

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 190
Week 19
15.05.06
Routine Phase

Prepared by: M. Walker (OPS-OFO)

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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 06.05.06 until 12.05.06 (both dates inclusive) and covers the revolutions 435, 436 and 437.

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 were a Galactic Plane survey, raster dithers of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9) and Cygnus X-3 (RA 20:32:25.50, DEC +40:57:27.7), which was a Target of Opportunity, and a couple of engineering calibration pointings.

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 continued with the 2nd, 3rd and 4th eclipse passages on 06-09-12 May 2006. The eclipse passages were nominal from an AOCS point of view.

As part of the AOCS routine activities for the eclipse season, were verified 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 slew was lost during the observation period.

The fuel consumption over the period between 04/05/2006 and 12/05/2006 was 0.2392 kg. The remaining propellant is in the order of 154.5564 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 was 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

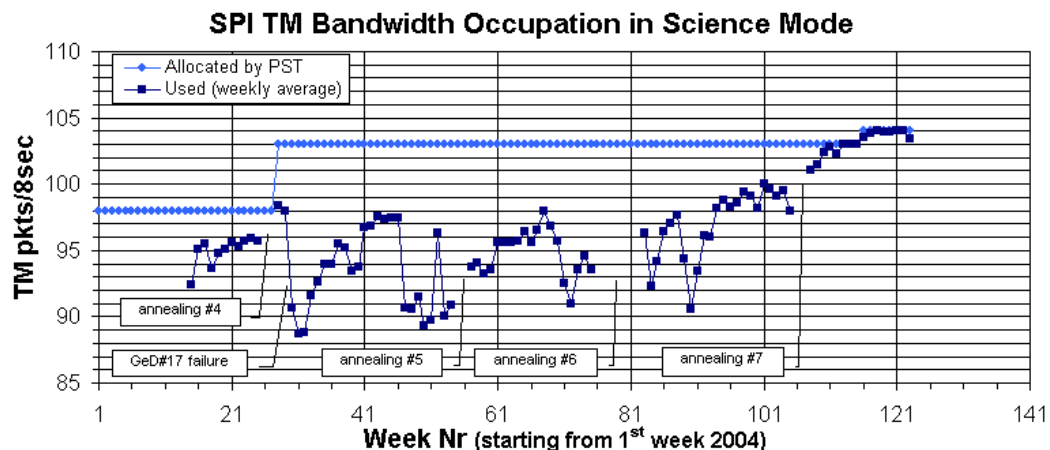
Following the 7th annealing, ended on 24th January, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #15, which is showing since 09.02.2006 a slightly degraded energy resolution. Detector #2 is failed since 06.12.2003, detector #17 since 17.07.2004.

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 of 104 pkts/cycle and the average telemetry occupation was 103.4 pkts/cycle. The telemetry downlink of SPI has therefore reached the saturation.

The Stirling compressors work nominally, maintaining the Germanium detectors at 85K +/-1K.

On the 3rd May the eclipse season has started and will last till 24th May. The instrument has so far behaved nominally at each post-eclipse re-activation. Some out of limit (OOL) on the PSAC temperatures appeared as expected.

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.

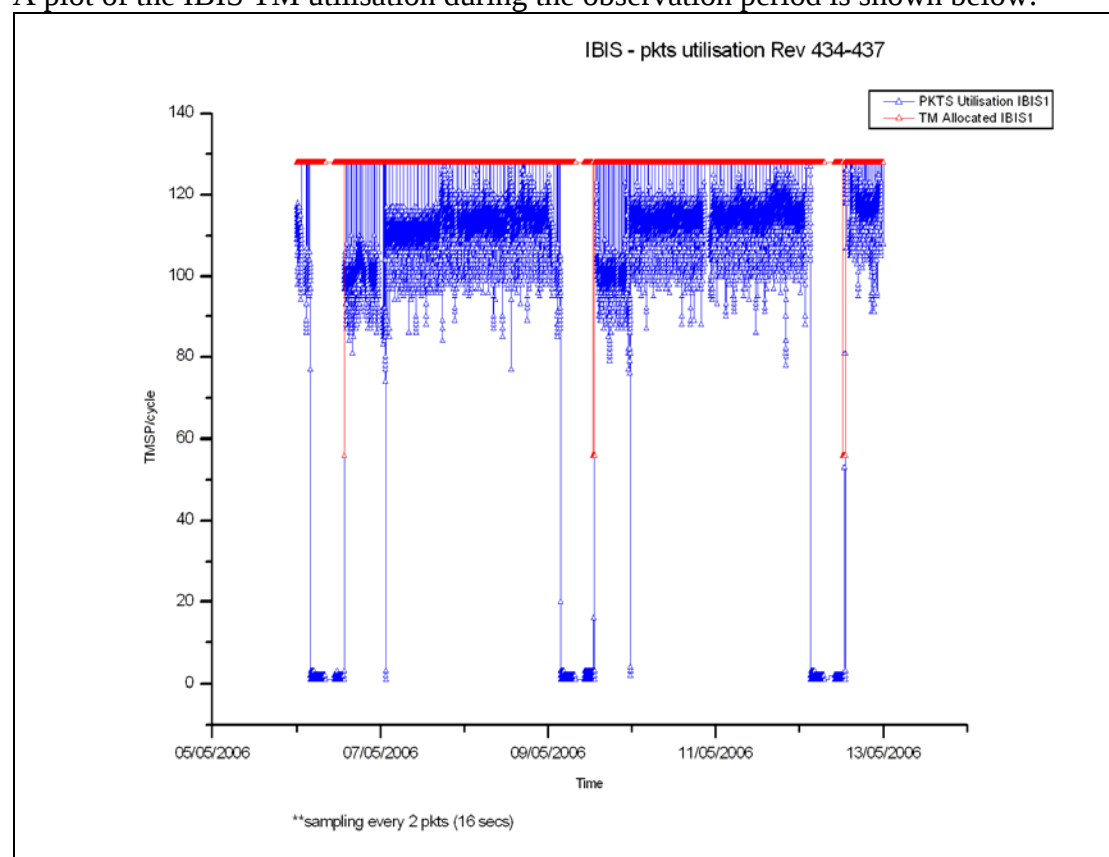
3.2.2 IBIS

The Overall status of the unit is nominal.

The summer eclipse season started on 2006-05-03. The reconfiguration of IBIS after each eclipse exit was successful.

During the reporting period, the PST allocation to IBIS was 128 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 112.91 TMPS/cycle, up 1.34 on last week.

A plot of the IBIS TM utilisation during the observation period 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 during science observations and JEM-X2 was dormant (DFEE OFF) with a TM allocation of 1 packet/cycle.

Further information on the JEM-X operations can be found 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/cycle.

During this reporting period, all of the 140 planned science pointings for OMC were executed nominally, none were lost.

Note: Some more information concerning the OMC operations is provided in the Appendix Section 8.3.5.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised low solar activity.

The several sunspots (875,878,880 and 881) that appeared last week disappeared over the observing period. Two new sunspots appeared (882 and 883). None of these posed a threat for strong 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 excellent this week, with no pointings lost. There were a few other minor problems with ground stations, but these had no impact. The overall performance was nearly 100%.

4.1 Mission Operations Centre

The performance of the MOC was excellent this week. The overall performance was nearly 100%.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were a few instances of bad frames and TM drops from both Redu and DSS-27, but these had no impact on the mission. The overall performance though was well above the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF for revolution 443 and 444 were received. This week has included many interactions with MOC and replannings. A ToO request was received and approved for execution in revolution 437. This necessitated also replanning of revolutions 438 to 440. However, further replanning and iterations with MOC occurred, as difficulties performing some very large slews were encountered in the eclipse season. Due to all these problems, ISOC has not performed any further planning this week. The planning will be resumed when the TSF's for at least 439 is available. Final versions of the TSF's for revolution 437 and 438 are currently available. This week it was also agreed to perform the next SPI annealing starting in revolution 446. During this revolution it will also be performed the AOCS calibration of STR / FSS. This is considered very good since it will minimise the loss of science time. It is also planned to change in revolution 441 the configuration of JEM-X 2 and IBIS to give more telemetry to SPI. This is also an activity that required coordination between all ground segment parts.

2. Observation status

No ECS's were received this week.

3. ISOC science data archive

A maintenance release (version 2.5.1) of ISDA is planned for June. A list of items to be included in the next major release, version 2.6, is agreed. Manpower estimate is ongoing. The target is to release this version sometime end of July. Problems with ingestion of data from ISDC has occurred again due to changes at ISDC.

4. ISOC system

The ISOC system version 12.3 has been used. No modifications performed.

5. AO 4

The technical evaluation at ISOC is ongoing and progressing as planned.

6. Problems

No new problems encountered

4.3.2 ISDC

Status of ISDC observation processing on 15/05/2006:

- Latest Standard Analysis completed: observation 03200280002 (SGR1900+14, Revolution 423) on 11/05/2006
- Latest products archived: observation 03201090062 (Gal. Bulge, Revolution 425) on 10/05/2006
- Latest observation products sent to the observer: observation 03297000006 (SN1006, Revolutions 404 - 407) on 08/05/2006

5 Special Events

6 Anomalies

There were no problems this week that impacted the operations.

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There were no new anomaly reports entered into the ARTS system this week:

7 Future Milestones

On the 3rd May the summer eclipse season begins, which continues until the 24th May when. There are a total of 8 eclipses.

A new imcs release will be installed in June. This release will be based on SCOS 2000 3.1 patch M04, to bring the system in-line with that used by XMM.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 435

The observations in revolution 435 began with a Galactic Plane survey, which lasted ~8.6 hours, and continued with of a raster dither of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9) for ~45.1 hours, which lasted until the end of the revolution.

Revolution 436

The observations in revolution 436 began with a Galactic Plane survey, which lasted ~8.6 hours, and continued with of a raster dither of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9) for ~49.0 hours, which lasted until the end of the revolution.

Revolution 437

The observations in revolution 437 began with an engineering pointing (RA 12:00:00.00, DEC +30:01:00.0) lasting ~0.25 hours. This was followed by a raster dither of Cygnus X-3 (RA 20:32:25.50, DEC +40:57:27.7), a Target of Opportunity lasting ~27.8 hours. This was followed by another engineering pointing, also with attitude (RA 12:00:00.00, DEC +30:01:00.0) and lasting ~0.25 hours. Finally, a raster dither of GRO J0852-4642 (RA 08:51:38.31, DEC -46:41:50.9) was performed for ~25.5 hours, which lasted until the end of the revolution.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 for which the DFEE was off, and the TM allocation was IBIS 128; SPI 104; JEM-X1 8; JEM-X2 1; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2006-04-17T15:32:36.000Z	155.1103	F	Automatic TM processing.
2006-04-18T13:06:22.000Z	155.0808	F	Automatic TM processing.
2006-04-19T23:45:30.000Z	155.0597	F	Automatic TM processing.
2006-04-21T23:55:43.000Z	155.0396	F	Automatic TM processing.
2006-04-22T23:01:54.000Z	155.0213	F	Automatic TM processing.
2006-04-24T12:29:10.000Z	155.0048	F	Automatic TM processing.
2006-04-24T21:38:07.000Z	154.9884	F	Automatic TM processing.
2006-04-25T04:48:55.000Z	154.9783	F	Automatic TM processing.
2006-04-25T22:54:25.000Z	154.9429	F	Automatic TM processing.
2006-04-27T12:13:09.000Z	154.9216	F	Automatic TM processing.
2006-04-28T22:44:57.000Z	154.9067	F	Automatic TM processing.
2006-04-29T03:54:50.000Z	154.8455	F	Automatic TM processing.
2006-04-30T12:11:41.000Z	154.8236	F	Automatic TM processing.
2006-05-03T05:49:40.000Z	154.8092	F	Automatic TM processing.
2006-05-04T22:34:24.000Z	154.7956	F	Automatic TM processing.

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, 06/05/2006 – 12/05/2006

AOCS operations were executed from the Automatic Timeline.

During this period, 74 Open Loop Slews, 84 Closed Loop Slews and 13 Momentum Biases were executed (this large number of biases was due to the combination of orbit control strategy, GPS obs and ToO).

No slew was lost during the observation period.

