

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 173
Week 02
16.01.13
Routine Phase

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LIST OF CONTENTS

1	General.....	3
2	Summary of Activities.....	3
3	Satellite Status.....	3
3.1	Platform.....	3
3.1.1	AOCS.....	3
3.1.2	Power.....	3
3.1.3	Thermal.....	3
3.1.4	OBDH.....	4
3.1.5	RFS.....	4
3.2	Payload.....	4
3.2.1	SPI.....	4
3.2.2	IBIS.....	4
3.2.3	JEM-X.....	5
3.2.4	OMC.....	5
3.2.5	IREM.....	6
4	Ground Facilities.....	6
4.1	Mission Operations Centre.....	6
4.2	Ground Stations & Network.....	6
4.3	Science Ground Segment.....	6
4.3.1	ISOC.....	6
4.3.2	ISDC.....	7
5	Special Events.....	7
6	Anomalies.....	7
7	Future Milestones.....	8
8	Appendix.....	9
8.1	Overview of Revolutions.....	9
8.2	Consumables.....	9
8.2.1	Detailed Fuel Book-keeping.....	9
8.3	Detailed Satellite Information.....	10
8.3.1	AOCS SUMMARY OPERATIONS REPORT, 07/01/2006 – 13/01/2006.....	10
8.3.2	SPI Operations.....	14
8.3.3	IBIS Operations.....	16
8.3.4	JEM-X Operations.....	20
8.3.5	OMC Operations.....	22
8.3.6	IREM Operations.....	23

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1 General

The Flight Control Team at MOC has compiled this report with some input provided by the Flight Dynamics Team, ISOC and ISDC.

It addresses the activities from 07.01.06 until 13.01.06 (both dates inclusive) and covers the revolutions 395, 396 and 397.

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 Cas A /Tycho (RA 23:51:43.00; DEC +62:03:55.0), NGC 4945 (RA 13:05:27.48; DEC -49:28:05.6), 3C 279 (RA 12:56:11.00; DEC -05:47:21.5), which were all raster dithering observations and a GPS survey.

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 Thrusters calibration, in synch with the winter eclipse season, was successfully executed on 10/01/2006 (DoY 2006.010).

3 (1 OSL, 2 CSL) slews were missed from the Timeline during this period due to problem on the IMCS.

The fuel consumption over the period between 05/01/2006 and 12/01/2006 was 0.2926 kg. The remaining propellant is in the order of 156.9374 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

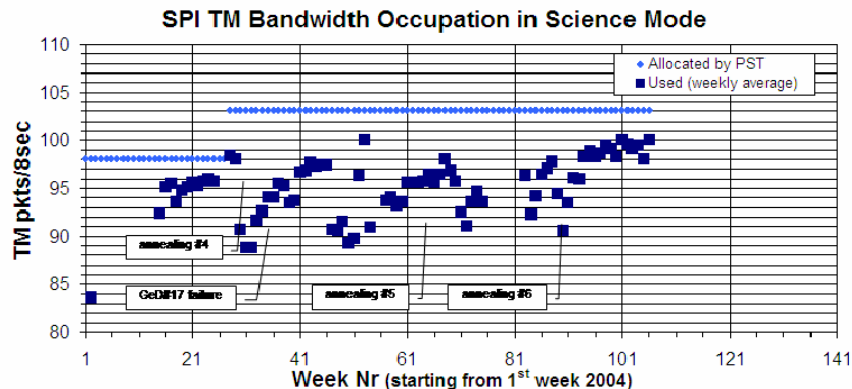
The overall status of the gamma-ray spectrometer is nominal.

As planned, the 7th annealing cycle of the Germanium detectors started on 9th January at radiation belts entry of rev 398 (14:18z).

During science operations, the instrument was kept in photon-by-photon mode, with spectra TM enabled, an assigned TM bandwidth in the science observation windows of 103 pkts/cycle and an average occupation of 100 pkts/cycle.

The Stirling compressors are working well, maintaining the detector cold-plate temperature within 85+/-1K.

The following plot shows the TM bandwidth occupation information.



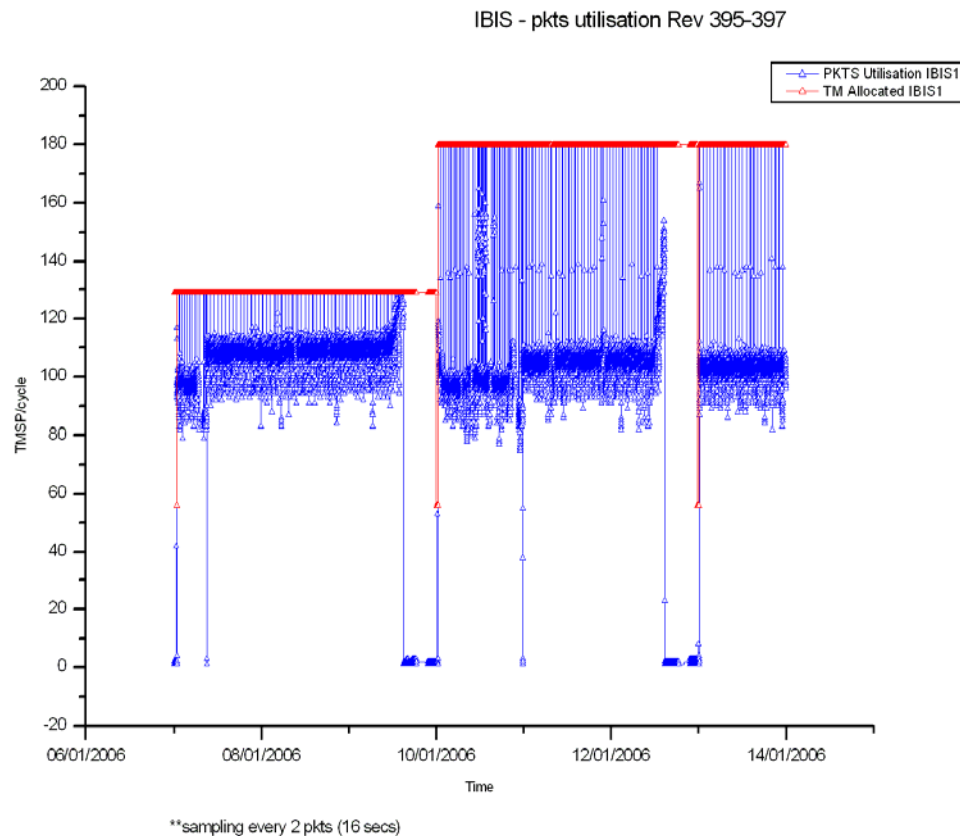
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

The Overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 129 TMPS/cycle. However in revolutions 396 and 397, due to SPI annealing, it was 180 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 109.10 TMPS/cycle, up 1.93 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 during science observations with a TM allocation of 8 packets/cycle in revolution 395 and with 15 packets/cycle in revolutions 396 and 397. 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, 146 of the 148 planned science pointings for OMC were executed nominally, 2 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 by low solar activity.

The sun was quiet this week. Only one very tiny sunspot (845) was present. It did not pose any threat of Solar Flare.

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, 2 pointings were lost. There were several minor problems with ground station links and IMCS tasks which had no impact. The overall performance was well above the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. Problems with the CPD TM cache, however, caused the loss of 2 pointings. The overall performance was still well above the 95% requirement.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were several instances though of bad frames and a few TM drops, 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's have been received for up to revolution 405. Mission planning in ISOC has been performed up to revolution 402. They have been sent to MOC. The revolutions sent and planned this week contain very special instrument configurations and associated telemetry allocation. Revolutions 397 to 399 have SPI off due to the annealing. The JEM-X 2 instrument is intended to be switched on during the special earth observation performed in revolution 401. Revolutions 397 to 399 were replanned several times. Firstly, a ToO was received and approved for execution. Secondly, there were changes to the use of JEM-X 2 in at least some of these revolutions. Two ToO requests were received at the end of week 1. One of the targets, 3C 379, was approved for execution and caused the above replanning.

TSF's have been received up to revolution 398.

2. Special earth observation

As proposed by the ISWT and endorsed by the IUG a special observation of the earth is planned to be executed in revolutions 401, 404, 405 and 406. After the first observation in 401 there will be a check point to examine the results and to give go ahead for the remaining observations. In principle the spacecraft will be pointed close to the earth and then the satellite will be left drifting while the earth crosses the instrument fields of view. These observations will be using both JEM-Xes and also some special modes for OMC have been defined in ISOC based a new ED delivered from MOC.

3. Observation status

ECS's for revolutions 381 to 385, except 384, were received. Corresponding OCS's have been sent to ISDC.

