

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 334
Week 07
16.02.09
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 07.02.09 until 13.02.09 (both dates inclusive) and covers the revolutions 771, 772 and 773.

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 Target of Opportunity, a hexagonal dither of the anomalous X-ray pulsar 1E1547.0-5408 (RA 15:50:55.30, DEC - 54:19:02.0) and a hexagonal dither of the Perseus OB2 Cloud (RA 03:32:48.00, DEC +31:26:00.0).

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.

No slews were missed from TL, during the observation period.

The fuel consumption over the period between 07/02/2009 and 13/02/2009 was 0.0944 Kg. The remaining propellant is in the order of 135.9562 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

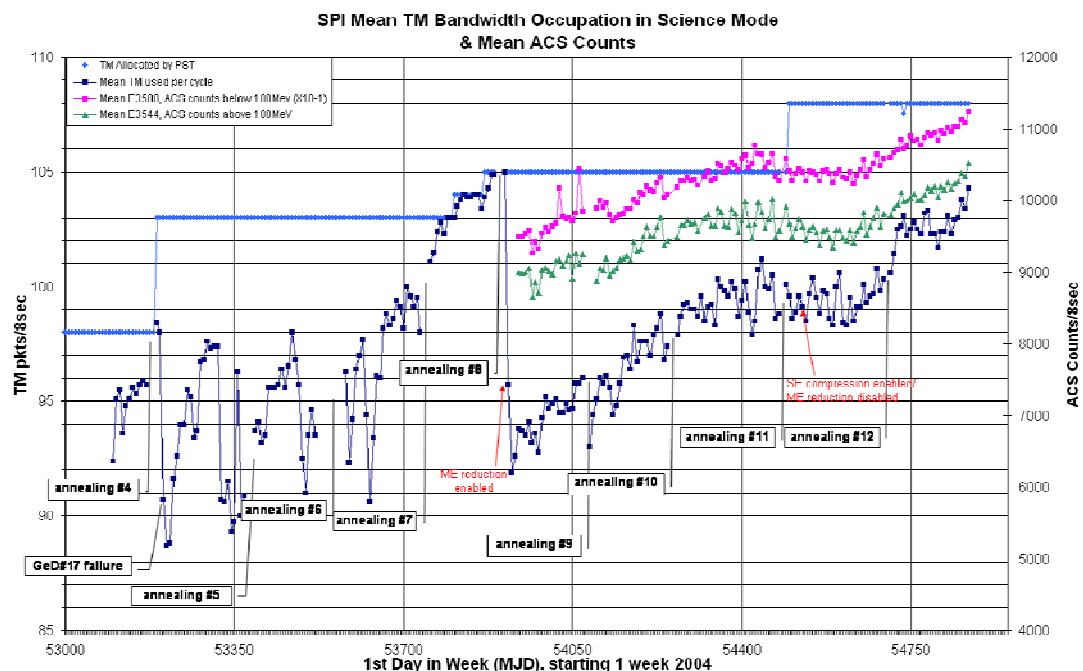
3.2.1 SPI

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 104.3 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.

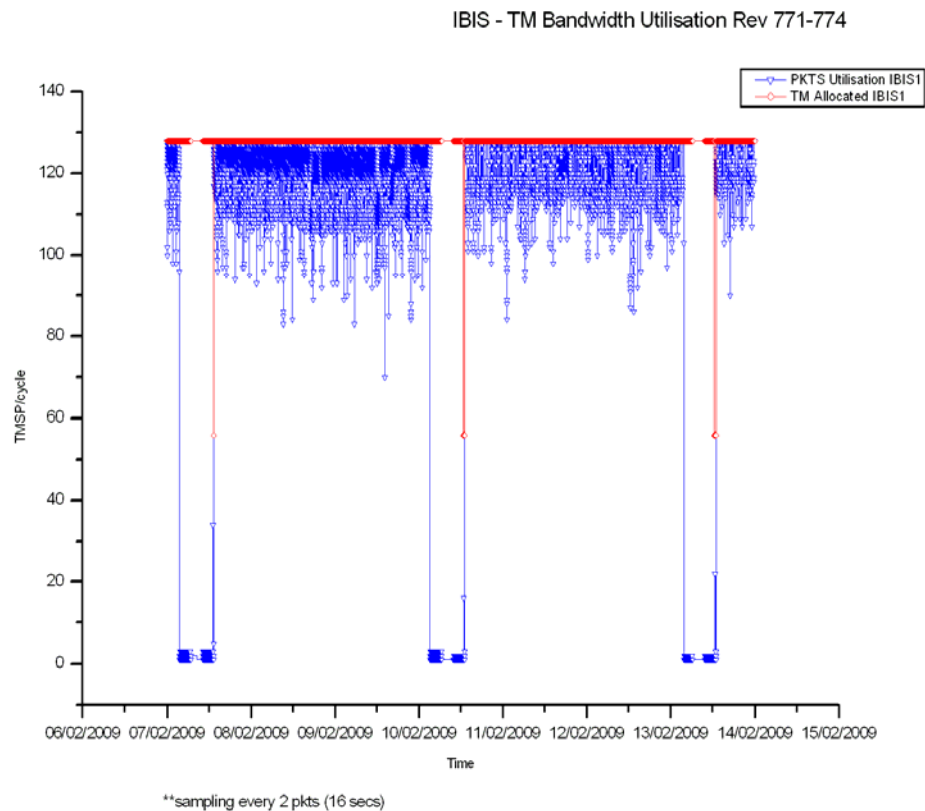
3.2.2 IBIS

The overall status of the unit is nominal.

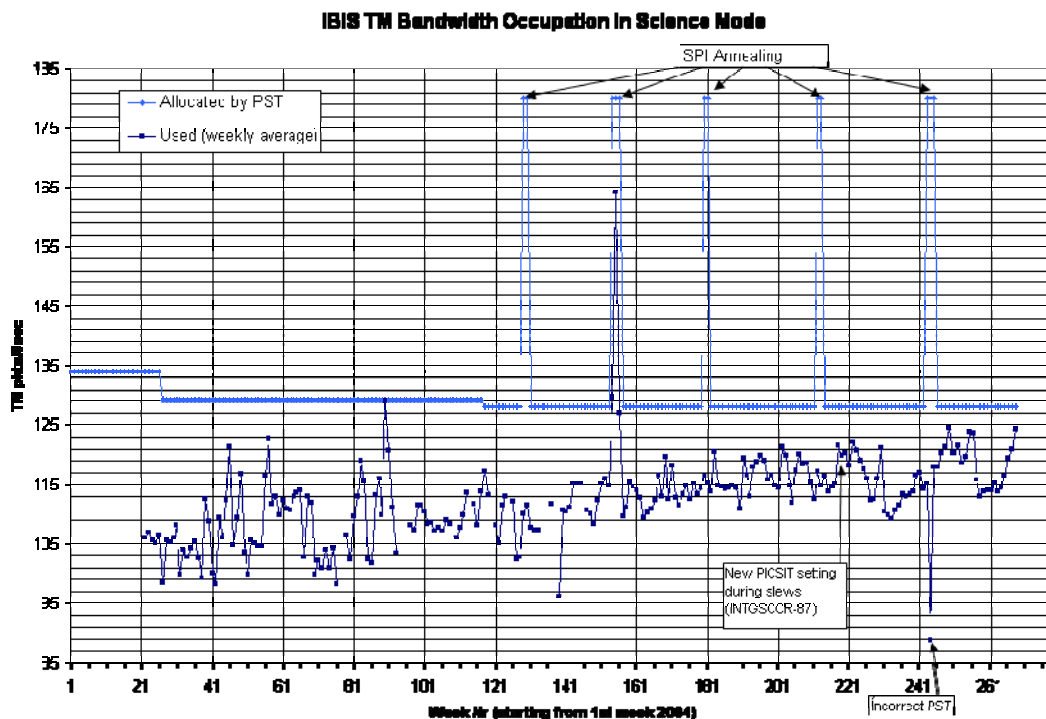
During the reporting period, the TM bandwidth statistics were as follows:

- PST allocation to IBIS above radiation belts: 128 packets/cycle
- IBIS mean bandwidth utilisation in science mode: 124.18 packets/cycle (up 3.22 on previous week)
- Percentage of TM cycles in which full bandwidth was used: 49.86%

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.

During revolution 771, 772 & 773, JEM-X1 was operated in Data Taking mode with a TM allocation of 8 packets/cycle, with JEM-X2 dormant (DPE OFF) and no TM slots allocated, during the part of revolution 774 this week, JEM-X2 was reactivated, and the TM allocation was 4 packets/cycle each.

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, all of the 141 planned science pointings were executed nominally.

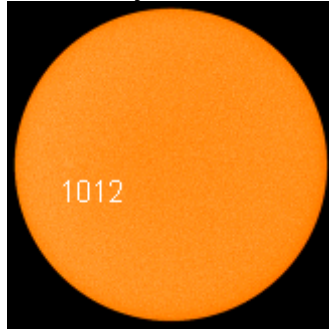
Note: Some more information concerning the OMC operations is provided in the Appendix.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity. The week began with a blank sun. Sun-spot #1012 appeared on the 12th, and was still visible on the 13th (Friday). 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. No pointing was lost due to ground problems. The overall performance was over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. No Restarts of ifrd or isds were necessary this week, it appears that the firewall stability is much improved.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. On DOY041 at 10:59 the TC link dropped from Redu's INCTRA. The TMTCS2 crashed. The uplink of the ISGRI-CTX tables and the Antenna TTs were interrupted. The ECC Operator switched to chain 1 (TMTCS1), and rebooted TMTCS2. On DOY043 at 07:05, DSN reported a problem with the DSS-27 antenna. The station personnel reset the Antenna M&C unit and recovered service. The Redu pass was extended 80 minutes.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

New PSFs have been received for revolutions 779 to 781.

Revolutions 779 to 781 were planned following the Long-Term Plan (files transmitted on Mon 16 Feb).

New TSFs have been received for revolutions 774 and 775.

2. Observation status

No new ECS files have been received, the latest available is for revolution 765.

3. ISOC Science Data Archive

A beta release of the updated GAIO interface to get ScW data for bulk processing has been successfully tested and will be installed operationally.

4. ISOC system

ISOC system V21 was released as planned on 9 February. Work is ongoing on V22 (post TAC s/w).

5. Problems

No new problems. A workaround for the lack of contact through Telefonica is in place, using an additional commercial SMS service. Work is ongoing to fix the fundamental issue with Telefonica.

4.3.2 ISDC

Status of ISDC observation processing on 13/02/2009:

- Latest Standard Analysis completed: observation 06200280123 (PKS 1510-089, Revolution 763) on 07/02/2009.
- Latest products archived: observation 06200280123 (PKS 1510-089, Revolution 763) on 09/02/2009.
- Latest observation products sent to the observer: observation 06200280123 (PKS 1510-089, Revolution 763) on 10/02/2009.

5 Special Events

6 Anomalies

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

AR id	Date Created	Subject	Segment	Status
INT-3056	2009-02-12	DSS27 - Antenna stopped track (DOY 043)	NASA Station	Pending

7 Future Milestones

- Lunar eclipse 25/2/2009
- Reconfiguration of Ita disks on idda
- sftp connectivity to SOC ongoing.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 771

The observation in revolution 771 was a Target of Opportunity, a hexagonal dither of the anomalous X-ray pulsar 1E1547.0-5408 (RA 15:50:55.30, DEC -54:19:02.0), lasting ~58.3 hours.