The AOCS eclipse operations were nominal. For the 2nd, 3rd and 4th eclipse passages, the ACC\FDE\FCE Eclipse Timers and the Time-Tagged sequence to re-enable the IMU Auto Switch-Off function of the ACC were loaded from the Timeline and the pre-eclipse IMU health checks was performed at the planned times. Some information regarding the eclipse times and IMU usage up to this stage of the eclipse season are provided below:

AOCS Eclipse Times														Summer 2006		
Date	LOS	AOS	ACC Eclipse Imminent	Eclipse Start						Eclipse End						Eclipse Duration
				ACC	FDE	FCE	Penumbra	FSS Sun Out	Umbra	Umbra	FSS Sun In	Penumbra	FDE/FCE	ACC		
2006-05-03	08:22:00	11:05:00	06:23:04	07:05:03	07:15:46	07:16:30	07:22:44	07:26:44	07:27:43	07:51:26	07:52:31	07:55:51	08:01:26	08:05:32	0:33:07	
2006-05-06	08:17:00	10:44:00	05:56:17	06:38:06	06:49:31	06:50:15	06:55:57	06:58:05	06:58:32	07:50:24	07:50:52	07:52:29	07:58:39	08:02:00	0:56:32	
2006-05-09	07:55:00	10:30:00	05:36:12	06:18:21	06:27:47	06:28:31	06:35:52	06:38:10	06:38:03	07:39:55	07:40:44	07:41:33	07:46:27	07:51:24	1:05:41	
2006-05-12	07:19:00	10:15:00	05:20:06	06:02:05	06:13:21	06:14:05	06:19:46	06:22:24	06:21:45	07:26:15	07:27:26	07:27:44	07:34:13	07:37:25	1:07:58	

IMU Usage during Eclipse Season						Summer 2006
IMU On	IMU Off	From Health Check		From Auto Calibration	On Time	Accumulated On Time
		Noise Roll [as/s]	Drift Roll [as/s]	Drift Roll [as/s]		
2006-05-03 04:32:40	2006-05-03 08:07:51	0.1877	0.2750	0.2561	3:35:11	3:35:11
2006-05-06 03:55:06	2006-05-06 08:04:18	0.1941	0.2635	0.2515	4:09:12	7:44:23
2006-05-09 03:45:29	2006-05-09 07:53:33	0.2404	0.2567	0.2779	4:08:04	11:52:27
2006-05-12 03:02:01	2006-05-12 07:39:44	0.2105	0.2350	0.2137	4:37:43	16:30:10

Orbit Control

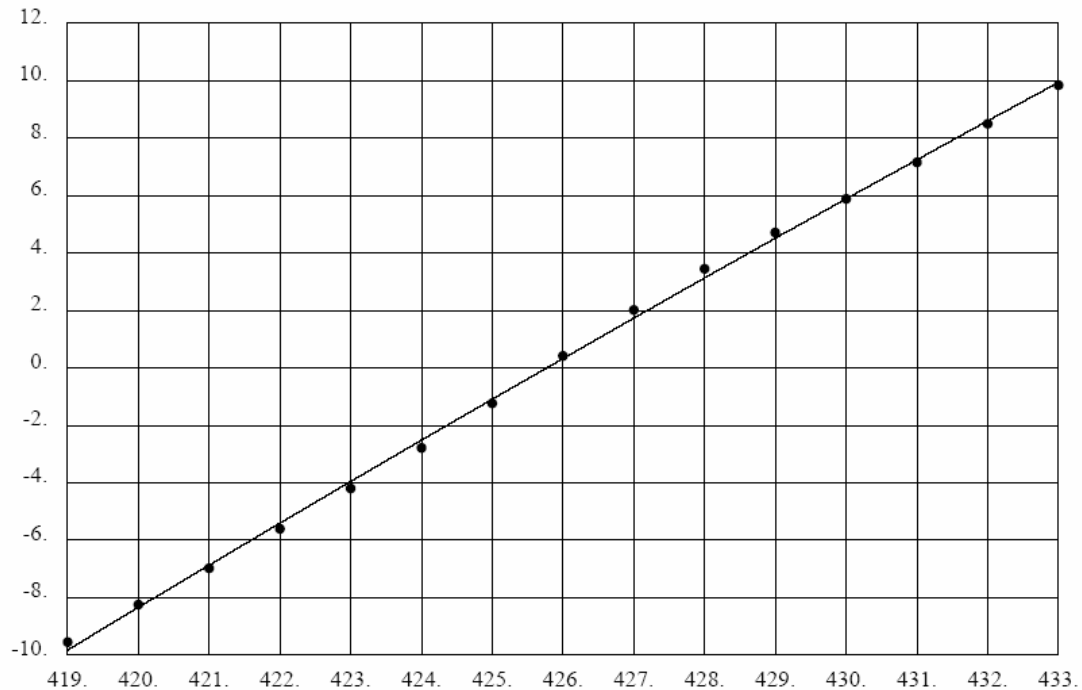
The following table shows the shortening of the necessary Goldstone pass:

Orbit number	Apogee passage date	Time from LOS Redu to 40000 km altitude
362	2005/10/01	284 min
372	2005/10/31	268 min
382	2005/11/30	244 min
393	2006/01/02	213 min
402	2006/01/29	188 min
412	2006/02/28	159 min
422	2006/03/30	122 min
433	2006/05/01	80 min

From mid July and onwards Redu should give coverage down to 40000 km altitude.

The attached plot shows the apogee longitude of Integral as a function of the orbit number.

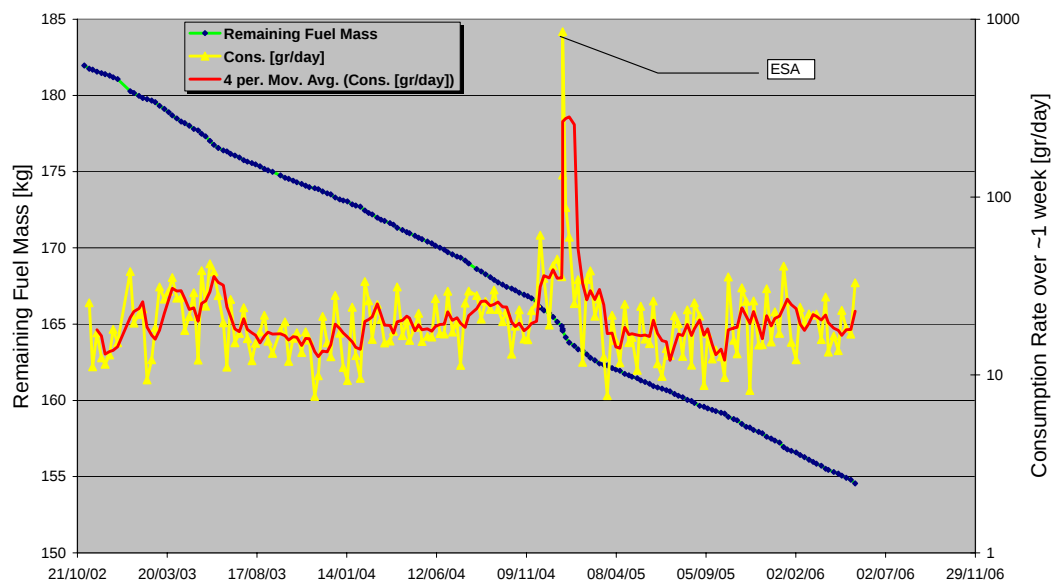
APOGEE LONGITUDES OF INTEGRAL 21.03.2006 - 01.05.2006
 LEAST SQUARES APPROXIMATION WITH PARABLE



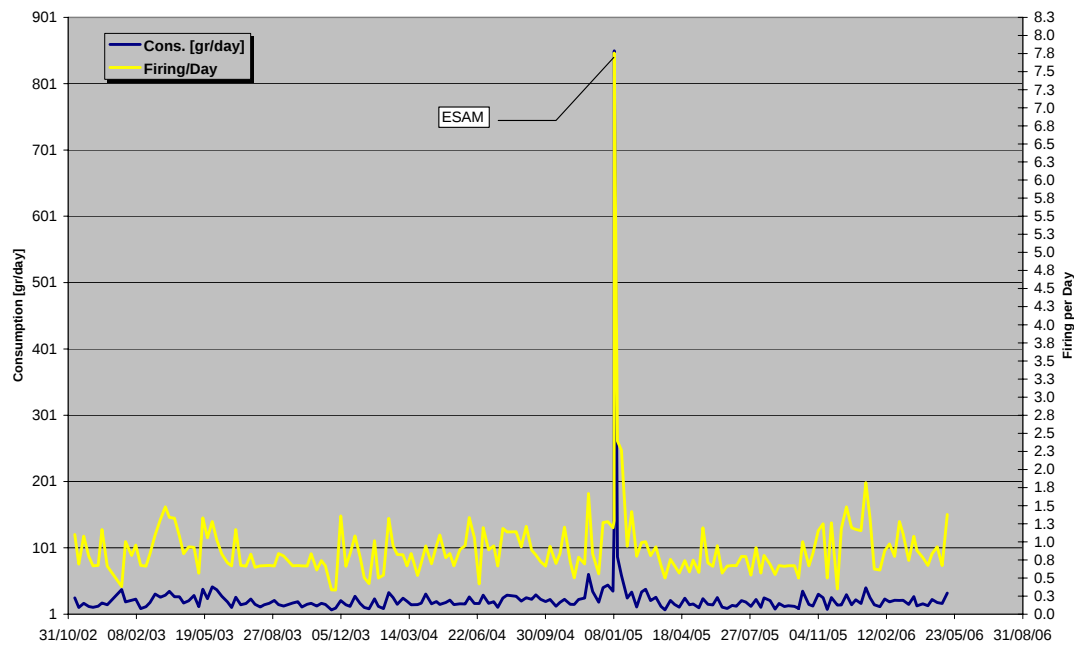
Fuel consumption

The fuel consumption (total, grams/day) over the period between 01/11/2002 and 12/05/2006 is reported in the plot below.

INTEGRAL FUEL CONSUMPTION HISTORY

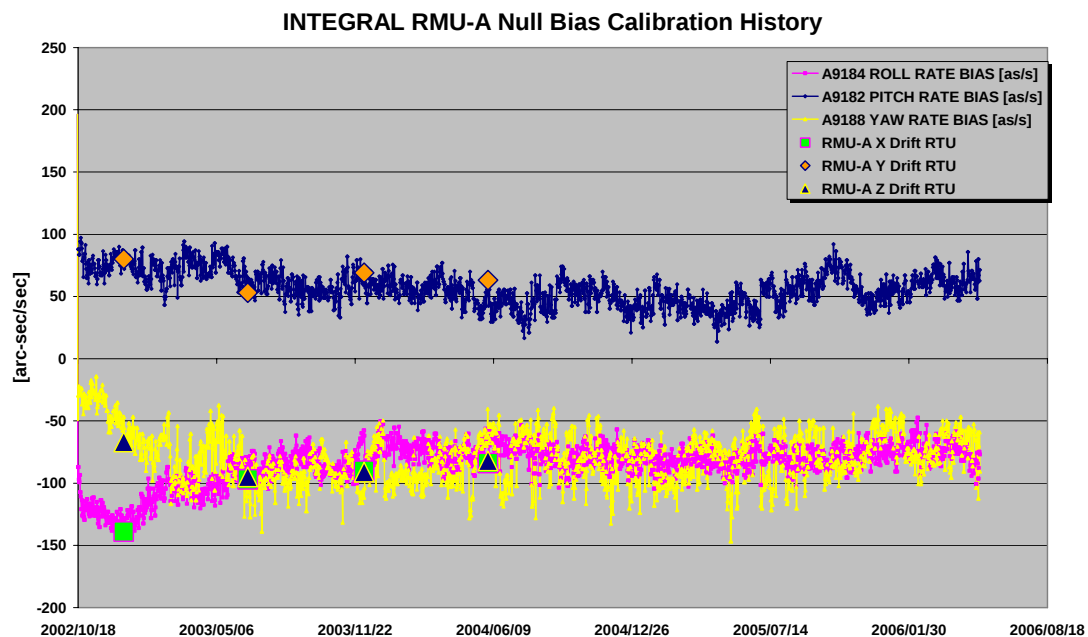


The firing\day over the period between 01/11/2002 and 12/05/2006 is reported in the plot below.

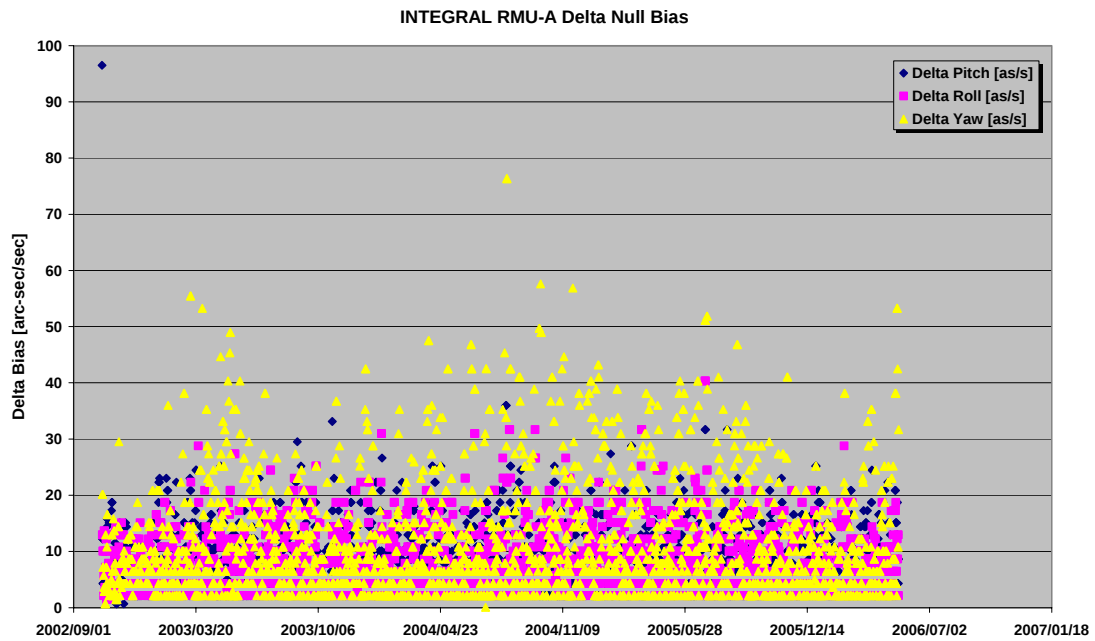


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 12/05/2006 is reported in the plot below.



The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 12/05/2006 is reported in the plot below.



06/05/06 (Day of Year 126, Revolution 434-435)

The eclipse operations were nominal from the AOCS point of view. Hereafter is reported summary of the second eclipse passage during rev 434:

AOCS ECLIPSE MONITORING			Revolution:	434		
Summer 2006			Date:	06/05/2006		
			DoY:	126		
Penumbra Start:	06/05/2006 06:55:57	LOS:	06/05/2006 08:17:00	antenna swap		
Umbra Start:	06/05/2006 06:58:32	AOS:	06/05/2006 10:44:00			
Umbra End:	06/05/2006 07:50:24					
Penumbra End:	06/05/2006 07:52:29					
Eclipse Duration:	0:56:32					
Eclipse Duration [sec]:	3392					
	06/05/2006					
IMU Health Check Start	03:51:00					
Eclipse Imminent Flag	06/05/2006 05:56:17					
ACC IMU AutoCal Start	06/05/2006 06:10:43					
ACC IMU AutoCal End	06/05/2006 06:30:43					
	06/05/2006					
Sun out of FSS FoV	06:58:05					
	06/05/2006					
Sun back in FSS FoV	07:50:52					
Eclipse Timers	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. Start [sec]	Absolute	WRT Pen		

				Start [sec]		
ACC Eclipse Start	06/05/2006 06:38:06	-1071.00	06/05/2006 06:38:09	-1068.00	-1064	
FDE Eclipse Start	06/05/2006 06:49:31	-386.00	06/05/2006 06:49:28	-389.00	-404	176
FCE Eclipse Start	06/05/2006 06:50:15	-342.00	06/05/2006 06:50:08	-349.00	-360	176
	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. End [sec]	Absolute	WRT Pen. End [sec]		
FCE Eclipse End	06/05/2006 07:58:39	370	06/05/2006 07:58:39	370.00	360	176
FDE Eclipse End	06/05/2006 07:58:39	370	06/05/2006 07:58:39	370.00	360	176
ACC Eclipse End	06/05/2006 08:02:00	571	06/05/2006 08:02:03	574.00	578	

IMU	Uplink	Execution	WRT Penumbra End [sec]
IMU Auto Off Enable	03/05/2006 12:05:09	06/05/2006 08:03:58	700
IMU On	06/05/2006 03:55:06	IMU H/C Noise Roll [as/s]	0.1941
IMU Off	06/05/2006 08:04:18	IMU H/C Drift Roll [as/s]	0.2635
IMU On Time	4:09:12	IMU Auto Cal Drift Roll [as/s]	0.2515

07/05/06 (Day of Year 127, Revolution 435)

Nothing to report

08/05/06 (Day of Year 128, Revolution 435)

Nothing to report

09/05/06 (Day of Year 129, Revolution 435-436)

The eclipse operations were nominal from the AOCS point of view. Hereafter is reported summary of the third eclipse passage during rev 435:

AOCS ECLIPSE MONITORING			Revolution:	435
Summer 2005			Date:	09/05/2006
			DoY:	129
Penumbra Start:	09/05/2006 06:35:52	LOS:	09/05/2006 07:55:00	
Umbra Start:	09/05/2006 06:38:03	AOS:	09/05/2006 10:30:00	
Umbra End:	09/05/2006 07:39:55			
Penumbra End:	09/05/2006 07:41:33			
Eclipse Duration:	1:05:41			
Eclipse Duration [sec]:	3941			
IMU Health Check Start	09/05/2006 03:40:00			
Eclipse Imminent Flag	09/05/2006 05:36:12			
ACC IMU AutoCal Start	09/05/2006 05:50:38			

ACC IMU AutoCal End	09/05/2006 06:10:38
---------------------	------------------------

Sun out of FSS FoV	09/05/2006 06:38:10
Sun back in FSS FoV	09/05/2006 07:40:44

Eclipse Timers	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. Start [sec]	Absolute	WRT Pen. Start [sec]		
ACC Eclipse Start	09/05/2006 06:18:21	-1051.00	09/05/2006 06:18:16	-1056.00	-1064	
FDE Eclipse Start	09/05/2006 06:27:47	-485.00	09/05/2006 06:29:28	-384.00	-404	176
FCE Eclipse Start	09/05/2006 06:28:31	-441.00	09/05/2006 06:30:16	-336.00	-360	176

	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. End [sec]	Absolute	WRT Pen. End [sec]		
FCE Eclipse End	09/05/2006 07:46:27	294	09/05/2006 07:48:12	399.00	360	176
FDE Eclipse End	09/05/2006 07:46:27	294	09/05/2006 07:48:12	399.00	360	176
ACC Eclipse End	09/05/2006 07:51:24	591	09/05/2006 07:51:09	576.00	578	

IMU	Uplink	Execution	WRT Penumbra End [sec]
IMU Auto Off Enable	06/05/2006 11:46:12	09/05/2006 07:53:12	699

IMU On	09/05/2006 03:45:29	IMU H/C Noise Roll [as/s]	0.2404
IMU Off	09/05/2006 07:53:33	IMU H/C Drift Roll [as/s]	0.2567
IMU On Time	4:08:04	IMU Auto Cal Drift Roll [as/s]	0.2779

ACC reports continuous Pitch threshold exceeded: at 21:59z, at the end of slew ID 04360014, the ACC pitch threshold was exceeded by causing the continuous generation of the OEM APID 640 ID 49 <<ACC PITCH ERROR OOL>>: the guide star was ID 8958-2844 and Mi 7.95 at CCD location [-1573 , -7324]. A dim star neighbor ID 8958-1343 (Mi 8.8) was in the STR FOV at about 1.6 arcmin away from the guide star, making difficult the determination of the baricentre of the system due to the oscillation of the tracked guide star between two positions separated by ~200 CCD units. This jump in position was reported in TM and triggered the generation of OEM ID 49 for all the duration of the PID 04360014. In order to compensate the error in pitch, the ACC demanded actuation mainly on RW2, causing the consequent oscillation of the wheel speed of RW2.

No action was taken, the problem disappeared with the starting for slew 04360015.

No impact on TL.

10/05/06 (Day of Year 130, Revolution 436)

Nothing to report.

11/05/06 (Day of Year 131, Revolution 436)

Doc. Title : INTEGRAL Mission Report #190
 Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OF
 Date : 15/05/06

Issue : 1
 Rev. : 0
 Page : 16

Nothing to report.

12/05/06 (Day of Year 132, Revolution 436-437)

The eclipse operations were nominal from the AOCS point of view. Hereafter is reported summary of the fourth eclipse passage during rev 436:

AOCS ECLIPSE MONITORING

Revolution: 436

Summer 2005

Date: 12/05/2006

DoY: 132

Penumbra Start:

12/05/2006
06:19:46

LOS:

12/05/2006
07:19:00

Umbra Start:

12/05/2006
06:21:45

AOS:

12/05/2006
10:15:00

Umbra End:

12/05/2006
07:26:15

Penumbra End:

12/05/2006
07:27:44

Eclipse Duration:

1:07:58

Eclipse Duration [sec]:

4078

IMU Health Check Start	12/05/2006 03:08:00
Eclipse Imminent Flag	12/05/2006 05:20:06
ACC IMU AutoCal Start	12/05/2006 05:34:32
ACC IMU AutoCal End	12/05/2006 05:54:32

Sun out of FSS FoV	12/05/2006 06:22:24
Sun back in FSS FoV	12/05/2006 07:27:26

Eclipse Timers	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. Start [sec]	Absolute	WRT Pen. Start [sec]		
ACC Eclipse Start	12/05/2006 06:02:05	-1061.00	12/05/2006 06:02:09	-1057.00	-1064	
FDE Eclipse Start	12/05/2006 06:13:21	-385.00	12/05/2006 06:13:50	-356.00	-404	176
FCE Eclipse Start	12/05/2006 06:14:05	-341.00	12/05/2006 06:14:14	-332.00	-360	176

	From Loaded Timers		Actual From Telemetry		UM [sec]	LSB [sec]
	Absolute	WRT Pen. End [sec]	Absolute	WRT Pen. End [sec]		
FCE Eclipse End	12/05/2006 07:34:13	389			360	176
FDE Eclipse End	12/05/2006 07:34:13	389			360	176
ACC Eclipse End	12/05/2006 07:37:25	581	12/05/2006 07:37:30	586.00	578	

IMU	Uplink	Execution	WRT Penumbra End [sec]
IMU Auto Off Enable	09/05/2006 11:29:30	12/05/2006 07:39:23	699
IMU On	12/05/2006 03:02:01	IMU H/C Noise Roll [as/s]	0.2105
IMU Off	12/05/2006 07:39:44	IMU H/C Drift Roll [as/s]	0.2350
IMU On Time	4:37:43	IMU Auto Cal Drift Roll [as/s]	0.2137

STR SEU threshold exceeded: at 14:36z , few minutes after the end of the slew ID 04370019, the STR SEU threshold was exceeded, when the guide star was Mi 8.3 at CCD location [939 , 10124] and the IMU1 switched ON. As consequence, the AOCS pointing bit passed to False and the OTF flag went low. The reason of the star lost is likely a false event reported for the guide star ID 3157-354. A dim neighbor, ID 3157-198, was found at ~2 arcmin (>2 pixels) from the guide star position.

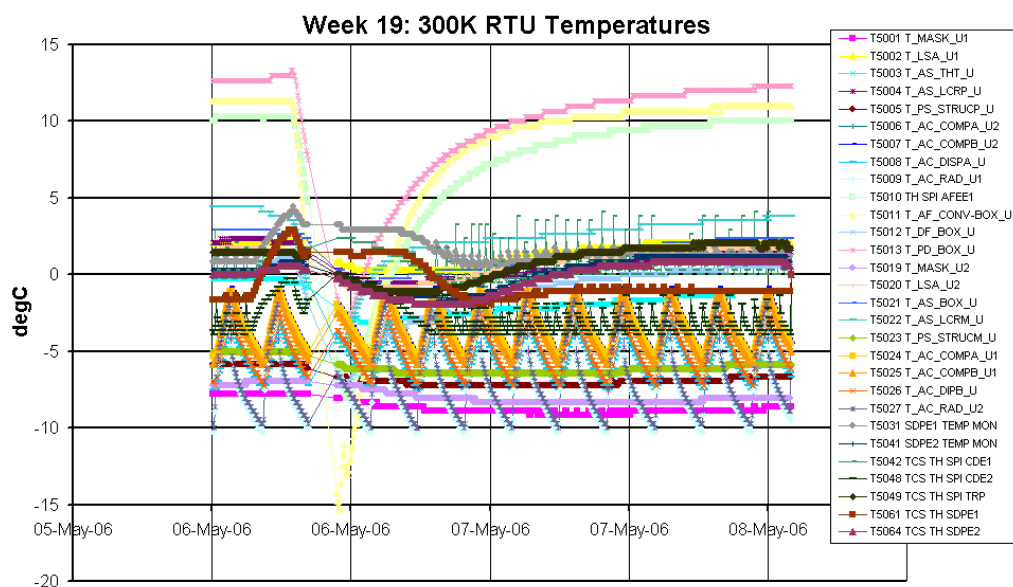
A new guide star was picked after the automatic mapping commanded by ACC.

No impact on TL, except the OTF low during PID 04370019.

8.3.2 SPI Operations

Unit Temperatures:

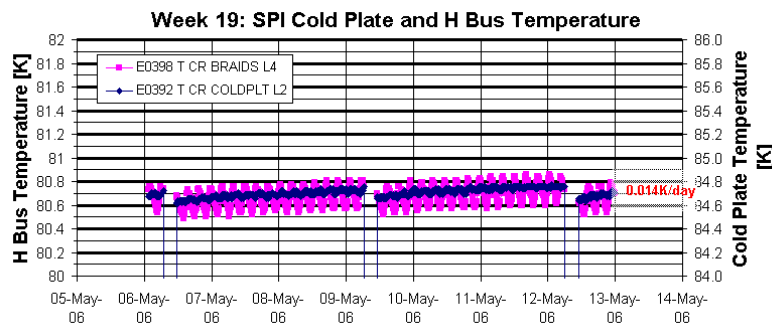
All the equipment temperatures are inside the operational limits. The following plot shows their evolution along the reporting period (due to data retrieval problems some gaps could be present).



Stirling Compressors and Cryostat:

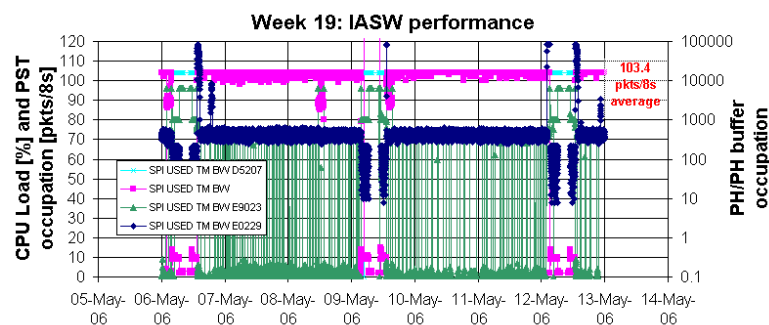
The performance of the compressors is nominal. The cold plate temperature was maintained at 85K $\pm$ 1K showing the expected positive drift.

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



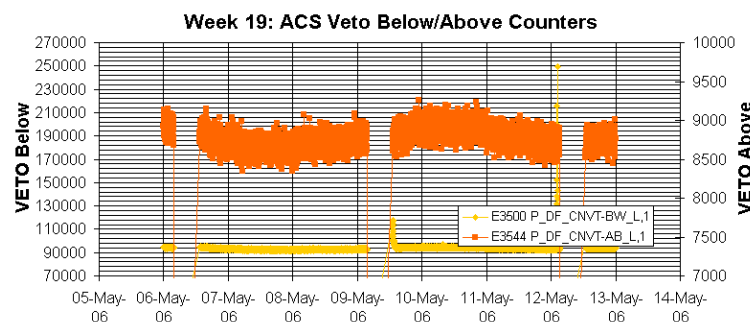
DPE & IASW:

The Iasw performance is nominal. The current IASW version installed is 432. The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS:

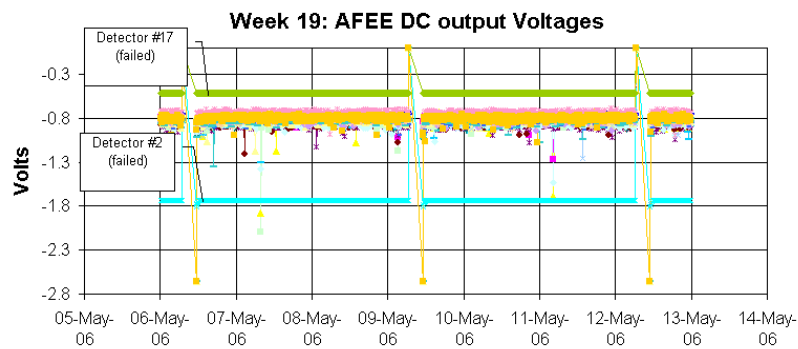
The performance of the ACS is nominal. The following plot shows the ACS overall count rate evolution during the reporting period



AFEE:

The performance of the AFEE and the detectors is nominal, except for detector #15, which shows a degraded energy resolution and for this works with a reduced bias of 3kV. The anomaly is recorded in the ESOC Anomaly Report and Tracking System (ARTS) as INT_SC-140.

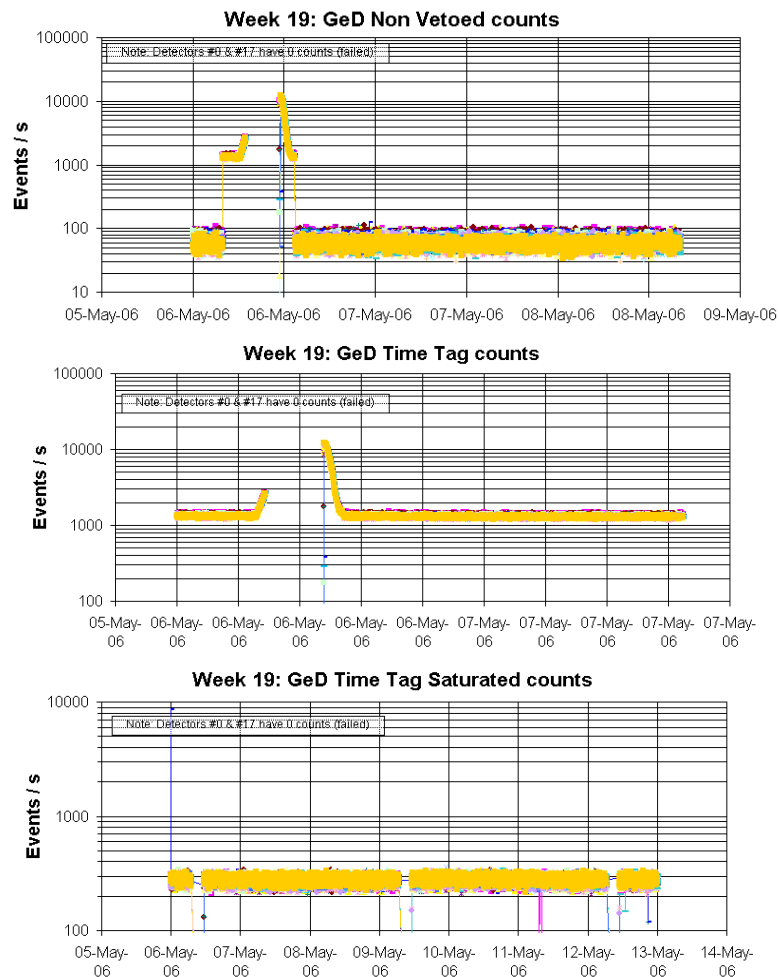
The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06.12.2003 and detector #17 is failed since 17.07.2004.



DFEE:

The performance of the unit is nominal.

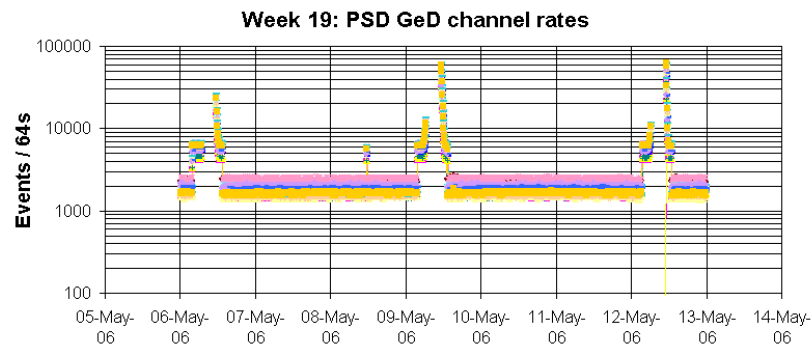
The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period (due to data retrieval problems, some gaps could be present).



PSD:

The performance of the unit is nominal.

The following plots show the PSD channel rates during the reporting period.



SPI Event Log:

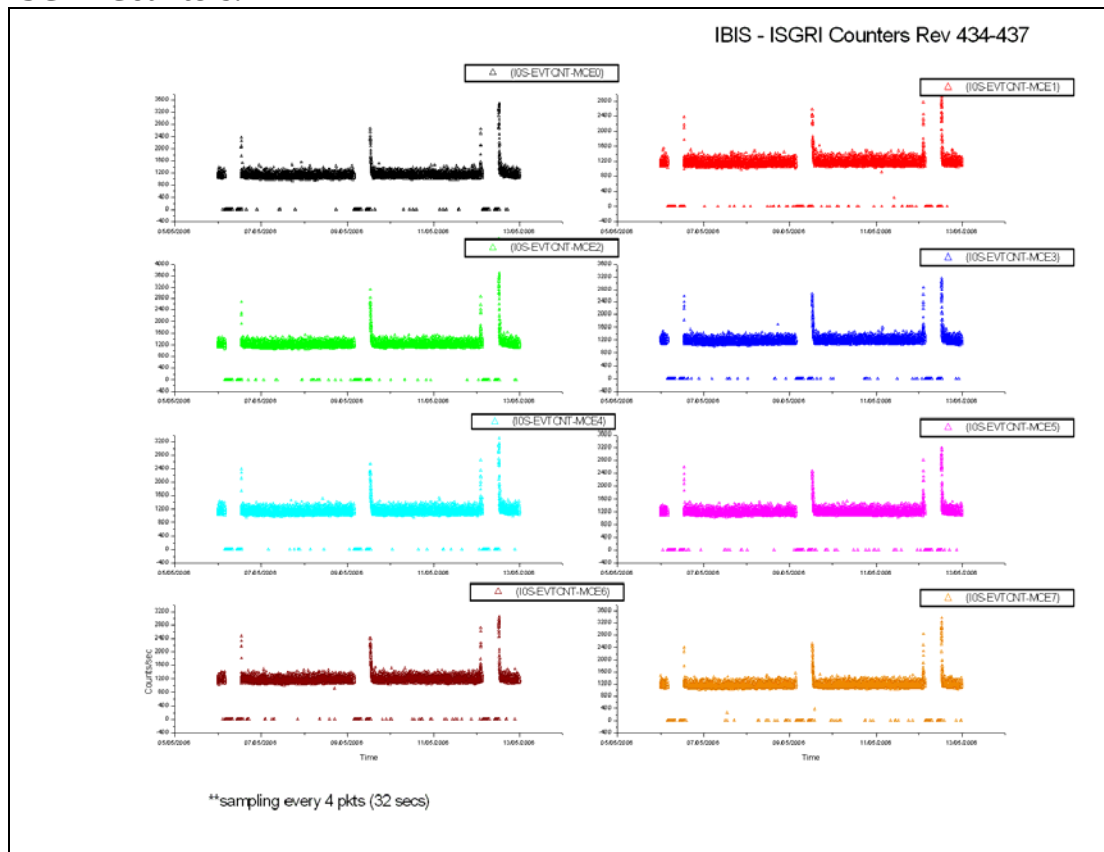
The following event log has been extracted from the revolution pass summary.

Time	Description	Analysis
126 - 21:41	TM: P2016 OOL, back in limits @ 21:42	Ok. Single occurrence
127 - 19:10	TM: P2016 OOL	Ok. Single occurrence
128 - 11:29	Execution of INT_OR_0210 - SPI! To CONF	Planned
128 - 11:31	Execution of INT_OR_0210 - SPI! To PHOTON	Planned
128 - 13:33	Execution of INT_OR_0210 - SPI! To CONF	Planned
128 - 13:34	Execution of INT_OR_0210 - SPI! To PHOTON	Planned
129 - 11:10	EV: SPI1 LSL Error (4x)	Expected, part of post eclipse reactivation
129 - 11:13	EV: SPI1 LSL Error	As
129 - 11:16	EV: SPI1 LSL Error	As above
129 - 13:12	TM: E3500 OOL	As above
129 - 13:24	Start of INT_OR_0210 - SPI1 to conf	Planned
129 - 13:27	TM: E3500 OOL	Expected, close to belts exit
129 - 15:26	End of INT_OR_0210 - SPI1 to photon	Planned
130 - 10:42	TM: E2331 OOL, back in limits @ 10:55	Ok, single occurrence
130 - 23:11	EV: SPI1 SPECTRA COMP. OVERFLOW (16x)	Under investigation, probably due to TM bandwidth limitations
130 - 23:16	EV: SPI1 SPECTRA COMP. OVERFLOW	As above
132 - 02:11	TM: E3500 OOL	Expected, close to belts entry

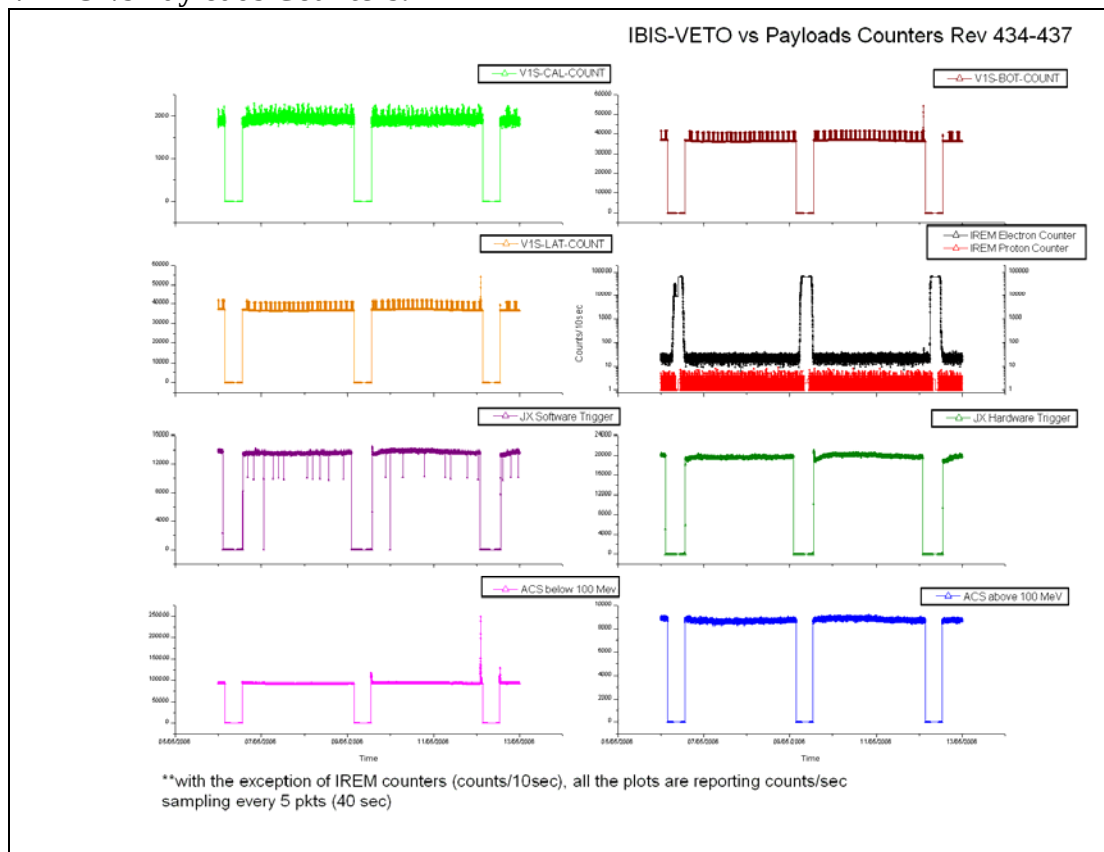
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

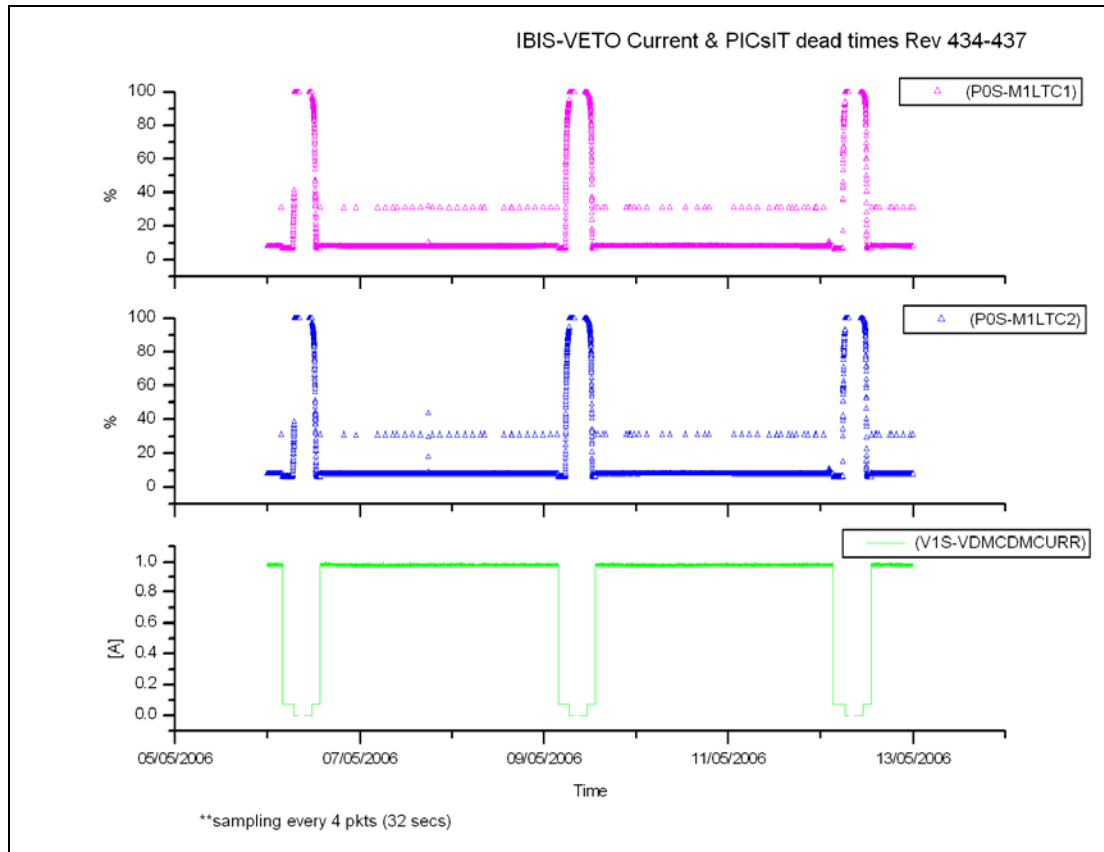


VETO vs Payloads Counters:

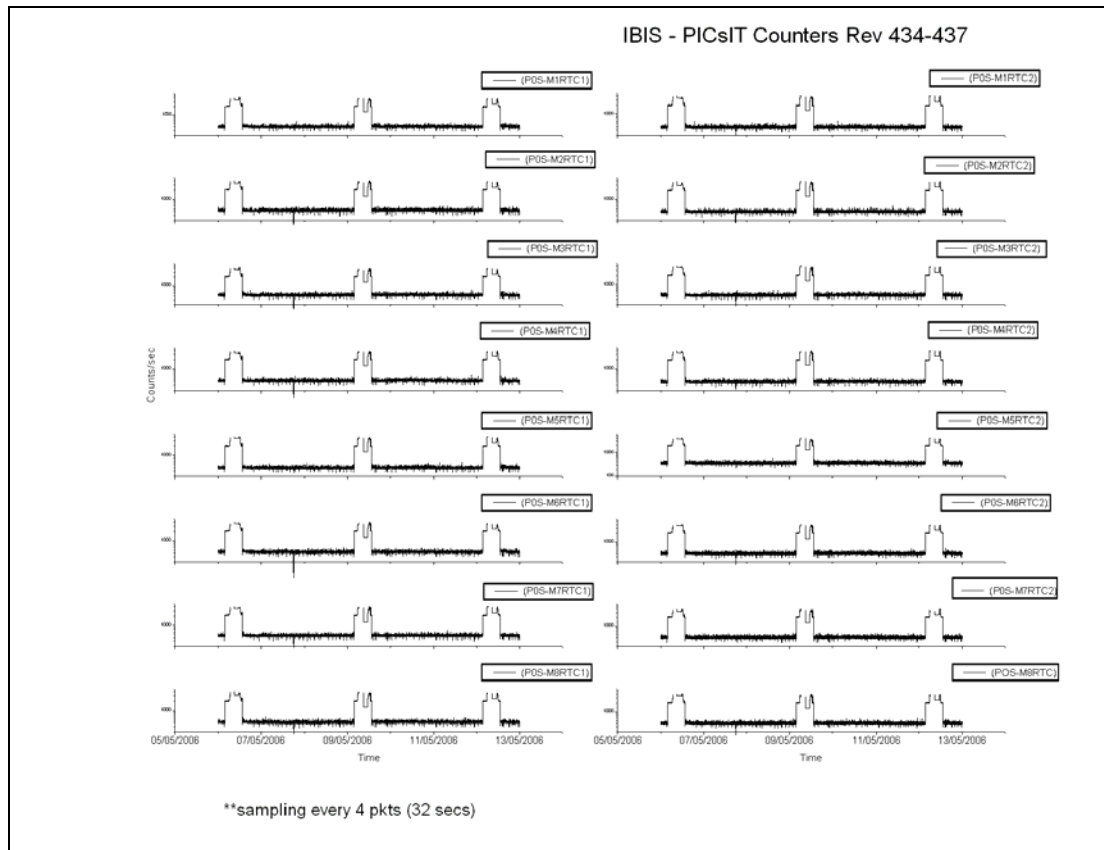


The week was characterised by low radiation.

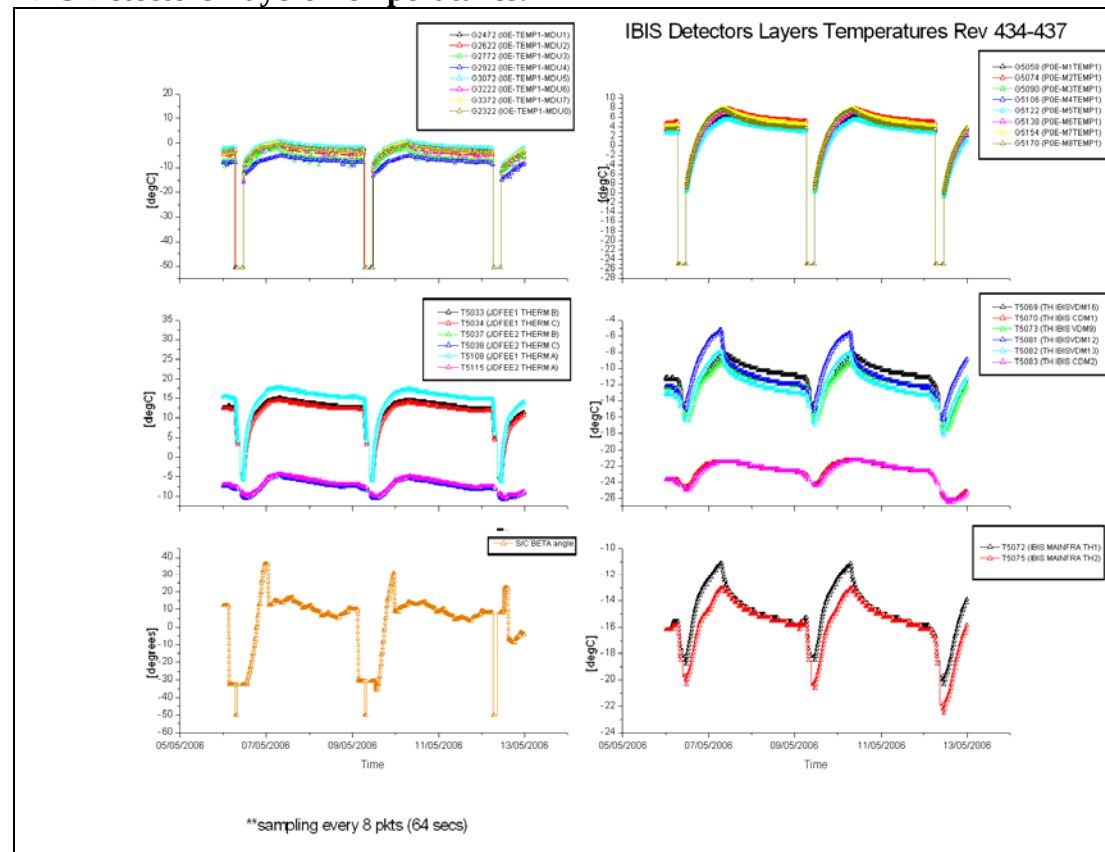
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2006.126 (06//05/2006):

At 04:00Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 13:38Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

TM parameters from G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) families were toggling OOL High while the spacecraft was in Radiation Belts. According to reaction P-CNT-1, no action was taken.

DoY 2006.127 (07//05/2006):

At 17:51Z, parameters G5068 (P0S-M1F1ERRF), G5104 (P0S-M3F2ERRF), G5136 (P0S-M5F2ERRF) and G5168 (P0S-M7F2ERRF) failed SCC and back. According to P-FIF-1, no action was taken.

DoY 2006.129 (09//05/2006):

At 03:42Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 13:21Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

TM parameters from G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) families were toggling OOL High while the spacecraft was in Radiation Belts. According to reaction P-CNT-1, no action was taken.

At 12:45Z TM parameters G2084 (I0E-OVFWPXADD-M6) and G2098 (I0E-OVFWPXADD-M7) failed SCC and back. According to I-OVF-1, no action was taken.

At 12:49Z TM family G2013 (I0S-EVTCNT-MCEi) went OOL high and back. As this happened at the exit of belts when the background was peculiarly high, according to I-CNT-1, no action was taken.

DoY 2006.132 (12//05/2006):

At 02:17Z TM parameters G6062 (V1S-BOT-COUNT) and G6063 (V1S-LAT-COUNT) went OOL high and back. As this happens when approaching Radiation Belts, according to V-BOT-1 and V-LAT-1, no action was taken.

At 03:23Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 13:07Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

TM parameters from G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) families were toggling OOL High while the spacecraft was in Radiation Belts. According to reaction P-CNT-1, no action was taken.

At 12:30Z, TM family G2000 (I0E-OVFWPXADD-Mi) failed SCC and back. According to I-OVF-1, no action was taken.

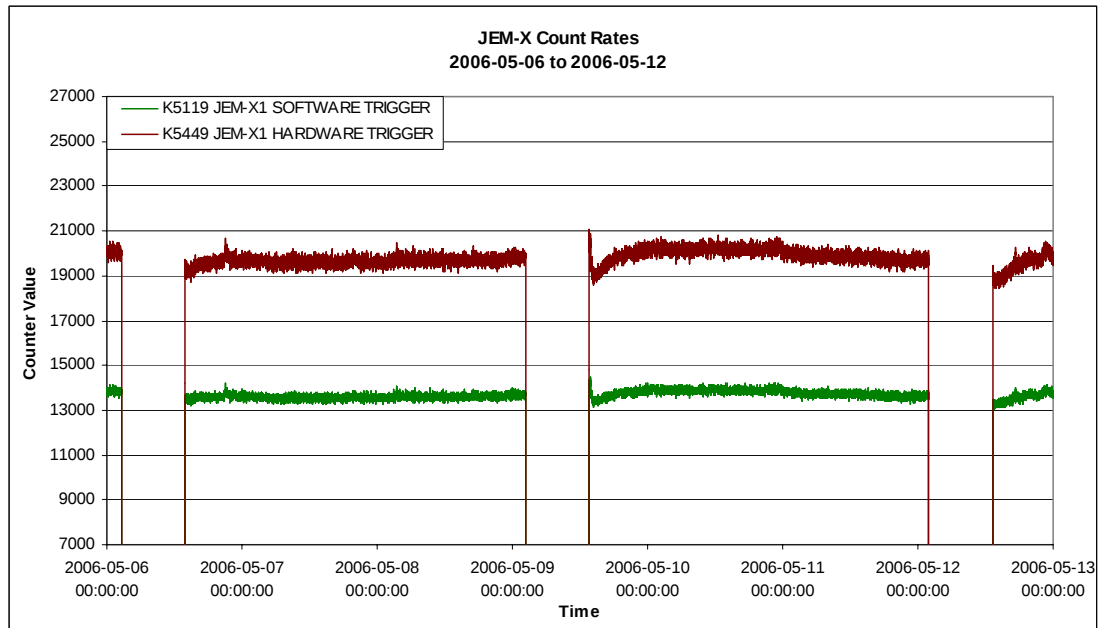
At 12:34Z, TM family G2013 (I0S-EVTCNT-MCEi) went OOL high and back. It occurs again at 212:40Z. As this happened at the exit of belts when the background was peculiarly high, according to I-CNT-1, no action was taken.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

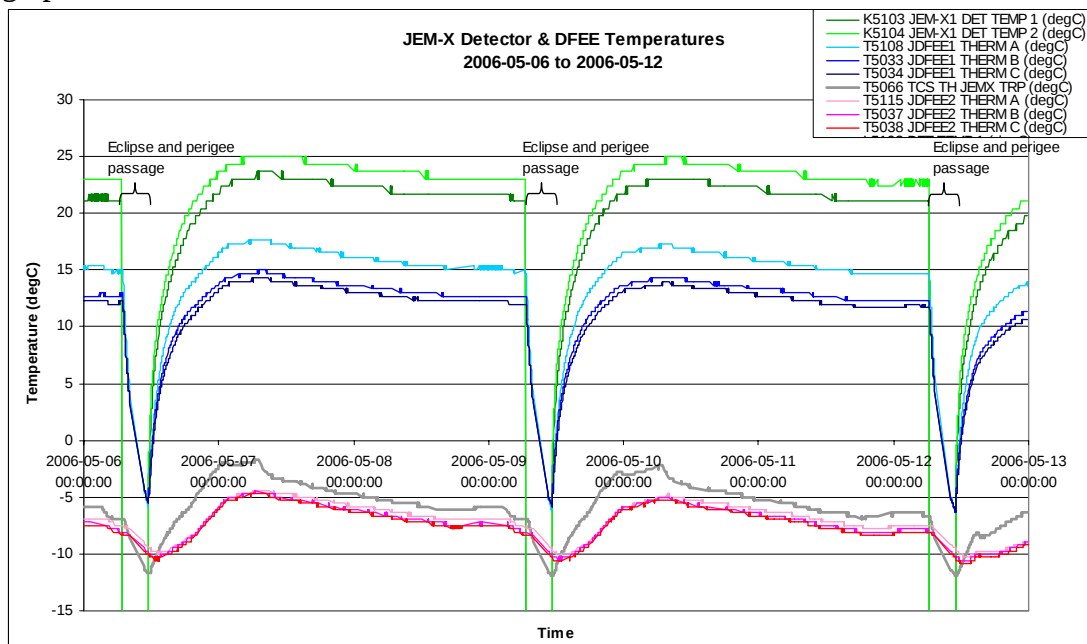
JEM-X count rates over the reporting period are displayed in the following graph¹.

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



8.3.4.2 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.



8.3.4.3 JEM-X Daily Report

2006-05-06 (DOY 126, Rev 434-435) to 2006-05-12 (DOY 132, Rev 436-437)

Nothing to report

² Data sampled (1 frame in 8)

8.3.5 OMC Operations

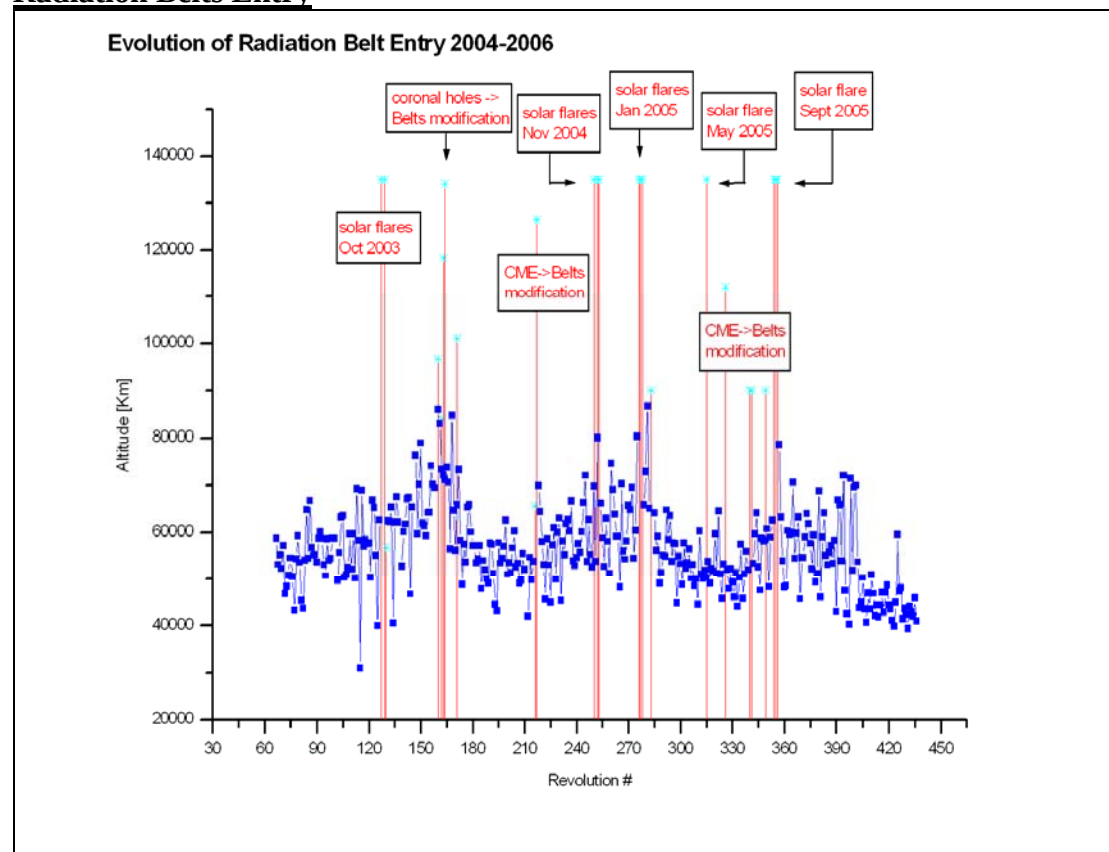
2006-05-06 (DOY 126, Rev 434) to 2006-05-12 (DOY 132, Rev 437)

Nothing to report

On DoY 126 at 04:00:34, DoY 129 at 03:42:19 and DoY 132 at 03:23:39 OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

Radiation Belts Entry



IREM daily report

On 06/05/2006 at 07:53Z, TC U4921 (INT GND LINK OFF) failed completion. This was due to a late update of the relevant TM parameter in the Command Verifier Task. No further action was taken after positive verification of the status OFF of the Ground Link (TM parameter U9903) in TM desktop.