No extra time has been credited.

4. ISOC science data archive

Although progress is made the release of version 2.5 has to be delayed. The new target is a formal release by mid February and a beta release 18 January. There is still some essential data to be delivered from outside and also some minor development to be done. Effort is being put to get the missing data.

5. ISOC system

The version 12.0 introduced before Christmas has been used essentially during the last week. One patch to the system has been introduced to correct the schedule information on the public web pages.

6. Problems

None.

4.3.2 ISDC

Status of ISDC observation processing on 16/01/2006:

- Latest Standard Analysis completed: observation 03297000001 (GRO J0852-4642, Revolutions 373-383) on 16/01/2006
- Latest products archived: observation 03200200011 (GRS 1915+105, Revolution 379) on 03/01/2006
- Latest observation products sent to the observer: observation 03200930001 (GX 17+2, Revolutions 369-370) on 02/01/2006

5 Special Events

6 Anomalies

There were a number of problems that impacted the operations:

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 395

The observations in revolution 395 commenced with GPS survey lasting ~5.5 hours and continued with a raster dithering observations of the Cas A / Tycho supernova (RA 23:51:43.00; DEC +62:03:55.0) lasting ~50.6 hours.

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 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

Revolution 396

The observations in revolution 396 commenced with GPS survey lasting ~12.8 hours and continued with a raster dithering observation of NGC 4945 (RA 13:05:27.48; DEC -49:28:05.6) lasting ~35.8 hours.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 for which the DFEE was off, and SPI, which was in Configuration Mode undergoing annealing. The TM allocation was IBIS 180; SPI 45; JEM-X1 15; JEM-X2 1; OMC 5.

Revolution 397

The observations in revolution 397 commenced with a raster dithering observation of 3C 279 (RA 12:56:11.00; DEC -05:47:21.5) lasting ~48.6 hours and continued with a GPS survey lasting ~7.3 hours.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 for which the DFEE was off, and SPI, which was in Configuration Mode undergoing annealing. The TM allocation was IBIS 180; SPI 45; JEM-X1 15; JEM-X2 1; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2006-01-05T14:10:42.000Z	157.2391	F	Automatic TM processing.
2006-01-05T18:30:10.000Z	157.2300	F	Automatic TM processing.
2006-01-06T16:02:05.000Z	157.1827	F	Automatic TM processing.
2006-01-06T18:27:01.000Z	157.1751	F	Automatic TM processing.
2006-01-06T22:42:13.000Z	157.1327	F	Automatic TM processing.
2006-01-07T07:01:34.000Z	157.1111	F	Automatic TM processing.
2006-01-08T09:44:09.000Z	157.1033	F	Automatic TM processing.
2006-01-09T18:03:49.000Z	157.0893	F	Automatic TM processing.
2006-01-09T22:24:53.000Z	157.0698	F	Automatic TM processing.
2006-01-10T07:26:06.000Z	157.0380	F	Automatic TM processing.
2006-01-10T10:11:34.000Z	157.0122	F	Automatic TM processing.
2006-01-10T14:15:00.000Z	156.9913	F	After thruster torque calibration

2006-01-10T15:16:32.000Z 156.9642 F Automatic TM processing.
2006-01-12T17:54:45.000Z 156.9529 F Automatic TM processing.
2006-01-12T22:08:54.000Z 156.9374 F Automatic TM processing.

This report was generated Fri Jan 13 08:00:30 GMT 2006

8.3 Detailed Satellite Information

This section contains some detailed information concerning the various subsystems of the satellite and instruments.

8.3.1 AOCS SUMMARY OPERATIONS REPORT, 07/01/2006 – 13/01/2006

AOCS operations were executed from the Automatic Timeline.

During this period, 60 Open Loop Slews, 99 Closed Loop Slews and 9 Momentum Bias were executed (TL + manual recovery).

3 (1 OSL, 2 CSL) slews were missed from the Timeline during this period due to problem on the IMCS.

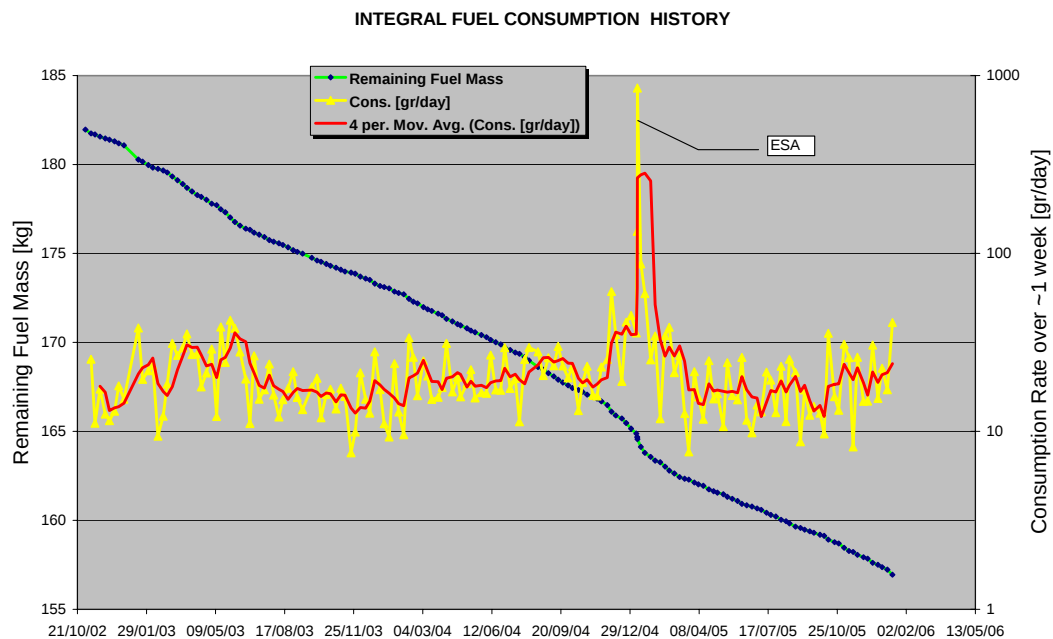
This is equivalent to a 1.9 % loss from the total number of slews planned (159).

Orbit Control

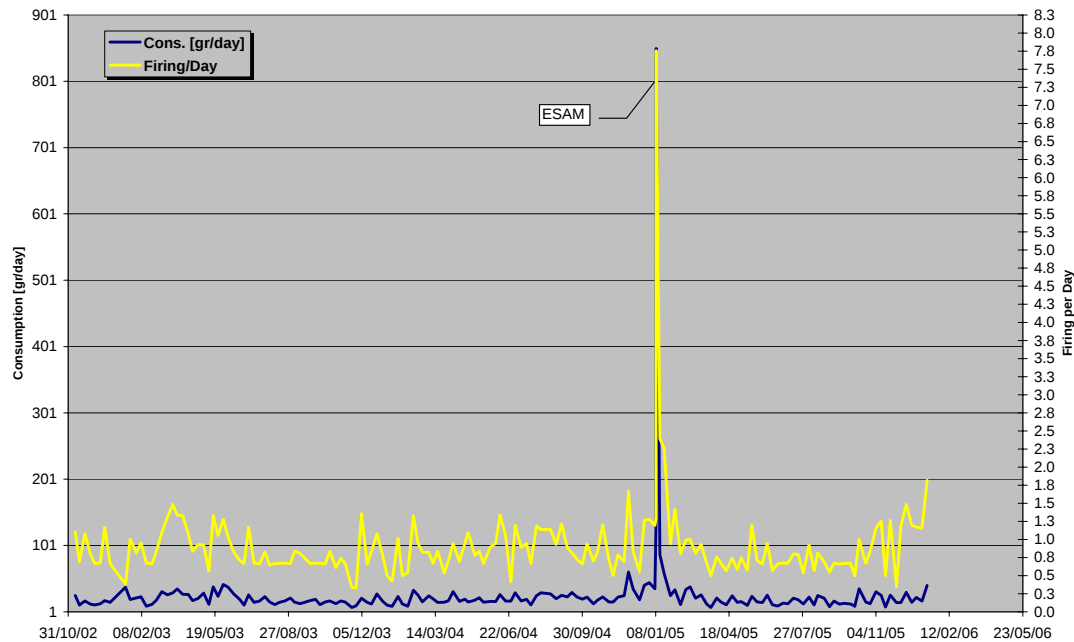
Provided on monthly basis

Fuel consumption

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



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



The RMU-A null bias calibration

The RMU-A null bias calibration history plot will be provided at the next issue of the weekly report due to unavailability of the relevant data.