Revolution 772

The observations in revolution 772 began with a Target of Opportunity, a hexagonal dither of the anomalous X-ray pulsar 1E1547.0-5408 (RA 15:50:55.30, DEC -54:19:02.0), lasting ~25.7 hours. They continued with a hexagonal dither of the Perseus OB2 Cloud (RA 03:32:48.00, DEC +31:26:00.0), lasting ~31.4 hours until the end of the revolution.

Revolution 773

The observation in revolution 773 was a hexagonal dither of the Perseus OB2 Cloud (RA 03:32:48.00, DEC +31:26:00.0), lasting ~58.8 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 108; JEM-X1 8; JEM-X2 0; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2009-01-27T06:54:59.000Z	136.3322	F	Automatic TM processing.
2009-01-27T21:36:53.000Z	136.3206	F	Automatic TM processing.
2009-01-28T13:37:35.000Z	136.3016	F	Automatic TM processing.
2009-01-29T05:37:29.000Z	136.2670	F	Automatic TM processing.
2009-01-29T06:53:21.000Z	136.2523	F	Automatic TM processing.
2009-01-29T11:31:53.000Z	136.2040	F	Automatic TM processing.
2009-01-30T20:48:21.000Z	136.1850	F	Automatic TM processing.
2009-02-01T11:18:49.000Z	136.1510	F	Automatic TM processing.
2009-02-02T21:25:08.000Z	136.0877	F	Automatic TM processing.
2009-02-04T11:04:25.000Z	136.0671	F	Automatic TM processing.
2009-02-05T21:24:36.000Z	136.0506	F	Automatic TM processing.
2009-02-07T10:51:04.000Z	136.0430	F	Automatic TM processing.
2009-02-08T16:02:35.000Z	136.0016	F	Automatic TM processing.
2009-02-10T10:36:24.000Z	135.9839	F	Automatic TM processing.
2009-02-11T20:38:44.000Z	135.9616	F	Automatic TM processing.

This report was generated Fri Feb 13 08:00:34 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, 07/02/2009 – 13/02/2009

The AOCS operations were executed from the Automatic Timeline.

During this period, 98 Open Loop Slews, 53 Closed Loop Slews and 5 Momentum Biases were executed (as reported by ACC OEM).

No slews were missed from TL, during the observation period.

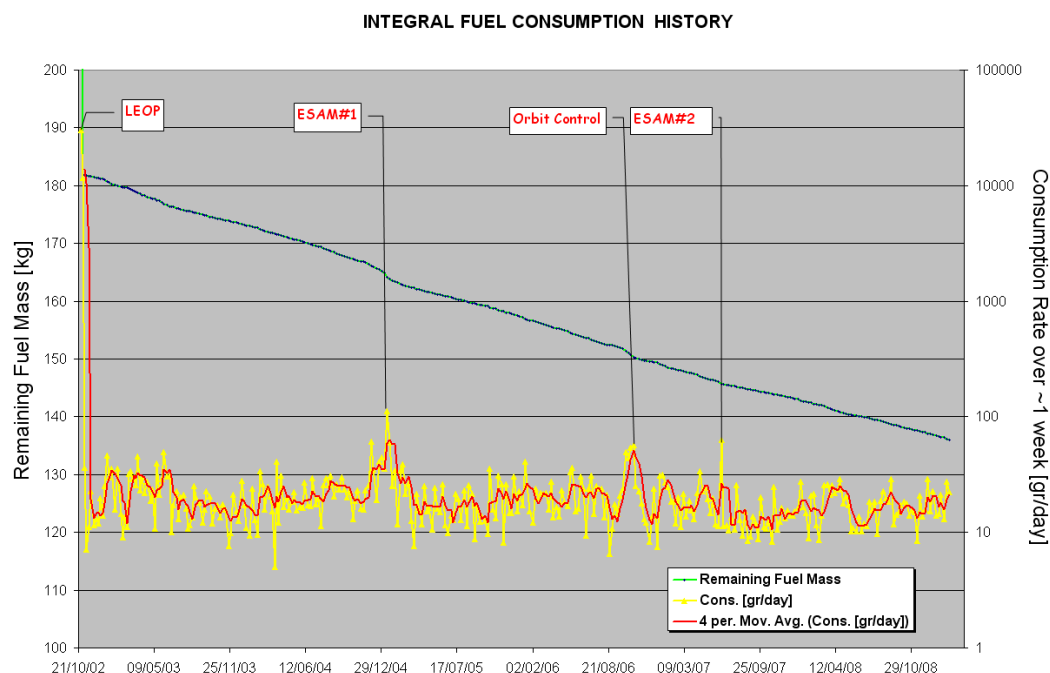
The OTF was not reached during part of PID 077200507, due to loss of guide star.

Orbit Control

No update.

Fuel consumption

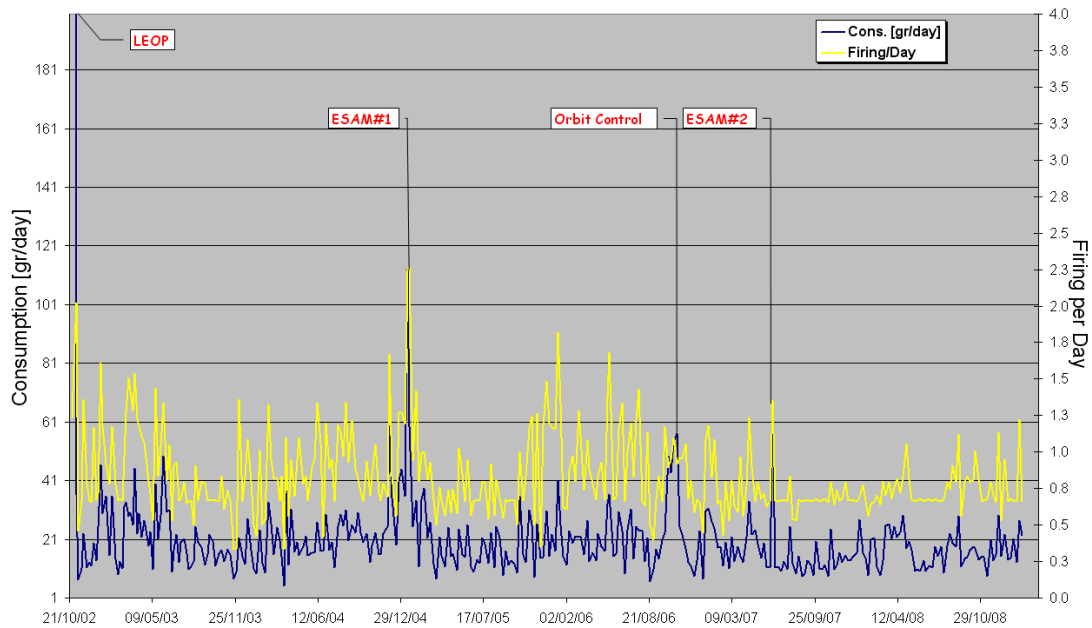
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 13/02/2009 is reported in the plot below.



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 13/02/2009 is reported in the plot below.

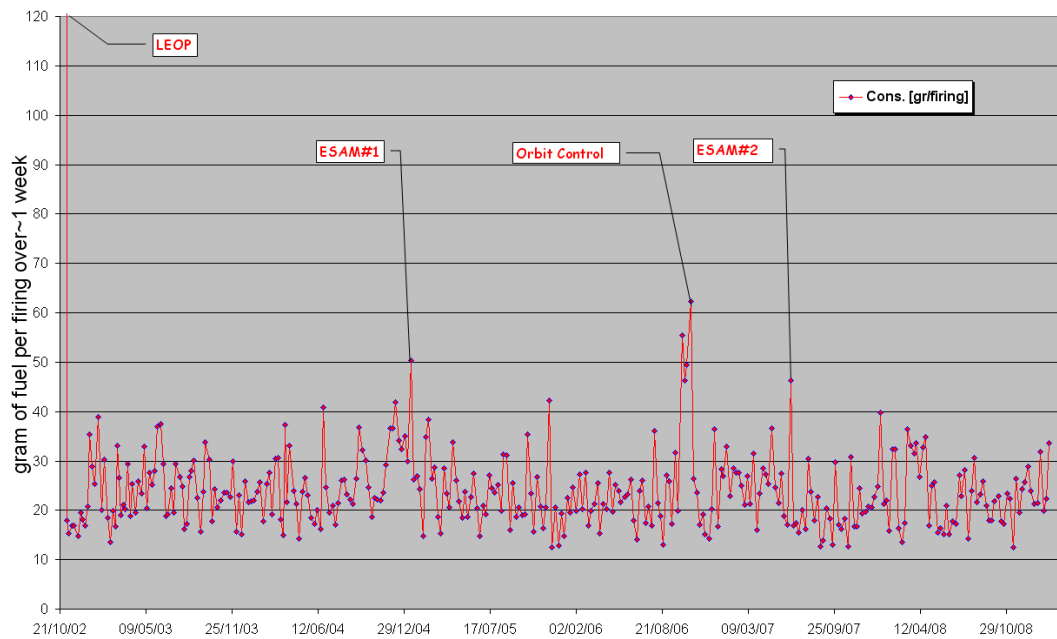
INTEGRAL FIRING PER DAY HISTORY



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 13/02/2009 is shown in the plot below.