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]
434	RAD_ENTR R 2006-05-06T04:00:28Z	2006-05-06 06:15:29	<42007.7	2006.05.06 05:22:59	48575
435	RAD_EXIT R 2006-05-06T13:19:49Z	2006-05-06 13:01:45	<<43012.6	2006-05-06 12:52:59	36563
435	RAD_ENTR R 2006-05-09T03:42:16Z	2006-05-09 05:26:09	>45895.6	2006-05-09 05:05:34	48539
436	RAD_EXIT R 2006-05-09T13:01:59	2006-05-09 12:44:49	<39023.5	2006-05-09 12:35:34	36536
436	RAD_ENTR R 2006-05-12T03:23:32Z	2006-05-12 05:41:37	>40966.1	2006-05-12 04:45:34	48902
437	RAD_EXIT R 2006-05-12T12:43:29Z	2006-05-12 12:25:29	<37373.1	2006-05-12 12:15:34	36110

Reference

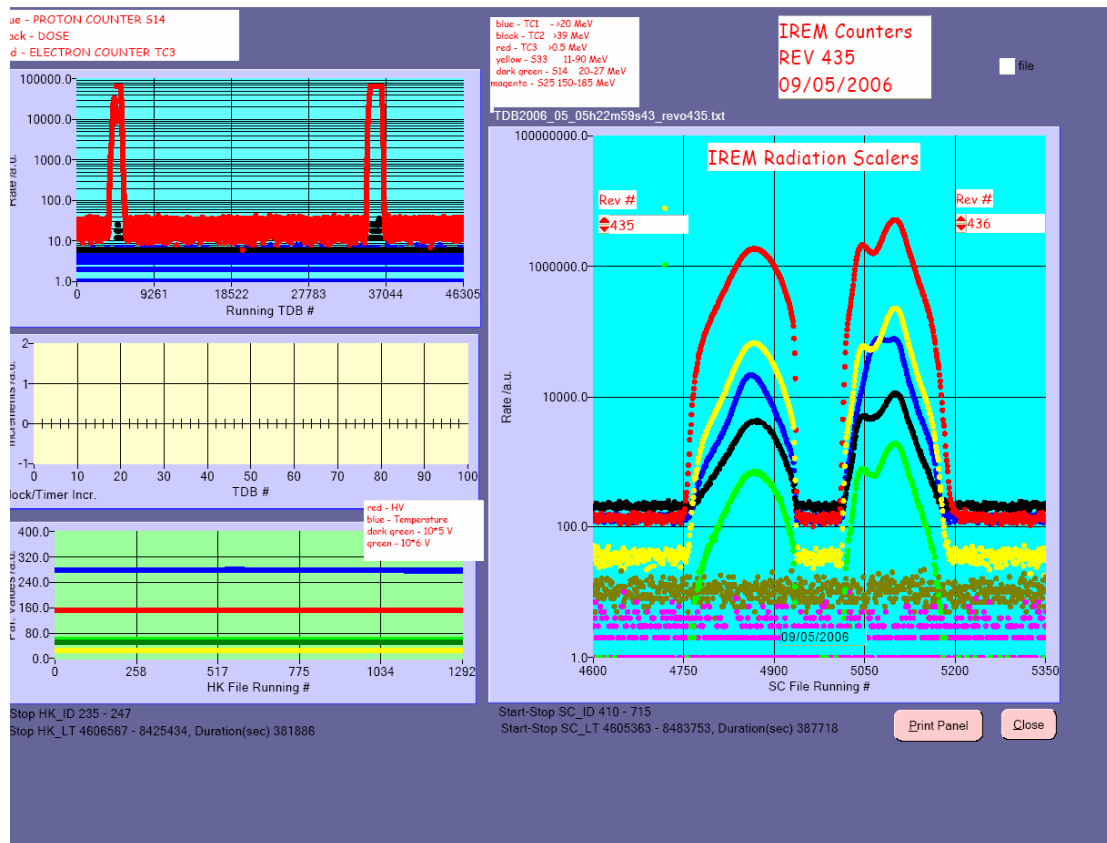
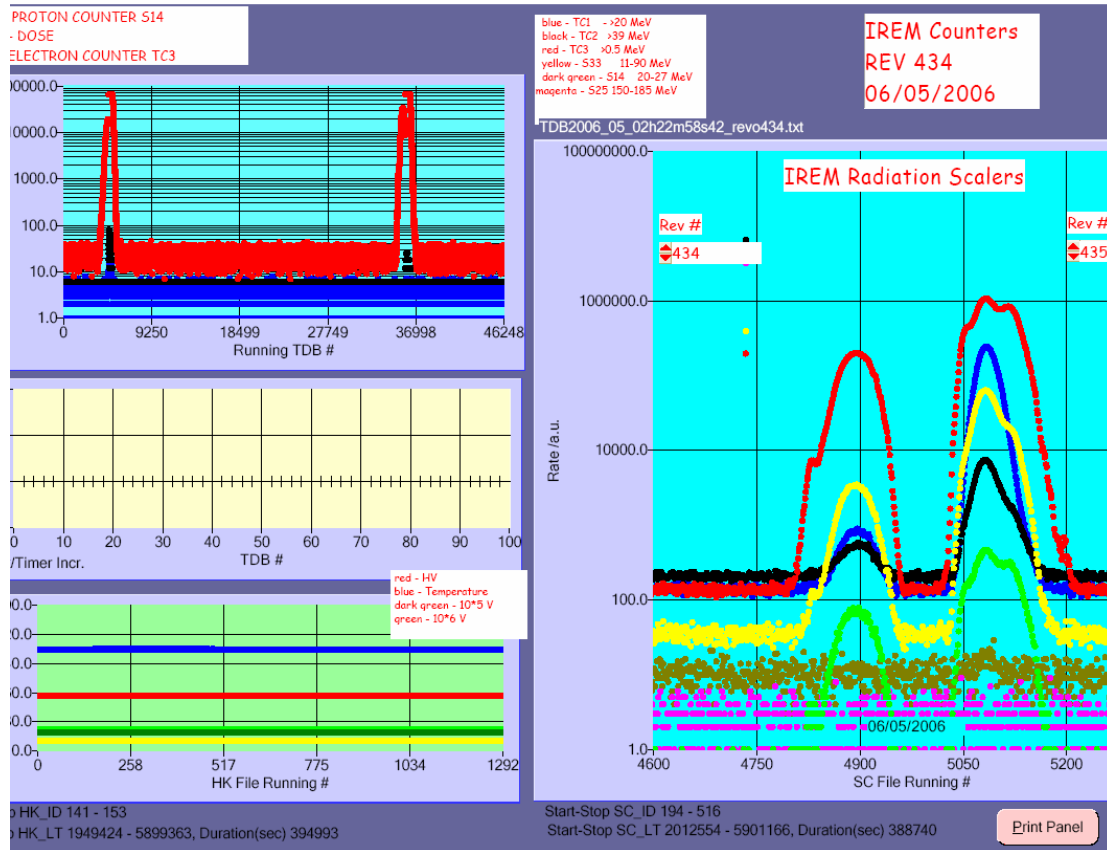
Very small error vs reference (less than 10 minutes)

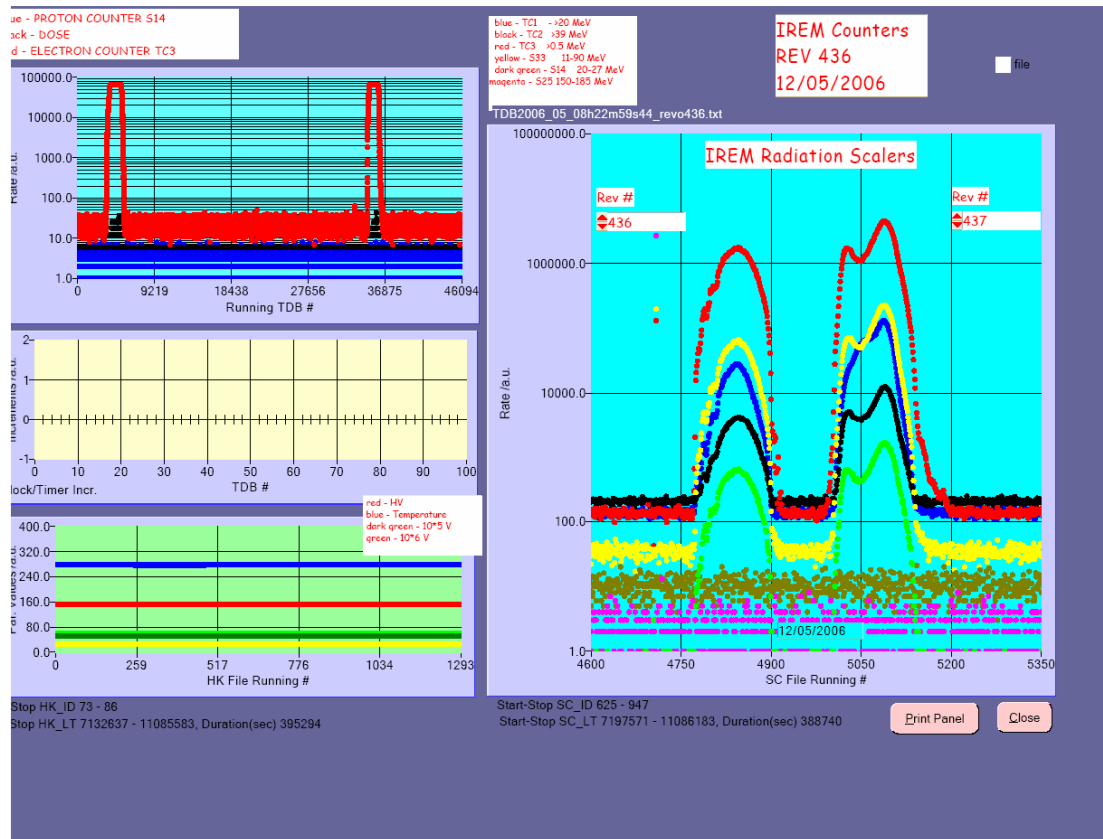
Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

Radiation Spike

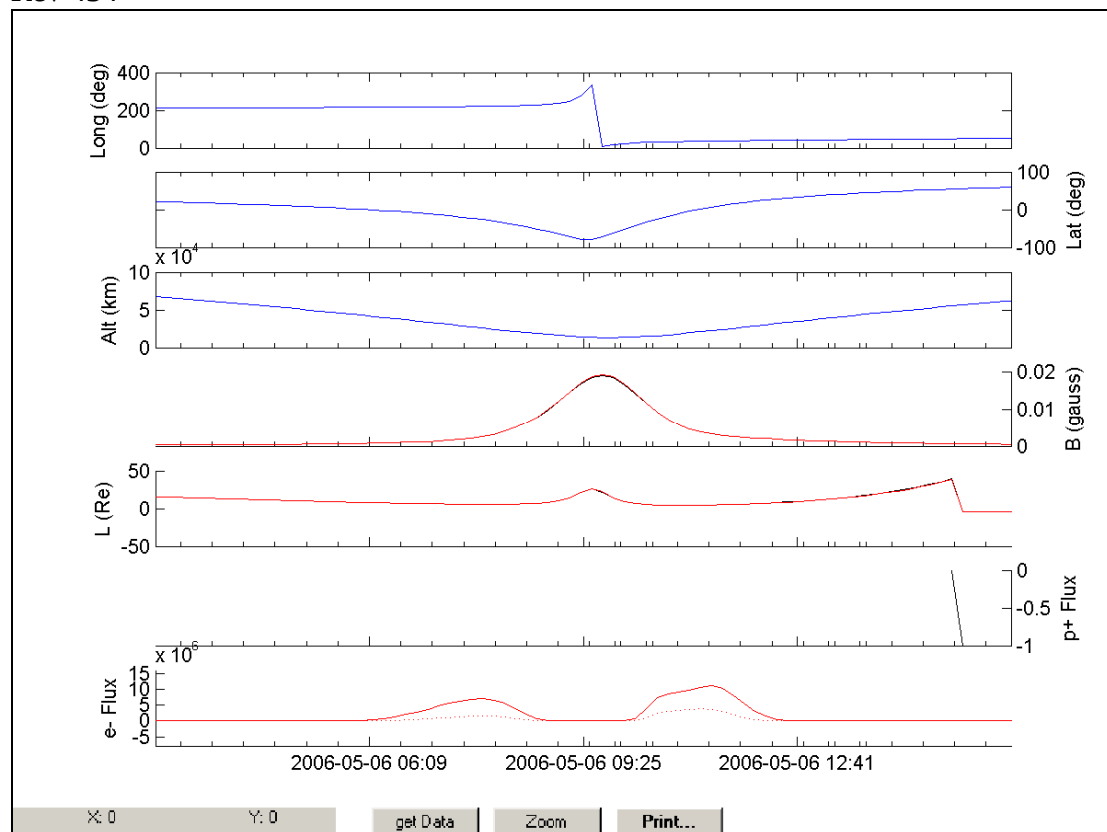
IREM radiation counters:



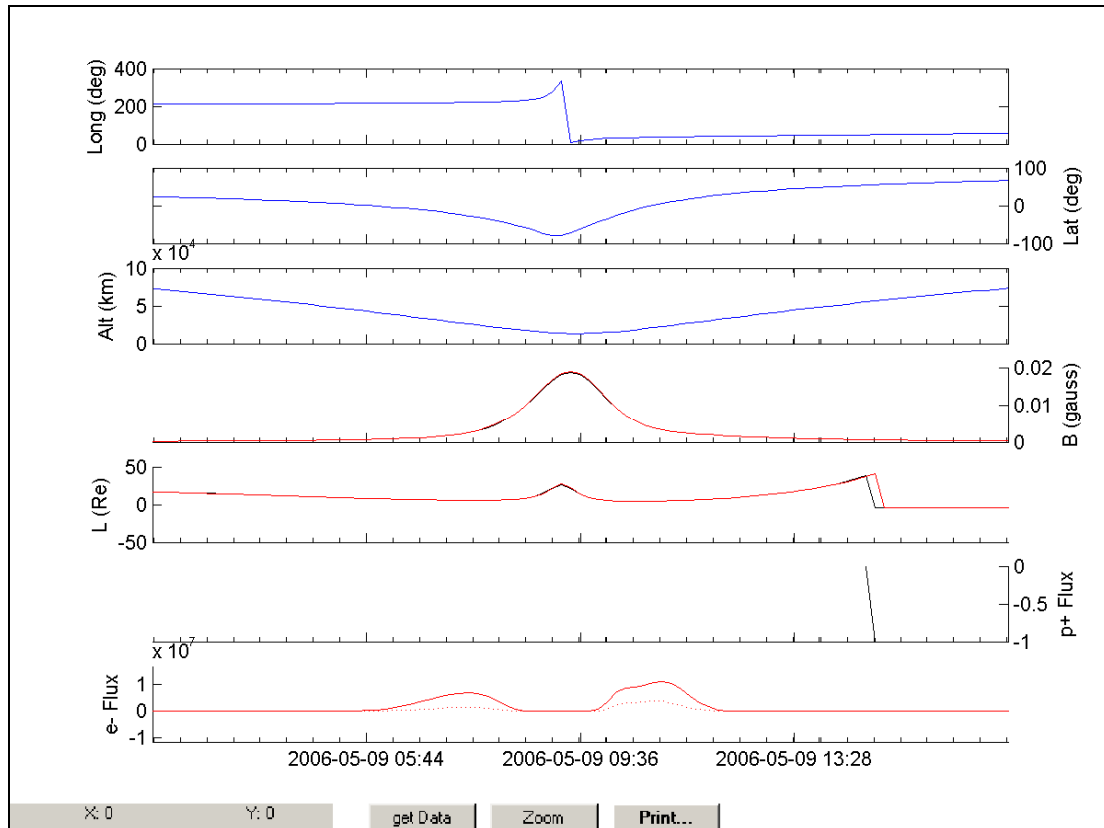


IREM Predicted Radiation Belt Passages:

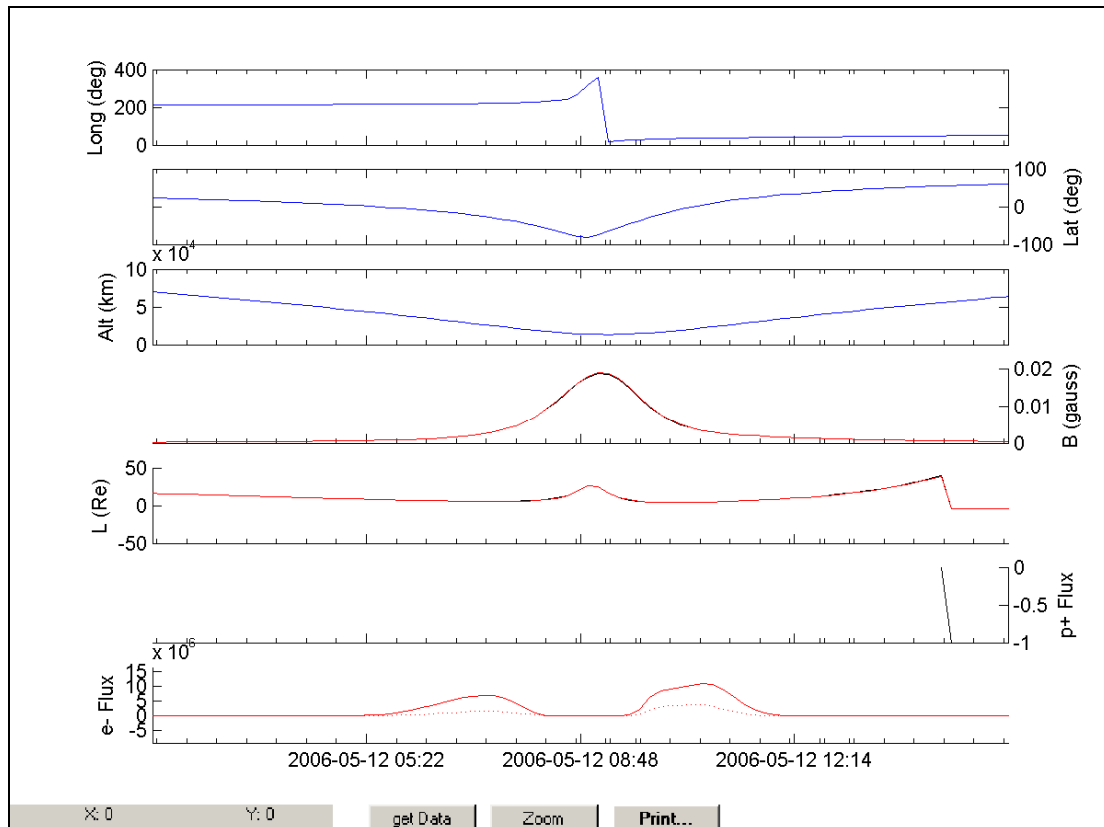
Rev 434



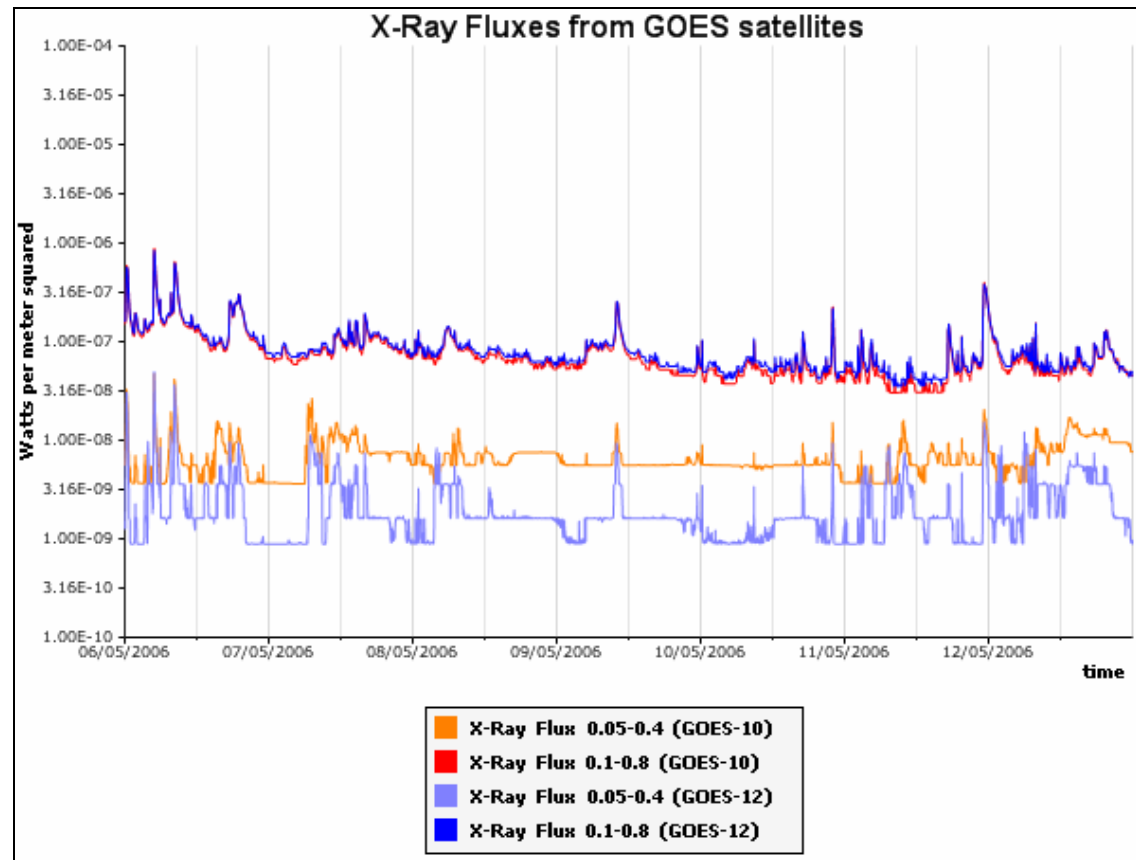
Rev 435



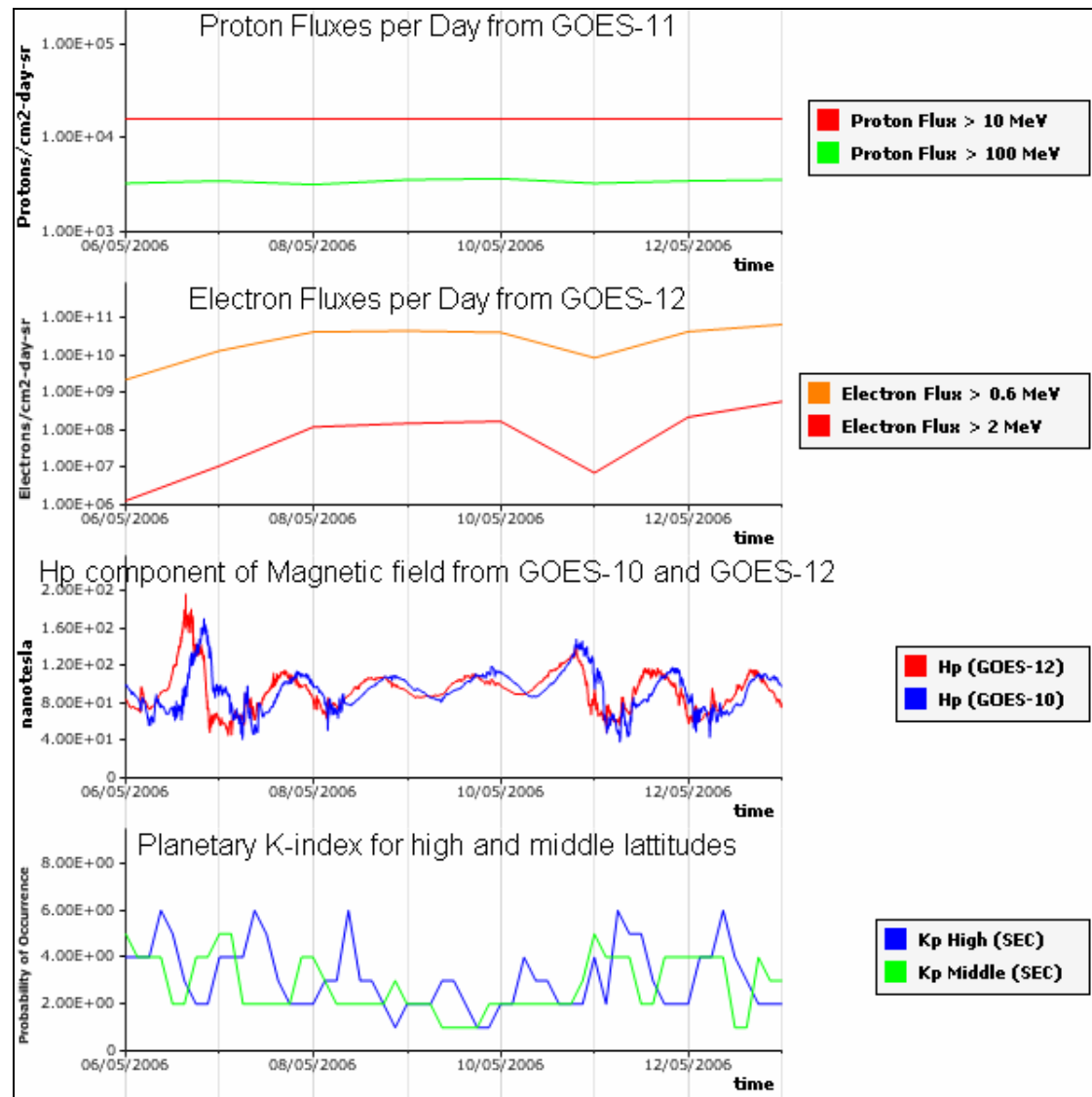
Rev 436



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



X-Ray fluxes start to be significant over 10^{-5}W/m^2 (corresponding to M-class flares). Above 10^{-4}W/m^2 , they correspond to strong X-class flares.



Proton and electron flux are rather low, reporting no high 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.