07/01/06 (Day of Year 007, Revolution 395)

Nothing to report.

08/01/06 (Day of Year 008, Revolution 395)

Slows missed from the Timeline: At 03:28Z, due to a problem on the CPD-TM cache task on IMCS-A chain, the slew ID 03950031 failed release.

The AOCS subsystem was disabled from the Timeline, and a manual recovery performed.

At 03:57:30Z a manual Closed Loop Slew was performed to the attitude of pointing 03950031. The next slew ID 03950032 was manually updated on the Autostack, and the Timeline rejoined at 04:10Z.

The following slew, 03950031 (CSL) was not executed from the TL.

09/01/06 (Day of Year 009, Revolution 395-396)

Nothing to report.

10/01/06 (Day of Year 010, Revolution 396)

The Thrusters calibration was executed according to EPOS for revolution 396, version 4. The calibration was performed based on the following timeline:

Time	Event	Execution
2006-01-10T10:00:00Z	Satellite Engineering Window Open	Timeline
2006-01-10T10:00:00Z	ED AECGS_00 Change of guide star before the execution of the RWB to meet the pointings requirements (FCP_AOC_0529)	Timeline
2006-01-10T10:05:00Z	ED AERWB_00 Reaction Wheel Bias Manoeuvre to set the wheel speeds at RW2=+2000 rpm, RW3=+2000 rpm, RW4=-2000 rpm (RW1 not used) AESAM at 10:16:41z. (FCP_AOC_0510)	Timeline
	Verify the automatic update of the next slew	
2006-01-10T10:30:41Z	ED AECSL_00 Corrective Closed Loop Slew (FCP_AOC_0520)	Timeline
	Verify SSL enabled. IF lost of guide star re-enable SSL	
2006-01-10T10:36:49Z	ED AESAM_00 Mapping (FCP_AOC_0531)	Timeline
	Verify that the CGS has not the same star picked after CSL.	
2006-01-10T10:55:00Z	ED AECGS_00 Change of guide star before the execution of the Thruster Calibration to meet the pointing requirements (FCP_AOC_0529)	Timeline
THRUSTER CALIBRATION Manual Thruster Calibration Operations Reference:INT-PR-MMB-0005, OO_017		
2006-01-10T11:00:00Z	Start of Manual Thruster Calibration Operations (FCP_AOC_1520)	
11:00:00Z	Reset the TIM accumulator (step 1-3.1 FCP_AOC_1520) WAIT 20 minutes of RW data collection to estimate the external torques. As required by FD, no update of the Thruster Torque Reciprocals and FCE PWM (RCA) will be done this time Set FCV-A ON (step 3.2 FCP_AOC_1520)	
11:20:00Z	First execution of the RCS_A thruster calibration sequence (FCP_AOC_1520). On loading TC sequence AS0715, the input value for the formal parameter THR_TIME shall be 553 raw (equivalent to 134.932 msec, where the quoted figure is the output of FD estimates* rounded down to the nearest 244ms LSB.). NOTE: Sequence shall be uplinked with Interlock disabled NOTE: verify that the release time in the sequence is consistent with the procedure and <u>NO SET ASAP</u> NOTE: the IMCS will ask authorization before commanding having the TC_seq Hazardous TCs. NOTE: possible occurrence of OEM APID 640 Class 0 ID 48<<ROLL ERR>>, ID 49<<PITCH ERR>>, ID 50<<YAW ERR>>. Due to an over generation of OEMs, potential OOL A5702 (Mod 4096 counter) →download on board OEMs (TC A1091 A1092) Execution duration is ~34 minutes. * on the basis of estimated* fuel mass of 157.29 kg and tank temperature of 25.61 C on the 10/01/2006	Manual
11:54:00Z	WAIT 20 minutes for IPS settling and RW data collection to determine the post-settling wheel speeds and external torques.	
12:14:00Z	Second execution of the RCS_A thruster calibration sequence	Manual

Time	Event	Execution
	(FCP_AOC_1520). On loading TC sequence AS0715, the input value for the formal parameter THR_TIME shall be 553 raw (equivalent to 134.932 msec engineering, LSB 0.244 msec). NOTE: Sequence shall be uplinked with Interlock disabled NOTE: verify that the release time in the sequence is consistent with the procedure NOTE: possible occurrence of OEM APID 640 Class 0 ID 48<<ROLL ERR>>, ID 49<<PITCH ERR>>, ID 50<<YAW ERR>>. Execution duration is ~34 minutes.	
12:48:00Z	WAIT 20 minutes for IPS settling and RW data collection to determine the post-settling wheel speeds and external torques.	
13:08:00Z	Third execution of the RCS_A thruster calibration sequence (FCP_AOC_1520). On loading TC sequence AS0715, the input value for the formal parameter THR_TIME shall be 553 raw (equivalent to 134.932 msec engineering, LSB 0.244 msec). NOTE: Sequence shall be uplinked with Interlock disabled NOTE: verify that the release time in the sequence is consistent with the procedure NOTE: possible occurrence of OEM APID 640 Class 0 ID 48<<ROLL ERR>>, ID 49<<PITCH ERR>>, ID 50<<YAW ERR>>. Execution duration is ~34 minutes.	Manual
13:42:00Z	WAIT 20 minutes for IPS settling and RW data collection to determine the post-settling wheel speeds and external torques.	
2006-01-10T14:02:00Z	End of Manual Thruster Calibration Operations	
	Spare time Verify that the guide star is still suitable for the incoming RWB activity	
2006-01-10T15:10:00Z	ED AERWB_00 Reaction Wheel Bias Manoeuvre to set the wheel speeds at RW2=+593 rpm, RW3=+2272 rpm, RW4=-1850 rpm (RW1 not used) AESAM at 15:21:41z. (FCP_AOC_0510)	Timeline
	Verify the automatic update of the next slew	
2006-01-10T15:35:41Z	ED AECSL_00 Corrective Closed Loop Slew to the science attitude (FCP_AOC_0518)	Timeline
2006-01-10T15:41:49Z	ED AESAM_00 Mapping (FCP_AOC_0531)	Timeline
2006-01-10T16:00:00Z	Satellite Engineering Window close	Timeline

11/01/06 (Day of Year 011, Revolution 396)

Slews missed from the Timeline: At 21:07Z, due to a problem with the CPD-TM cache task on IMCS-A chain the TC A7192 (Start Manoeuvre Timer) failed release. The AOCS subsystem was disabled from the Timeline, and a manual recovery performed.

At 21:32Z a manual Open Loop Slew was performed to the attitude of pointing ID 03960051. The next slew ID 03960052 was updated on the Autostack, and the Timeline rejoined at 22:09Z.

The following slews, 03960050 (OSL) and 03970051 (CSL) were not executed from the TL.

12/01/06 (Day of Year 012, Revolution 396-397)

Nothing to report.

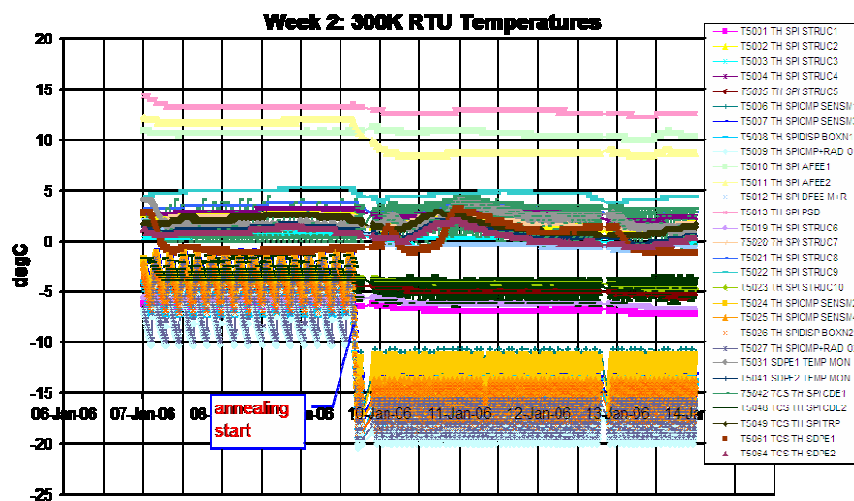
13/01/06 (Day of Year 013, Revolution 397)

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 along the reporting period.