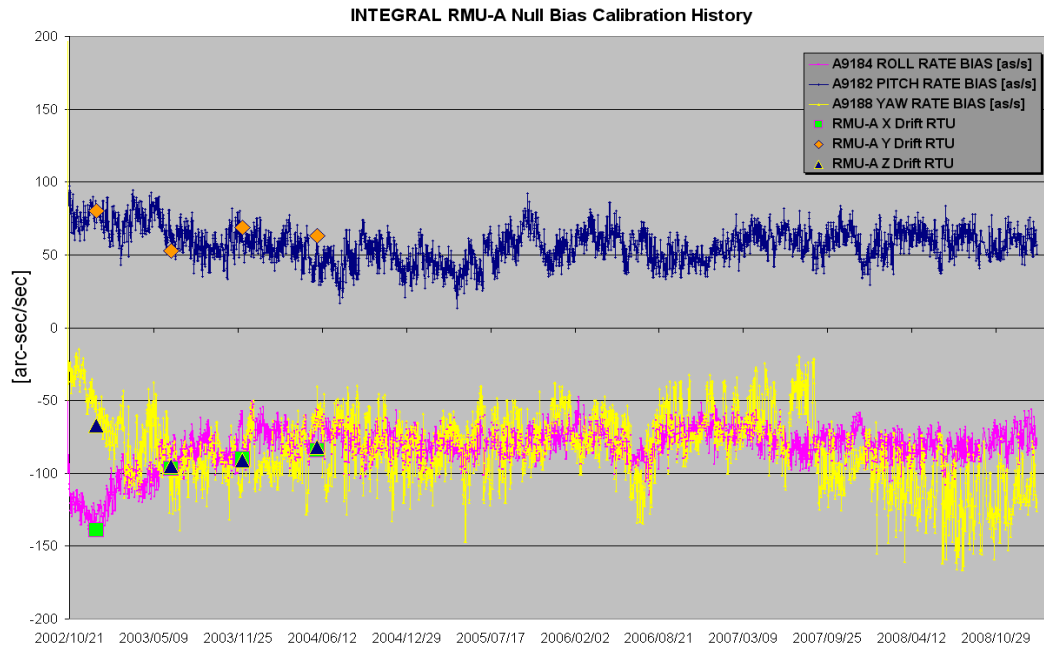
INTEGRAL FUEL MASS PER FIRING HISTORY



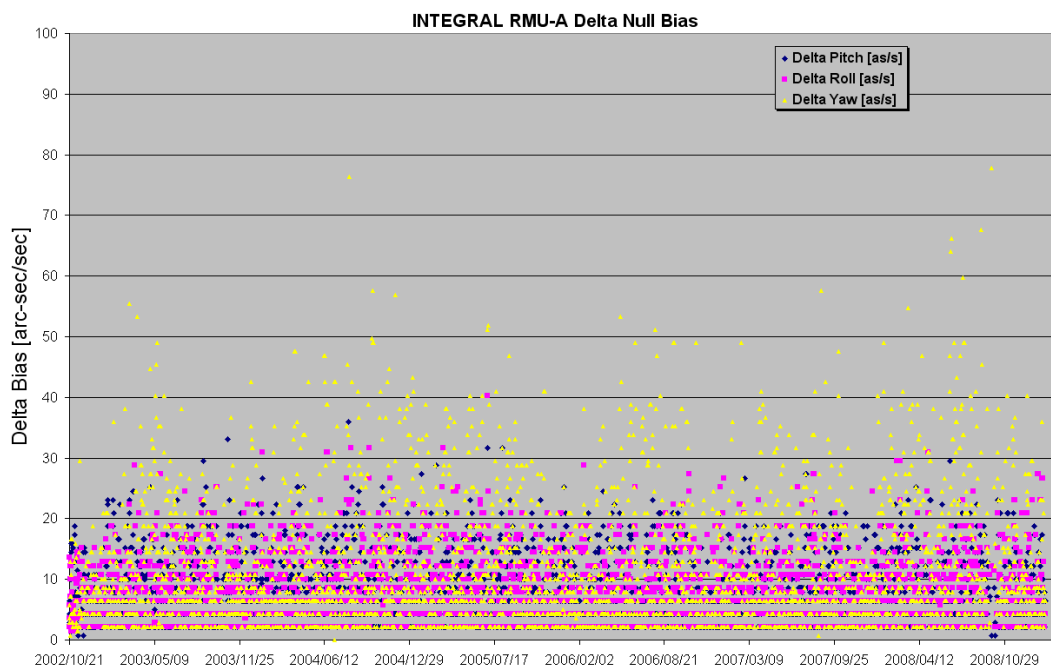
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 13/02/2009 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 13/02/2009 is reported in the plot below.



07/02/2009 (Day of Year 038, Revolution 771-772)

Nothing to report.

08/02/2009 (Day of Year 039, Revolution 772)

Nothing to report.

09/02/2009 (Day of Year 040, Revolution 772)

Loss of guide star: at 15:54:28z a loss of the selected guide star occurred during PID 07720050. 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 07720051 was manually updated in TL.

No impact on TL.

The OTF was not reached during the part of PID 07720050.

10/02/2009 (Day of Year 041, Revolution 772-773)

Nothing to report.

11/02/2009 (Day of Year 042, Revolution 773)

Nothing to report.

12/02/2009 (Day of Year 043, Revolution 773)

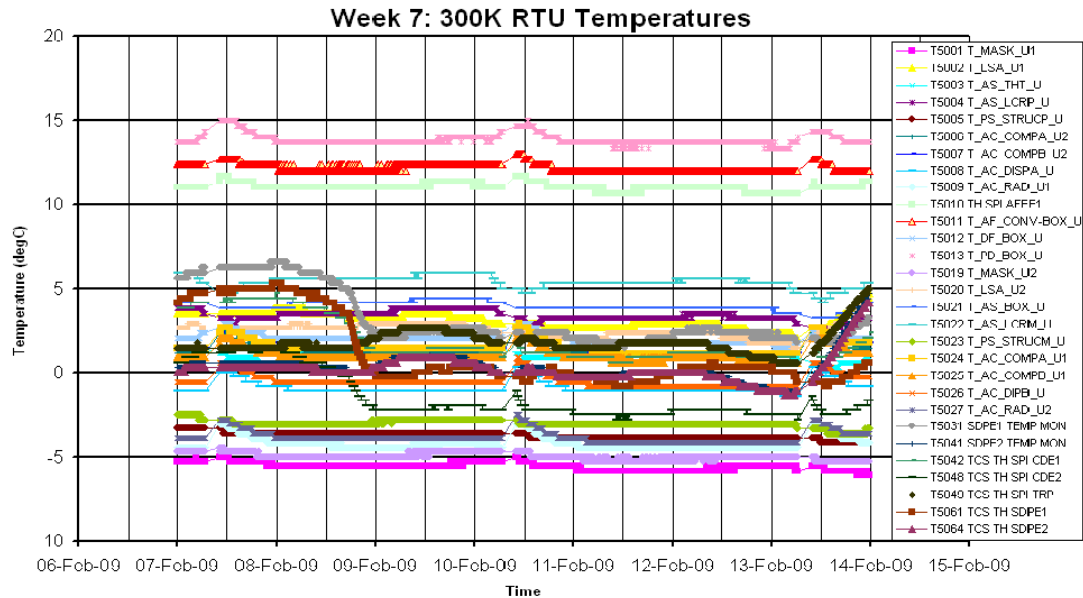
Nothing to report.

13/02/2009 (Day of Year 044, Revolution 773-774)

Nothing to report.

8.3.2 SPI Operations

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



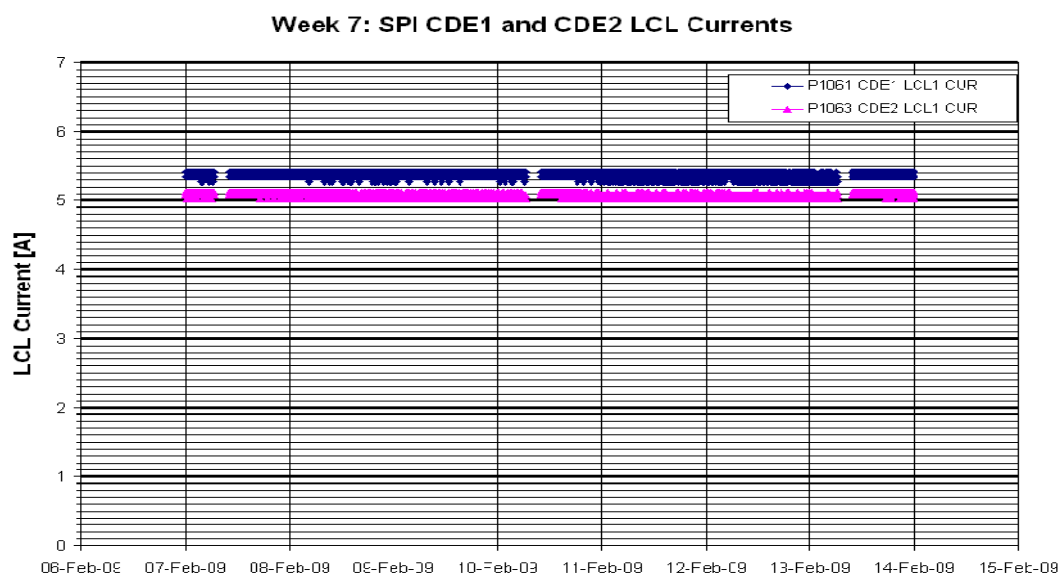
Stirling Compressors and Cryostat: The performance of the compressors is nominal.

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

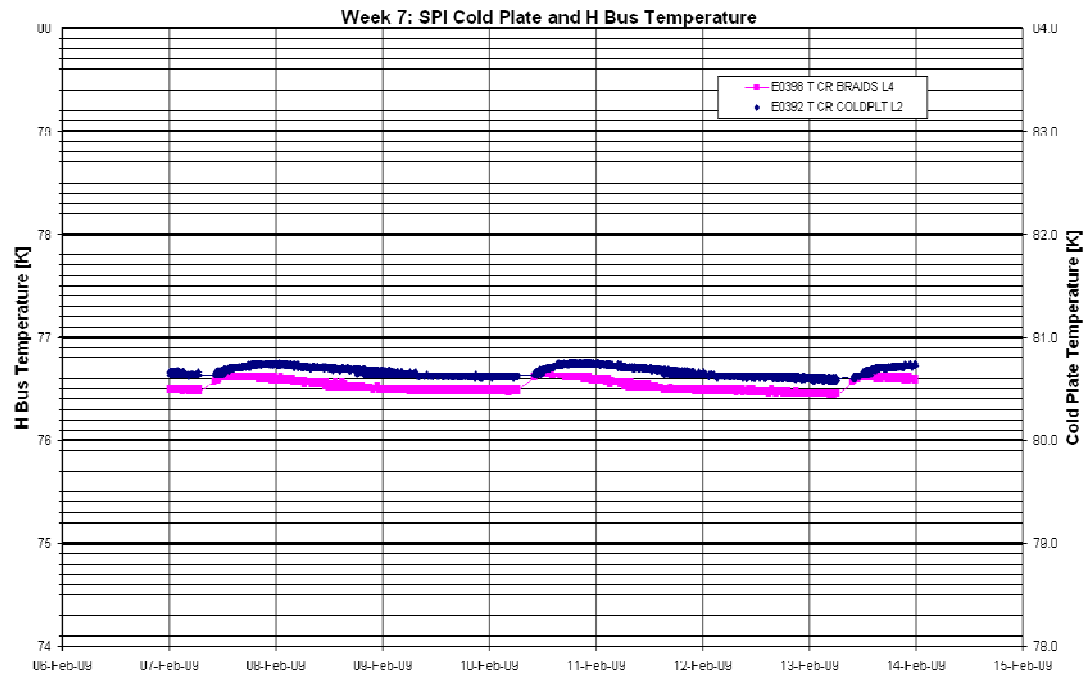
The stroke of all four compressors was set to 42 throughout the week and the average CDE LCL currents were as follows:

- CDE1 LCL Current = 5.36A
- CDE2 LCL Current = 5.07A

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



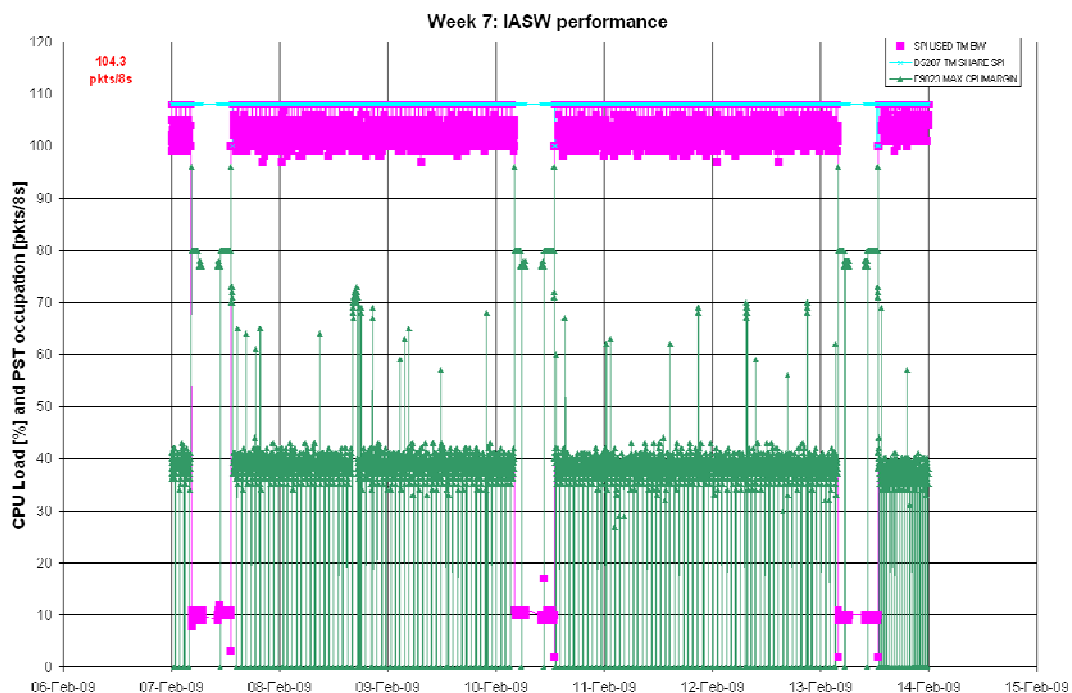
The following plot shows the evolution of the cold plate and H bus temperatures during the reporting period.



