

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 278
Week 03
21.01.08
Routine Phase

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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 12.01.08 until 18.01.08 (both dates inclusive) and covers the revolutions 641, 642 and 643.

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 three raster dithers of M31 (RA 00:42:44.31, DEC +41:16:09.0), an OMC Flat-Field calibration exercise at attitude (RA 02:28:24.00, DEC +15:30:00.0), and a raster dither of PKS 1510-089 (RA 15:12:50.53, DEC -09:05:59.8).

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

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

The fuel consumption over the period between 12/01/2008 and 18/01/2008 was 0.1281 Kg. The remaining propellant is in the order of 142.6859 Kg.

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

3.1.2 Power

The EPS is working nominally; available power from the arrays is of the order of 2100W.

3.1.3 Thermal

The thermal control of the satellite is working well. The temperatures are currently all within the specified operational limits.

3.1.4 OBDH

The OBDH subsystem is working flawlessly. No on-board communications problem has been identified.

3.1.5 RFS

The RF subsystem is working properly. The link margin is sufficient to ensure proper TM reception and execution of commands with the ranging channel enabled.

3.2 Payload

3.2.1 SPI

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

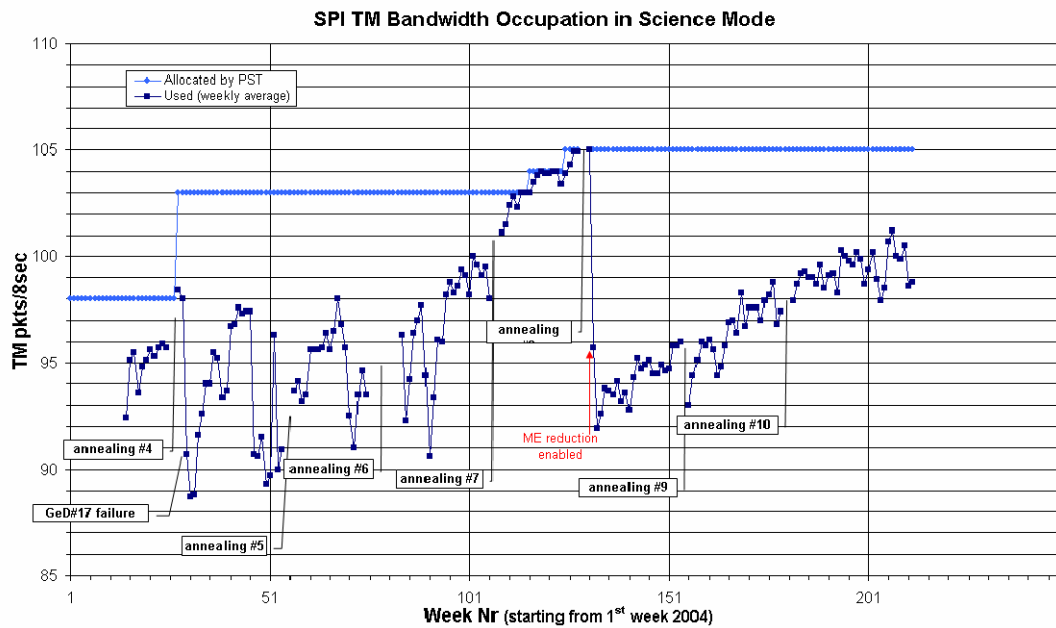
The 11th annealing was started on 2008-01-12 at 06:11Z. This annealing is progressing nominally. The summary annealing timeline is included in the future activities section of this report. The following table reports the major events/steps performed so far (i.e. up to 18th January) since the start of the annealing:

Date/Time	Activity
12/01/2008 06:11Z	Configure SPI for start of Annealing and stop SPI active cooling
12/01/2008 07:12Z	Annealing Heater Main ON
12/01/2008 09:12Z	Annealing Heater Redundant ON
13/01/2008 18:25Z	Cold plate temperature reached 373K (100degC)

The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K, with the stroke of all four compressors remaining at 42 until 2008-01-12 at 06:43Z, when the operations to stop active cooling as part of the 11th SPI annealing were started

During science operations, the instrument was kept in photon-by-photon mode with spectra TM enabled. The assigned TM bandwidth in the science observation windows was 105 packets/cycle. The average telemetry occupation in the science windows was 98.8 packets/cycle. From revolution 641 onwards, the assigned TM bandwidth was 46 packets/cycle and SPI was in CONF mode due to the annealing.

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



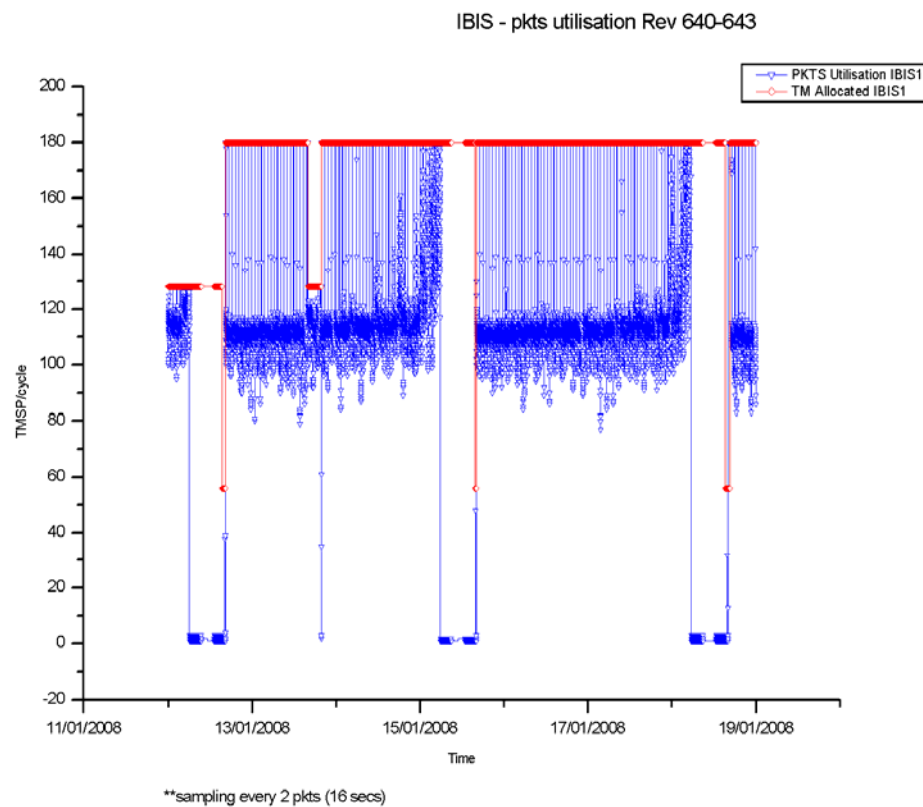
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

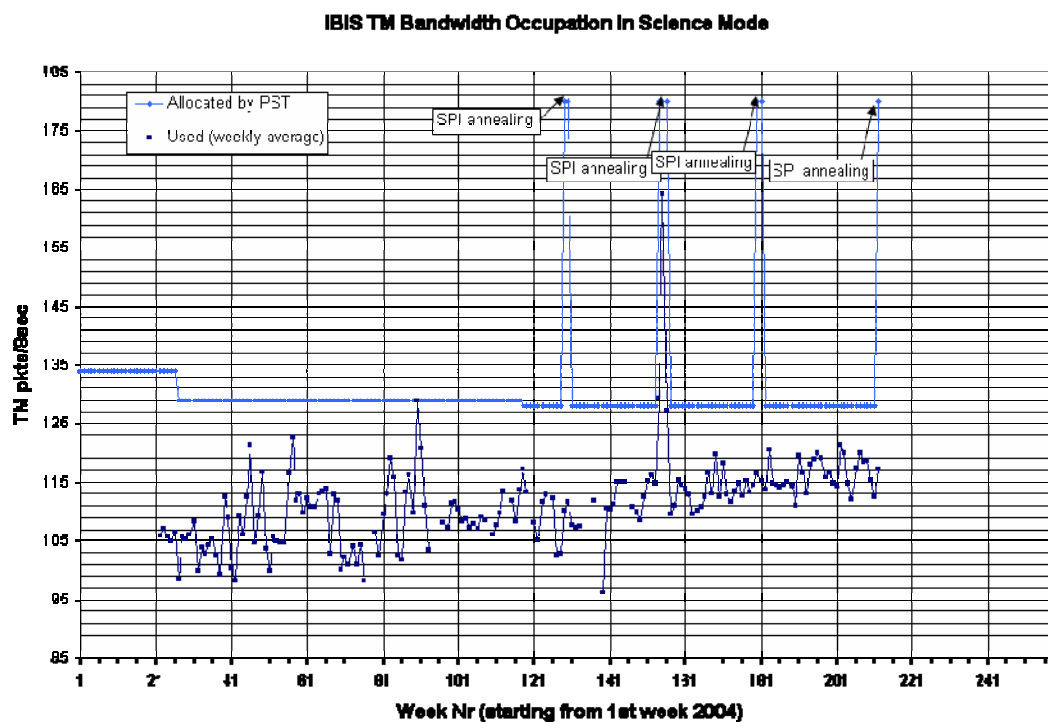
The overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 128 packets/cycle until the start of revolution 641, when the TM allocation increased to 180 packets/cycle due to SPI Annealing (except from 2008-01-13T16:00:44Z to 2008-01-13T19:54:06Z when the allocation was reduced to 128 packets/cycle due to an OMC Flat Field Calibration). The IBIS mean bandwidth utilisation during the observation period (when IBIS was in Science mode) was 117.31 packets/cycle, up 4.81 on last week.

A plot of the IBIS TM utilisation during the observation period is shown below:



A plot of the IBIS weekly bandwidth utilisation since 2004 is shown below:



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

3.2.3 JEM-X

The status of both JEM-X units is nominal.

JEM-X operations were performed by the automatic Timeline.

JEM-X1 was operated in Data Taking mode with a TM allocation of 8 packets/cycle. JEM-X2 was dormant (DPE OFF) with no TM slots allocated.

Note: Some more information concerning the JEM-X operations is provided in the Appendix.

3.2.4 OMC

The status of OMC is nominal.

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

During this reporting period, 138 of the 139 planned science pointings for OMC were executed nominally, 1 was lost.

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

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity. The Sun was blank all week, with very low risk of solar flares.



Reference: www.spaceweather.com

Note: Some more information concerning the IREM operations is provided in the Appendix Section 8.3.6.

4 Ground Facilities

The Operational ground facilities performance was very good this week. Two pointings were lost. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. However, there were 2 occasions of lost connections with the RT cache, and the Command Verifier crashed, which led to the loss of 2 pointings.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. There was, however, 3 occasions of TM drops from Redu, 1 of which delayed a recovery and contributed to the loss of a pointing, and 1 from DSS24, without impact. There were 2 incidences where the link with ISDC dropped, also without impact.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

New PSFs have been received for revolutions 649-650.

Revolutions have been planned up to revolution 650, but this revolution will need re-planning because the PSF was updated shortly after it was planned.

The TSFs for revolution 643-645 have been received.

The Long-Term Plan has been updated with the changes caused by the SPI annealing and approved by the Project Scientist.

2. Observation status

New ECSs have been received for Revolutions 629-631.

3. ISOC Science Data Archive

Data has been ingested up to revolution 629.

4. ISOC system

Work is progressing on version 18.0 according to schedule.

5. Problems

None.

4.3.2 ISDC

Status of ISDC observation processing on 21/01/2008:

- Latest Standard Analysis completed: observation 05200260002 (mid-latitude 2, Revolutions 621-622) on 09/01/2008.

- Latest products archived: observation 05200260002 (mid-latitude 2, Revolutions 621-622) on 09/01/2008.

- Latest observation products sent to the observer: observation 05200310002 (3C 454.3, Revolutions 623-624) on 11/01/2008.

5 Special Events

6 Anomalies

The following problem was reported that impacted operations:

- On DoY 018, at 15:12, the Command Verifier task within the imcs crashed. A recovery was performed, which was then delayed by continuous link drops. The Timeline was rejoined at 16:12. The impact was the loss of pointings 06430001 & 06430002.

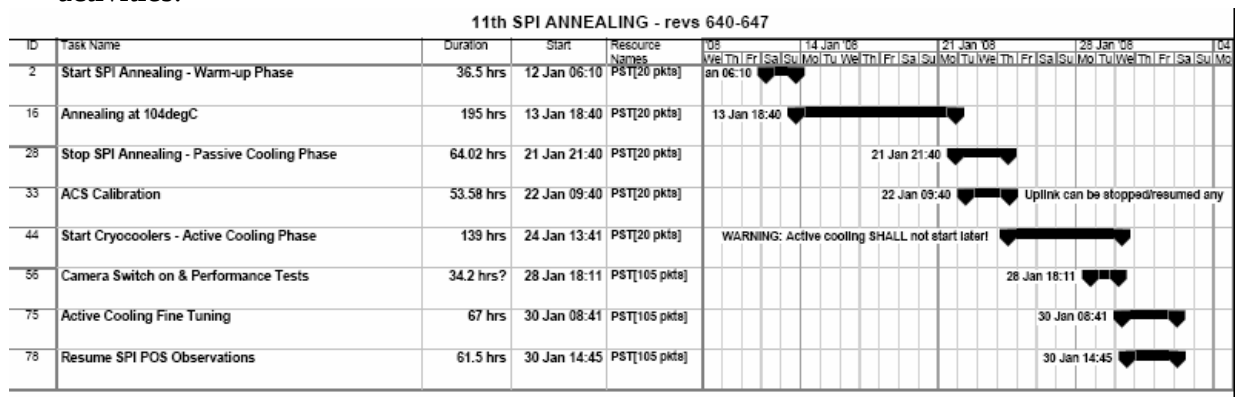
The following anomaly report was entered into the ARTS system this week.

AR id	Date Created	Subject	Segment	Status
INT-2976	2007-12-10	Time correlation inaccuracy in rev. 629	FDS	Pending

7 Future Milestones

The following activities are foreseen in the next few weeks.

- The 11th annealing operations started on 12th January at radiation belt entry of revolution 640. Below is the summary timeline of the planned annealing activities:



- A SAS calibration is planned for revolution 644.
- The next On-Board Clock wrap-around is expected during revolution 650.

• Appendix

The appendix includes various detailed information.

7.1 Overview of Revolutions

Revolution 641

The observations in revolution 641 began with of a raster dither of M31 (RA 00:42:44.31, DEC +41:16:09.0), lasting ~22.2 hours. They continued with an OMC Flat-Field calibration exercise at attitude (RA 02:28:24.00, DEC +15:30:00.0) for ~3.5 hours, finally a return to the raster dither of M31 (RA 00:42:44.31, DEC +41:16:09.0) for a further ~31.1 hours was performed until the end of the revolution.

Revolution 642

The observations in revolution 642 consisted entirely of a raster dither of M31 (RA 00:42:44.31, DEC +41:16:09.0), lasting ~57.8 hours, until the end of the revolution.

Revolution 643

The observations in revolution 643 consisted entirely of a raster dither of PKS 1510-089 (RA 15:12:50.53, DEC -09:05:59.8), lasting ~56.2 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 and SPI, which was undergoing annealing. The TM allocation was IBIS 180; SPI 46; JEM-X1 15; JEM-X2 0; OMC 5, except during the Flat-Field calibration from 2008-01-13T16:01:27Z to 2008-01-13T19:54:49Z when the allocation was IBIS 128; SPI 46; JEM-X1 9, JEM-X2 0; OMC 63.

7.2 Consumables

7.2.1 Detailed Fuel Book-keeping

2007-12-28T14:44:00.000Z	143.1194	F	Automatic TM processing.
2007-12-30T00:19:08.000Z	143.0722	F	Automatic TM processing.
2007-12-31T14:31:45.000Z	143.0581	F	Automatic TM processing.
2008-01-02T00:20:21.000Z	143.0246	F	Automatic TM processing.
2008-01-03T14:17:29.000Z	143.0129	F	Automatic TM processing.
2008-01-04T19:19:24.000Z	142.9786	F	Automatic TM processing.
2008-01-06T14:09:05.000Z	142.9520	F	Automatic TM processing.
2008-01-07T17:56:12.000Z	142.9236	F	Automatic TM processing.
2008-01-09T13:57:44.000Z	142.9099	F	Automatic TM processing.
2008-01-10T19:08:44.000Z	142.8140	F	Automatic TM processing.
2008-01-12T08:42:00.000Z	142.7945	F	Automatic TM processing.
2008-01-12T13:43:04.000Z	142.7789	F	Automatic TM processing.
2008-01-13T23:41:56.000Z	142.7519	F	Automatic TM processing.
2008-01-15T13:31:36.000Z	142.7354	F	Automatic TM processing.
2008-01-16T22:51:08.000Z	142.7038	F	Automatic TM processing.

This report was generated Fri Jan 18 08:00:20 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, 12/01/2008 – 18/01/2008

The AOCS operations were executed from the Automatic Timeline.

During this period, 73 Open Loop Slews, 78 Closed Loop Slews and 6 Momentum Biases were executed.

2 slews (OSL) were missed from TL, during the observation period, due to problem on the Command Verifier Task on the MCS.

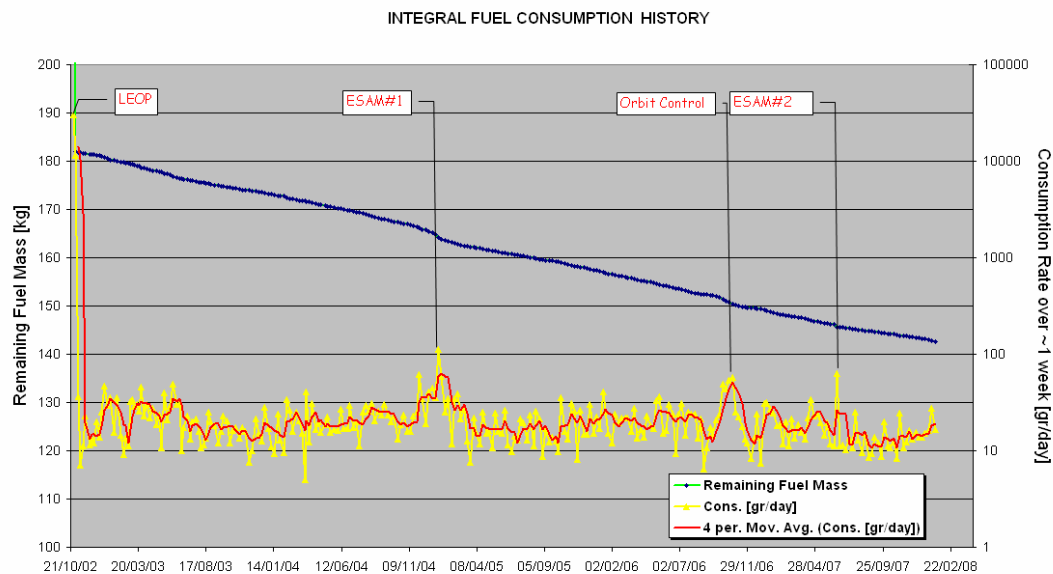
This is equivalent to ~ 1.3 % of the total number of slews planned (152).

Orbit Control

No update.

Fuel consumption

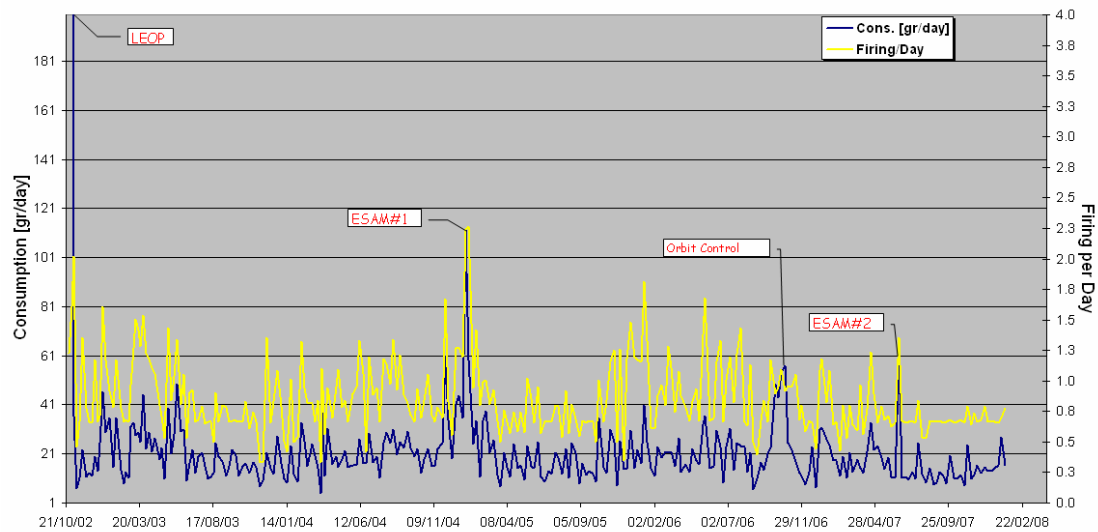
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 18/01/2008 is reported in the plot below.



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 18/01/2008 is reported in the plot below.

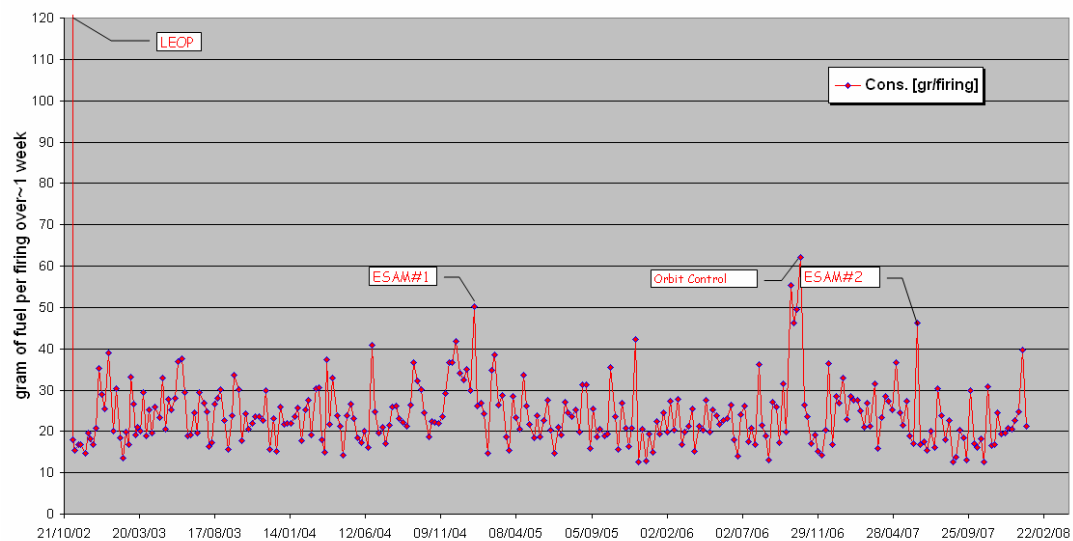
INTEGRAL FIRING PER DAY HISTORY



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

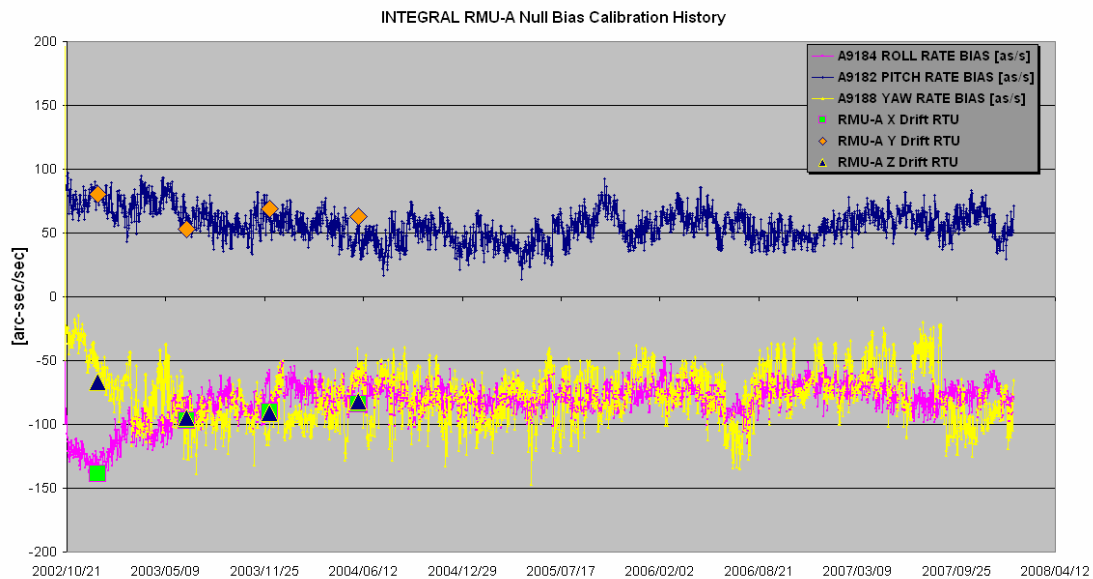
The fuel per firing over the period between 01/11/2002 and 18/01/2008 is reported in the plot below.

INTEGRAL FUEL MASS PER FIRING HISTORY



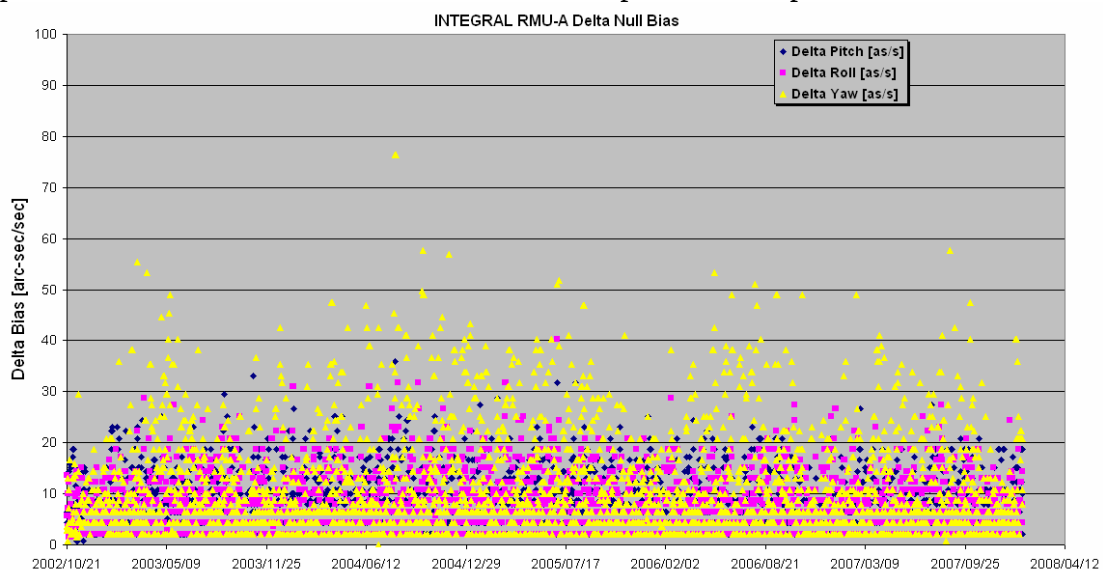
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 18/01/2008 is reported in the plot below.



The evolution of the drift on yaw channel is under constant monitoring.

The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over period between 01/11/2002 and 18/01/2008 is reported in the plot below.



12/01/2008 (Day of Year 012, Revolution 640-641)

Loss of guide star: at 13:16:26z a loss of the selected guide star (STR SEU filter exceeded) occurred during the perigee passage of rev 640.

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.

No impact on TL.

13/01/2008 (Day of Year 013, Revolution 641)

Nothing to report.

14/01/2008 (Day of Year 014, Revolution 641)

Nothing to report.

15/01/2008 (Day of Year 015, Revolution 641-642)

Nothing to report.

16/01/2008 (Day of Year 016, Revolution 642)

Nothing to report.

17/01/2008 (Day of Year 017, Revolution 642)

Nothing to report.

18/01/2008 (Day of Year 018, Revolution 642-643)

Problem on IMCS: at 15:12z a problem on the IMCS-A Command Verifier task caused the slew ID 06430001 to fail release.

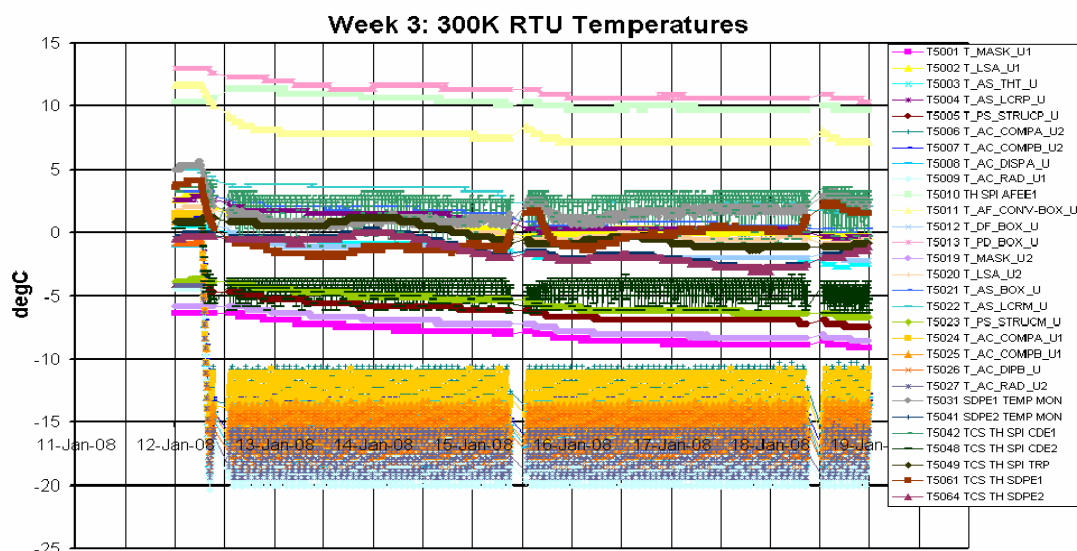
A manual recovery was performed from attitude of PID 06420068 to the attitude of PID 06430002 and the next slew ID 06430003 manually updated in TL.

At 16:18z the AOCS s/s was enabled in TL.

The following slews were missed in TL: 06430001(OSL)-02(OSL).

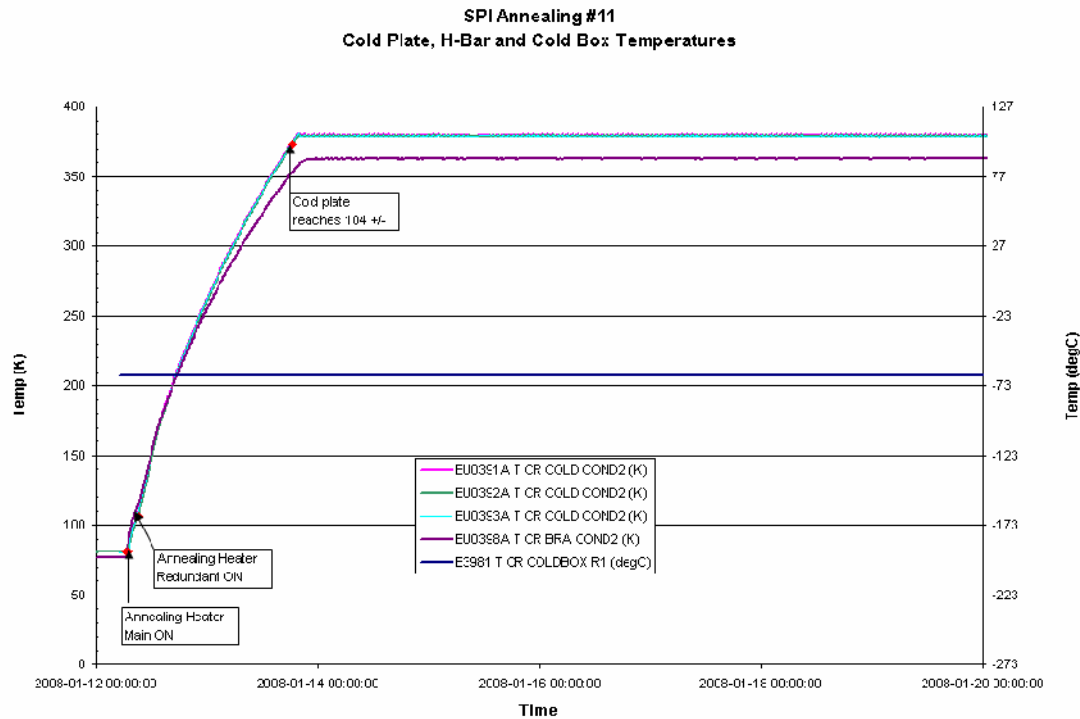
7.3.2 SPI Operations

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

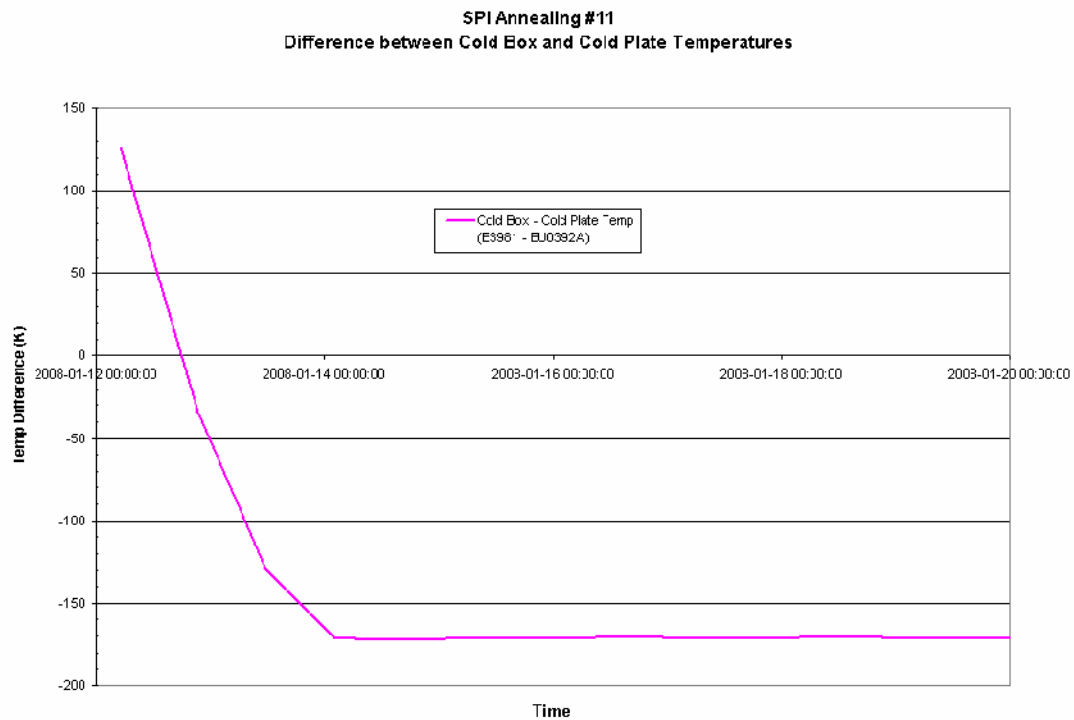


Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K until the start of the 11th annealing cycle on the 12th January. The cold plate temperature reached 100degC on 13/01/2008 at 18:25Z.