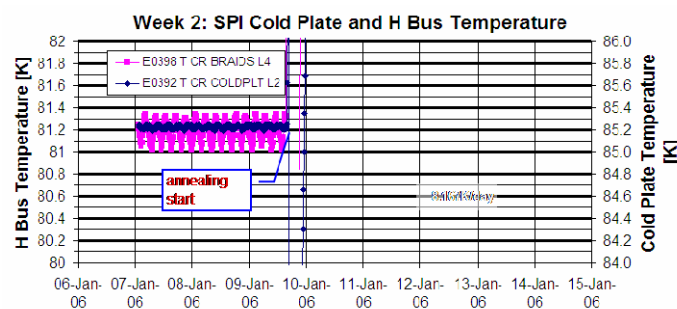


Stirling Compressors and Cryostat

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

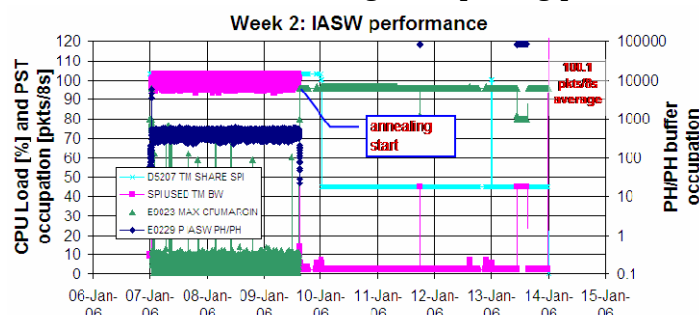
The compressors were shut down at annealing start.

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



DPE & IASW

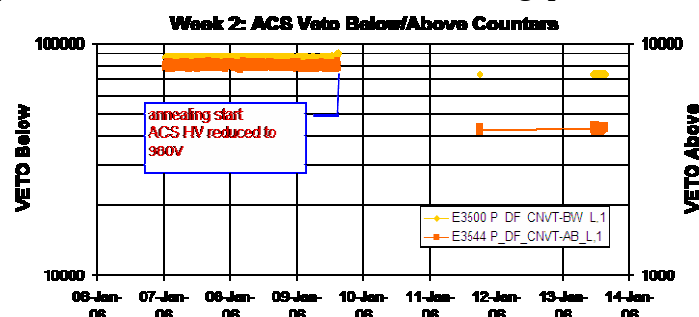
The Iasw performance is nominal. The current Iasw version installed is 432.
 The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS

The performance of the ACS is nominal. For the annealing, the ACS high voltage power supplies have been left on, reducing the voltage setting to the minimum (980V).

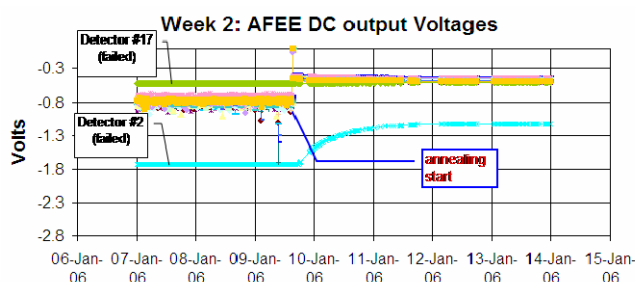
The following plot shows the ACS overall count rate evolution during the reporting period (due to problems in the data retrieval tool, some gaps could be present).



AFEE

The performance of the AFEE and the detectors is nominal except for the detector #2, failed since 06.12.2003, and detector #17, failed since 17.07.2004.

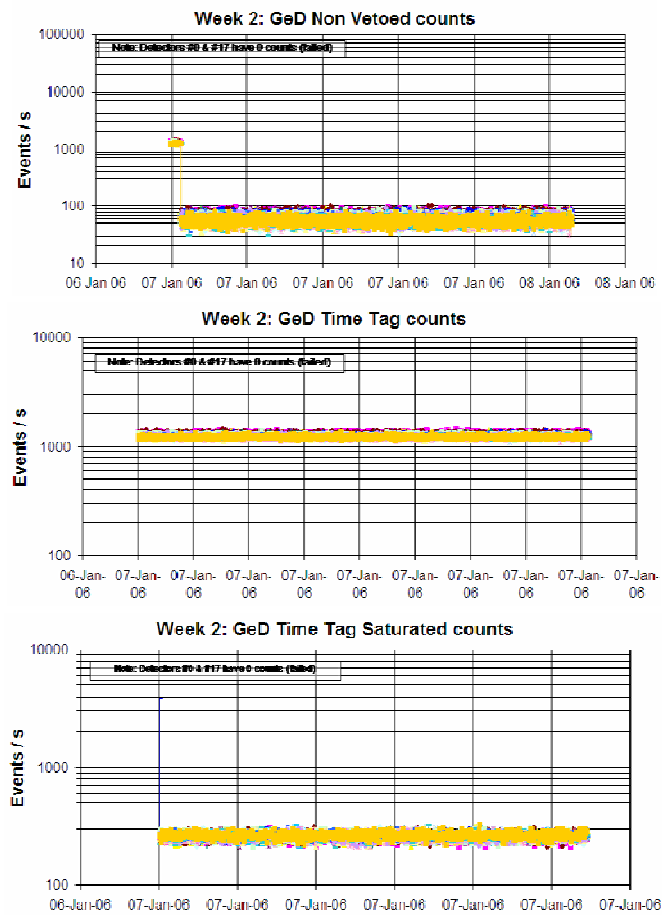
The following plot shows the dc voltage offset of the detector channels during the reporting period.



DFEE

The performance of the unit is nominal.

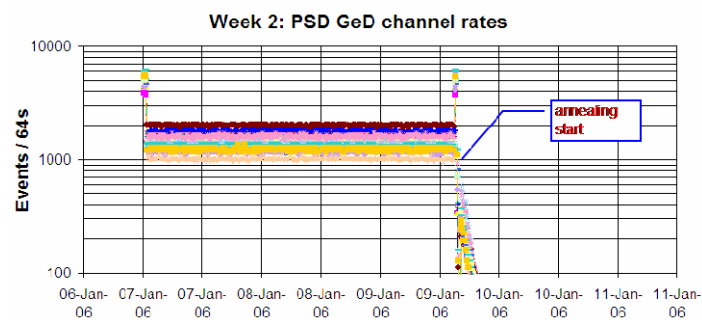
The following plots show the count rates of the detectors during the reporting period (due to problems in the data retrieval tool, some gaps could be present).



PSD

The performance of the unit is nominal.

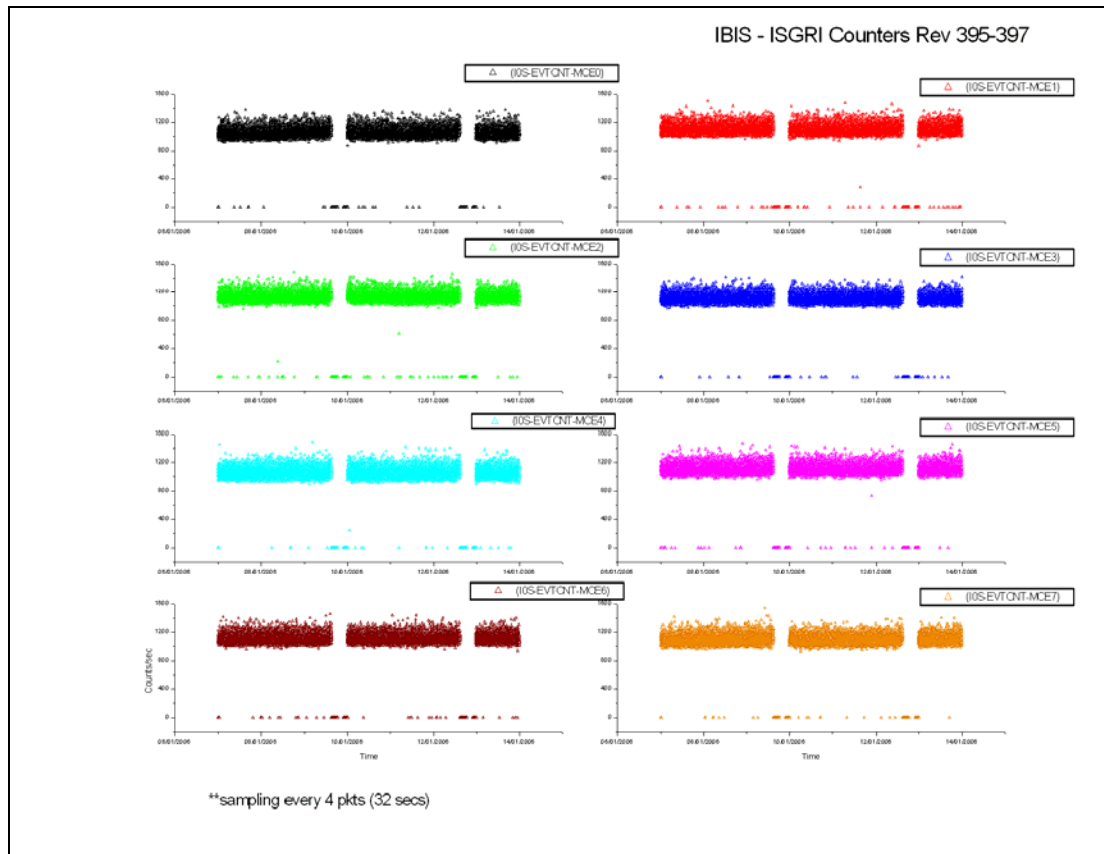
The following plots show the PSD channel rates during the reporting period.