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

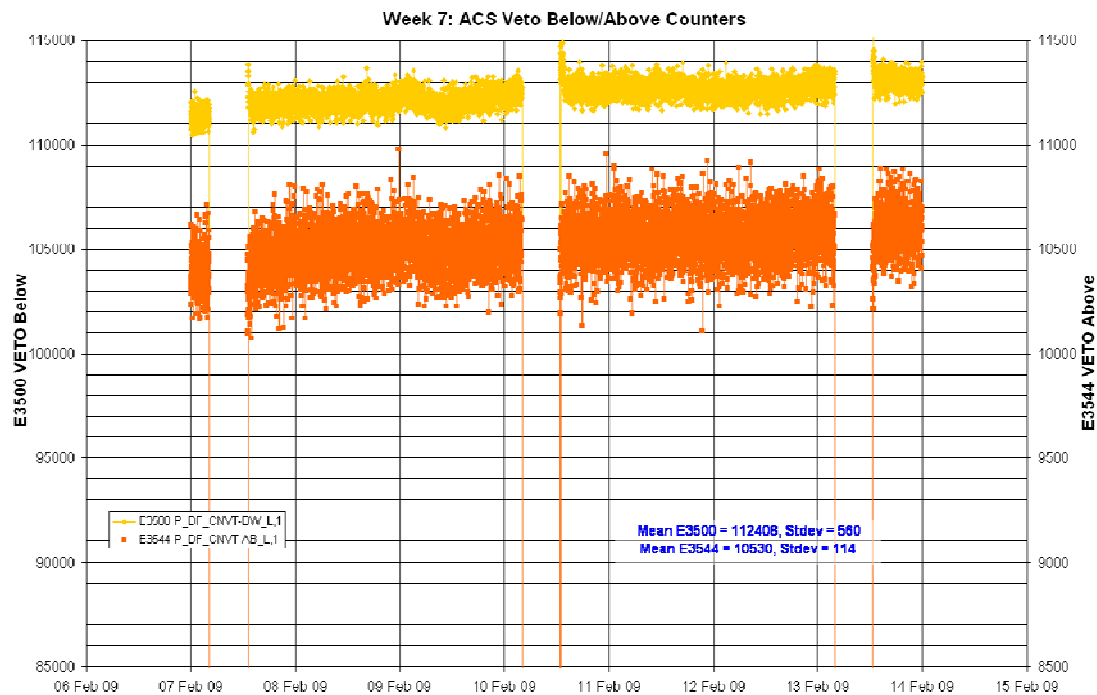
The IASW version installed is v4.3.4 with SE compression only enabled and the spectra scaling factor set to 8/19 SE. The average TM bandwidth occupation of SPI was 104.3 packets/cycle over the science window when the TM allocation was 108 packets/cycle.

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

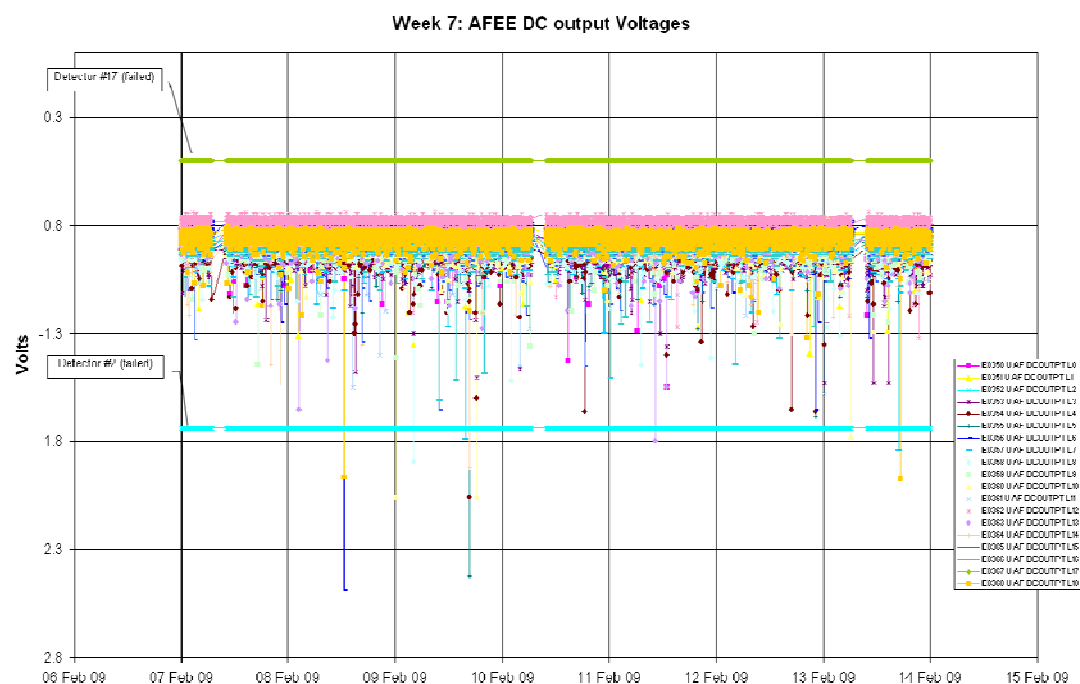


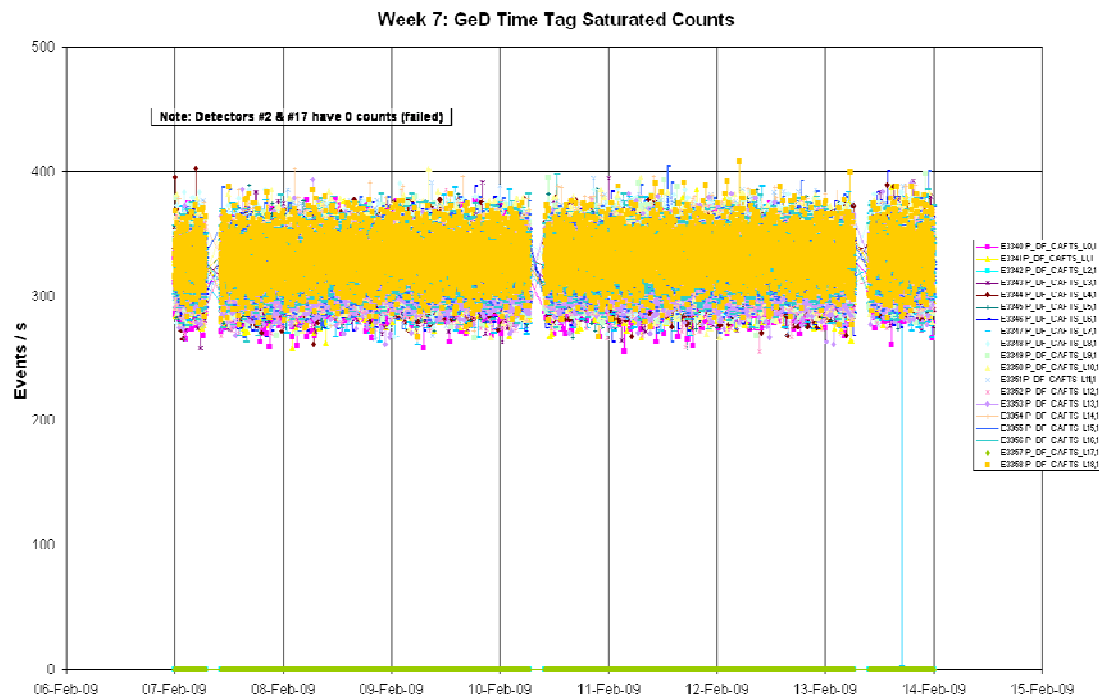
ACS: The performance of the ACS is nominal, except for FEE #81 which remains nominally switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is nominally OFF due to the anomaly on 5/8/2003 (INT_SC-61).

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

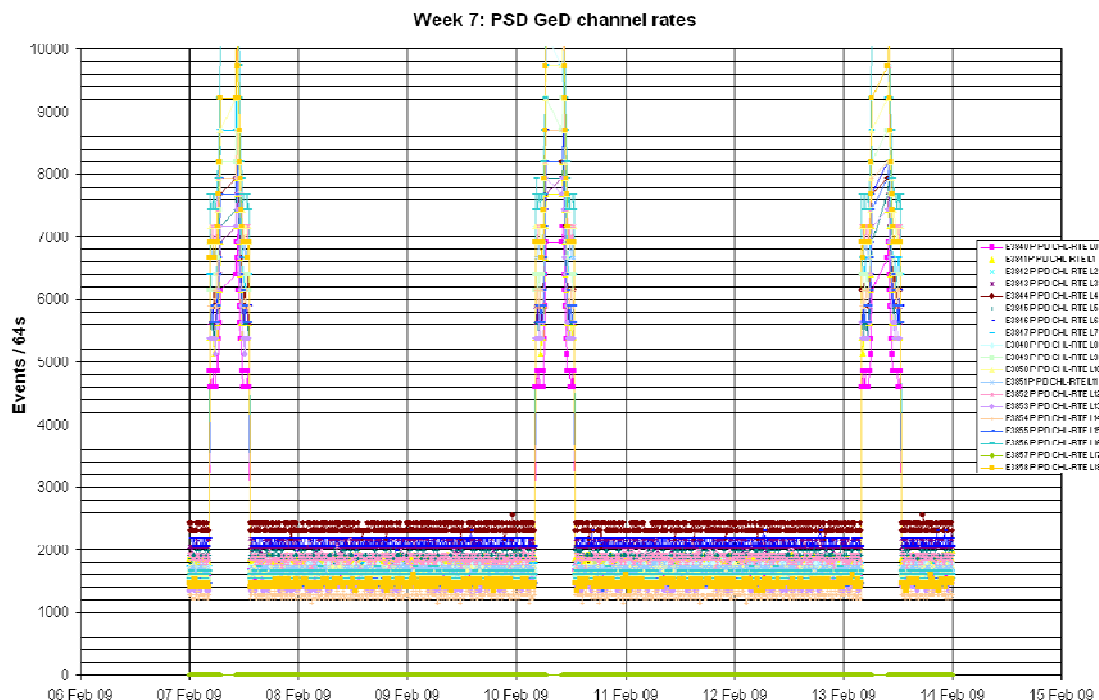


AFEE: The health of the AFEE is nominal. The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.





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 with SPI during the reporting period:

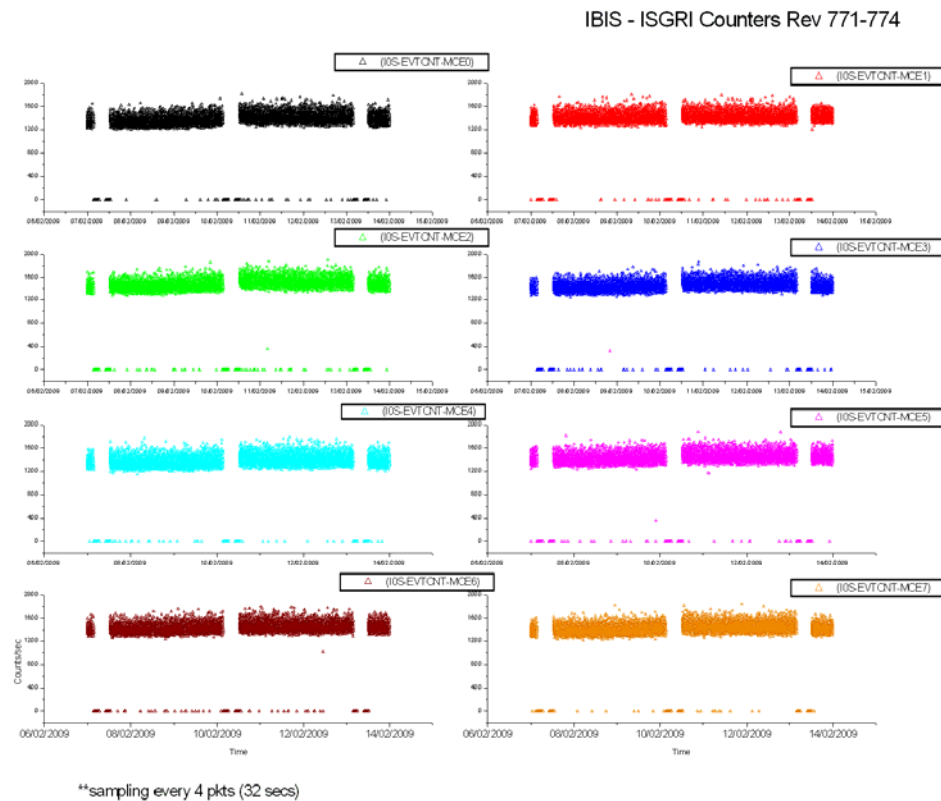
- On 2009-02-11 at 21:26:43Z TM parameter E2304 went OOL (value = PARAM > SPEC). This is the ACS FEE analogue status 5 V #54. As this parameter returned within limits of its own accord at 21:33:08Z, no action was taken.

- On 2009-02-13 at 03:53:35Z TM parameters E0219- E0228 went OOL (value = 0). These are the AFEE PA 2 temperatures for GeD#9-GeD#18. As they returned within limits of their own accord at 03:56:19Z, no action was taken. This is a re-occurrence of AR INT_SC-225.

8.3.3 IBIS Operations

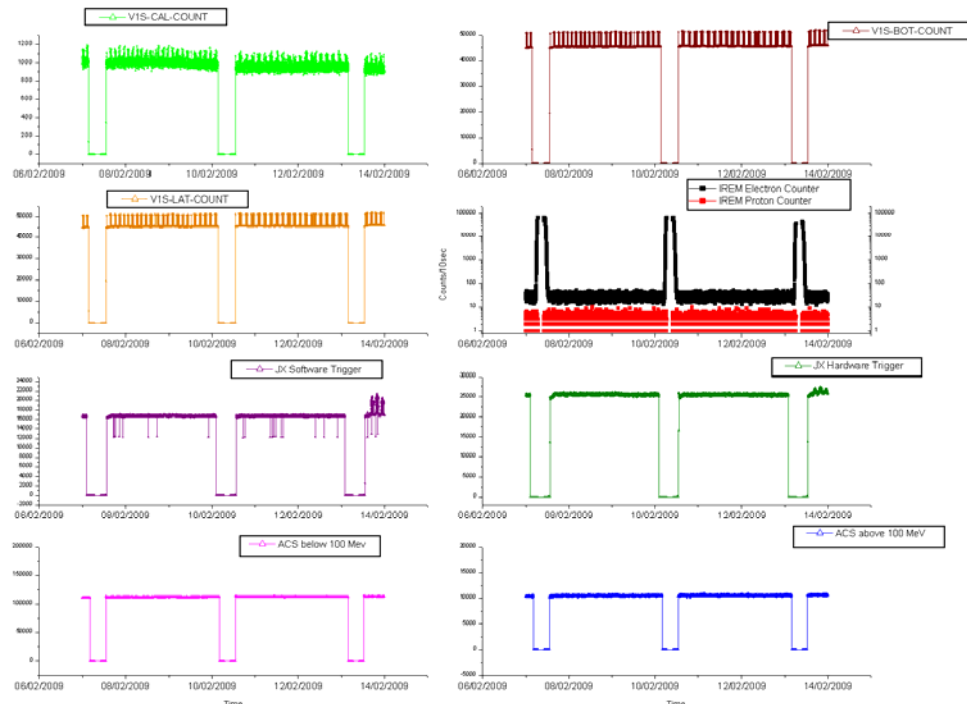
IBIS Event Counters Plots

ISGRI Counters:



VETO vs Payload Counters:

IBIS-VETO vs Payloads Counters Rev 771-774

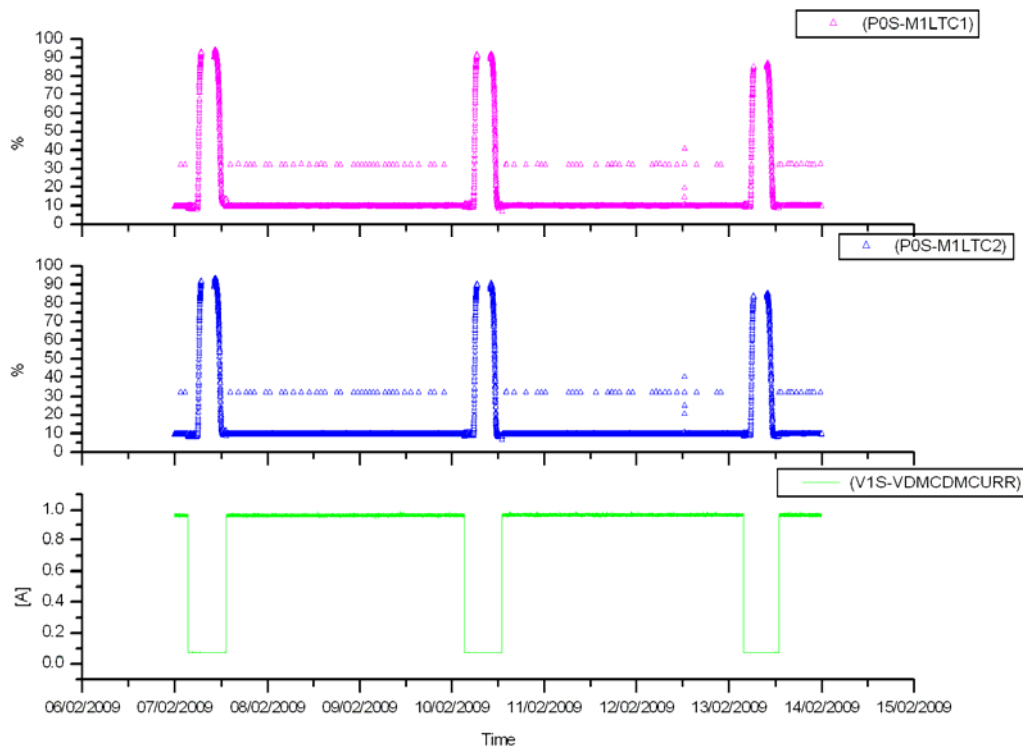


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

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

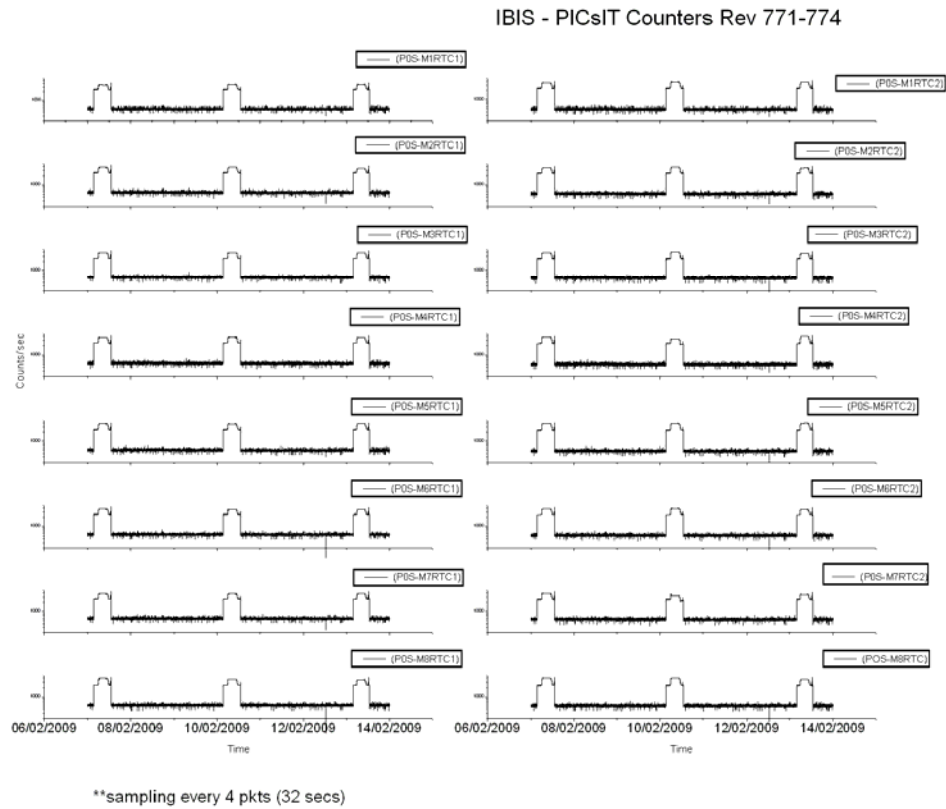
VETO Current:

IBIS-VETO Current & PICsIT dead times Rev 771-774

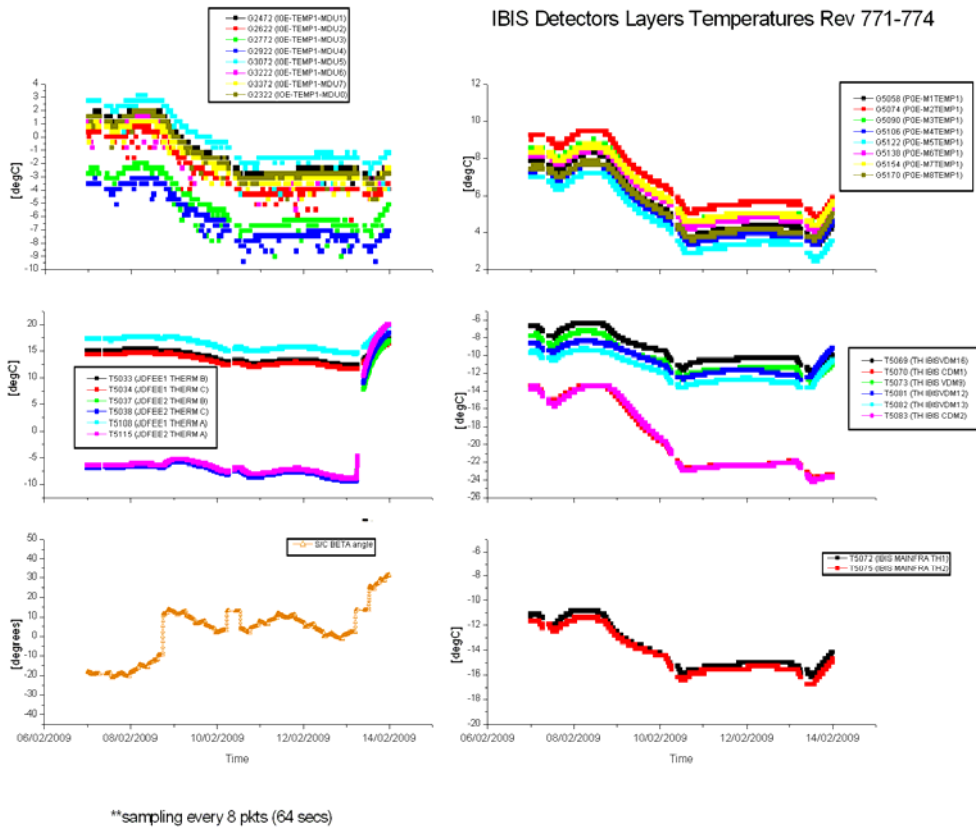


**sampling every 4 pkts (32 secs)

PICsIT Counters:



IBIS Detectors Layers Temperatures:



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.