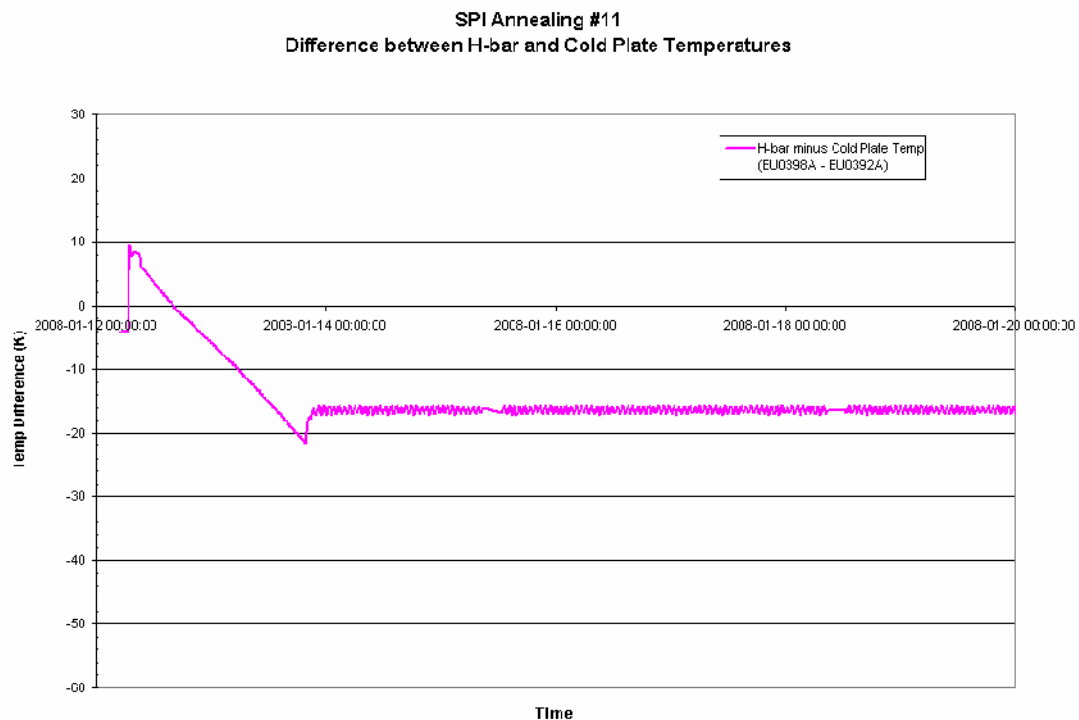
The following plot shows the evolution of the cold plate and H bus temperatures during the reporting period.



The following plot shows the difference between the cold box and cold plate temperatures since the start of annealing.



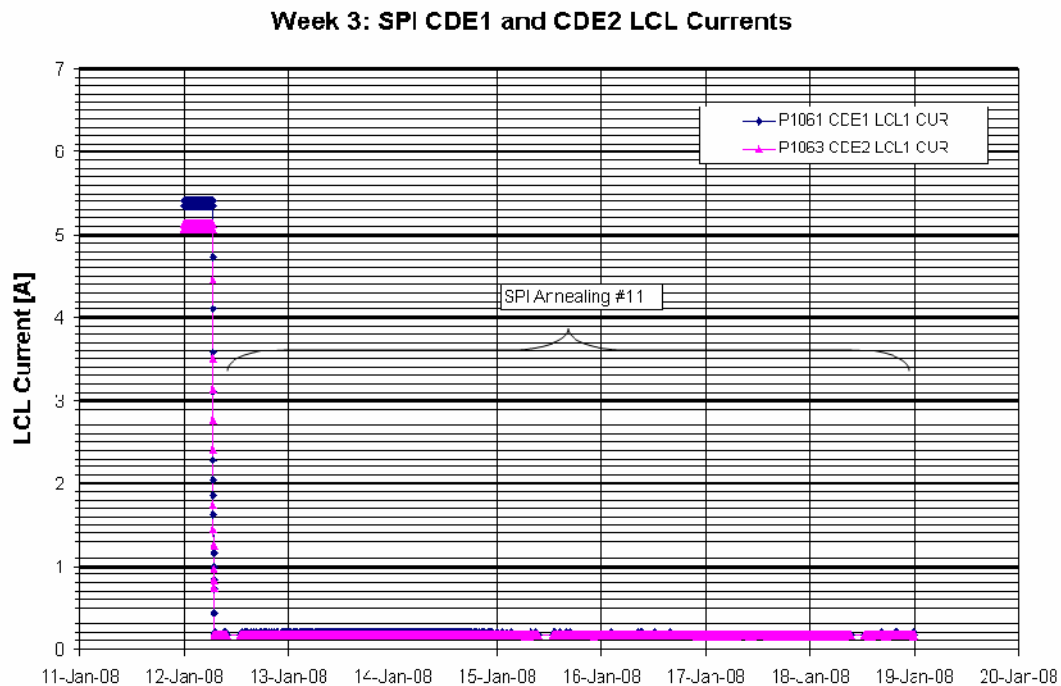
The following plot shows the difference between the H-bar and cold plate temperatures since the start of annealing.



Before the start of annealing operations, the stroke of all four compressors was set to 42 and the average LCL currents of the CDEs were:

- Average CDE1 LCL Current = 5.37A
- Average CDE2 LCL Current = 5.10A

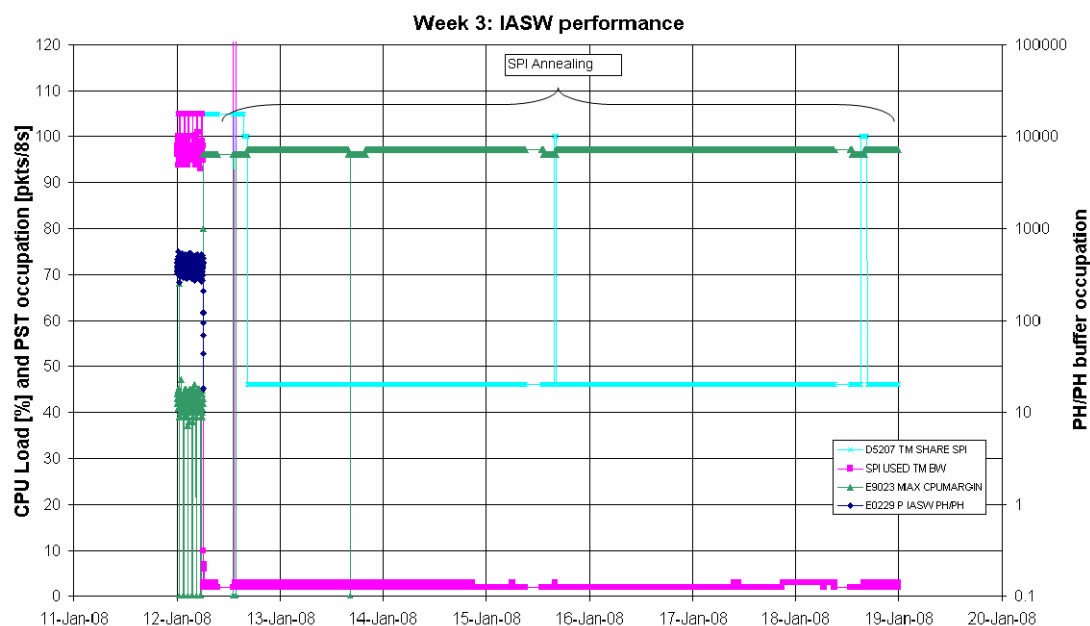
The following plot shows the evolution of the CDE LCL currents during the reporting period.



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

The average TM bandwidth occupation of SPI was 98.8 packets/cycle over the science window, when the TM allocation was 105 packets/cycle. From revolution 641 onwards, the TM allocation was 46 packets/cycle and the IASW was in CONF mode due to the ongoing annealing.

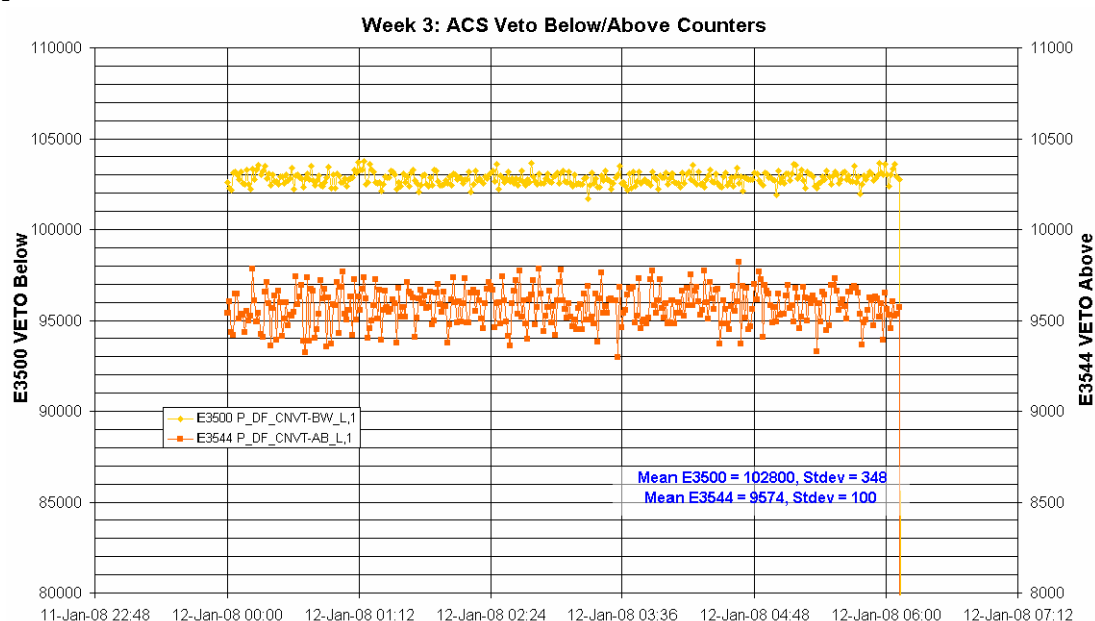
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



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

For the 11th annealing operations, started on 12th January, the ACS High Voltages have been set to the minimum voltage (~980V) and the ACS is in CONF mode.

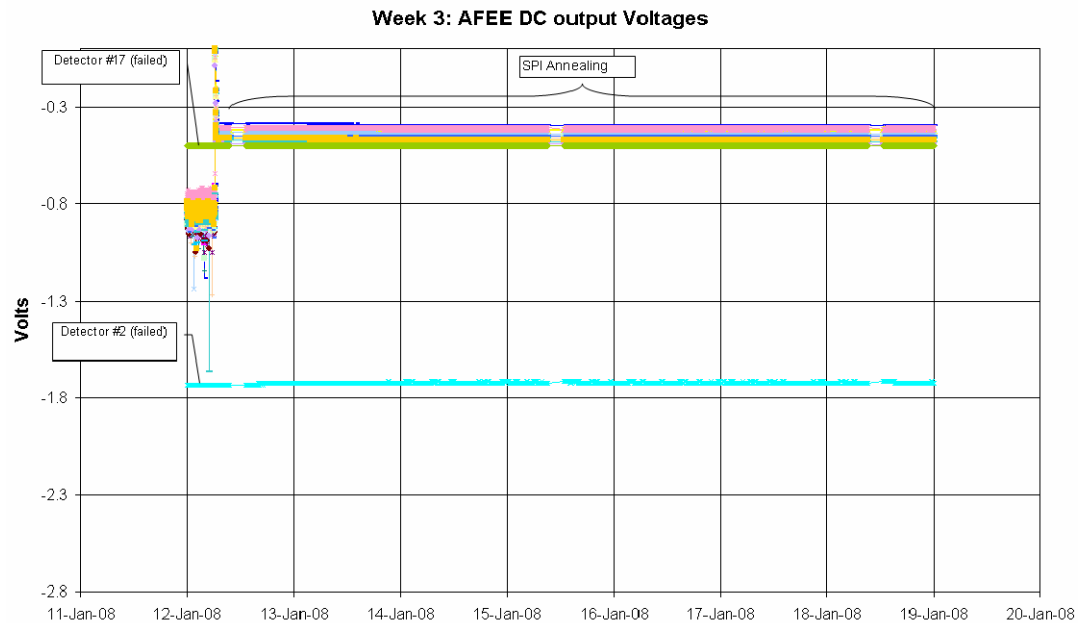
The following plot shows the ACS overall count rate evolution during the reporting period:



AFEE: The health of the AFEE is nominal. The performance of the AFEE and the detectors is nominal, except for the Ge detector #12 which is showing a slightly degraded energy resolution and is therefore operated at a lower HV setting of 3.5kV (instead of 4kV).