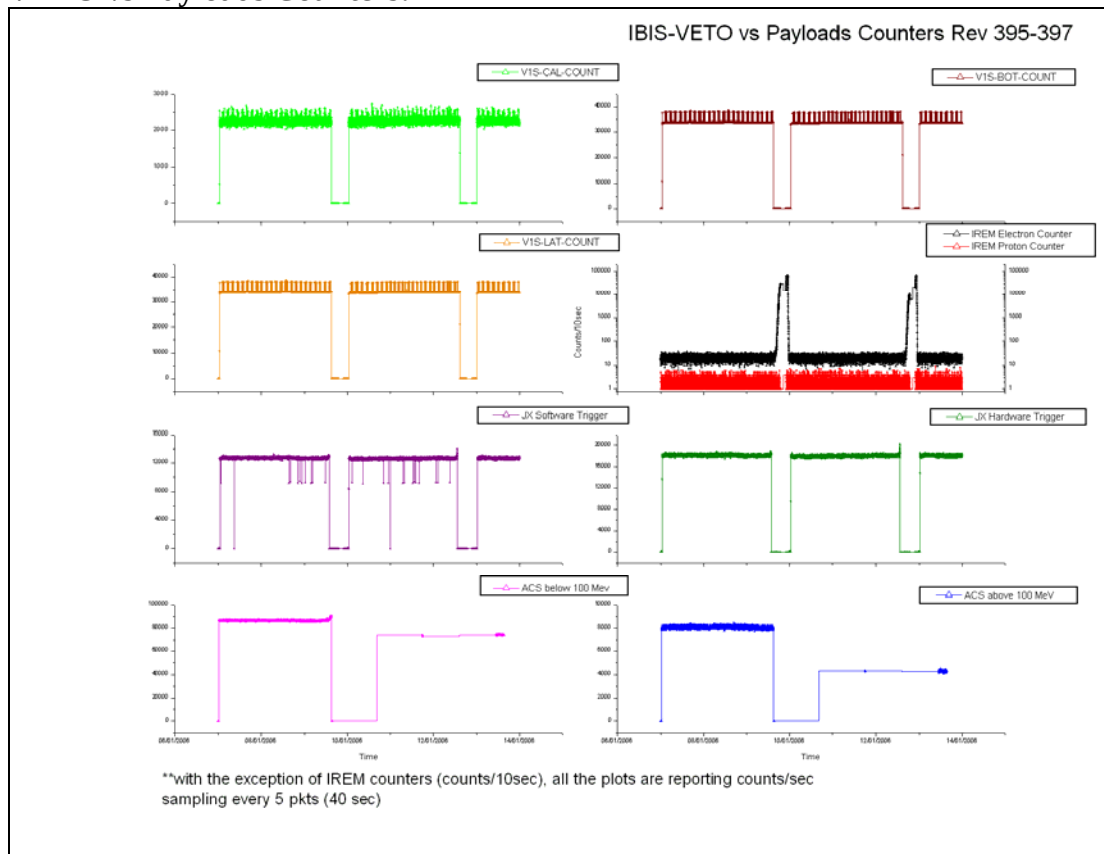
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

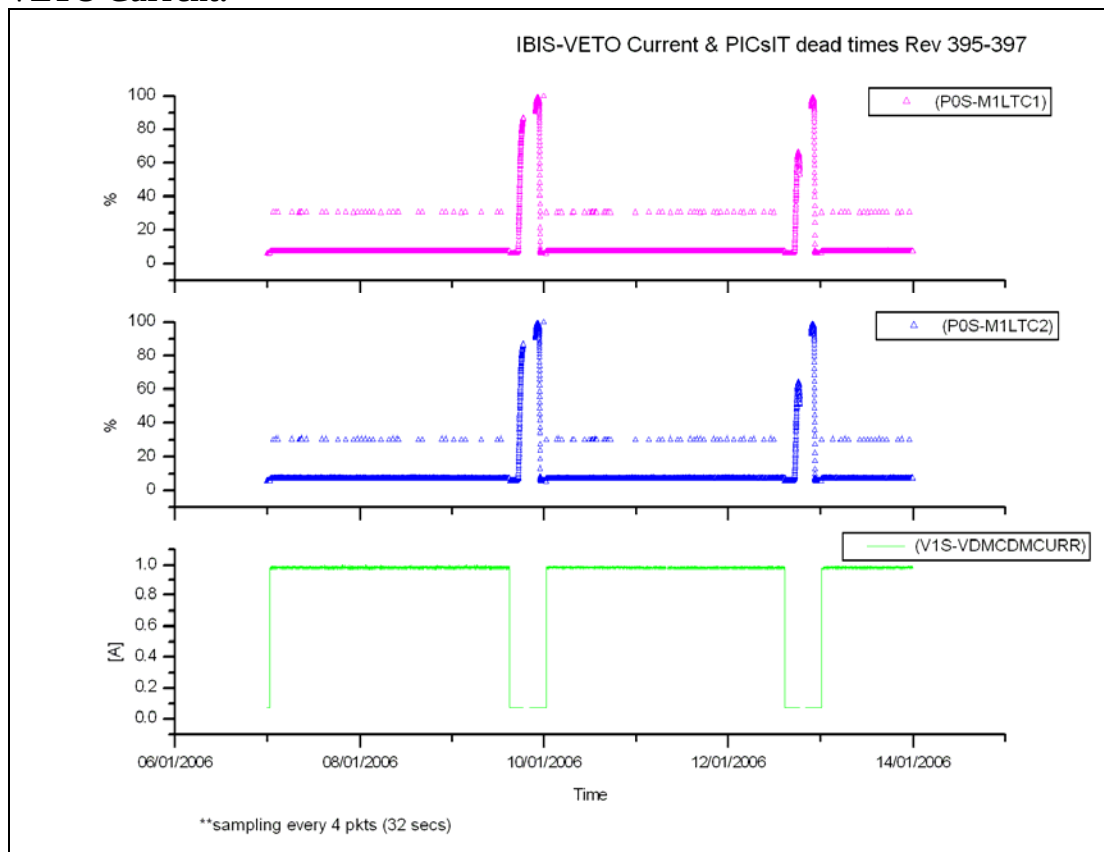


VETO vs Payloads Counters:

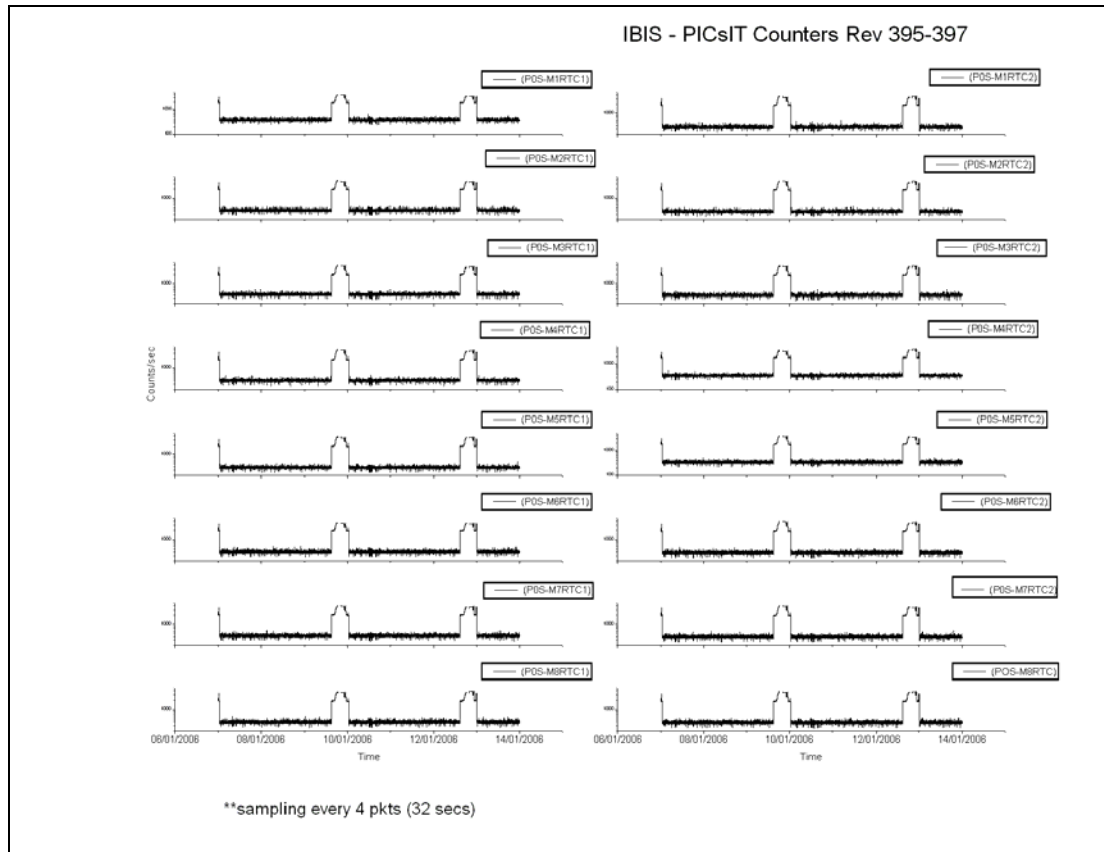


The week was characterised by low radiation.

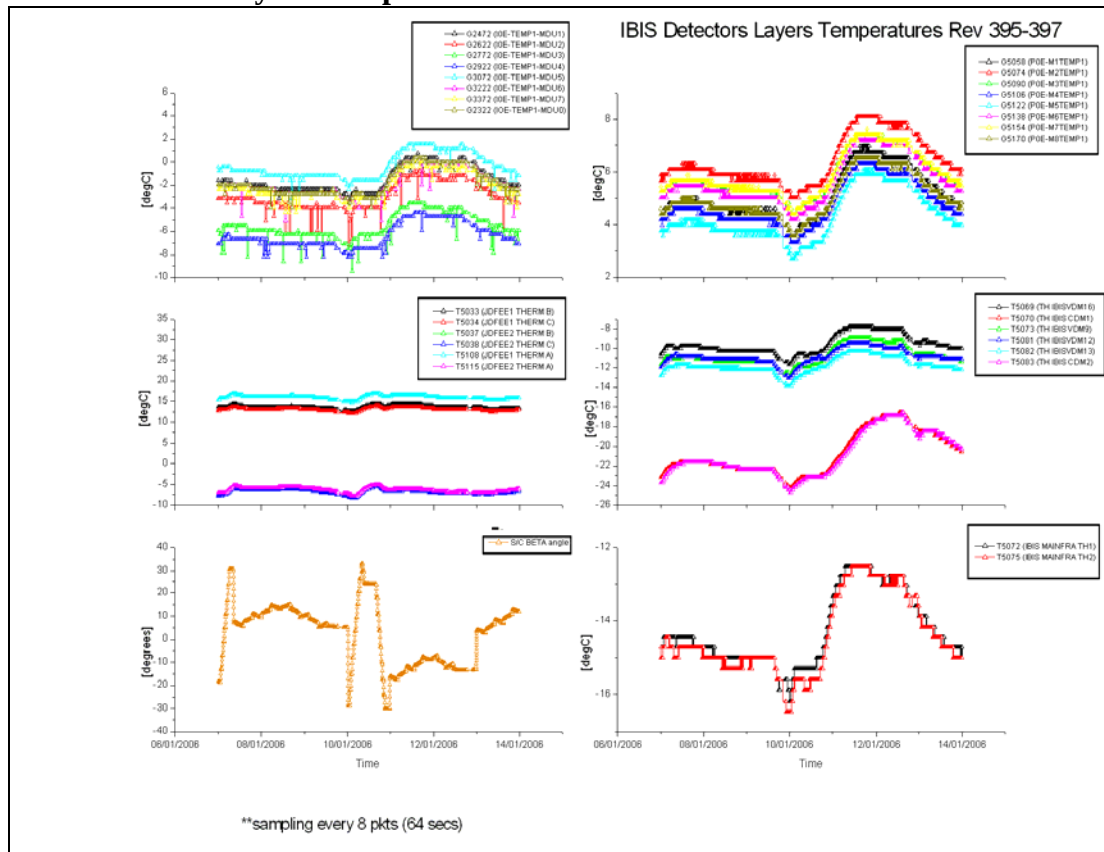
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2006.007 (07/01/2006):

Since DoY 2006.006.15:20Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit on DoY 2006.007 at 00:48Z. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

DoY 2006.009 (09/01/2006):

At 15:05Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit on DoY 2006.010 at 00:33Z. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

Inside radiation belts, TM parameters G5017 (POS-M4RTC1) and G5033 (POS-M7RTC2) were toggling OOL high. According to P-CNT-1, no action was taken.

DoY 2006.010 (10/01/2006):

At 00:16Z, TM parameters G2014 (IOE-OVFWPXADD-M1) failed SCC. According to I-OVF-1, as this happened inside radiation belts, no action was taken.

DoY 2006.012 (12/01/2006):

At 14:48Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit on DoY 2006.013 at 00:13Z. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

Inside radiation belts, TM parameter G5018 (POS-M4RTC2) was toggling OOL high. According to P-CNT-1, no action was taken.

At 23:54Z, TM parameters G2014 (IOE-OVFWPXADD-M1) failed SCC. According to I-OVF-1, as this happened inside radiation belts, no action was taken.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

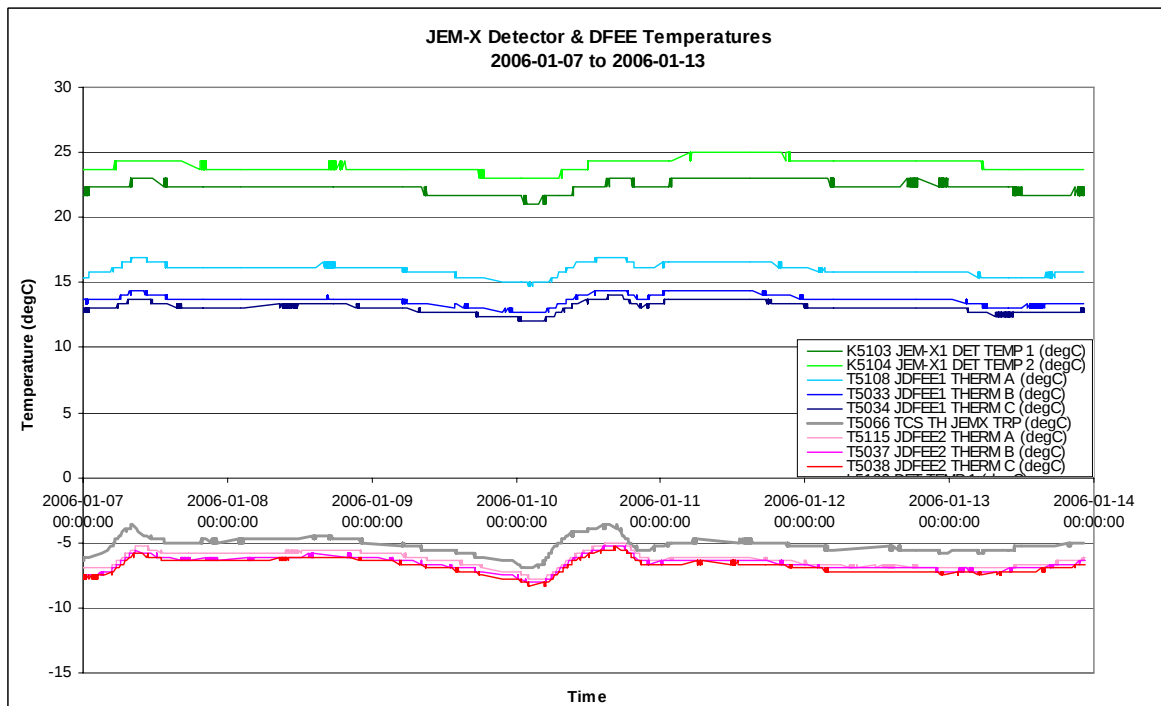
JEM-X count rates over the reporting period are displayed in the following graph¹.

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.