2009-02-07 (DOY 038, Rev 771-772)

Due to a mis-configuration of the Mission Planning System, the lower radiation belt entry altitude of 48000km, which came into effect from revolution 769 onwards, had not been applied to the scheduling of the GEBENT02 ED (time-tagged ED to ensure safe configuration of IBIS after radiation belt entry). Therefore at the end of revolution 771 IBIS went to Safe configuration due to the execution of this ED at 03:29:08Z instead of the planned radiation belt entry time of 04:19:12Z.

2009-02-08 (DOY 039, Rev 772) to 2009-02-09 (DOY 040, Rev 772)

IBIS operations executed nominally.

2009-02-10 (DOY 041, Rev 772-773)

Due to a mis-configuration of the Mission Planning System, the lower radiation belt entry altitude of 48000km had not been applied to the scheduling of the GEBENT02 ED. Therefore at the end of revolution 772, IBIS went to Safe configuration due to the execution of this ED at 03:14:04Z instead of the planned radiation belt entry time of 04:04:12Z.

2009-02-11 (DOY 042, Rev 773)

IBIS operations executed nominally.

2009-02-12 (DOY 043, Rev 773)

At 12:31:30Z the TM parameters families G5068 and G5072 failed status consistency check (value = TRUE). These are the PDM semi-module FIFO error flags. As these parameters had all returned within limits by 12:34:10Z, no action was taken.

Due to a mis-configuration of the Mission Planning System, the lower radiation belt entry altitude of 48000km had not been applied to the scheduling of the GEBENT02 ED in revolution 773. As this was realised before the end of the revolution, this ED was re-uplinked manually at 2009-02-12T13:29:45Z with the correct execution time of 2009-02-13T03:55:50Z. This problem was corrected in the Mission Planning files for revolutions 774 onwards.

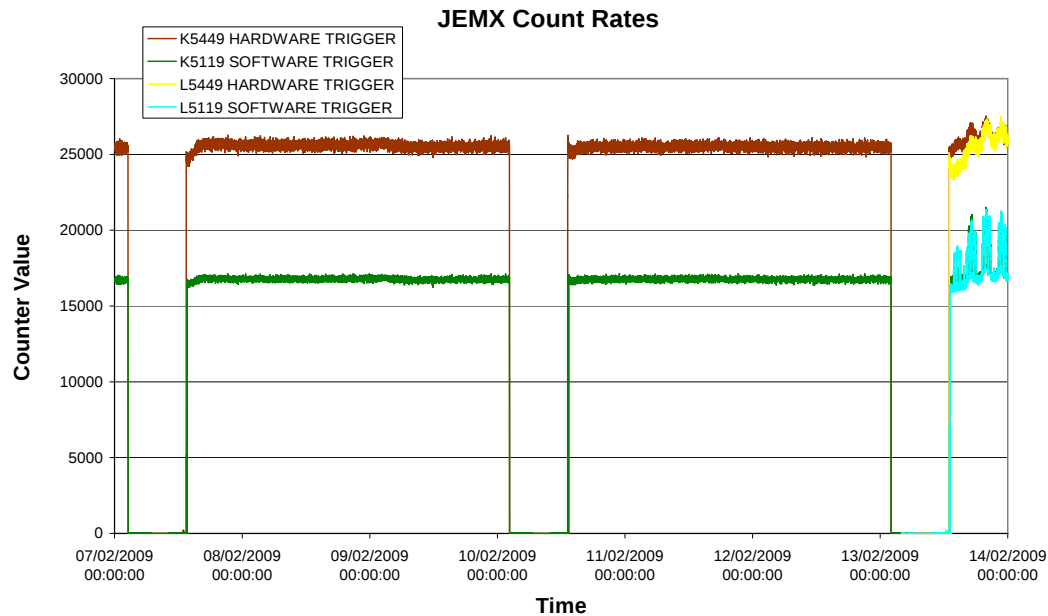
2009-02-13 (DOY 044, Rev 773-774)

IBIS operations executed nominally.

8.3.4 JEM-X Operations

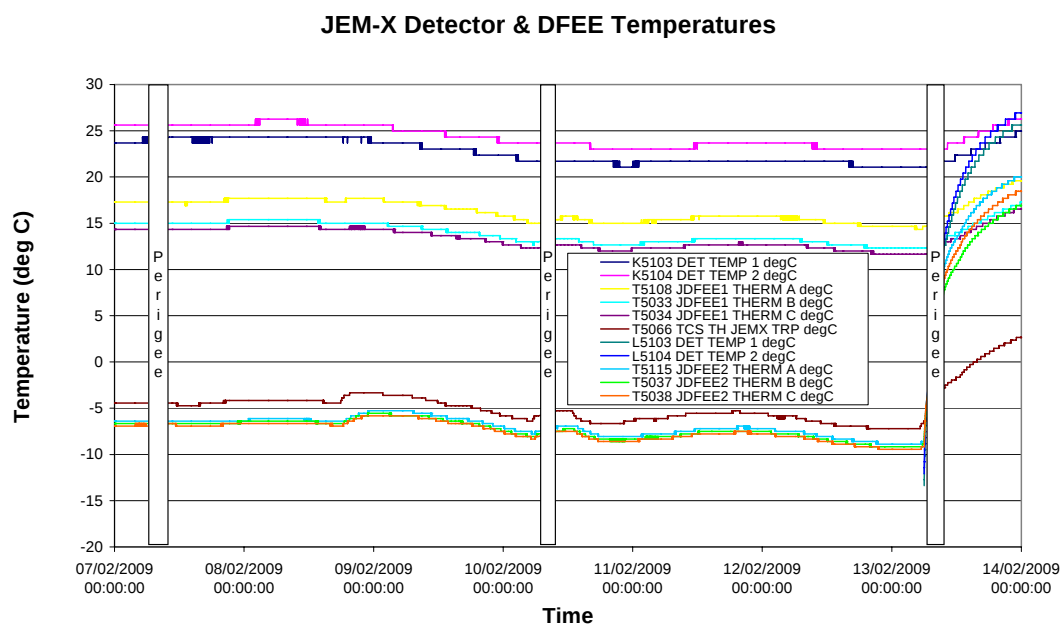
JEM-X Count Rates

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)

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JEM-X Daily Report

2009-02-07 (DoY 038, Rev 771) to 2009-02-11 (DoY 042, Rev 773)

JEM-X 1 operations executed nominally.

2009-02-12 (DoY 043, Rev 773)

The following OEMs were received at the indicated times:

2009.043.15.39.34.481	2009.043.15.39.36.090	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2009.043.15.39.34.481	2009.043.15.39.36.144	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2009.043.15.39.34.481	2009.043.15.39.36.146	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2009.043.15.39.34.481	2009.043.15.39.36.148	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2009.043.15.39.34.481	2009.043.15.39.36.149	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	5336				

No action was taken and there was no impact.

2009-02-13 (DoY 044, Rev 773-774)

At 03:51, operations began to activate JEMX-2 prior to the crab calibration.

First, the ED DEBWHI00 to assign bandwidth to JEM-X2 was uplinked, then at

03:53: FCP_JEM2_0010 JEMX2 DPE AND CSSW ACTIVATION
05:23: FCP_JEM2_0015 JEMX2 IASW ACTIVATION
05:36: FCP_JEM2_0016 JEMX2 ENABLE BCP DISTRIBUTION
05:43: FCP_JEM2_0017 JEMX IASW EXTENDED TM CHECK
05:48: FCP_JEM2_0020 JEMX2 DFEE 1ST ACTIVATION AFTER DPE SWITCH

At this point the perigee LOS interrupted operations. After AOS, the operations continued with:

09:53: FCP_JEM2_0060 JEMX2 UPDATE ENERGY LINEARISATION TABLE
10:08: FCP_JEM2_0040 JEMX2 TRANSITION TO SAFE

The rest of the activation was executed from the Timeline, with both units entering Data-taking at 13:10.

There was a string of JEMX-2 out of limits associated with the switch-on, but these were normal, and disappeared after the unit had warmed up.

8.3.5 OMC Operations

2009-02-07 (DoY 038, Rev 771) to 2009-02-13 (DoY 044, Rev 774)

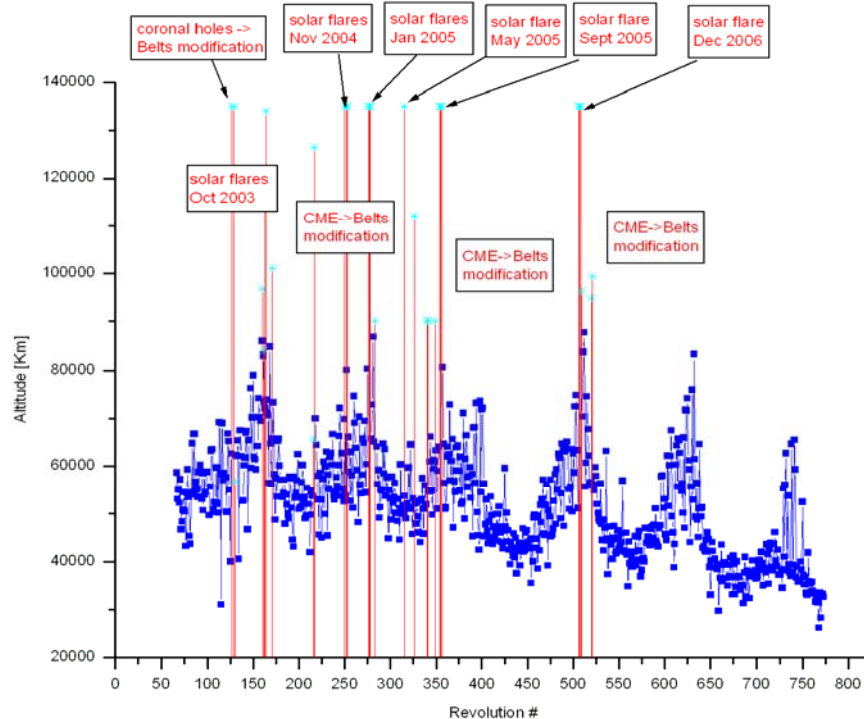
Nothing to report.