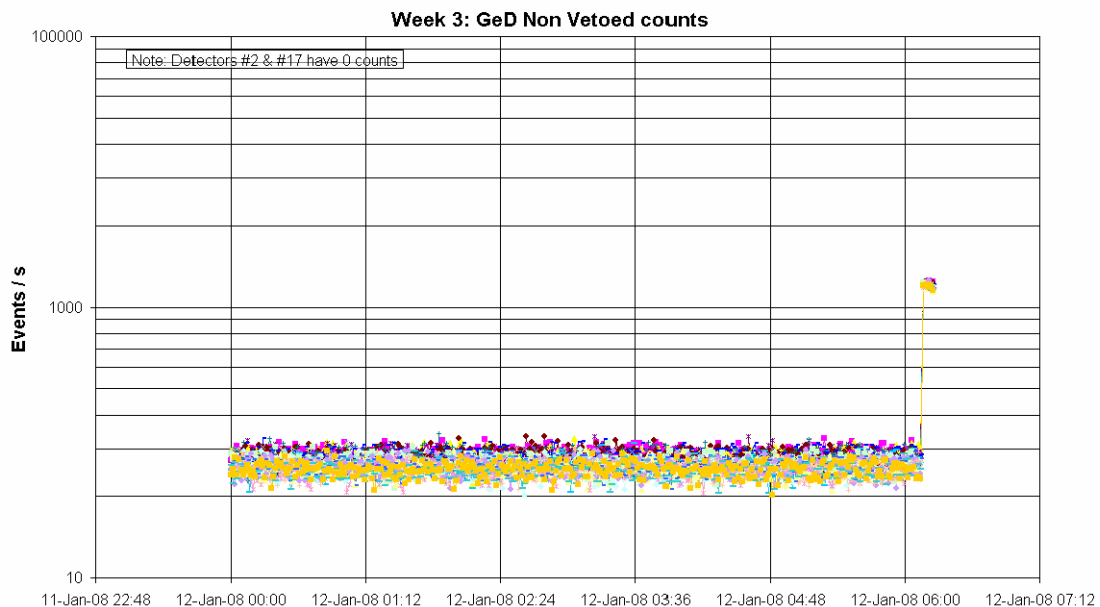
For the 11th annealing operations, started on 12th January, all detector HVPSs were switched off and only the LVPSs are left on.

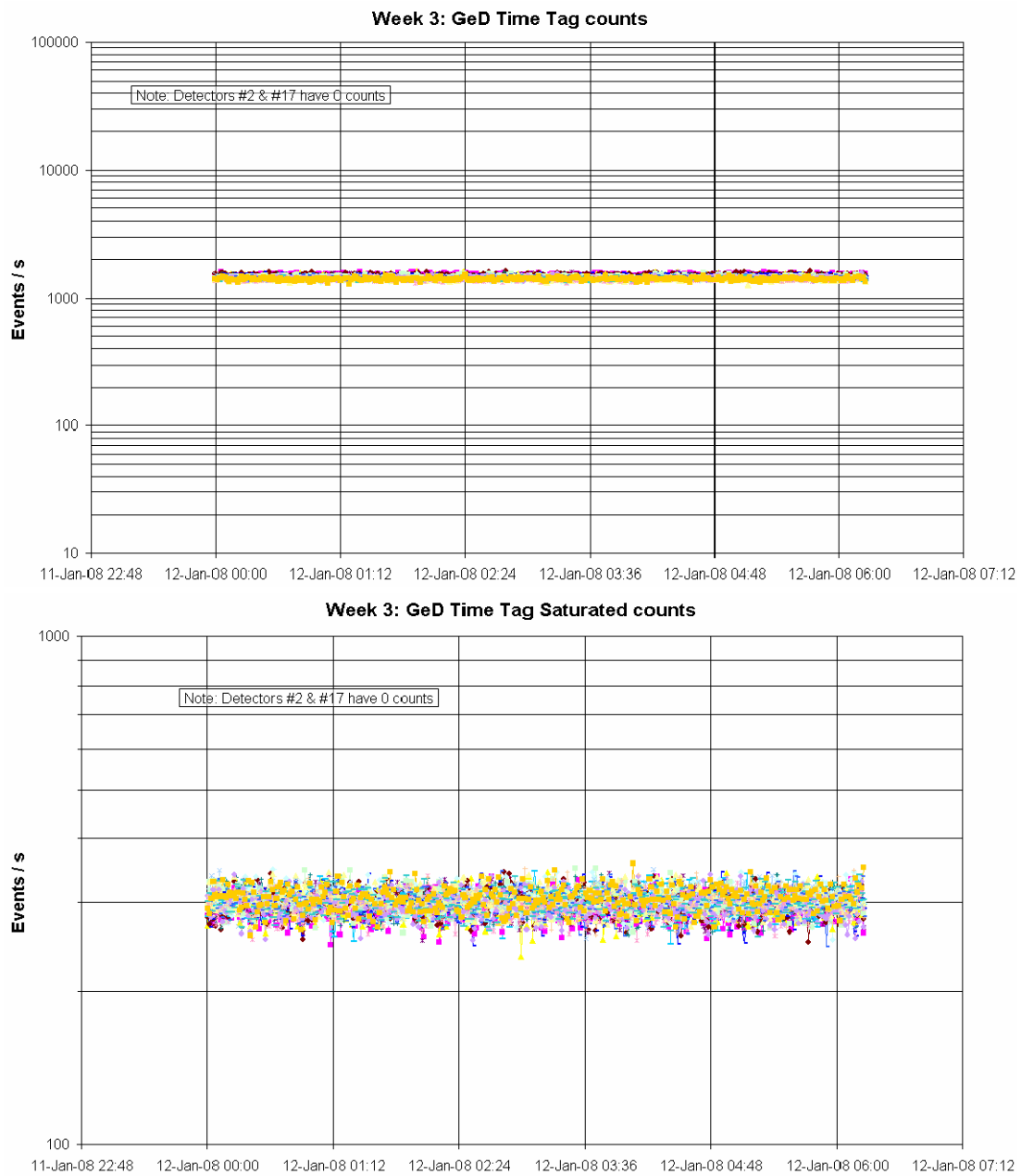
The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.



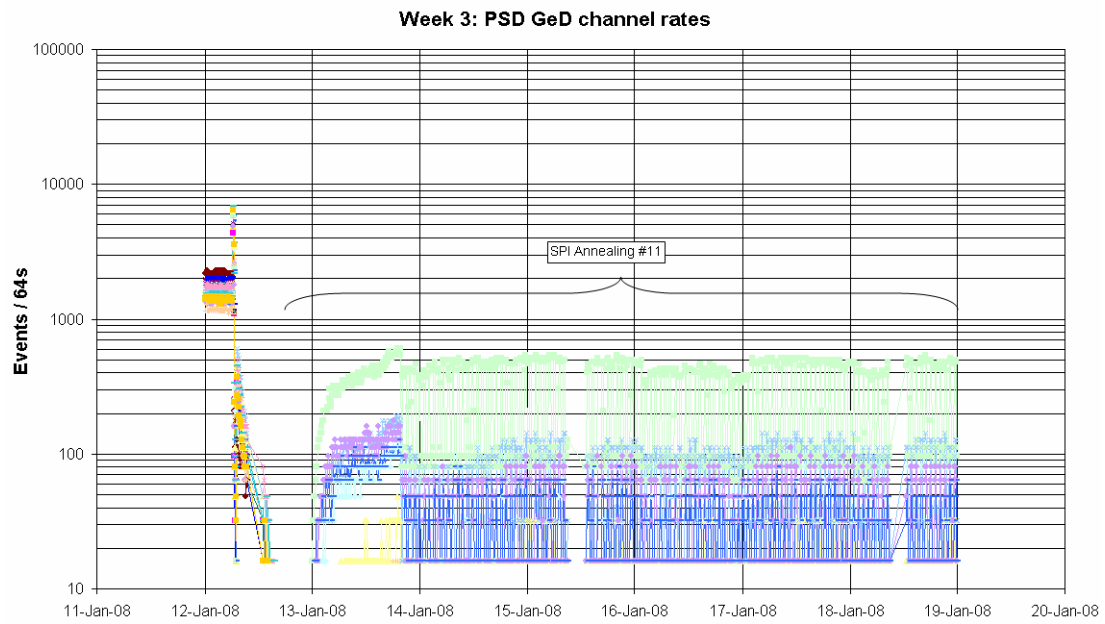
DFEE: The performance of the unit is nominal. For the 11th annealing operations, started on 12th January, the DFEE is in CONF mode.

The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period.





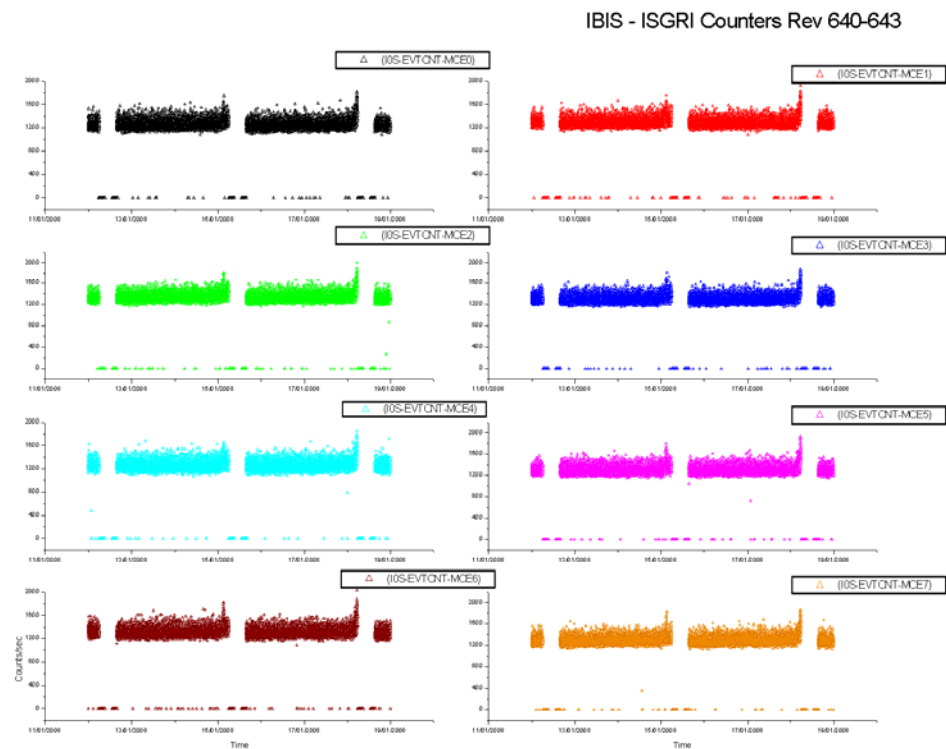
PSD: The health of the unit is nominal. For the 11th annealing operations, started on 12th January, the PSD is in CONF mode. The following plot shows the PSD channel rates during the reporting period.



7.3.3 IBIS Operations

IBIS Event Counters Plots

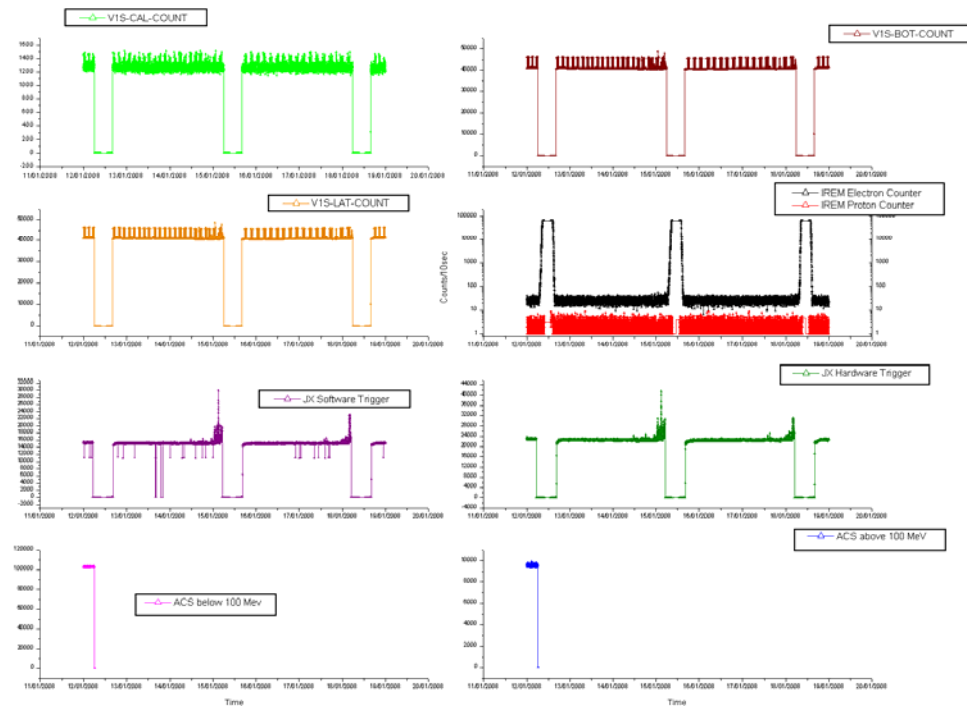
ISGRI Counters:



**sampling every 4 pkts (32 secs)

VETO vs Payloads Counters:

IBIS-VETO vs Payloads Counters Rev 640-643

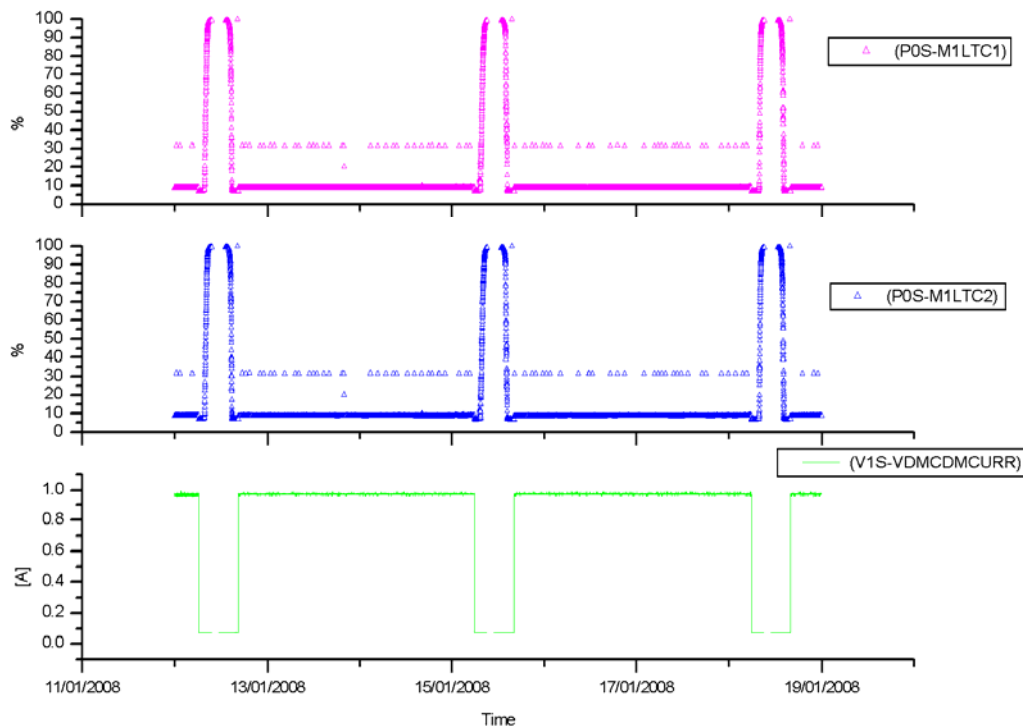


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

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

VETO Current:

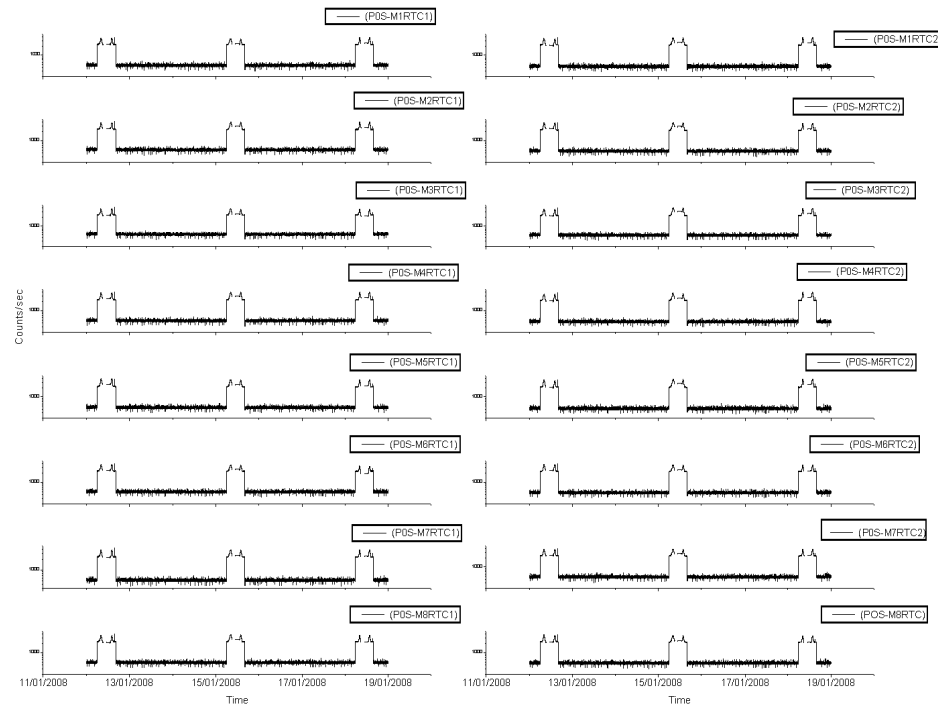
IBIS-VETO Current & PICsIT dead times Rev 640-643



**sampling every 4 pkts (32 secs)

PICsIT Counters:

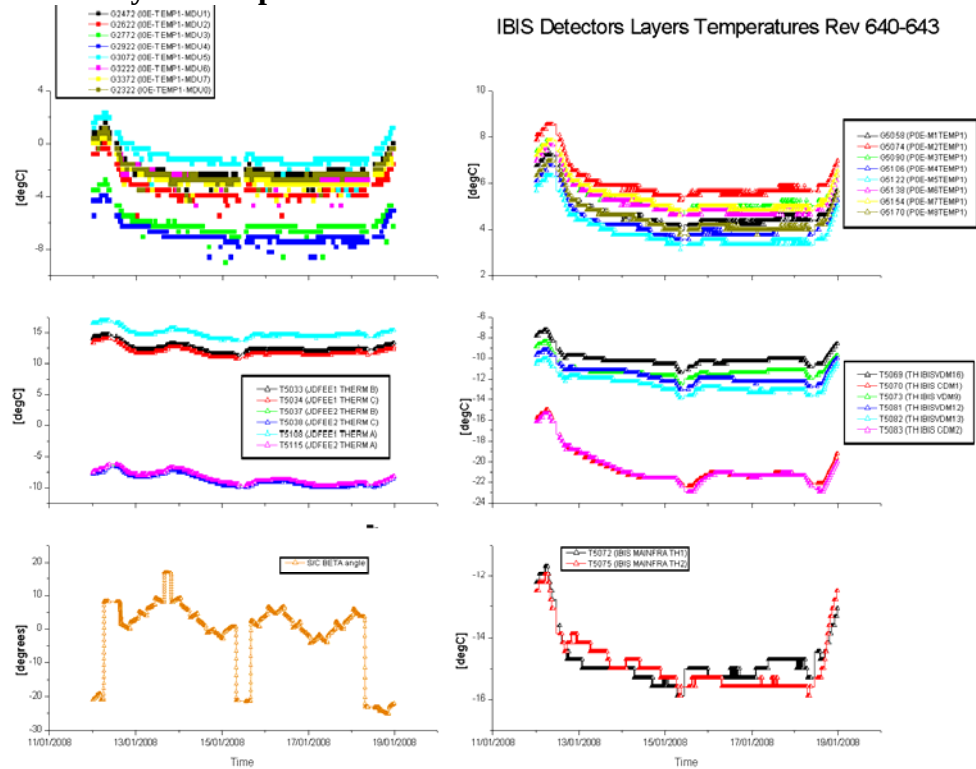
IBIS - PICsIT Counters Rev 640-643



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:

IBIS Detectors Layers Temperatures Rev 640-643



**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 (I0E-OVFWPXADD-Mi) were received during the radiation belt passages.

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

2008-01-12 (DOY 012, Rev 640-641) to 2008-01-14 (DOY 014, Rev 641)

IBIS operations executed nominally.

2008-01-15 (DOY 015, Rev 641-642)

At 15:39:53Z, during the execution of the ED GEISCL03 before radiation belt exit of revolution 642, the TM parameter G2041 went OOL Low (Value = 0). This is the number of events triggering the MCE2 per second. As it returned within limits at 15:40:09Z no action was taken.

2008-01-16 (DOY 016, Rev 642) to 2008-01-18 (DOY 018, Rev 642-643)

IBIS operations executed nominally.