² Data sampled (1 frame in 8)

8.3.4.3 JEM-X Daily Report

2006-01-07 (DOY 007, Rev 395) to 2006-01-13 (DOY 013, Rev 397)

Nothing to report

8.3.5 OMC Operations

2006-01-07 (DOY 007, Rev 395)

Nothing to report

2006-01-08 (DOY 008, Rev 395)

At 03:28, a problem with the CMD-TM cache caused the loss of pointing 03950031.
The following commands rejected shortly after:

2006.008.03.29.52.111	2006.008.03.29.58.405	1792	RealTime	131	TC	REJECT		
REJECTED TC1			0	0	65535	PR	N	
E	E							
2006.008.03.29.58.361	2006.008.03.30.06.487	1792	RealTime	131	TC	REJECT		
REJECTED TC1			0	0	65535	PR	N	
E	E							

Which correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) for that pointing.

2006-01-09 (DOY 009, Rev 395) to 2006-01-10 (DOY 010, Rev 396)

Nothing to report

2006-01-11 (DOY 011, Rev 396)

At 21:06, a problem with the CMD-TM cache caused the loss of pointing 03960050.
The following commands rejected shortly after:

2006.011.21.08.28.048	2006.011.21.08.38.784	1792	RealTime	131	TC	REJECT		
REJECTED TC1			0	0	65535	PR	N	
E	E							
2006.011.21.08.34.173	2006.011.21.08.38.817	1792	RealTime	131	TC	REJECT		
REJECTED TC1			0	0	65535	PR	N	
E	E							

Which correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) for that pointing.

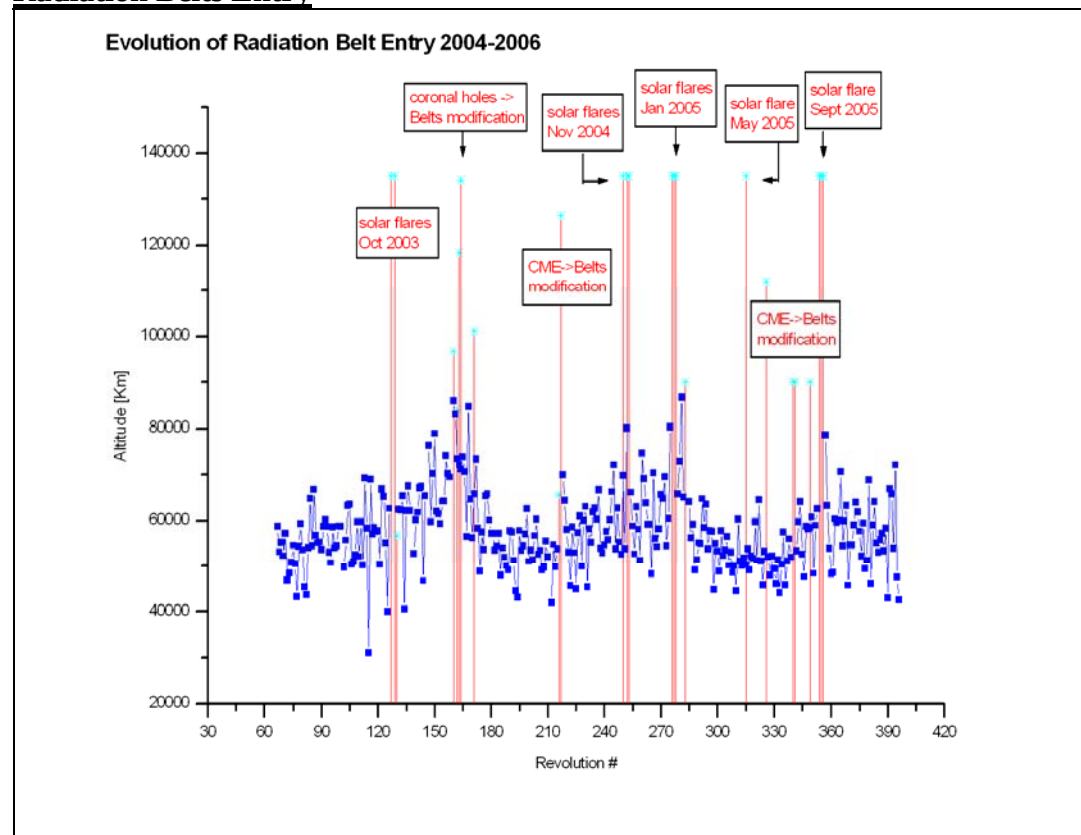
2006-01-12 (DOY 012, Rev 396) to 2006-01-13 (DOY 013, Rev 397)

Nothing to report

On DoY 009 at 15:05:01 and DoY 012 at 14:48:29 OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

Radiation Belts Entry



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]
395	RAD_ENTR R 2006-01-09T15:04:54Z	2006-01-09 16:35:40	>47514.1	2006-01-09 16:15:19	50318
396	RAD_EXIT R 2006-01-10T00:21:53Z	2006-01-09 23:31:32	<<38321.2	2006-01-09 23:25:19	31692
396	RAD_ENTR R 2006-01-12T14:48:25Z	2006-01-12 16:53:32	>42538.8	2006-01-12 14:27:15	48938
397	RAD_EXIT R 2006-01-13T00:05:11Z	2006-01-12 22:58:44	>>23364.9	2006-01-12 21:47:15	34398

Reference

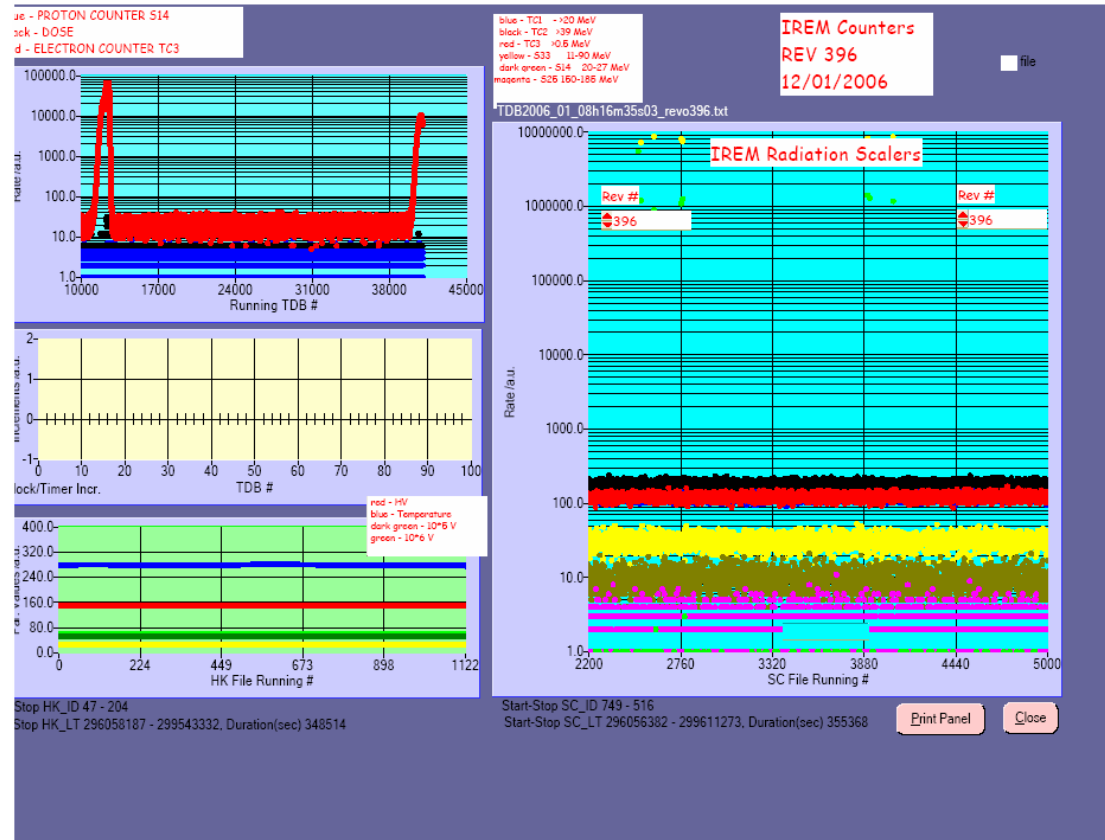
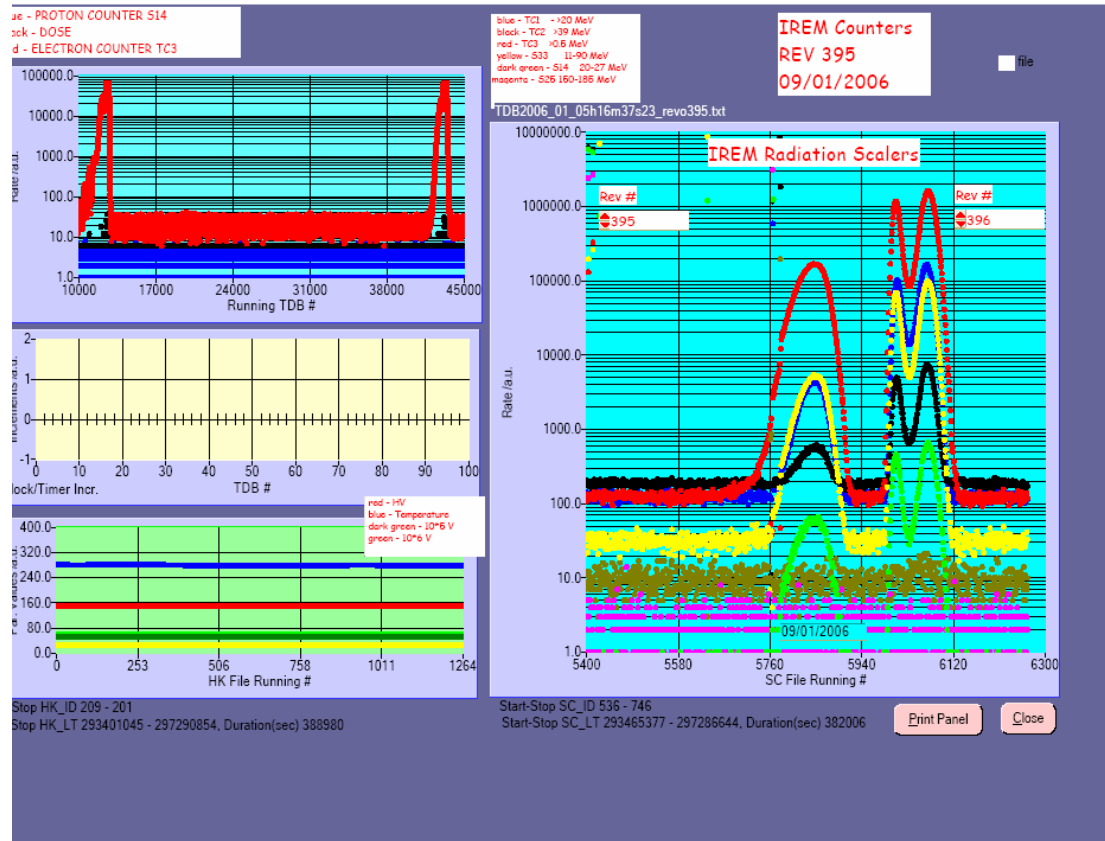
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