On DoY 038 at 04:19:19, DoY 041 at 04:04:15 and DoY 044 at 03:50:56 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]
771	RAD_ENTR R 2009-02-07T04:19:12Z	07/02/2009 05:49:18	33204.9	07-Feb-2009 05:41:28	34778.01
772	RAD_EXIT R 2009-02-07T13:05:29Z	07/02/2009 12:28:14	>>33998.3	07-Feb-2009 12:21:28	46363.15
772	RAD_ENTR R 2009-02-10T04:04:12Z	10/02/2009 05:35:26	33287.7	10-Feb-2009 05:30:23	34454.82
773	RAD_EXIT R 2009-02-10T12:51:00Z	10/02/2009 12:01:26	>>33975.6	10-Feb-2009 12:10:23	46563.46
773	RAD_ENTR R 2009-02-13T03:50:50Z	13/02/2009 05:26:55	32611.2	13-Feb-2009 05:20:23	34237.57
774	RAD_EXIT R 2009-02-13T12:37:22Z	13/02/2009 11:36:07	>>33985.9	13-Feb-2009 12:00:23	46781.94

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)

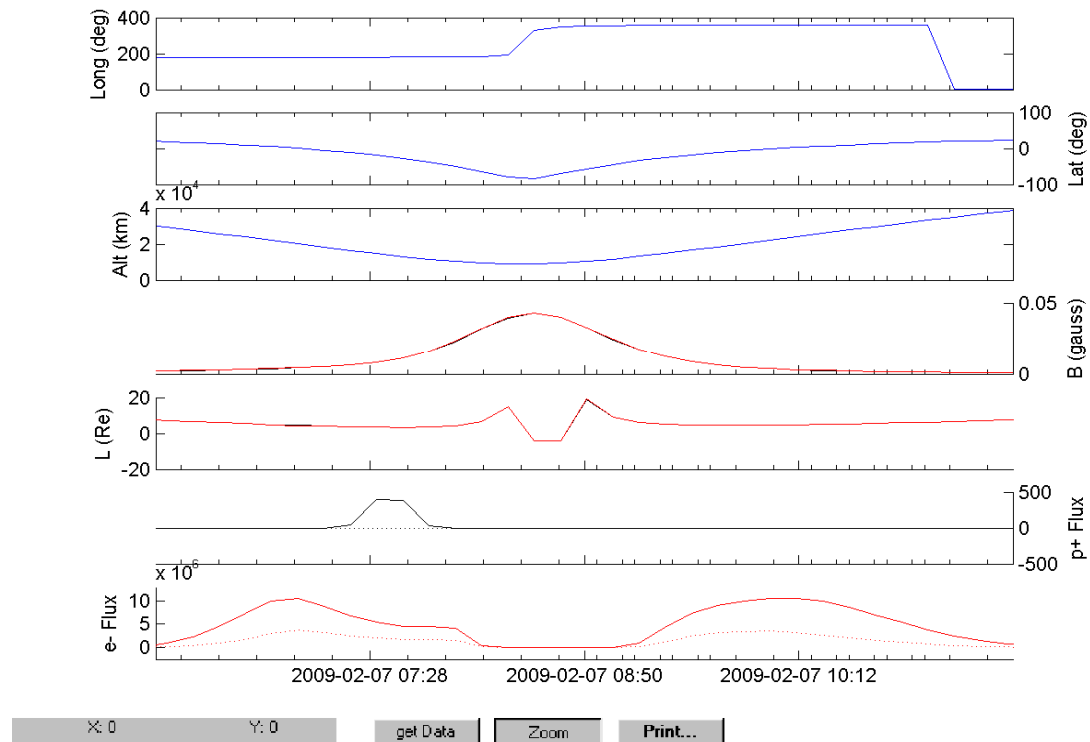
* Rad belt entry time ignoring previous threshold crossings where a gap of more than 30 minutes is present.

IREM radiation counters:

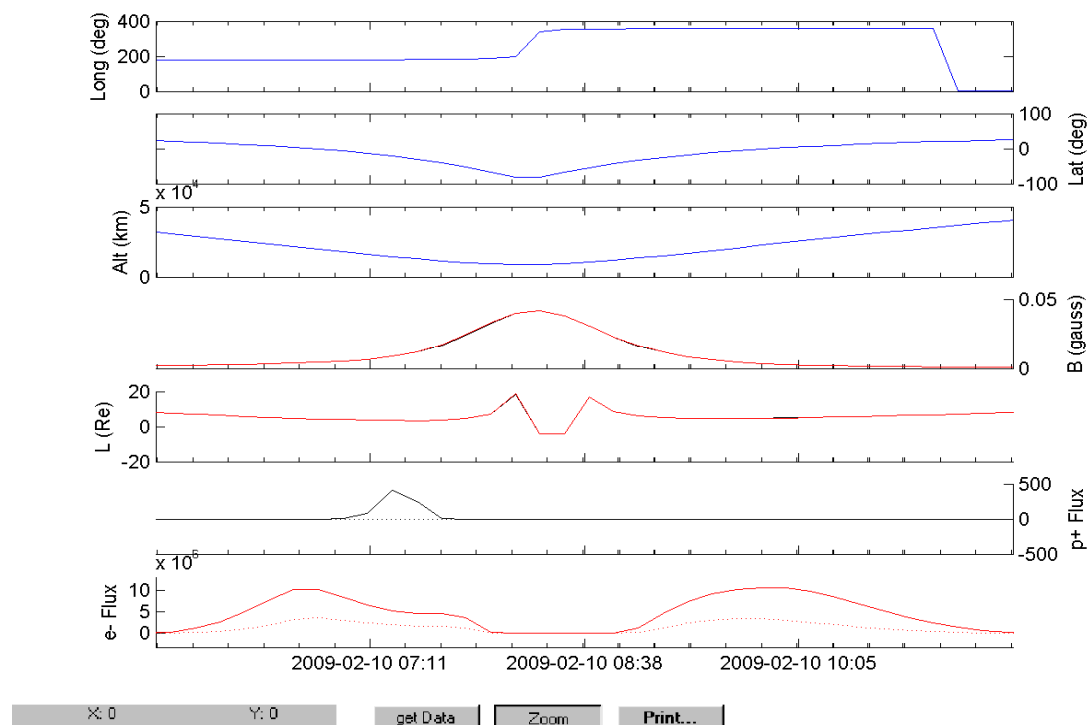
The IREM radiation counter plots are not available this week.

IREM Predicted Radiation Belt Passages

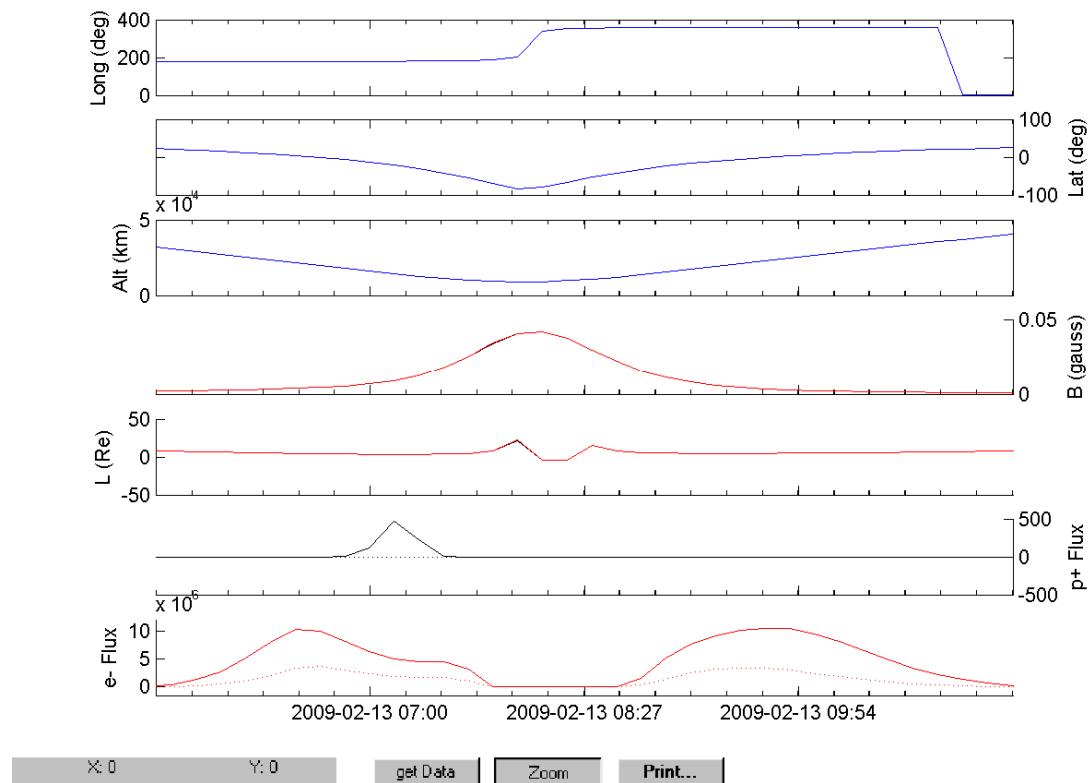
Rev 771



Rev 772



Rev 773



Radiation Assessment

Generated with SEIS Report and Analysis tool.

INTRODUCTION

This note summarises the space weather status over the observation period

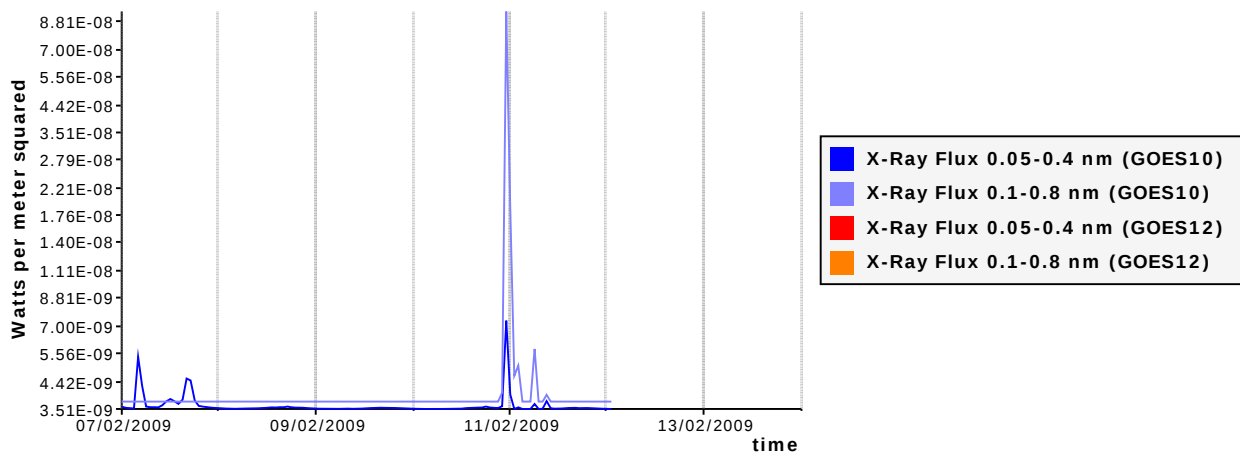
DAILY SUN

see in WR section 3.2.5

RADIATION FLUXES

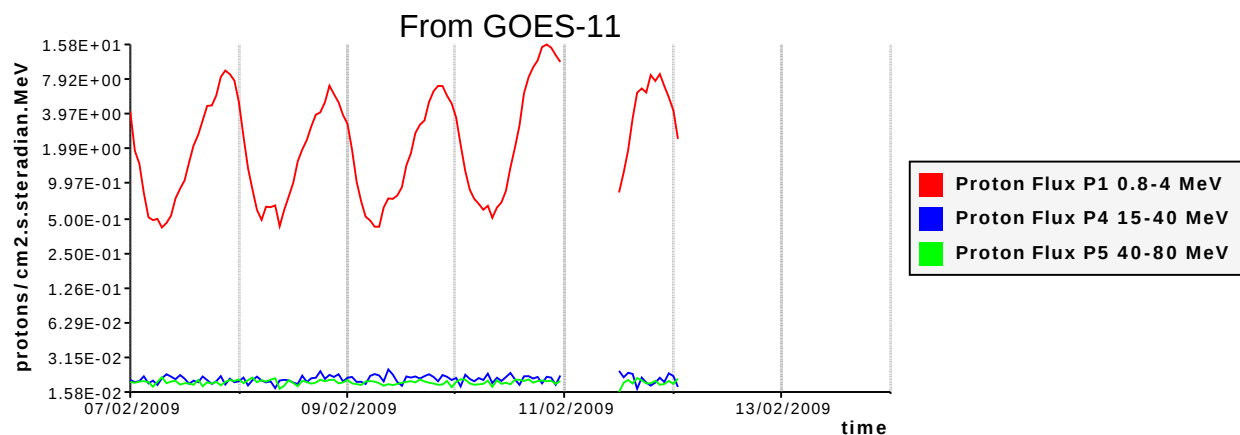
X-ray fluxes

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.