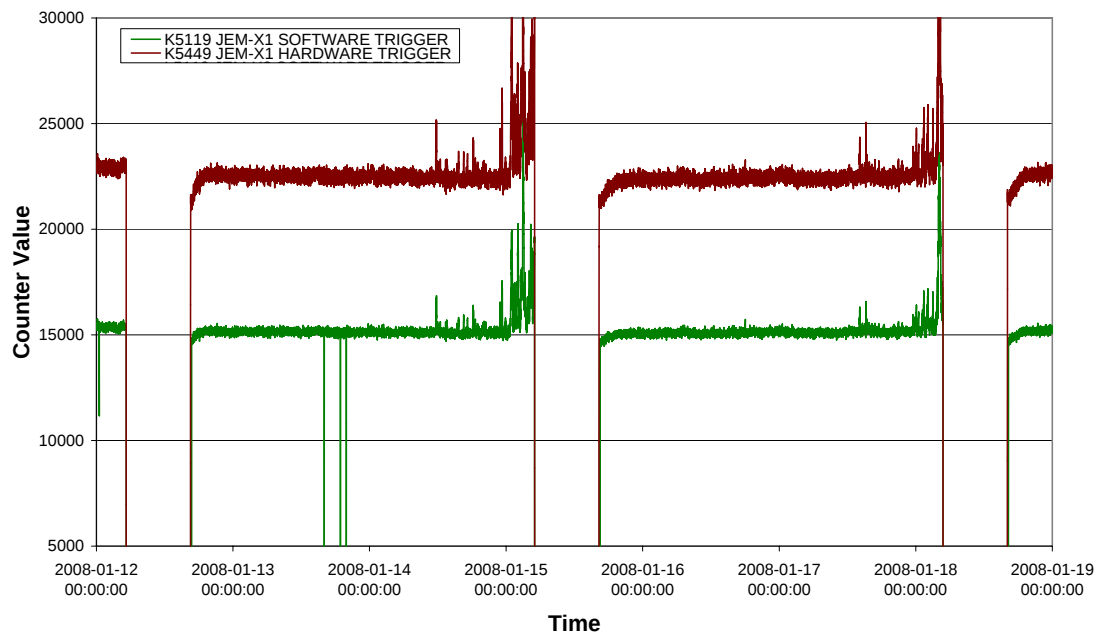
7.3.4 JEM-X Operations

JEM-X Count Rates

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

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

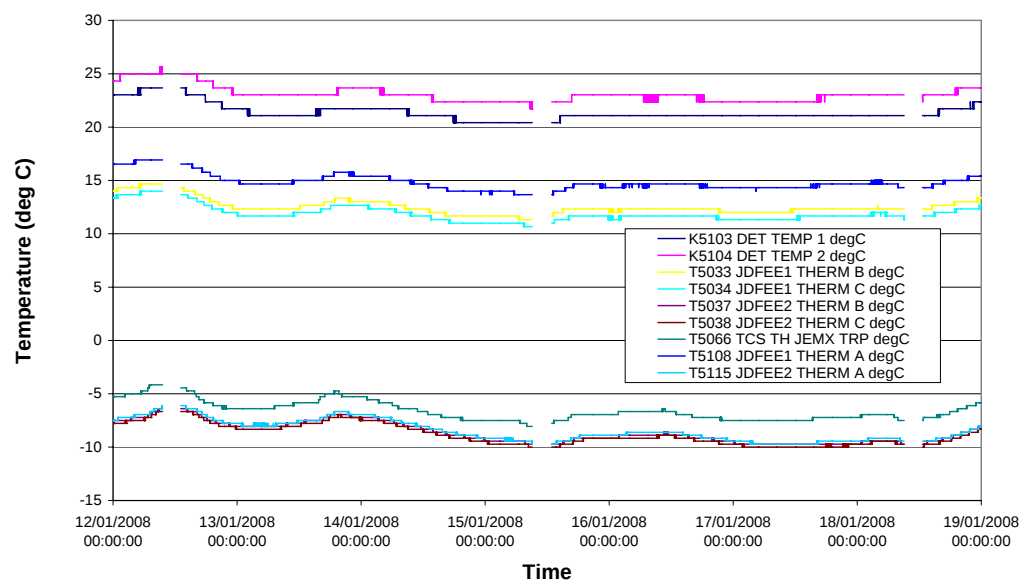
JEM-X Count Rates



JEM-X Temperatures

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

JEMX-1 Detector & DFEE Temperatures



JEM-X Daily Report

² Data sampled (1 frame in 8)

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2008-01-12 (DoY 012, Rev 640-641) to 2008-01-14 (DoY 014, Rev 641)

JEM-X1 operations executed nominally

2008-01-15 (DoY 015, Rev 641-642)

From 00:57:24 to 05:00:28, during the belt entry, there were a few warnings of the parameters K5449 & K5136 exceeding soft limits. No action was taken, and there was no impact.

2008-01-16 (DoY 016, Rev 642)

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

2008.016.08.15.46.389	2008.016.08.15.47.594	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.613	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.616	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.622	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.624	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.626	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
E						
FIX6		0				
K9079	MESS CLASS	2				
K9080	MESS ID	5				
K9074	TASK ID 16	12				
K9067	LOGICAL ADDRESS	4989				
2008.016.08.15.46.389	2008.016.08.15.47.628	1536	RealTime	5		ANOMALY
JEM-X1 CSSW INT ER EXCEPTIO			0	0	65535	PR N
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 the messages did not reappear. There was no impact.

2008-01-17 (DoY 017, Rev 642)

JEM-X1 operations executed nominally

2008-01-18 (DoY 018, Rev 642-643)

From 03:54:05 to 04:19:41, during the belt entry, there were a again a few warnings of the parameters K5449 & K5136 exceeding soft limits. No action was taken, and there was no impact.

At 15:37:46, the TC K0032 failed release. This was caused by link drops from the ground station. The command was part of the KEACAL01 ED. The command was manually sent at 15:42:08. There was no impact.

7.3.5 OMC Operations

2008-01-12 (DoY 012, Rev 640-641) to 2008-01-17 (DoY 017, Rev 642)

Nothing to Report.

2008-01-18 (DoY 018, Rev 642-643)

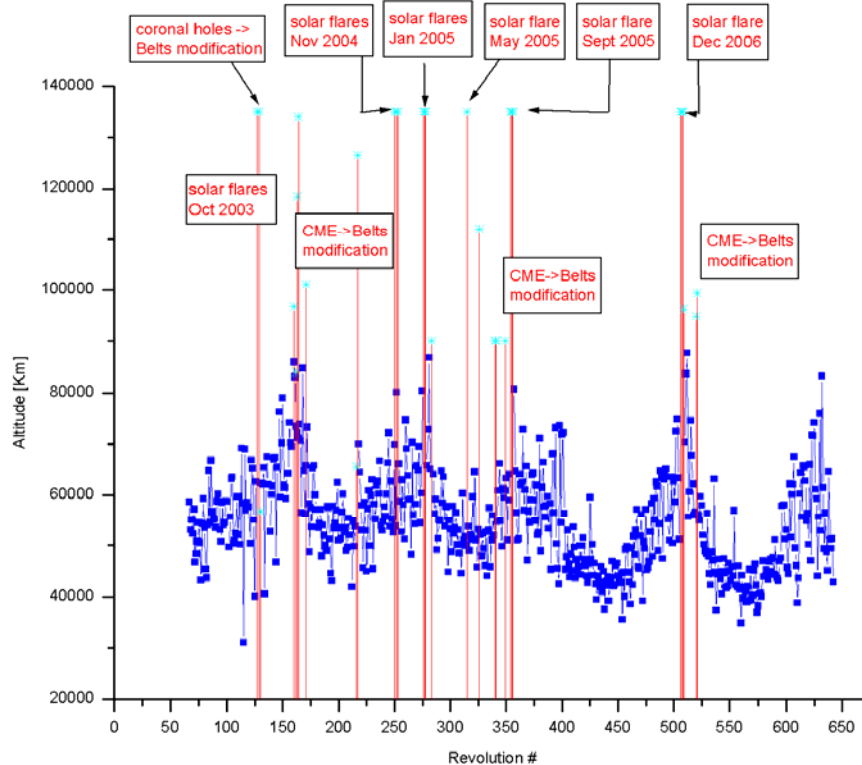
At 15:12, the Command verifier task crashed. During the recovery, there were continuous link drops, which delayed things. The Timeline was rejoined at 16:12. The impact was the loss of pointing 06430002.

On DoY 012 at 06:08:19, DoY 015 at 05:55:07, DoY 018 at 05:41:16 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]
640	RAD_ENTR R 2008-01-12T06:08:17Z	12/01/2008 06:53:38	49382.4	12-Jan-2008 07:41:28	42506.93
641	RAD_EXIT R 2008-01-12T16:10:49Z	12/01/2008 15:04:34	>>31605.8	12-Jan-2008 15:11:28	44579.62
641	RAD_ENTR R 2008-01-15T05:55:01Z	15/01/2008 06:28:26	51313.0	15-Jan-2008 07:23:43	43387.38
642	RAD_EXIT R 2008-01-15T15:58:07Z	15/01/2008 14:47:14	>>33245.8	15-Jan-2008 15:03:43	45118.8
642	RAD_ENTR R 2008-01-18T05:41:10Z	18/01/2008 07:14:42	42891.7	18-Jan-2008 07:13:43	43126.85
643	RAD_EXIT R 2008-01-18T15:44:02Z	18/01/2008 14:19:47	31598.0	18-Jan-2008 14:43:43	43906.89

Reference

High radiation

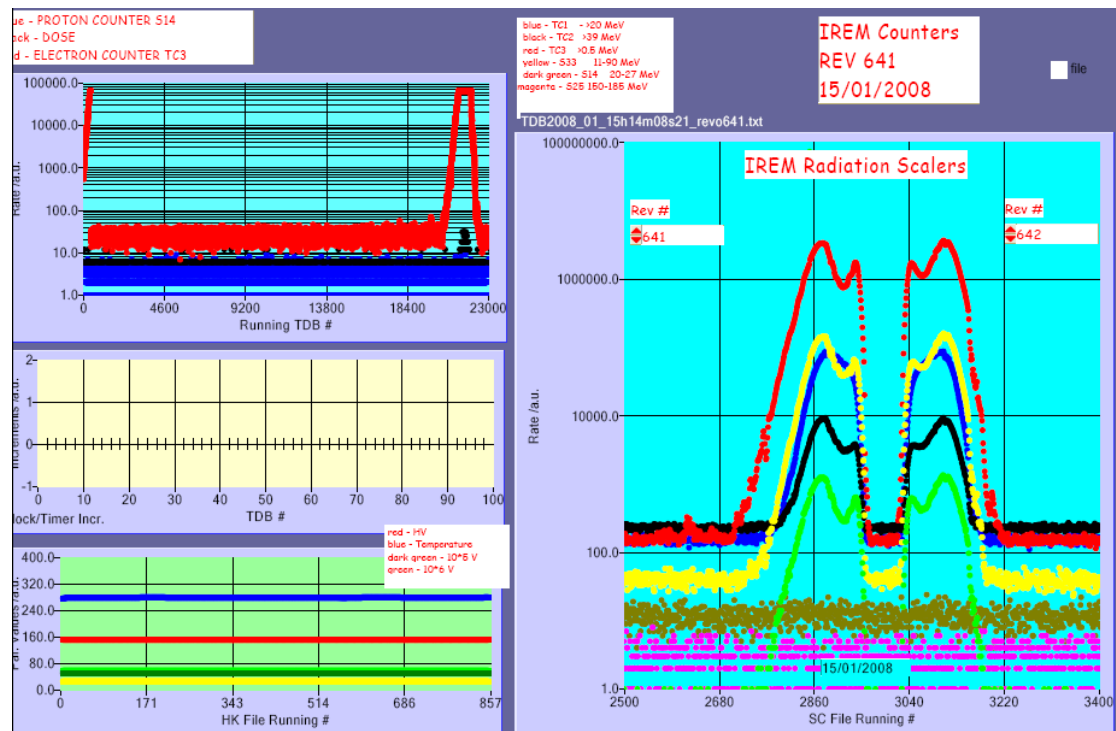
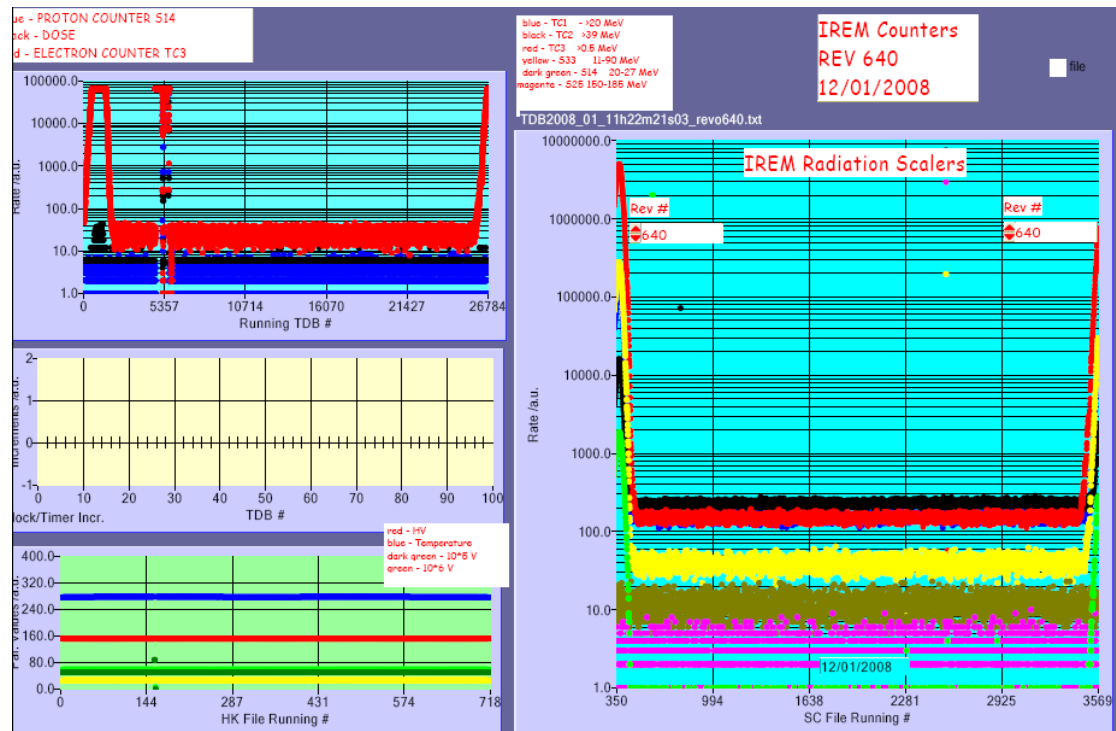
Very small error vs reference (less than 10 minutes)