Radiation Spike

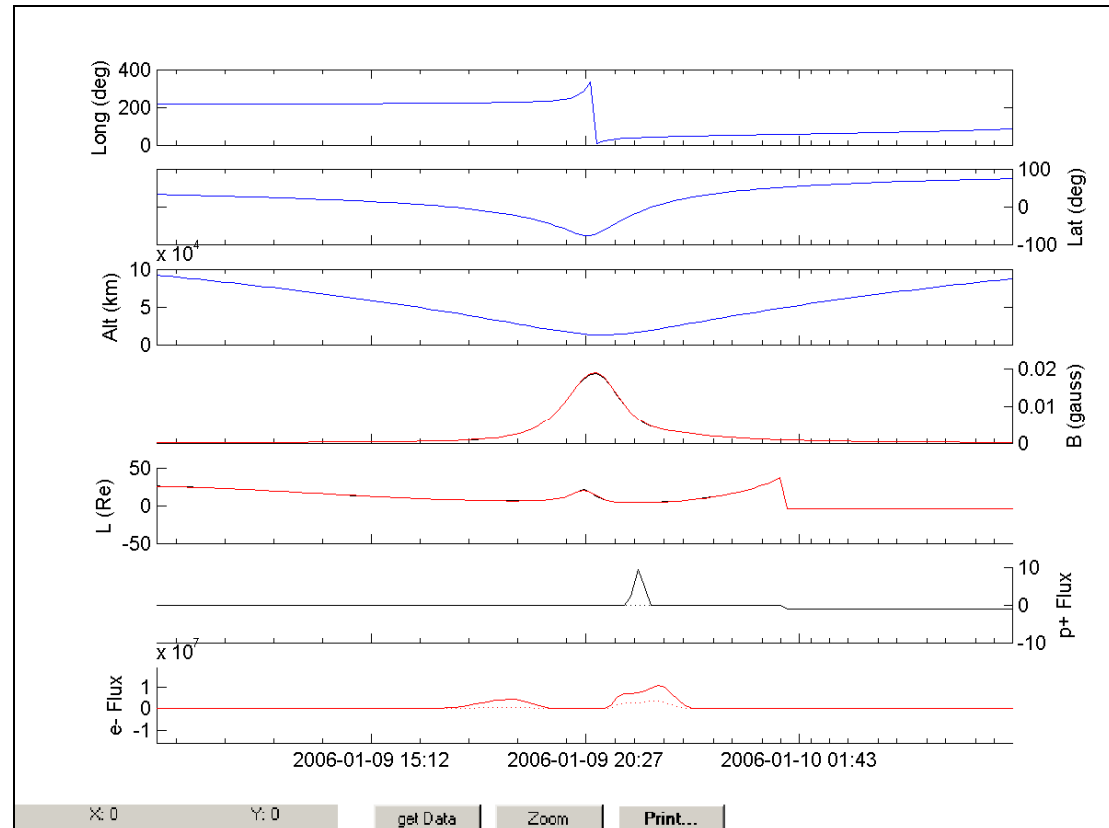
IREM radiation counters:



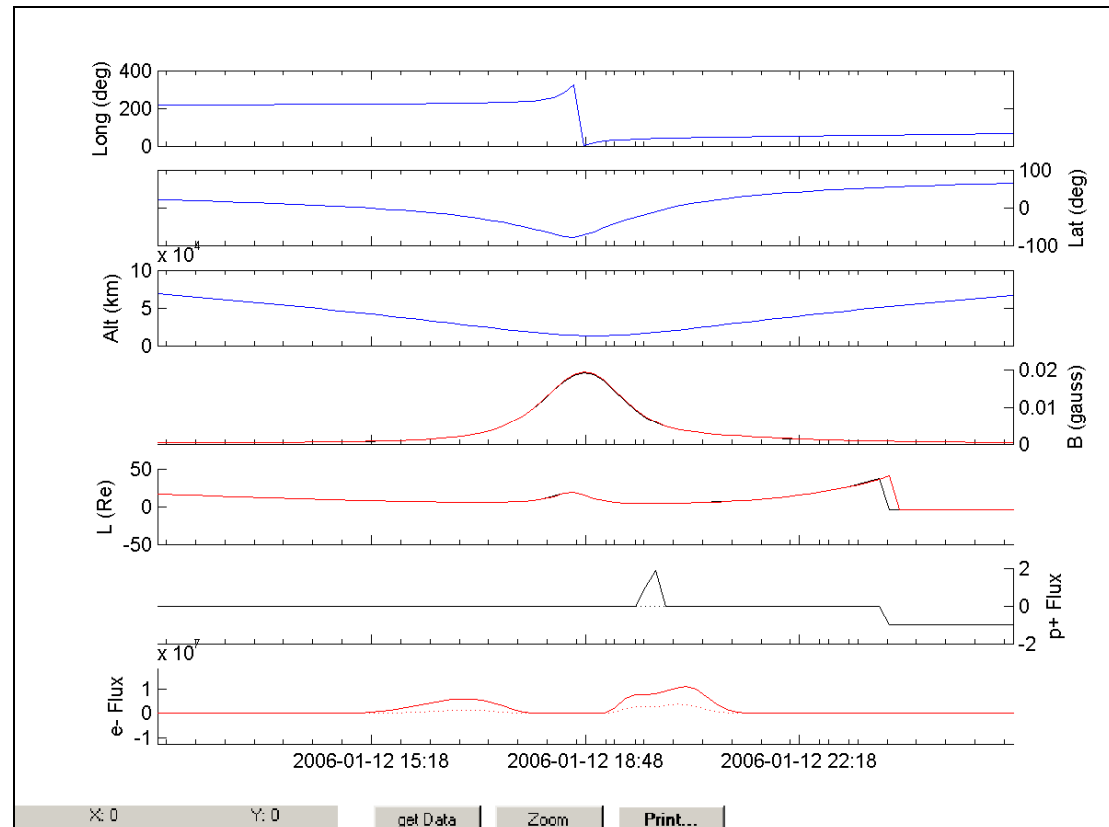
Data for the passage in radiation belts from revolution 396 to 397 are not available due to a disconnection of the server during the installation of a new IMCS software.

IREM Predicted Radiation Belt Passages:

Rev 395



Rev 396



SEC-GOES Observed Particles Fluxes:

