

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 291
Week 16
21.04.08
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 12.04.08 until 18.04.08 (both dates inclusive) and covers the revolutions 672 and 673.

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 two hexagonal dithers of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), a custom pointing of the Galactic disk (RA 19:04:22.00, DEC +06:17:13.0), a raster dither, of the mid-latitude 1 region (RA 18:36:17.05, DEC -60:24:50.7), a hexagonal dither of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), a hexagonal dither of 4U0115+63 (a TOO) (RA 01:18:31.90, DEC +63:44:24.0), and a raster dither, of the Cygnus Region (RA 20:35:53.00, DEC +40:39:49.0).

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.

The Eclipse season started on 30/03/2008. The sixth and seventh eclipse passages were nominal from an AOCS point of view.

As part of the AOCS preparation for the summer eclipse season were verified for revolutions 671-672 the load of the TT sequence to re-enable the IMU Auto Switch-Off function in the ACC and the Eclipse ACC\FDE\FCE timers.

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

The fuel consumption over the period between 11/04/2008 and 18/04/2008 was 0.1962 Kg. The remaining propellant is in the order of 140.9775 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.

The 6th and 7th eclipses of the 12th eclipse season took place on 14th and 17th April, the relevant details are given below:

Date	Penumbra Entry	Umbra Entry	Umbra Exit	Penumbra Exit	Total Eclipse Duration	Umbra duration Only	Observed DOD 1	Observed DOD 2	Recharge Duration Battery 1	Recharge Duration Battery 2
14/04/2008	02:34:16	02:35:41	03:29:37	03:30:37	0:56:21	0:53:56	5.39	5.33	3:13:05	3:11:05
17/04/2008	02:26:01	02:27:28	03:16:47	03:17:51	0:51:50	0:49:19	4.98	4.93	2:58:32	2:56:56

From the EPS point of view the eclipse passage was entirely nominal.

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. However, one minor software anomaly occurred during the reporting period.

The PST Allocation was over-subscribed by 3 packets to SPI for 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 11th annealing, which ended on 30th January, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #12 which, although its energy resolution improved since the previous annealing, is still showing a slightly degraded energy resolution compared to the other detectors and is therefore operating at a lower HV setting of 3.5kV (instead of 4kV). Detector #2 is failed since 06/12/2003 and detector #17 since 17/07/2004.

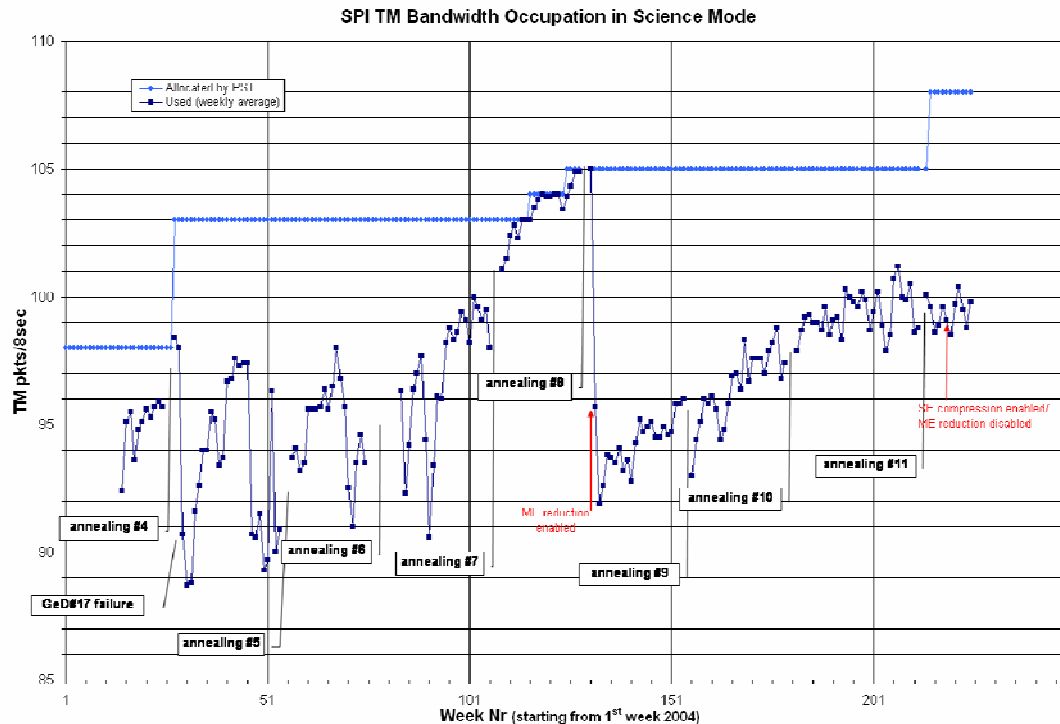
The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K.

The first eclipse in the 12th eclipse season occurred on 30/03/2008. Eclipse operations for SPI have been progressing nominally.

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. The over-allocated PST with an additional 3 packets/cycle for SPI was used however the Broadcast Packet TM allocation was not updated. The average telemetry occupation in the science window was 99.8 packets/cycle.

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



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

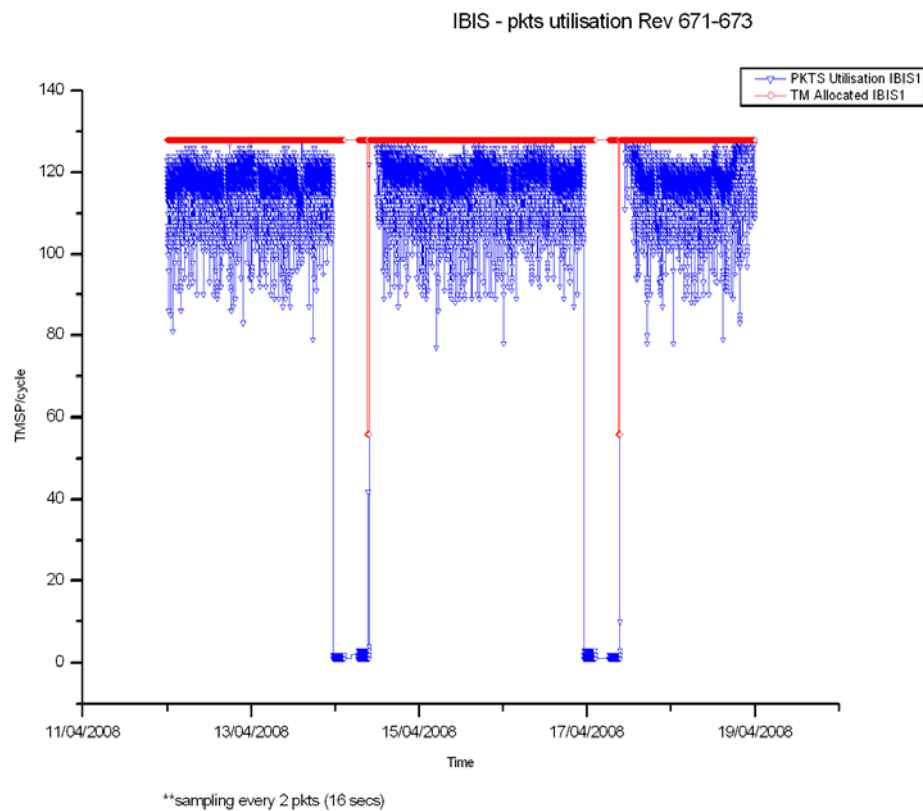
3.2.2 IBIS

The overall status of the unit is nominal.

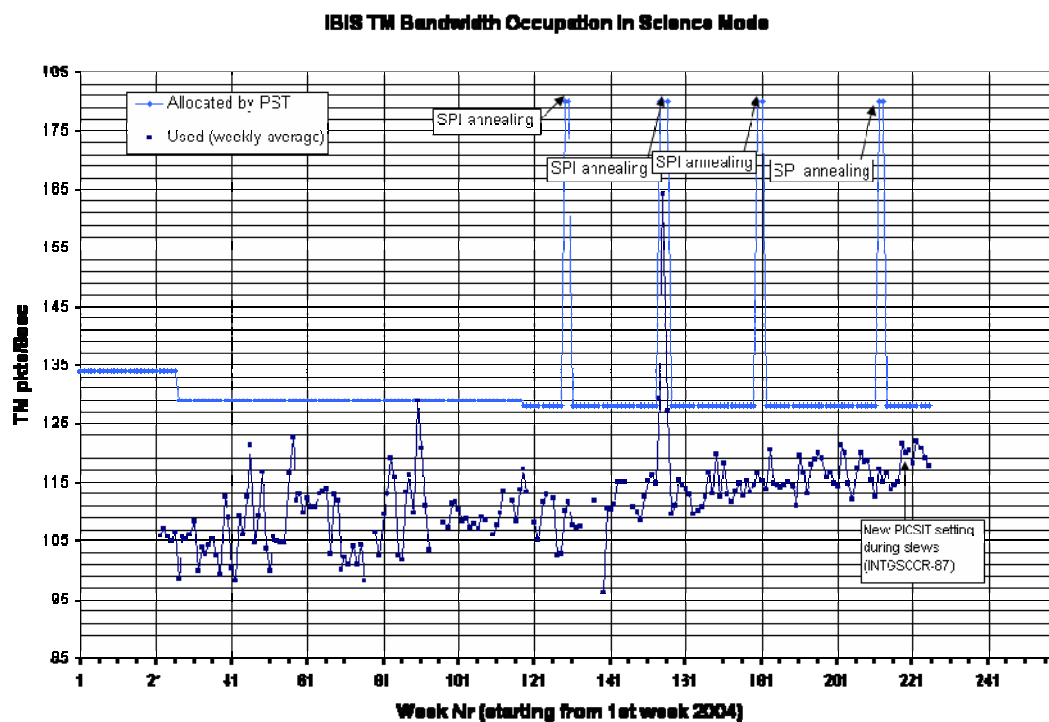
The first eclipse in the 12th eclipse season occurred on 30/03/2008. Eclipse operations for IBIS have been progressing nominally.

During the reporting period, the PST allocation to IBIS above the radiation belts was 128 packets/cycle. During the observation period, when IBIS was in science mode, the IBIS mean bandwidth utilisation was 117.75 packets/cycle (down 1.33 on last week) and the percentage of TM cycles in which the full bandwidth of 128 packets was used was 7.56%.

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, all of the 212 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. A new sunspot #990 appeared on the 12th April, but had faded away by the 15th. For the rest of the week, the sun was blank, with a 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 good this week. No pointings were lost to ground problems. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was very good this week. The only problem reported was the HFA_TM task crashed, there was no impact.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were however 5 occasions where the TM dropped from Redu, one occasion when the voice loop was not working, and a problem with the links to ISDC, all without impact.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

New PSFs have been received for revolutions 679 and 680.

No new observations have been planned in order to wait for further evolution of 4U 0115+634, but the planning for 674 was updated with one dummy pointing to avoid a slew >135 deg in eclipse season.

New TSFs have been received for revolutions 673 and 674.

2. Observation status

New ECS files have been received for revolutions 662 to 664.

3. ISOC Science Data Archive

No news.

4. ISOC system

V19.0 has been formally released on 15 April.

5. Problems

There were some stability problems with the loading of received proposals into the database, but counter measures allowed an orderly finish of the proposal submission.

4.3.2 ISDC

Status of ISDC observation processing on 21/04/2008:

- Latest Standard Analysis completed: observation 05200010020 (Galactic Bulge region, Revolutions 657) on 26/03/2008.
- Latest products archived: observation 05200010021 (Galactic Bulge region, Revolutions 658) on 27/03/2008.

- Latest observation products sent to the observer: observation 04200080003 on 29/03/2008.

5 Special Events

6 Anomalies

There were no problems reported this week that impacted operations.

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

AR id	Date Created	Subject	Segment	Status
INT-2992	2008-04-18	FDS: slew update failed due to Bright Object (VENUS) in STR FOV	FDS	Pending

.

7 Future Milestones

The following activity is foreseen in the next few weeks.

- The Spring eclipse season starts on the 30th March 2008, at the end of revolution 666, and continues until the last eclipse on 26th April.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 672

The observations in revolution 672 began with a hexagonal dither of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. They continued with a custom pointing of the Galactic disk (RA 19:04:22.00, DEC +06:17:13.0), lasting ~48.9 hours. Finally, a raster dither, of the mid-latitude 1 region (RA 18:36:17.05, DEC -60:24:50.7), lasting ~1.0 hours was performed until the end of the revolution.

Revolution 673

The observations in revolution 673 began with a hexagonal dither of the Galactic bulge region (RA 17:45:36.00, DEC -28:56:00.0), lasting ~3.5 hours. They continued with a hexagonal dither of the Gamma Ray Source 1915+105 (RA 19:15:11.50, DEC +10:56:44.0), lasting ~5.6 hours. After that, a hexagonal dither of 4U0115+63 (a TOO) (RA 01:18:31.90, DEC +63:44:24.0), lasting ~13.9 hours was executed. Finally, a raster dither, of the Cygnus Region (RA 20:35:53.00, DEC +40:39:49.0), lasting ~31.1 hours was performed 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

2008-03-30T09:06:52.000Z	141.4107	F	Automatic TM processing.
2008-03-31T17:54:23.000Z	141.3717	F	Automatic TM processing.
2008-04-02T08:52:19.000Z	141.3565	F	Automatic TM processing.
2008-04-03T01:10:21.000Z	141.3342	F	Automatic TM processing.
2008-04-05T08:41:56.000Z	141.3163	F	Automatic TM processing.
2008-04-06T17:07:11.000Z	141.2840	F	Automatic TM processing.
2008-04-07T08:24:49.000Z	141.2664	F	Automatic TM processing.
2008-04-08T08:28:28.000Z	141.2308	F	Automatic TM processing.
2008-04-10T07:50:41.000Z	141.1975	F	Automatic TM processing.
2008-04-10T09:05:37.000Z	141.1737	F	Automatic TM processing.
2008-04-11T08:15:07.000Z	141.1430	F	Automatic TM processing.
2008-04-14T07:58:19.000Z	141.1238	F	Automatic TM processing.
2008-04-15T16:23:42.000Z	141.1047	F	Automatic TM processing.
2008-04-17T00:54:42.000Z	141.0942	F	Automatic TM processing.
2008-04-17T07:49:23.000Z	141.0347	F	Automatic TM processing.

This report was generated Fri Apr 18 08:00:22 GMT 2008

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, 12/04/2008 – 18/04/2008

The AOCS operations were executed from the Automatic Timeline.

During this period, 87 Open Loop Slews, 143 Closed Loop Slews and 5 Momentum Biases were executed (as reported by ACC).

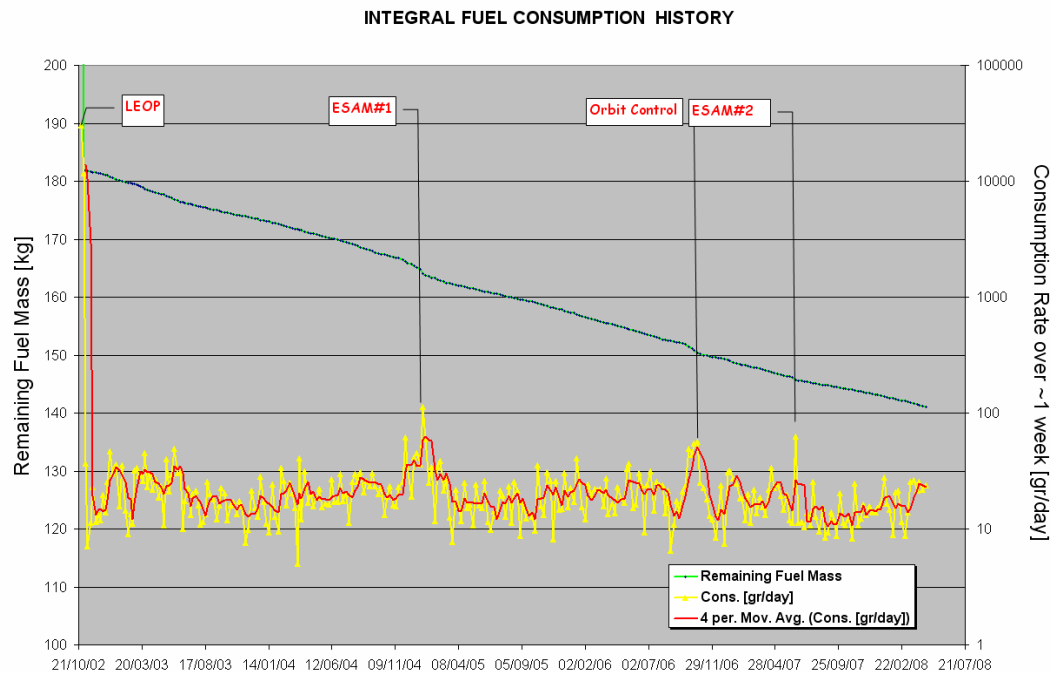
No slews were missed from TL, during the observation period.

Orbit Control

No update

Fuel consumption

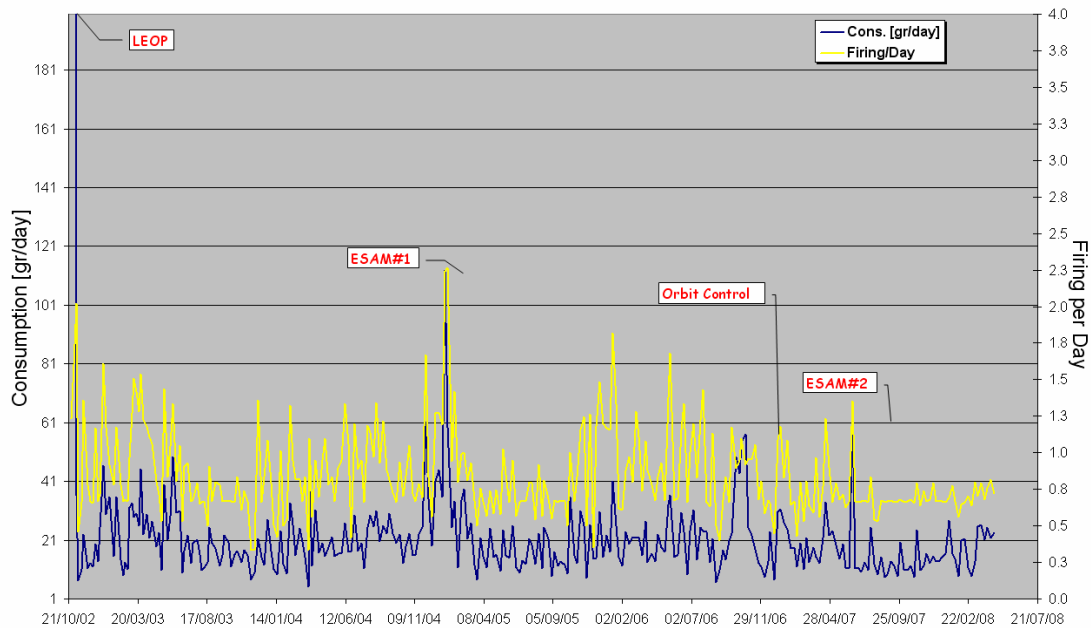
The fuel consumption (total, grams per day) over the period between 01/11/2002 and 18/04/2008 is reported in the plot below.



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 18/04/2008 is reported in the plot below.

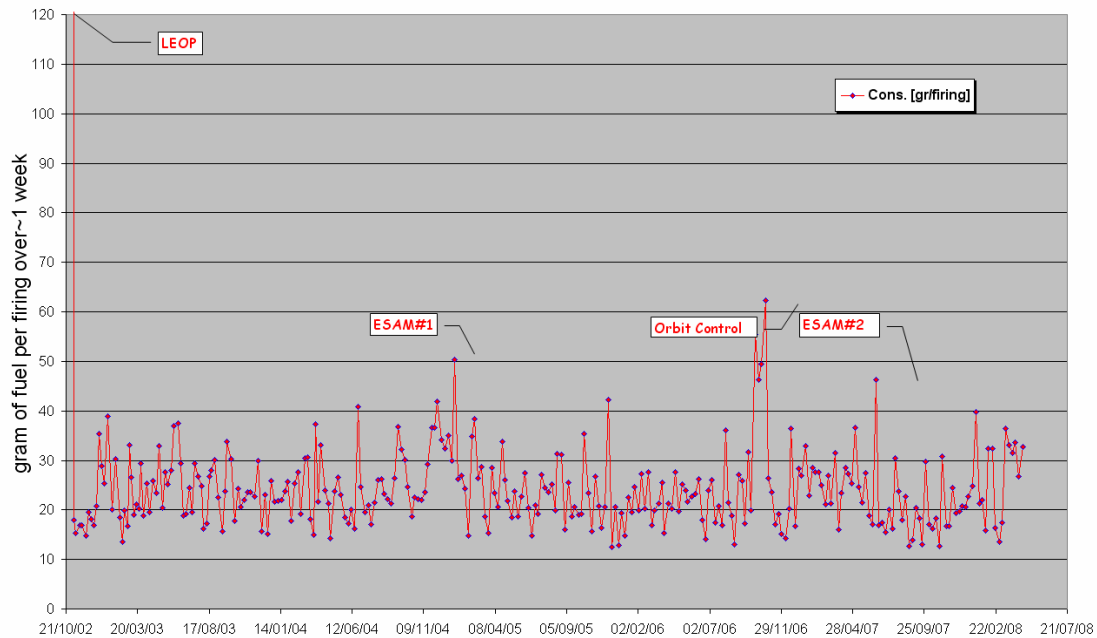
INTEGRAL FIRING PER DAY HISTORY



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

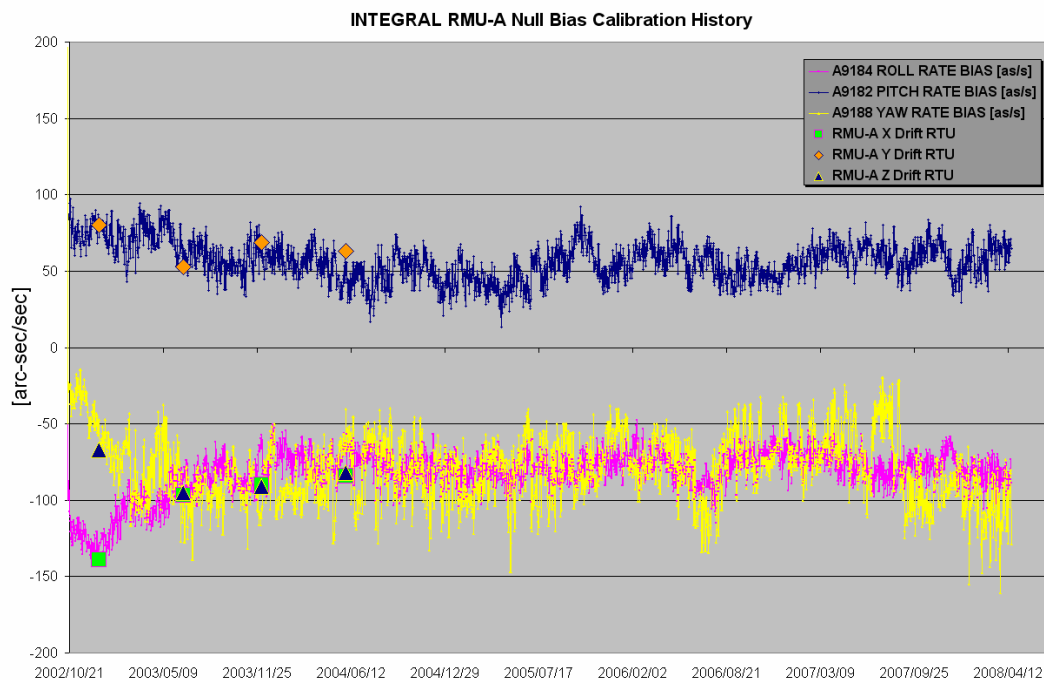
The fuel per firing over the period between 01/11/2002 and 18/04/2008 is shown in the plot below.

INTEGRAL FUEL MASS PER FIRING HISTORY



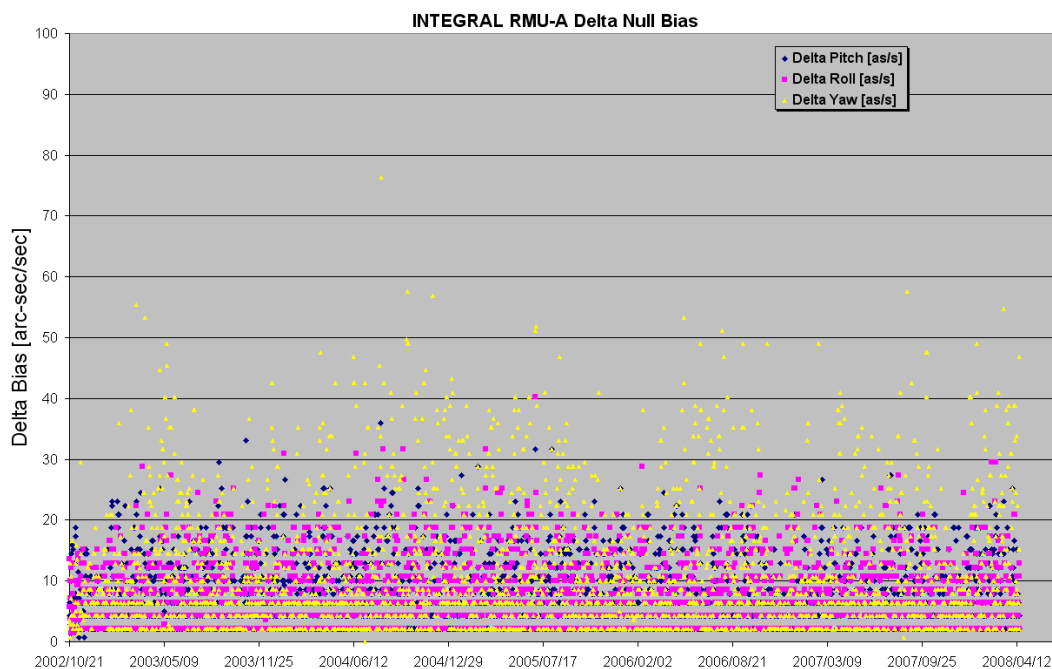
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 18/04/2008 is reported in the plot below.



Problems have been reported during the last period on FDS when generating the drift update for the RMU-A Yaw channel: the limits set on FDS have been violated few times. 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 18/04/2008 is reported in the plot below.



12/04/2008 (Day of Year 103, Revolution 671)

Nothing to report.

Issue : 1
Rev. : 0
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The seventh eclipse operations were nominal from the AOCS point of view. Hereafter is reported the summary of the eclipse passage during rev 672:

INPUT		AOCs ECLIPSE MONITORING Summer 2008		Revolution: 672 Date: 17/04/2008 DoY: 109	
Penumbra Start	17/04/2008 02:26	Penumbra Start:	17/04/2008 02:26:22	LOS:	17/04/2008 02:32:00
Penumbra End	17/04/2008 03:19	Umbral Start:	17/04/2008 02:27:49	AOS:	17/04/2008 06:23:00
Umbral Start	17/04/2008 02:27	Umbral End:	17/04/2008 03:18:14		
Umbral End	17/04/2008 02:17				
ACC Sample Time	14/04/2008 13:01:06	Eclipse Duration:	0:51:52		
FDE Sample Time	14/04/2008 13:01:06	Eclipse Duration [sec]:	3112		
FCE Sample Time	14/04/2008 13:01:06	IMU Health Check Start	16/04/2008 23:16:00		
ACC Eclipse Counter	18895	Eclipse Imminent Flag	17/04/2008 01:26:42		
ACC Eclipse Start	230227	ACC IMU AutoCal Start	17/04/2008 01:41:08		
ACC Eclipse End	243079	ACC IMU AutoCal End	17/04/2008 02:01:08		
FDE Eclipse Start	230148	Sum out of FSS FoV	17/04/2008 02:36:43		
FDE Left to Eclipse Start	230701	Sum back in FSS FoV	17/04/2008 03:30:02		
FDE Eclipse Duration	3864				
FCE Eclipse Start	230350				
FCE Left to Eclipse Start	220734				
FCE Eclipse Duration	3040				

Eclipse Timers		From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute		WRT Pen. Start [sec]		WRT Pen. Start [sec]		
ACC Eclipse Start	17/04/2008 02:08:48		-1054.00	17/04/2008 02:08:48	-1054.00	-1054	
FDE Eclipse Start	17/04/2008 02:19:16		-426.00	17/04/2008 02:19:16	-384.00	-404	176
FCE Eclipse Start	17/04/2008 02:20:00		-382.00	17/04/2008 02:20:38	-344.00	-360	176

		From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute		WRT Pen. End [sec]		WRT Pen. End [sec]		
FCE Eclipse End	17/04/2008 03:24:00		346			360	176
FDE Eclipse End	17/04/2008 03:24:00		346			360	176
ACC Eclipse End	17/04/2008 03:28:00		508	17/04/2008 03:28:00	508.00	578	

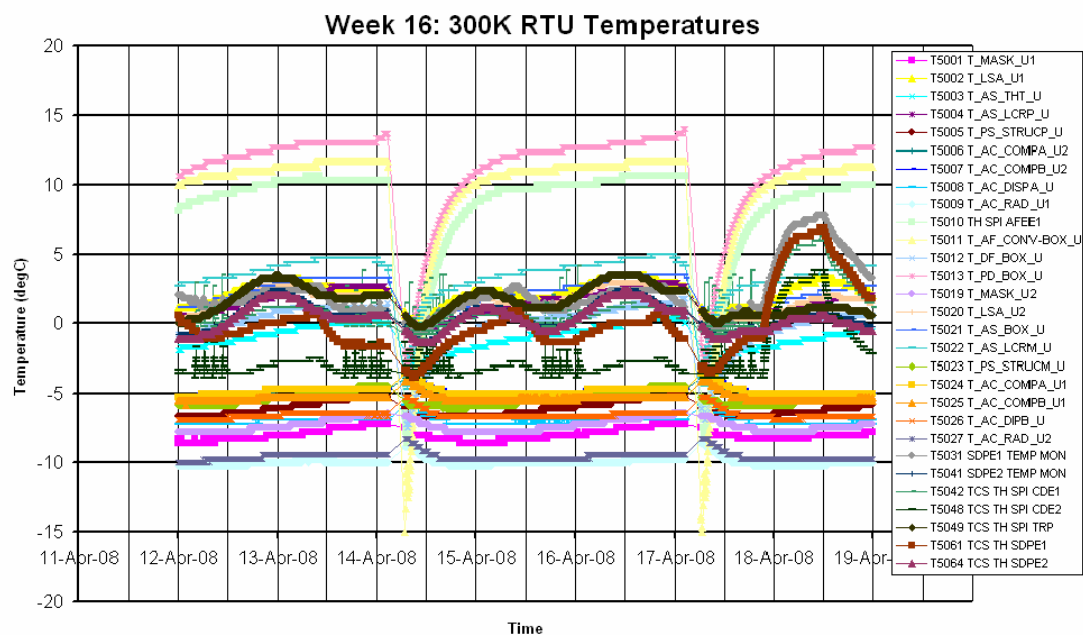
IMU		Uplink	Execution	WRT Penumbra End [sec]
IMU Auto Off Enable	14/04/2008 07:40:44		17/04/2008 03:29:54	700
IMU On	16/04/2008 23:18:56	IMU H/C Noise Roll [sec]		0.2439
IMU Off	17/04/2008 03:42:26	IMU H/C Drift Roll [sec]		0.2420
IMU On Time	4:23:30	IMU Auto Cal Drift Roll [sec]		0.3030

18/04/2008 (Day of Year 109, Revolution 673)

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.

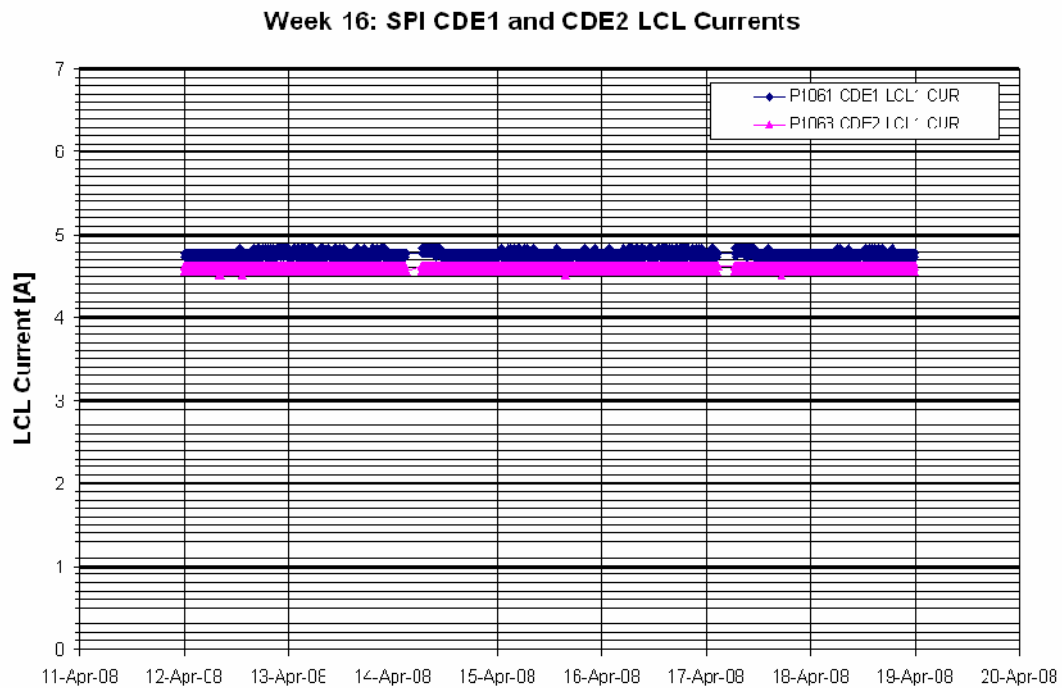


Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K.

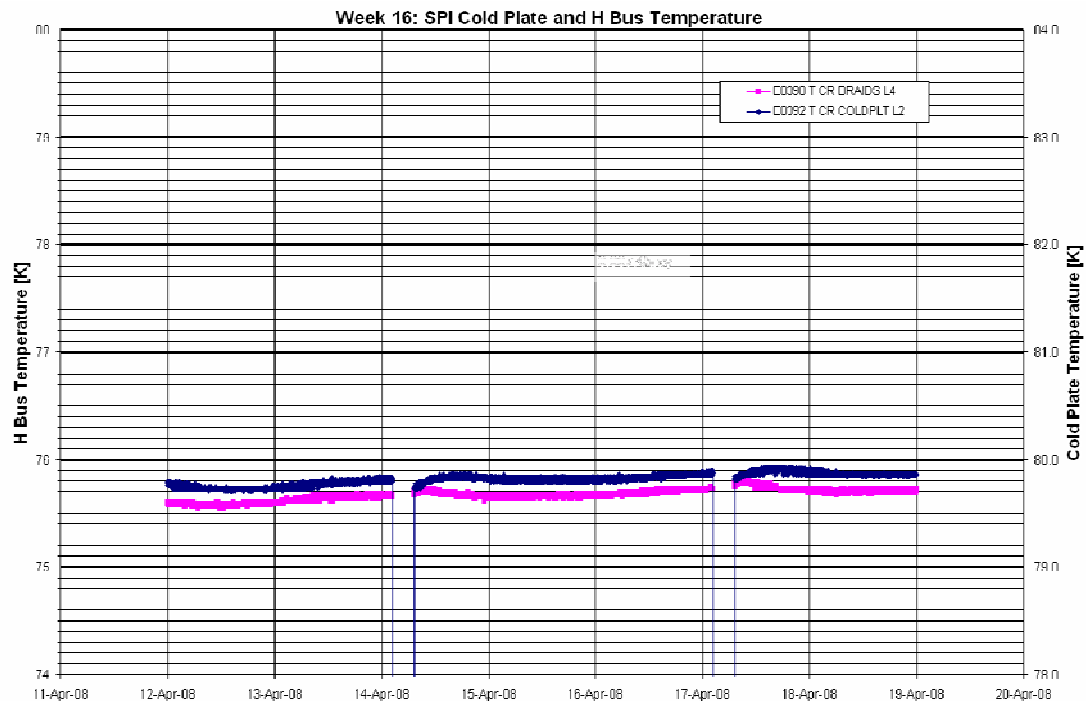
The stroke of all four compressors was set to 40 throughout the week. The average CDE LCL currents were as follows:

- CDE1 LCL Current = 4.78A
- CDE2 LCL Current = 4.58A

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.

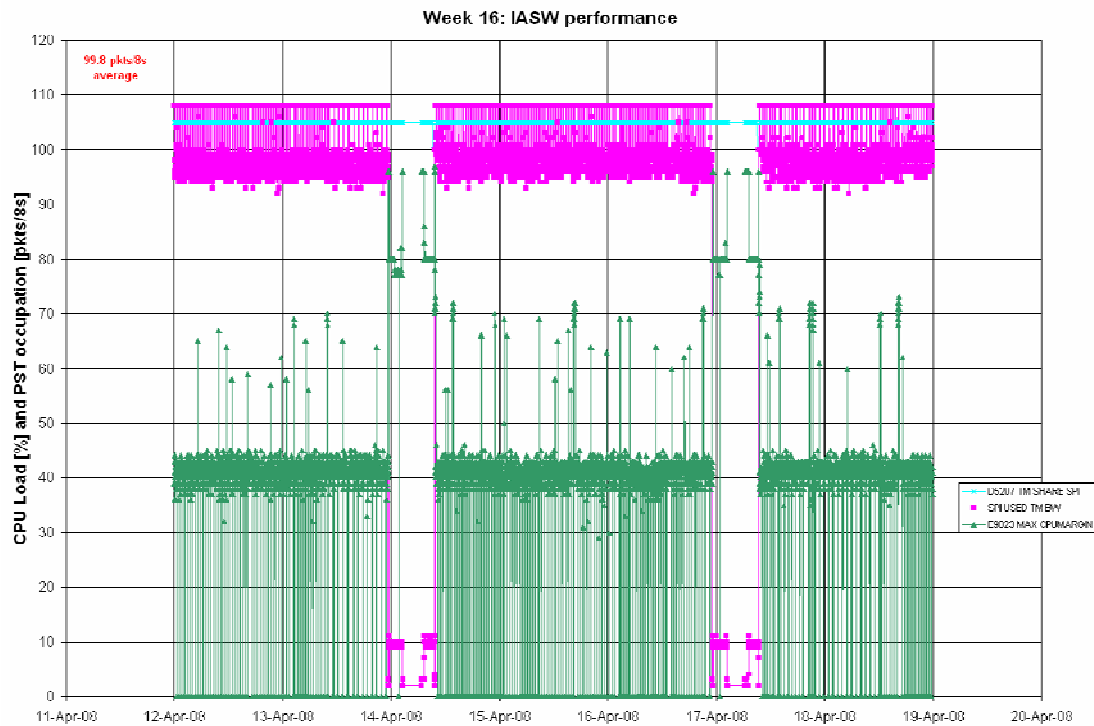


DPE & IASW: The DPE health and IASW performance is nominal.

The IASW version installed is v4.3.4 with SE compression only enabled and the spectra scaling factor set to 8/19 SE.

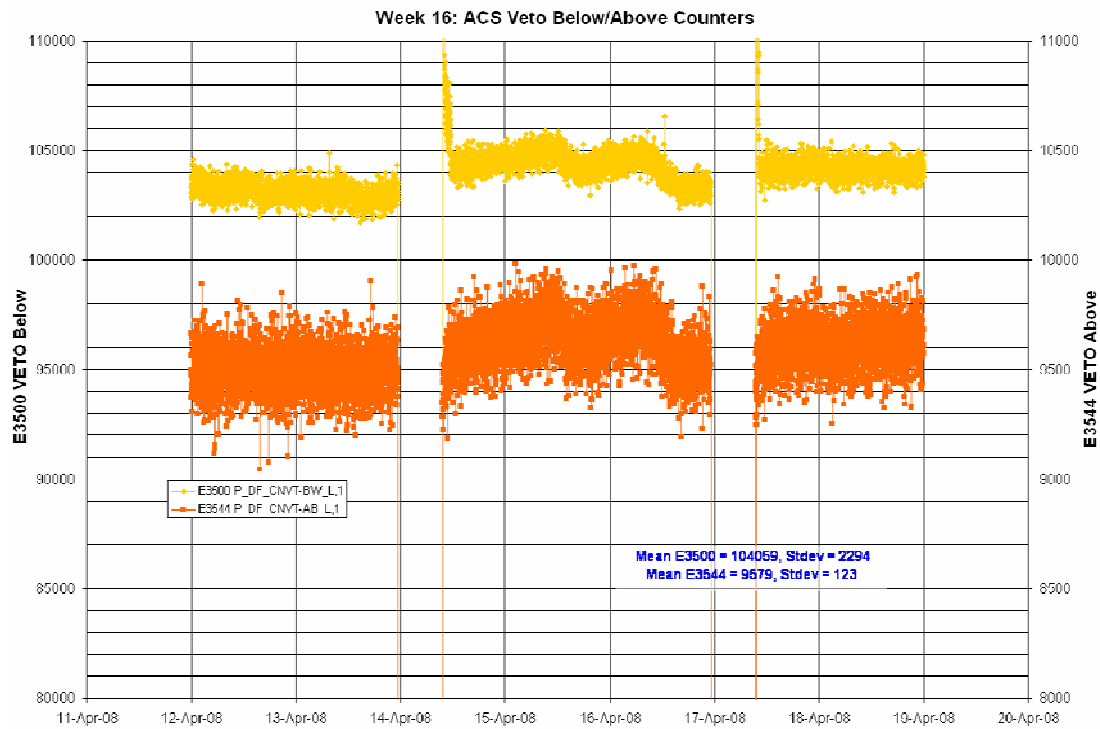
The average TM bandwidth occupation of SPI was 99.8 packets/cycle over the science window. The TM allocation in the science window was 108 packets/cycle. This allocation is considering that the over-allocated PST with the additional 3 packets/cycle for SPI was being used, however the Broadcast Packet TM allocation was not updated (see plot below).

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

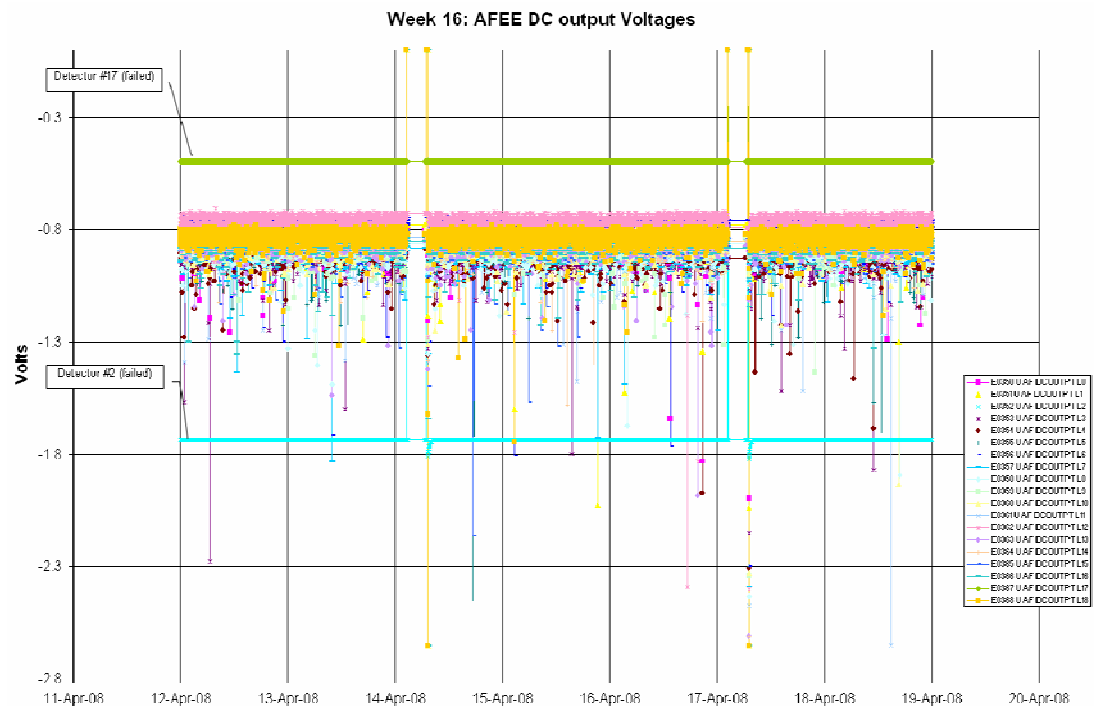


ACS: The performance of the ACS is nominal, except for FEE #81 which remains nominally switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is nominally OFF due to the anomaly on 5/8/2003 (INT_SC-61).

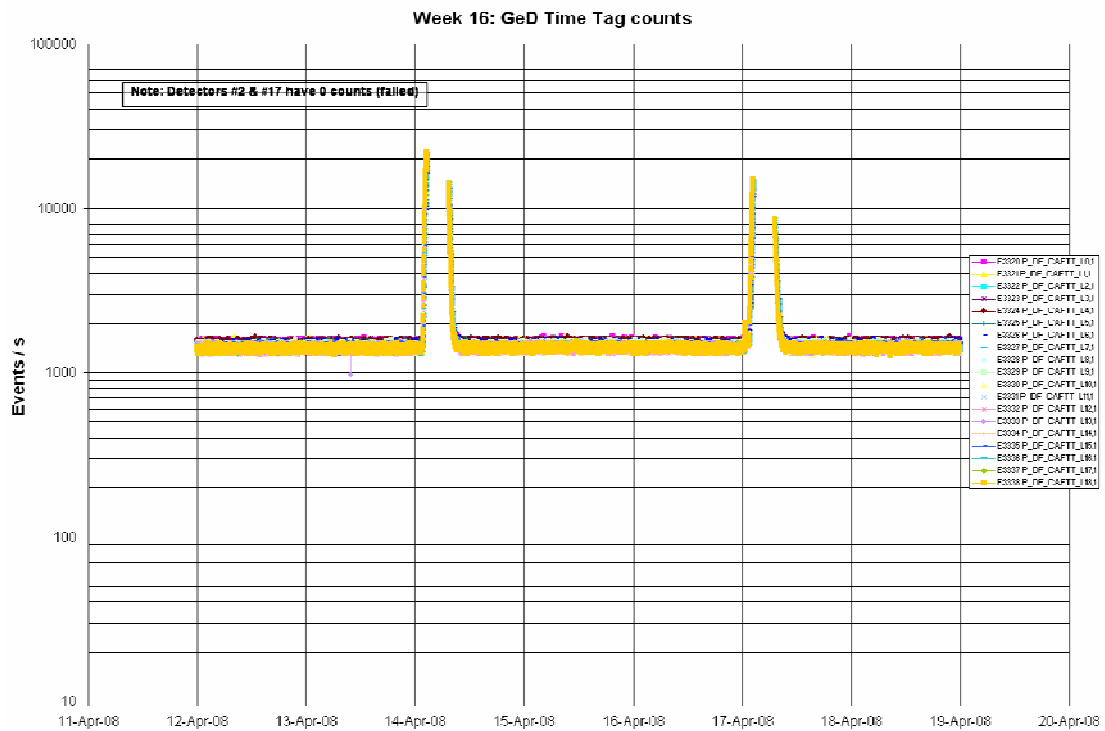
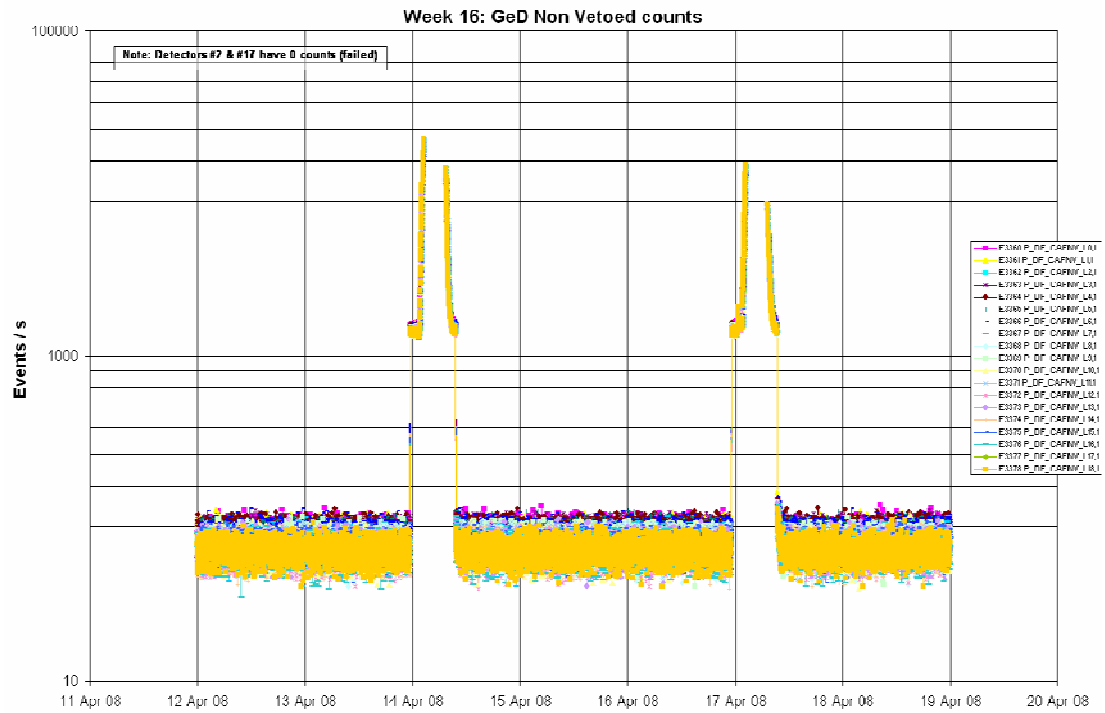
The following plot shows the ACS overall count rate evolution during the reporting period:

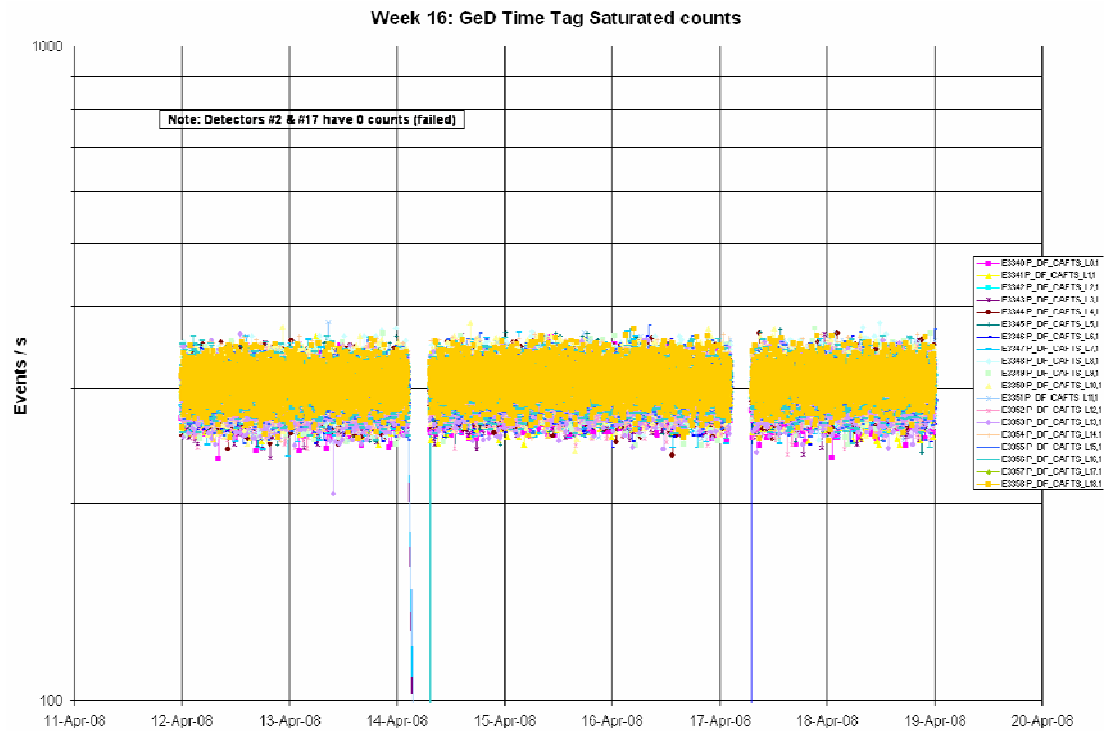


AFEE: The health of the AFEE is nominal. The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.

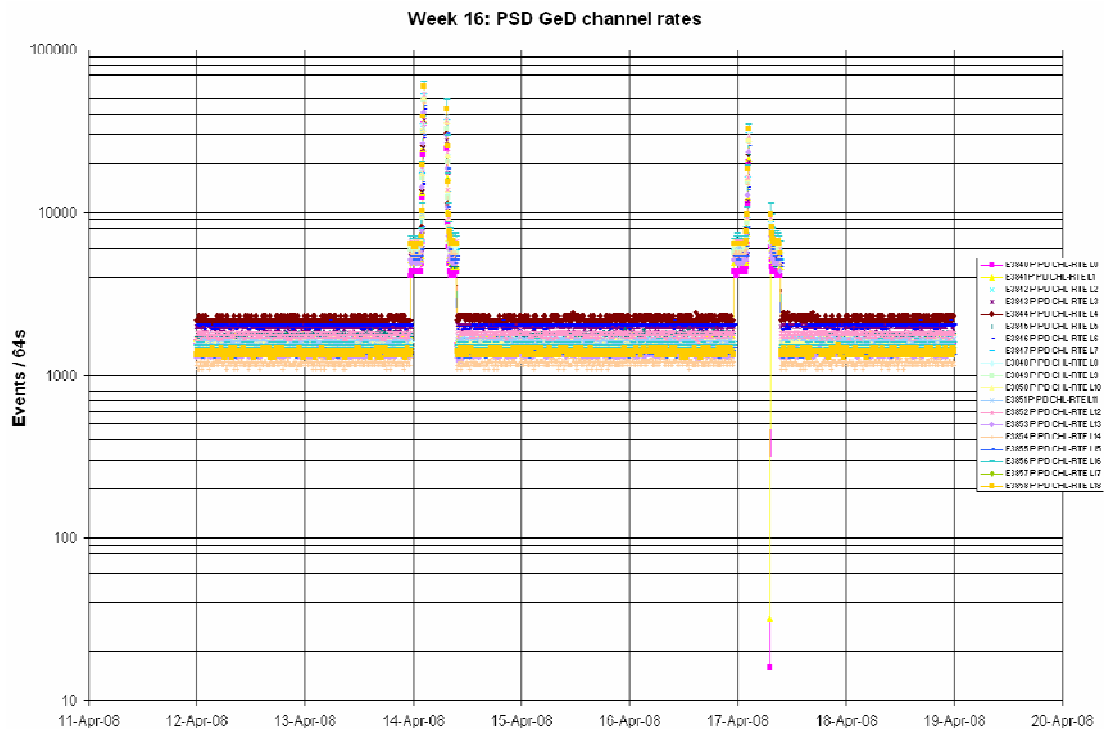


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event count rates during the reporting period.





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



Event Log:

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

- At radiation belt entry of revolution 671, on 2008-04-13 at 23:23:48Z, TM parameters E2002; E2350 and E3164 went OOL (value = PARAM > SPEC). These are the HV; analogue status -5 V and temperature status of ACS FEE #0

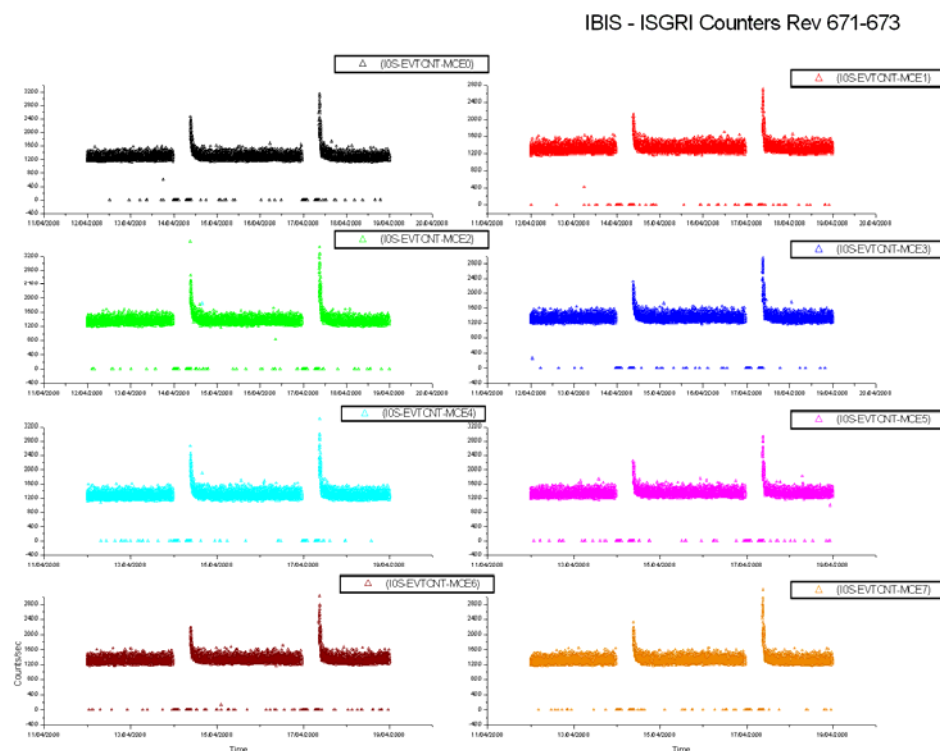
respectively. As they had all returned within limits by 23:26:32Z, no action was taken. This is a re-occurrence of Anomaly INT_SC-211.

- Due to continuing high radiation after the expected radiation belt exit of revolution 672, the TM parameter E3500 went OOL High on 2008-04-14 at 09:44:33Z. It returned within limits at 09:48:49Z and no action was taken.
- Due to continuing high radiation after the expected radiation belt exit of revolution 673, the TM parameter E3500 went OOL High on 2008-04-17 at 09:30:48Z. It returned within limits at 09:51:12Z and no action was taken.
- TM parameter E2115 went OOL Warning Low on several occasions during the week. In each case it returned within limits of its own accord and no action was taken. However, this parameter is going OOL Warning Low more frequently and for longer periods, a trend seeming to indicate a degradation in the thermistor as occurred for the TM parameter E2116. The lower limit for E2115 will be updated in the next IODB release.

8.3.3 IBIS Operations

IBIS Event Counters Plots

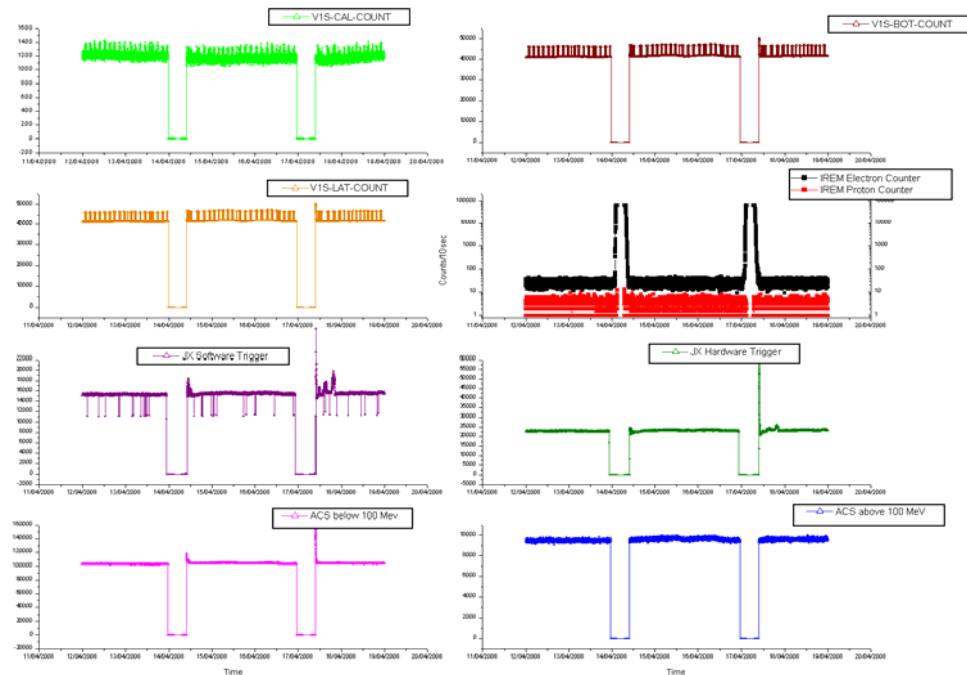
ISGRI Counters:



*sampling every 4 pkts (32 secs)

VETO vs Payload Counters:

IBIS-VETO vs Payloads Counters Rev 671-673

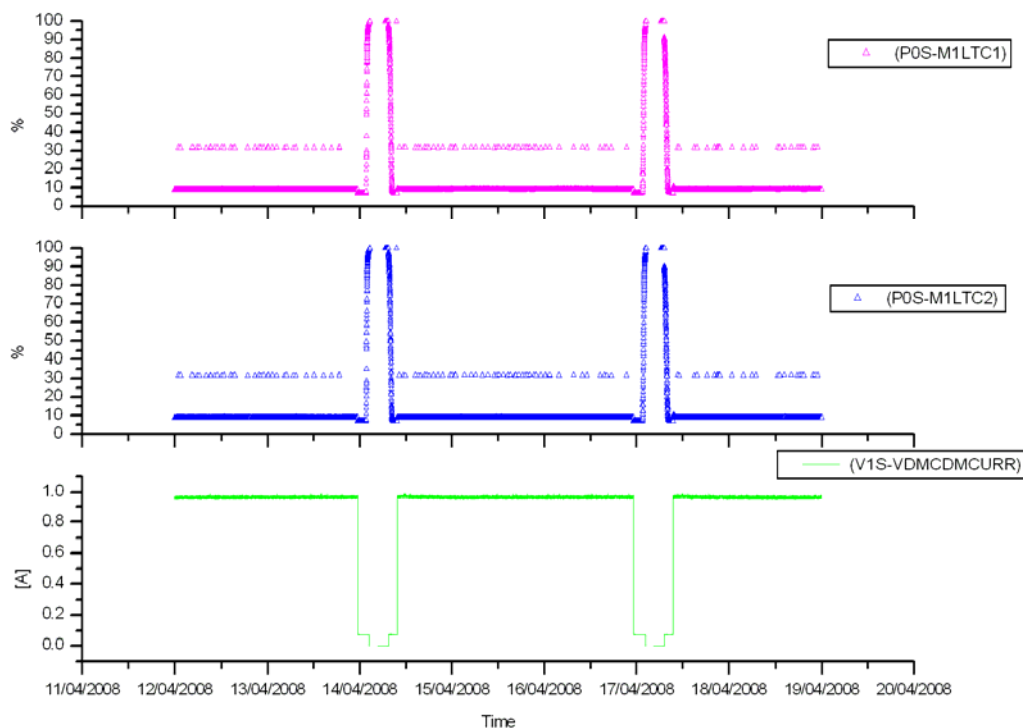


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

The week was characterised by slightly high radiation after the expected radiation belt exit of revolutions 672 and 673 as reported by the payload.

VETO Current:

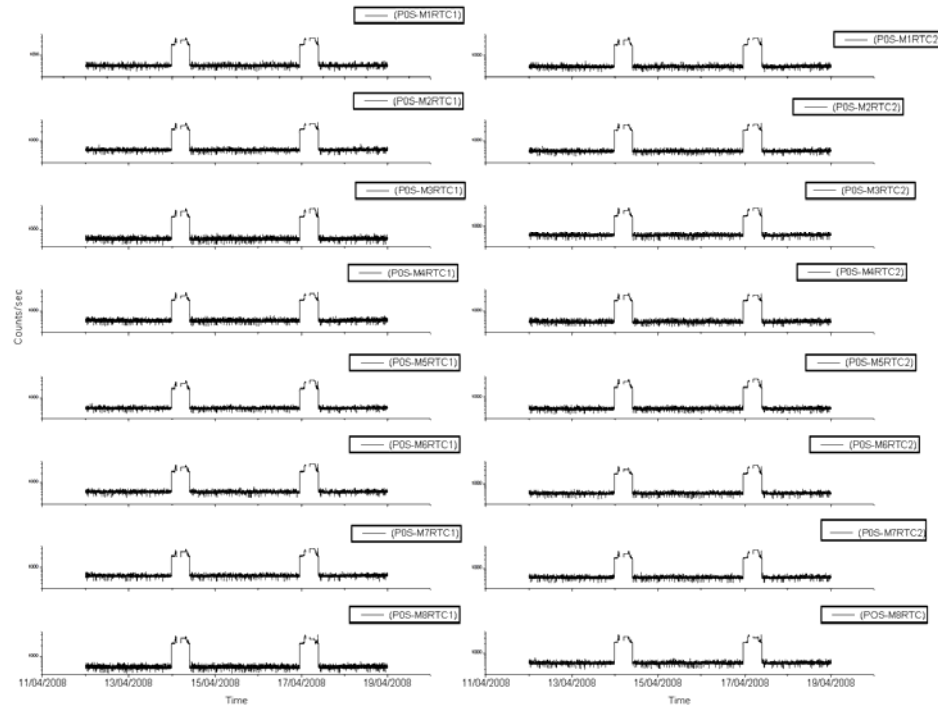
IBIS-VETO Current & PICsIT dead times Rev 671-673



**sampling every 4 pkts (32 secs)

PICsIT Counters:

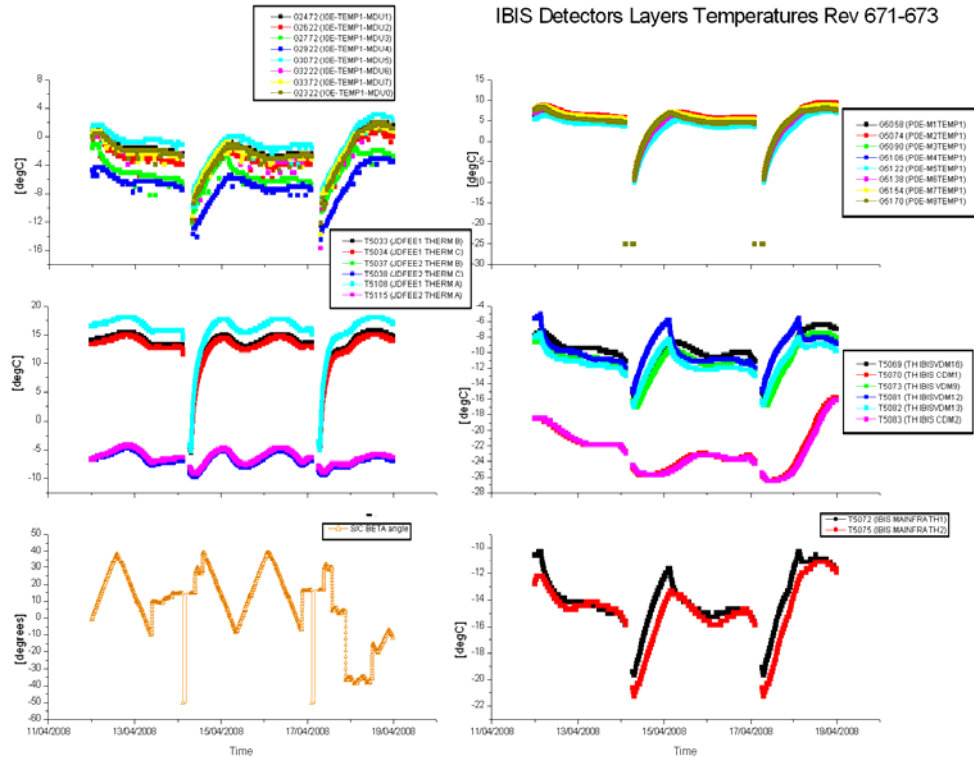
IBIS - PICsIT Counters Rev 671-673



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:

IBIS Detectors Layers Temperatures Rev 671-673



**sampling every 8 pkts (64 secs)

IBIS daily report:

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

In addition the TM parameter G6061 toggled OOL Warning Low several times during the reporting period. This is the Veto calibration source counter and the OOL is due to the decreasing value of the counter resulting from the nominal radioactive decay of the calibration source. The lower limits for this parameter will be updated in the next IODB release.

2008-04-12 (DOY 103, Rev 671) to 2008-04-13 (DOY 104, Rev 671)

IBIS operations executed nominally.

2008-04-14 (DOY 105, Rev 671-672)

Following a request from the IBIS PI, the Module Counter Maximum of the Noisy Pixel Handling System was changed from 10000 to 20000 at the start of revolution 672. This was done by disabling the Timeline such that the ED GEISCL03 for the ISGRI calibration scheduled at 09:07:25Z was not released and a manually edited GEISCL03 sequence with the new parameter value was up-linked instead.

During the execution of the ED GEISCL03, the TM parameter family G2013 toggled OOL Warning High from 09:13:58Z to 09:25:58Z. These are the number of events triggering the MCEi per second. As they returned within limits of their own accord, no action was taken.

Due to a loss TC capability, the ED GEVESP01 scheduled in the Timeline at 07:31:44Z failed release. When the TC links were re-established, the ED was resent manually at 07:39:25Z.

2008-04-15 (DOY 106, Rev 672) to 2008-04-16 (DOY 107, Rev 672)

IBIS operations executed nominally.

2008-04-17 (DOY 108, Rev 672-673)

Following a request from the IBIS PI, the Module Counter Maximum of the Noisy Pixel Handling System was changed from 10000 to 20000 at the start of revolution 673. This was done by disabling the Timeline such that the ED GEISCL03 for the ISGRI calibration scheduled at 08:53:34Z was not released and a manually edited GEISCL03 sequence with the new parameter value was up-linked instead.

At 09:00:14Z, during the execution of the ED GEISCL03, the TM parameter family G2013 started toggled OOL Warning High. These are the number of events triggering the MCEi per second. They had all returned within limits by 09:49:02Z and no action was taken.

Due to slightly high radiation after the expected radiation belt exit of revolution 673, from 09:43:50Z to 09:46:46Z the VETO counters, TM parameters G6062 and G6063, toggled OOL High. As they returned within limits of their own accord, no action was taken.

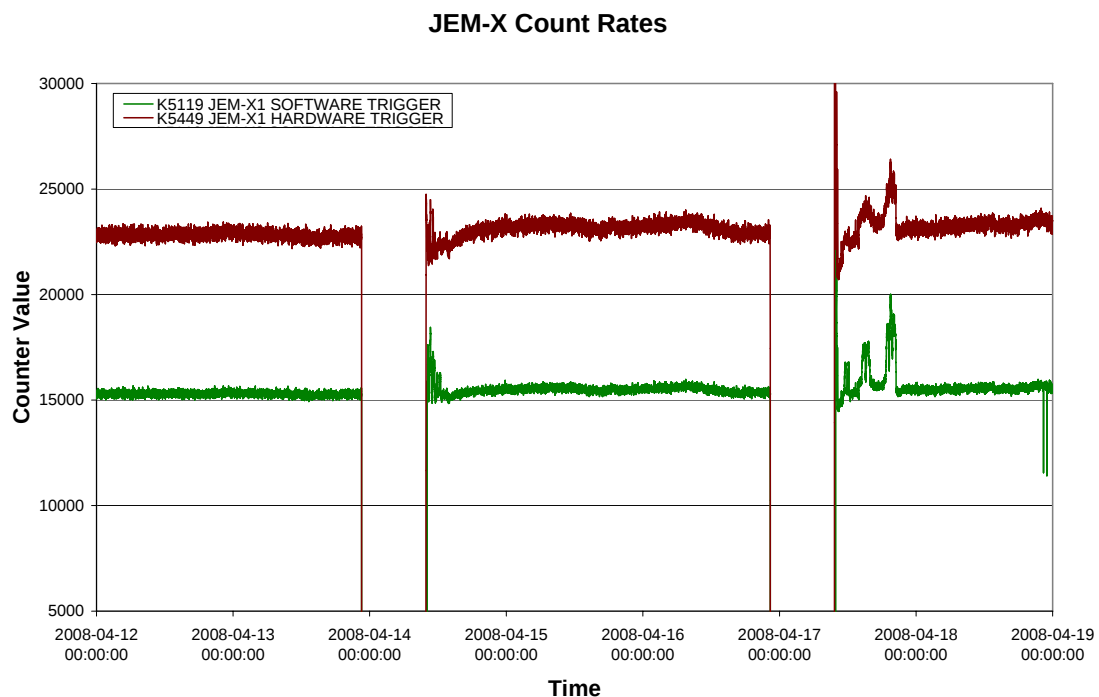
2008-04-18 (DOY 109, Rev 673)

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.



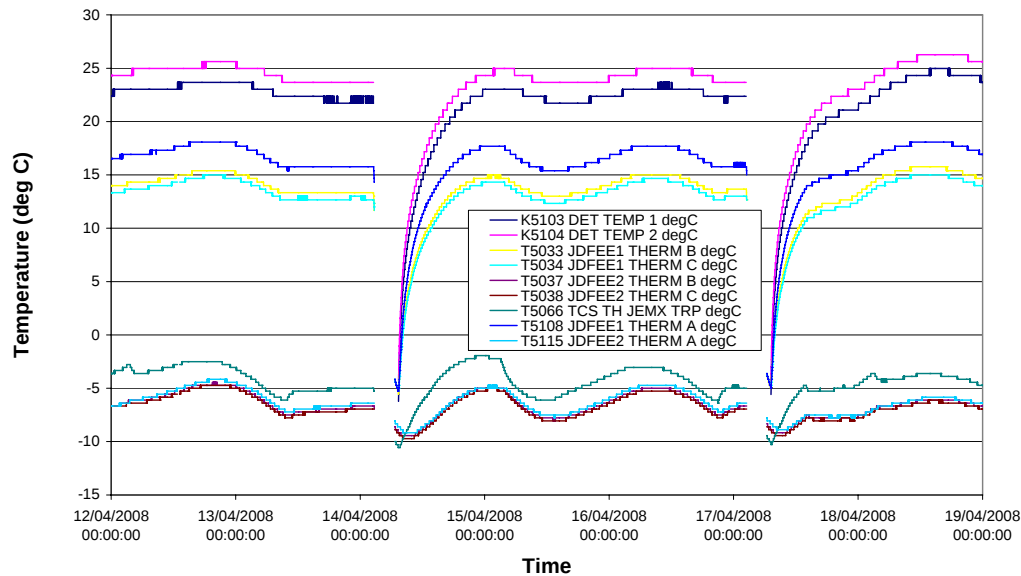
JEM-X Temperatures

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)

JEMX Detector & DFEE Temperatures



JEM-X Daily Report

2008-04-12 (DoY 103, Rev 671) to 2008-04-13 (DoY 104, Rev 671)

JEM-X1 operations executed nominally.

2008-04-14 (DoY 105, Rev 672)

From 07:25:16 to 07:25:36, parameter KD5380D was briefly out of hard limits. From 07:52:52 to 10:35:52, parameter K5102 was intermittently outside soft limits. From 08:19:16 to 08:55:05, parameter K5101 was intermittently outside soft limits. No action was taken on any of the above events, and there was no impact.

2008-04-15 (DoY 106, Rev 672) to 2008-04-16 (DoY 107, Rev 672)

JEM-X1 operations executed nominally.

2008-04-17 (DoY 108, Rev 673)

From 07:13:08 to 07:13:28, parameter KD5380D was briefly out of hard limits. From 07:43:28 to 10:06:25, parameter K5102 was intermittently outside soft limits. From 09:04:00 to 09:06:08, parameter K5317 exceeded hard limits. From 09:40:57 to 09:48:08, parameter K5449 intermittently exceeded hard and soft limits. At 09:43:04 parameter K9116 exceeded soft limits. From 09:44:48 to 09:48:03, parameter KD5020D exceeded hard limits. From 09:48:32 to 09:51:28, parameter K5136 exceeded soft limits. No action was taken on any of the above events, and there was no impact.

2008-04-18 (DoY 109, Rev 673)

JEM-X1 operations executed nominally.

8.3.5 OMC Operations

2008-04-12 (DoY 103, Rev 671) to 2008-04-18 (DoY 109, Rev 673)

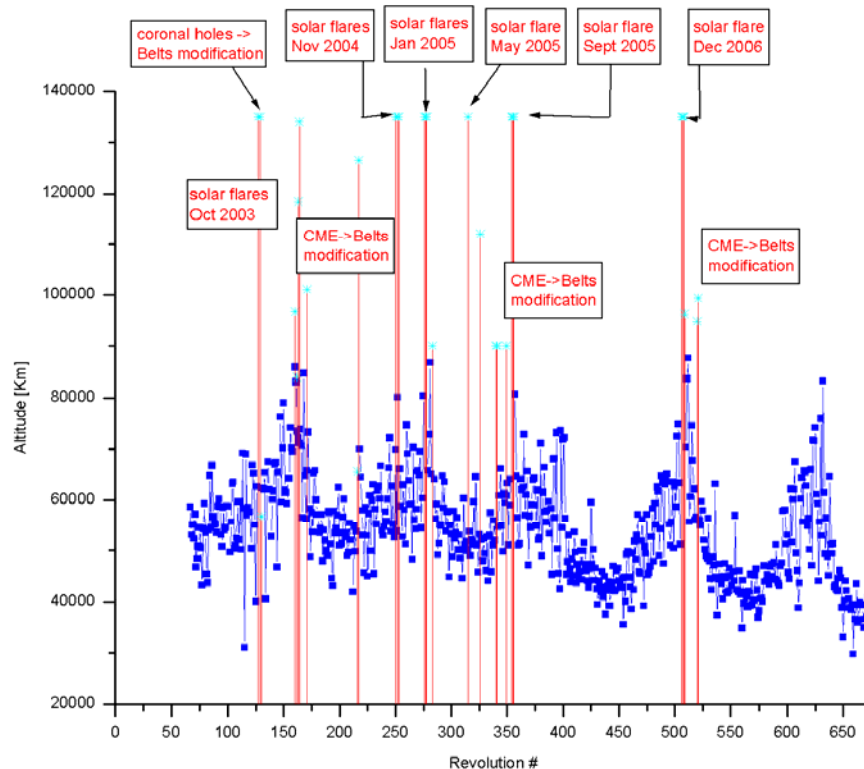
Nothing to Report.

On DoY 104 at 23:29:20 and DoY 107 at 23:15:52 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]
671	RAD_ENTR R 2008-04-13T23:29:17Z	14/04/2008 01:39:51	36910.5	14-Apr-2008 01:02:14	42305.2
672	RAD_EXIT R 2008-04-14T09:32:14Z	14/04/2008 08:44:47	>>41239.3	14-Apr-2008 08:42:14	46224.69
672	RAD_ENTR R 2008-04-16T23:15:50Z	17/04/2008 01:06:07	40770.5	17-Apr-2008 00:53:45	41768.16
673	RAD_EXIT R 2008-04-17T09:18:54Z	17/04/2008 09:44:55	56547.1	17-Apr-2008 08:23:45	45225.49

Reference

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Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OAI
Date : 21/04/08

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High radiation

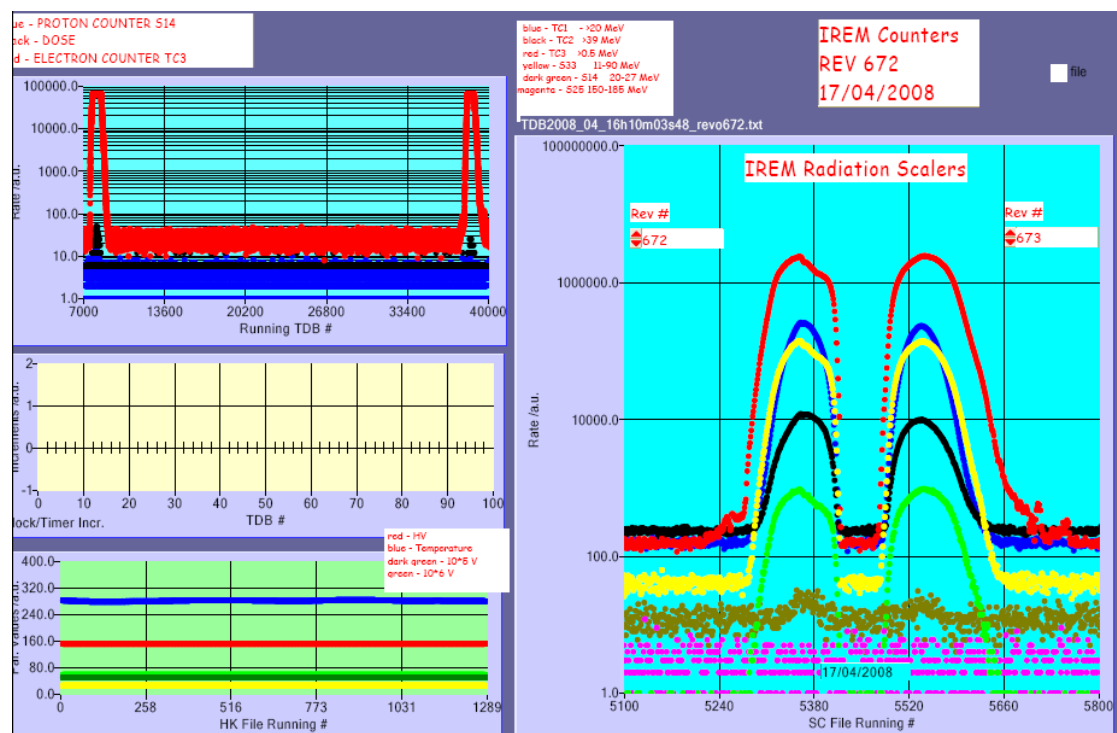
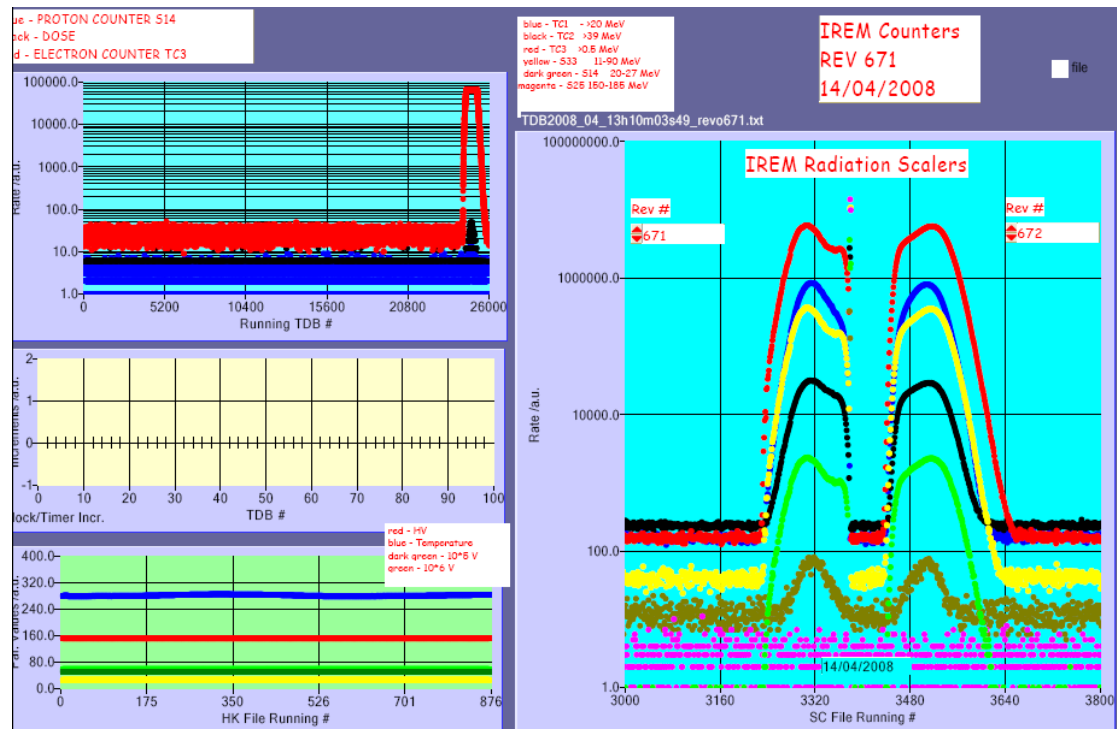
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

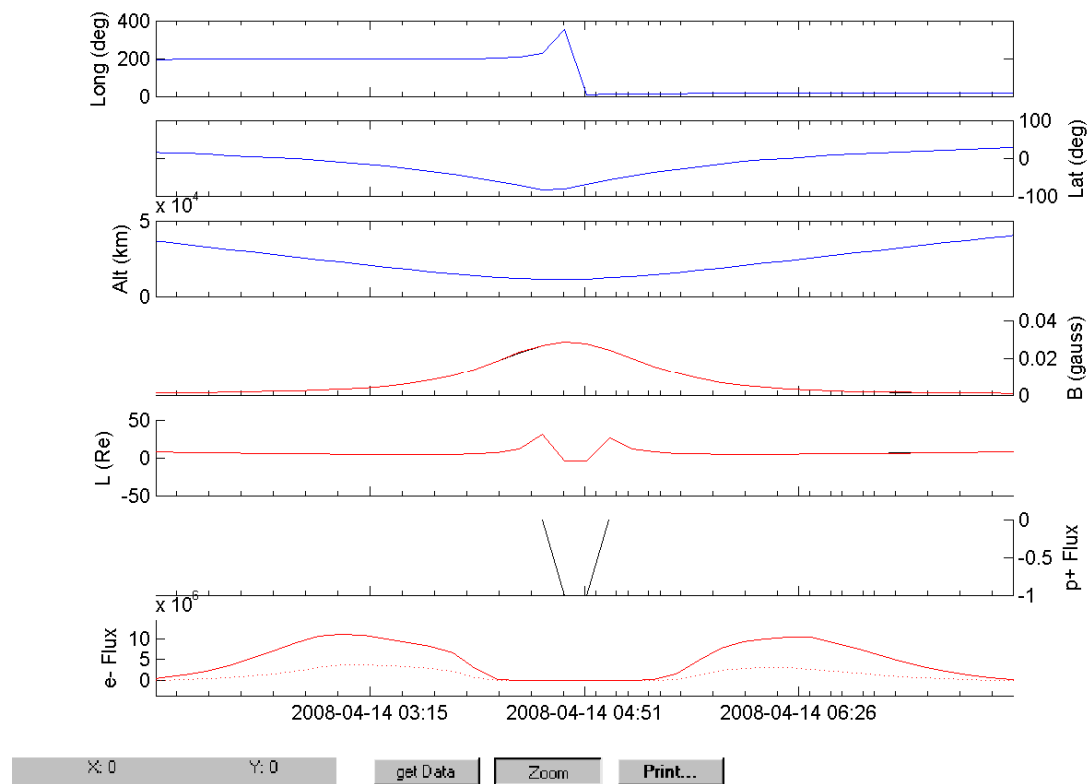
* Rad belt entry time ignoring previous threshold crossings where a gap of more than 30 minutes is present.

IREM radiation counters:

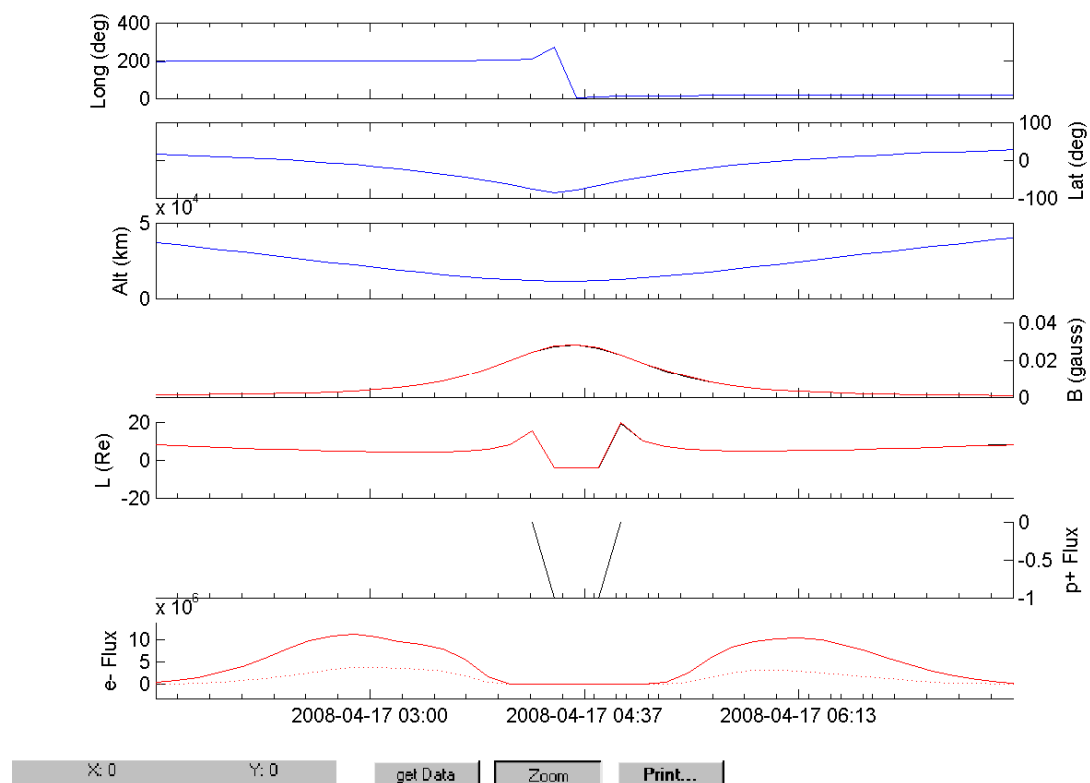


IREM Predicted Radiation Belt Passages

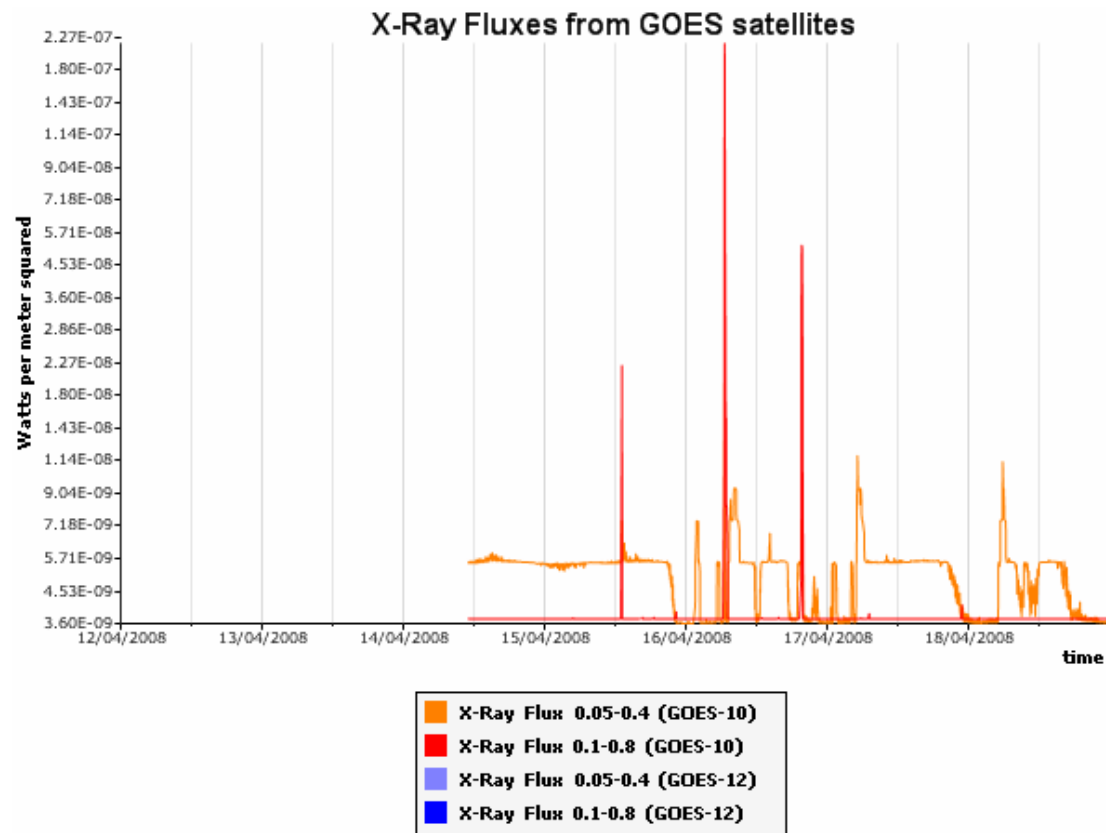
Rev 671



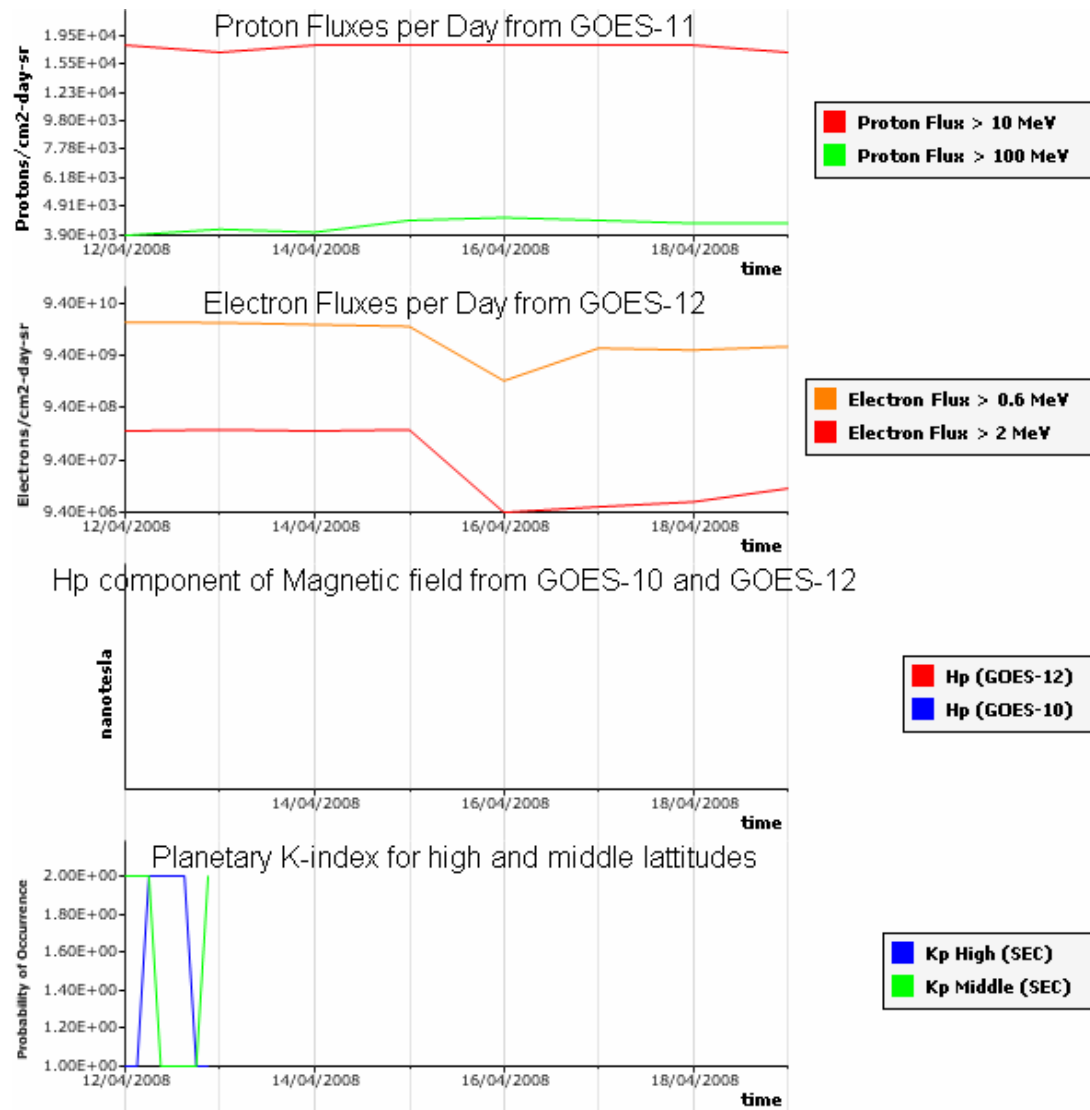
Rev 672



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



X-Ray fluxes start to be significant over 10^{-5} W/m² (corresponding to M-class flares). Above 10^{-4} W /m², they correspond to strong X-class flares.



Proton and electron flux report low radiation background.

Hp component of the Geomagnetic Field is essentially parallel to the Earth's rotation axis. A drop near 0 nT is associated with a significant variation in the magnetic field. Kp index is based on ground magnetometers. Kp ≥ 5 features storm-level geomagnetic activity.