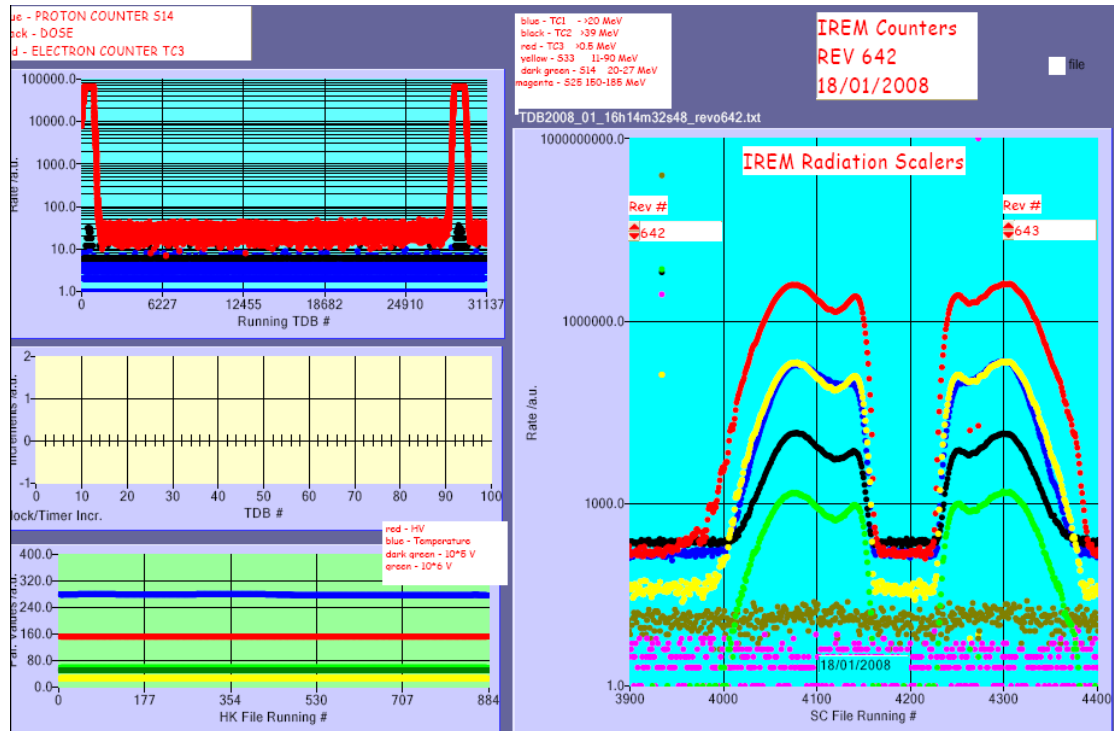
Small error vs reference (between 10 and 30 minutes)

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.

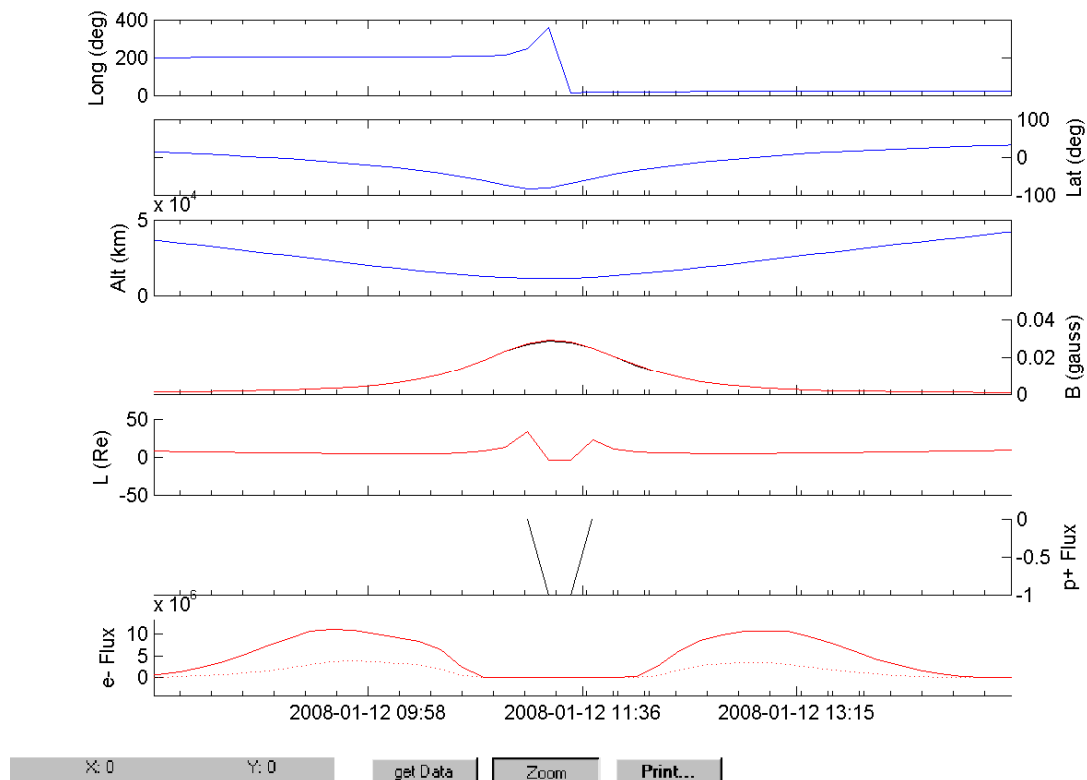
IREM radiation counters:



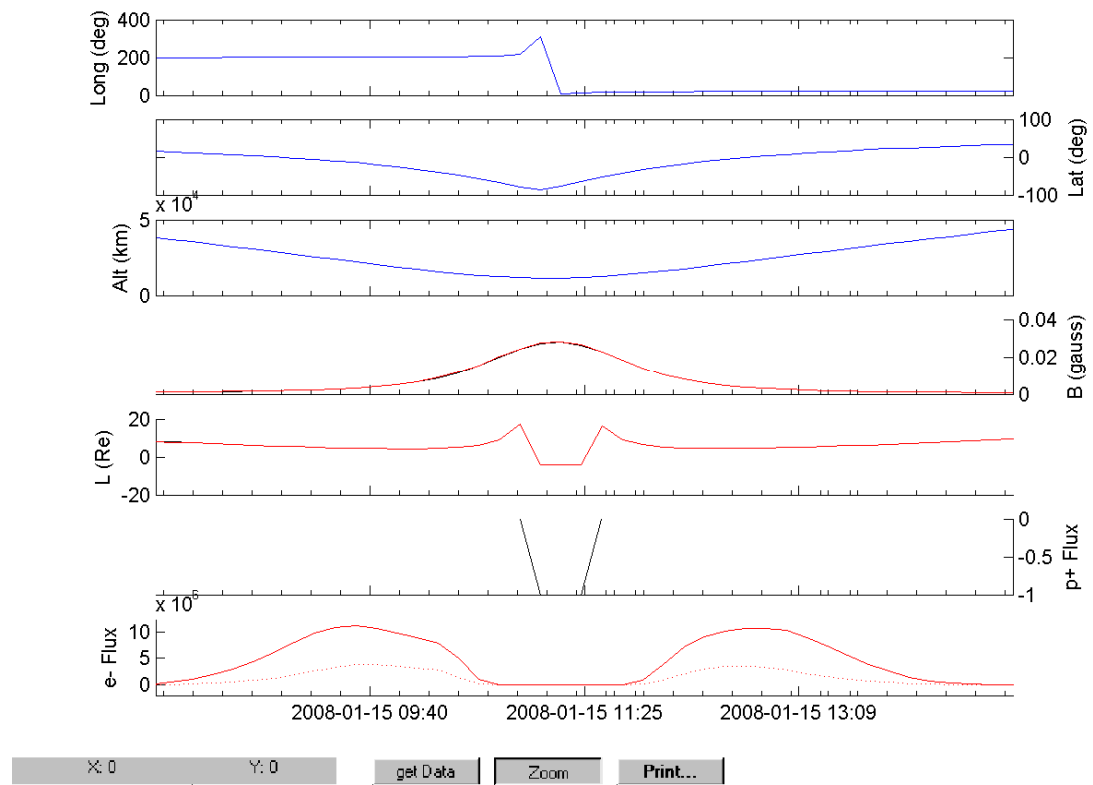


IREM Predicted Radiation Belt Passages

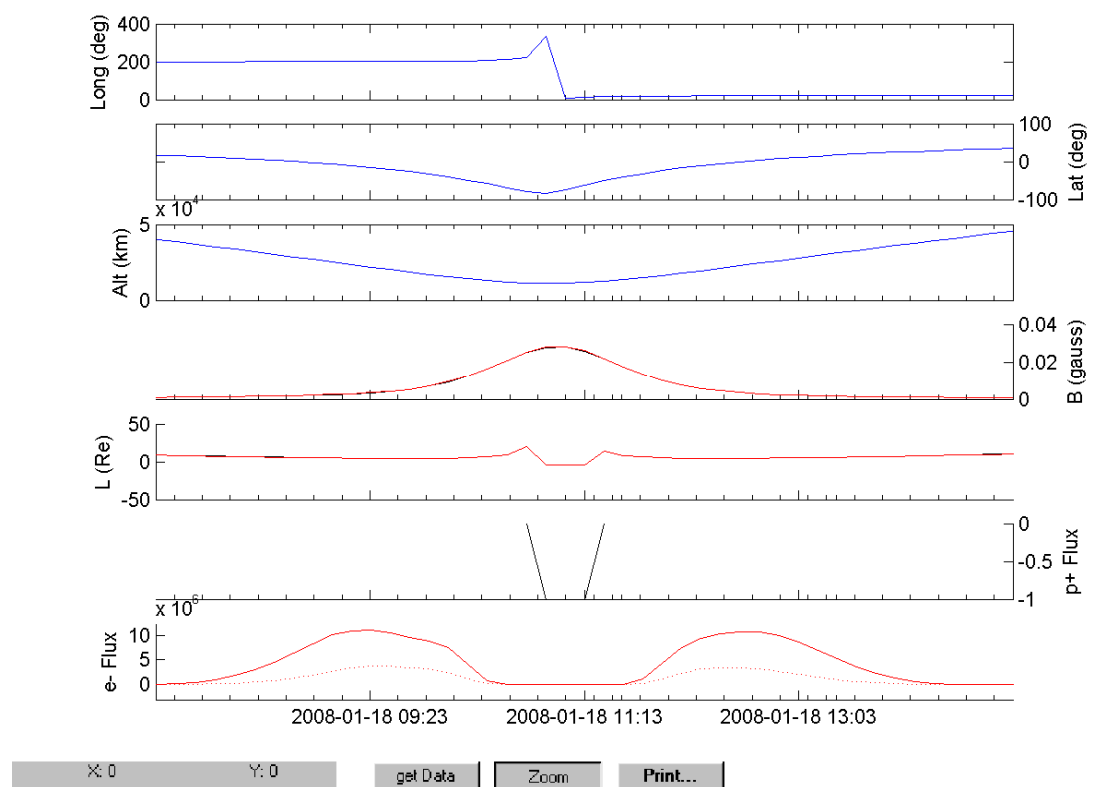
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SEC-GOES Observed Particles Fluxes (using SEIS/RAT tool):

Due to a problem on the SEISOP server, no data are available this week. However, the week was very quiet and no radiation was reported.