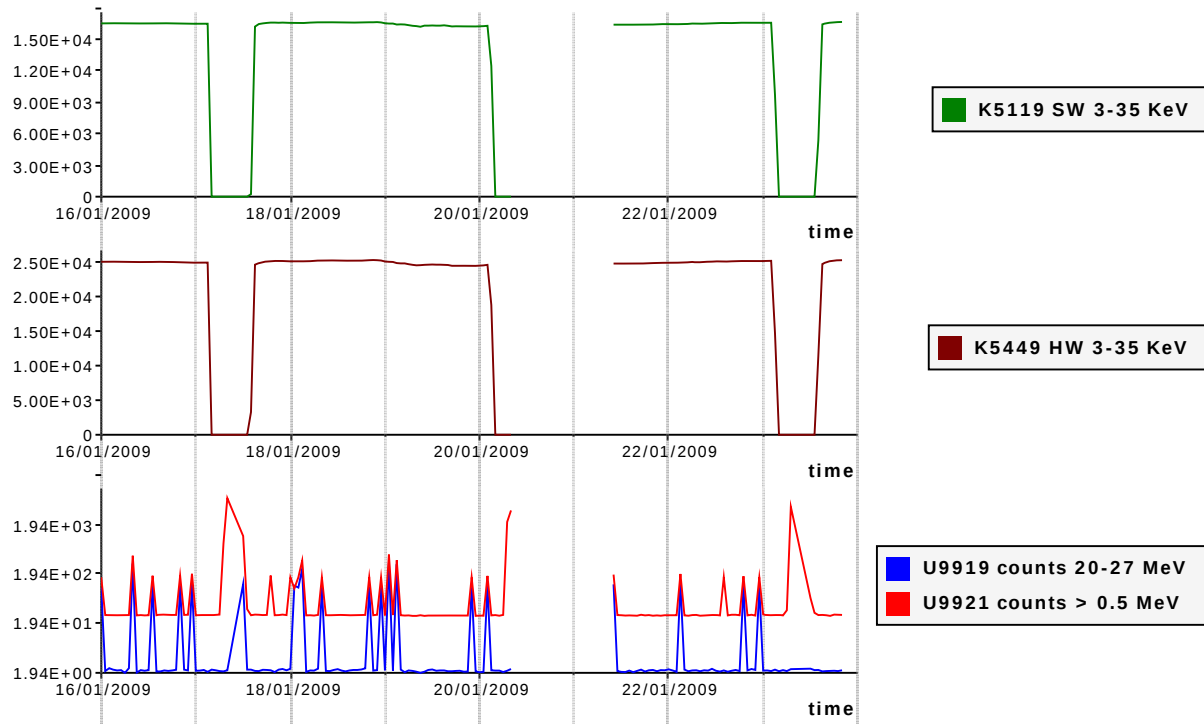
The neutron counts for the last 3 days are presented in the following plot. Nominally they remain stable around 7.2E+2.



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.

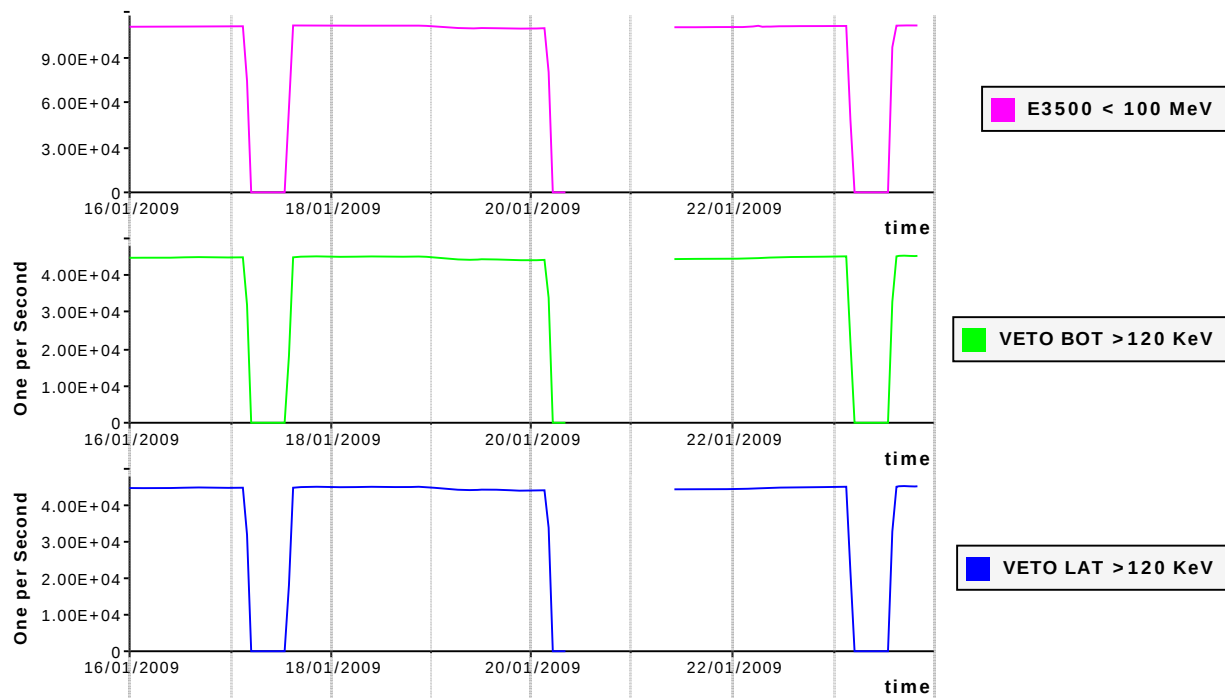
Nominal values are respectively about 1 and 18 for IREM counts, and, 13000 and 19000 for JEM-X ones.



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%.