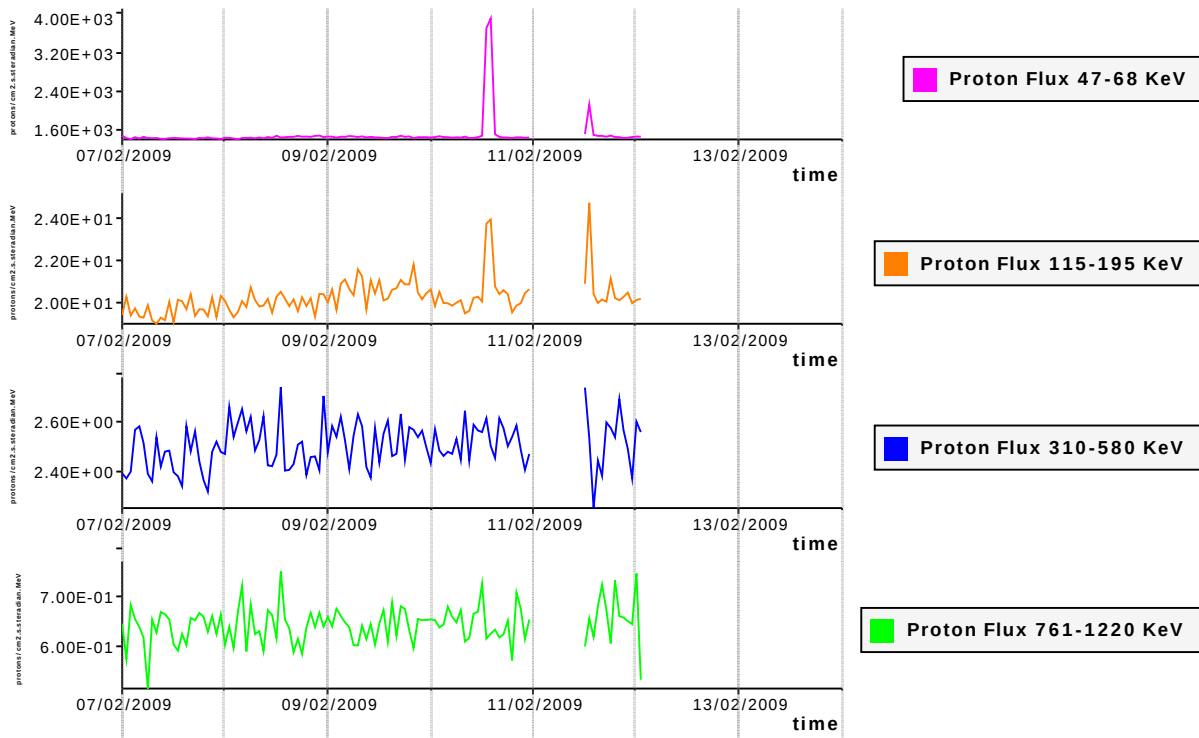
Proton fluxes (GOES-11)

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 $1\text{E-}2$.



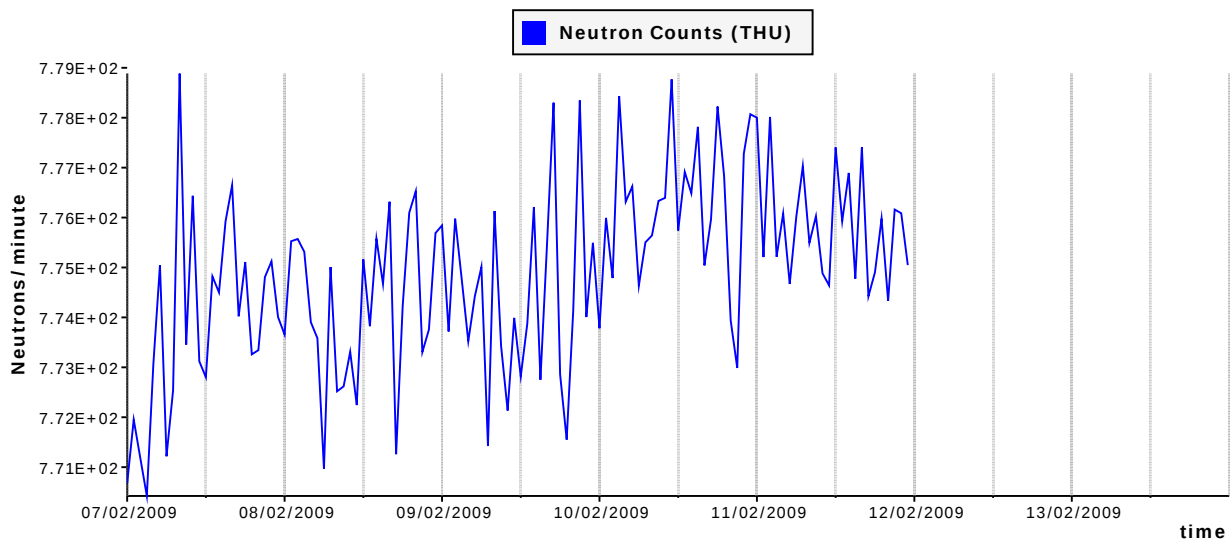
Proton fluxes (ACE)

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



Neutron counts

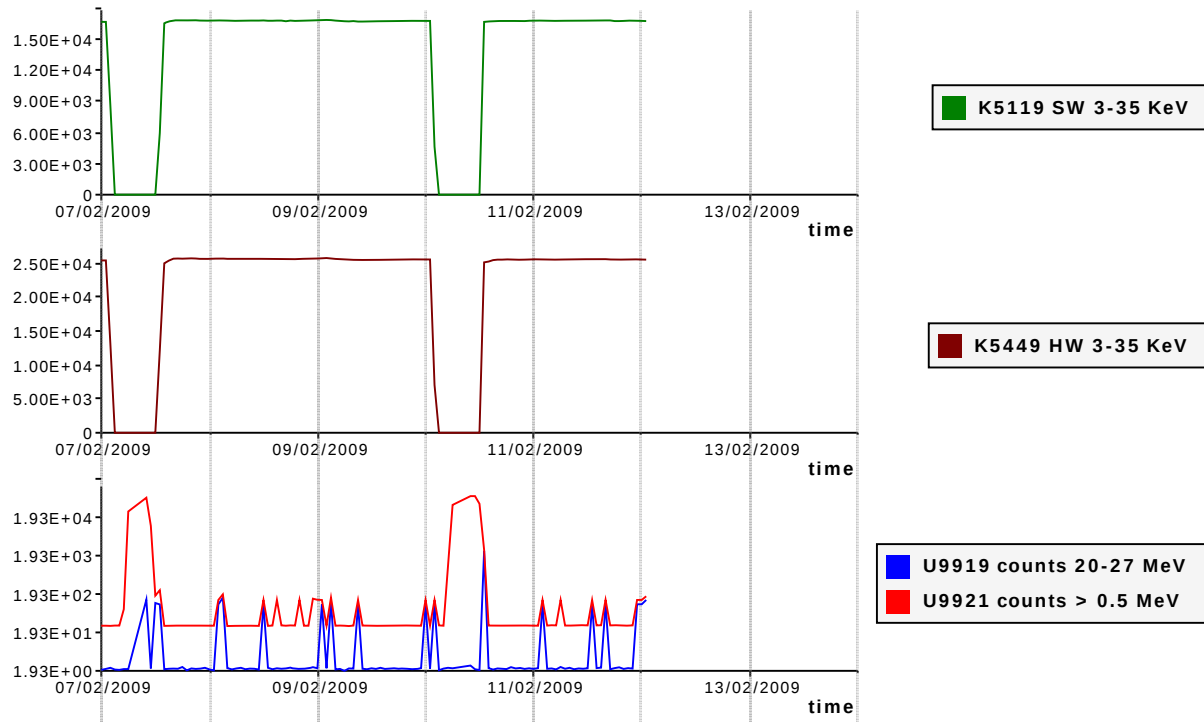
The neutron counts for the last 3 days are presented in the following plot. Nominally they remain stable around 7.2E+2.



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.

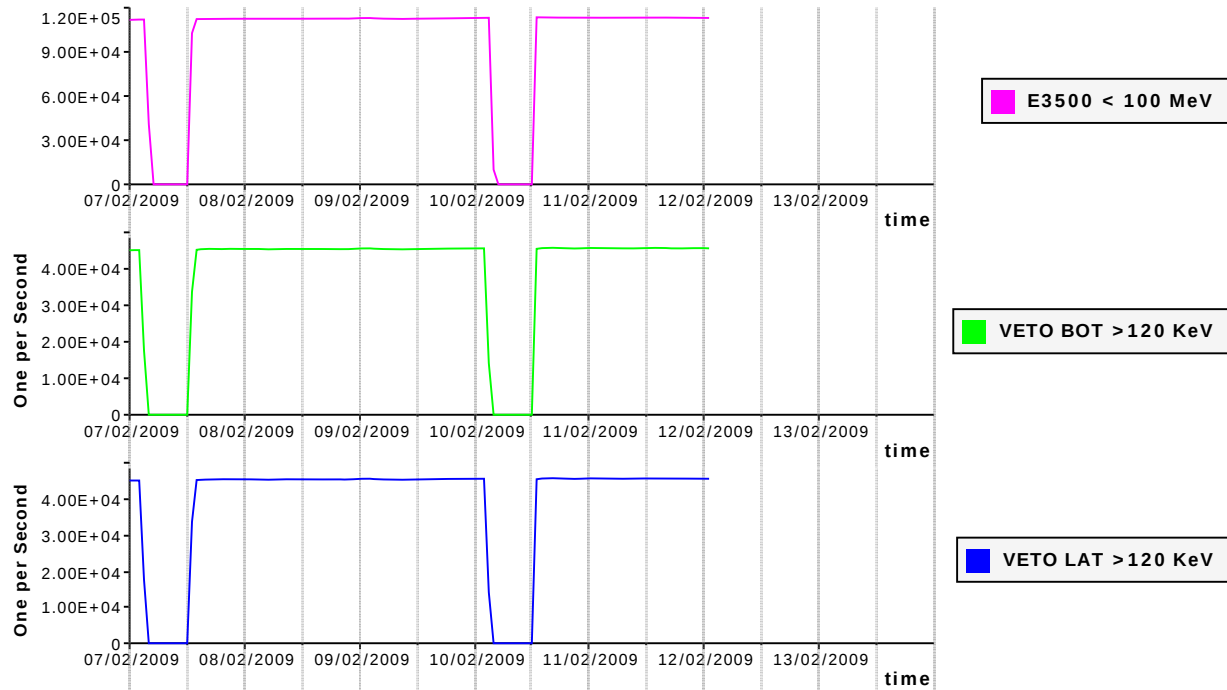
Nominal values are respectively about 1 and 18 for IREM counts, and, 13000 and 19000 for JEM-X ones.



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%.

