
EUROPEAN SPACE AGENCY
DIRECTORATE OF TECHNICAL & OPERATIONAL SUPPORT
MISSION OPERATIONS DEPARTMENT

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 151
Week 32
15.08.05
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 06.08.05 until 12.08.05 (both dates inclusive) and covers the revolutions 344 and 345.

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 3C120 (RA 04:33:11.10; DEC +05:21:15.6); SWIFT J1753.5-0127 (RA 17:53:28.30; DEC -01:27:09.3) and the Norma Arm. The activities consisted of raster and hexagonal dithering and grid (5x10) observations.

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.

13 slews (6 CSL, 7 OSL) were not executed from the Timeline during this period, due to problems with the REDU station (modulation lost on Downlink, tracking receiver locked on spurious carrier), IMCS (CMD verifier task reported problem) and FDS (Test and Validation processes failed due to problem in the attitude reconstruction process).

The fuel consumption over the period between 04/08/2005 and 11/08/2005 was 0.0798 kg. The remaining propellant is in the order of 159.9539 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.

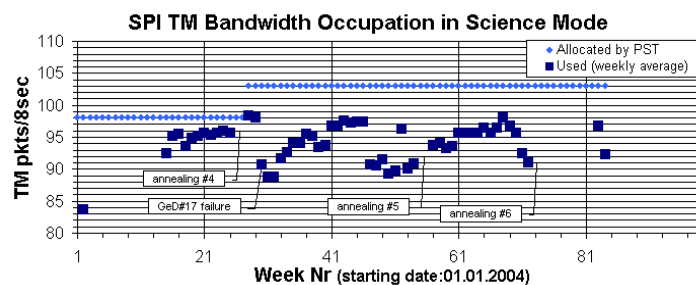
3.2 Payload

3.2.1 SPI

The overall status of the instrument is nominal.

During the reporting period, the instrument has been 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 92.3 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.

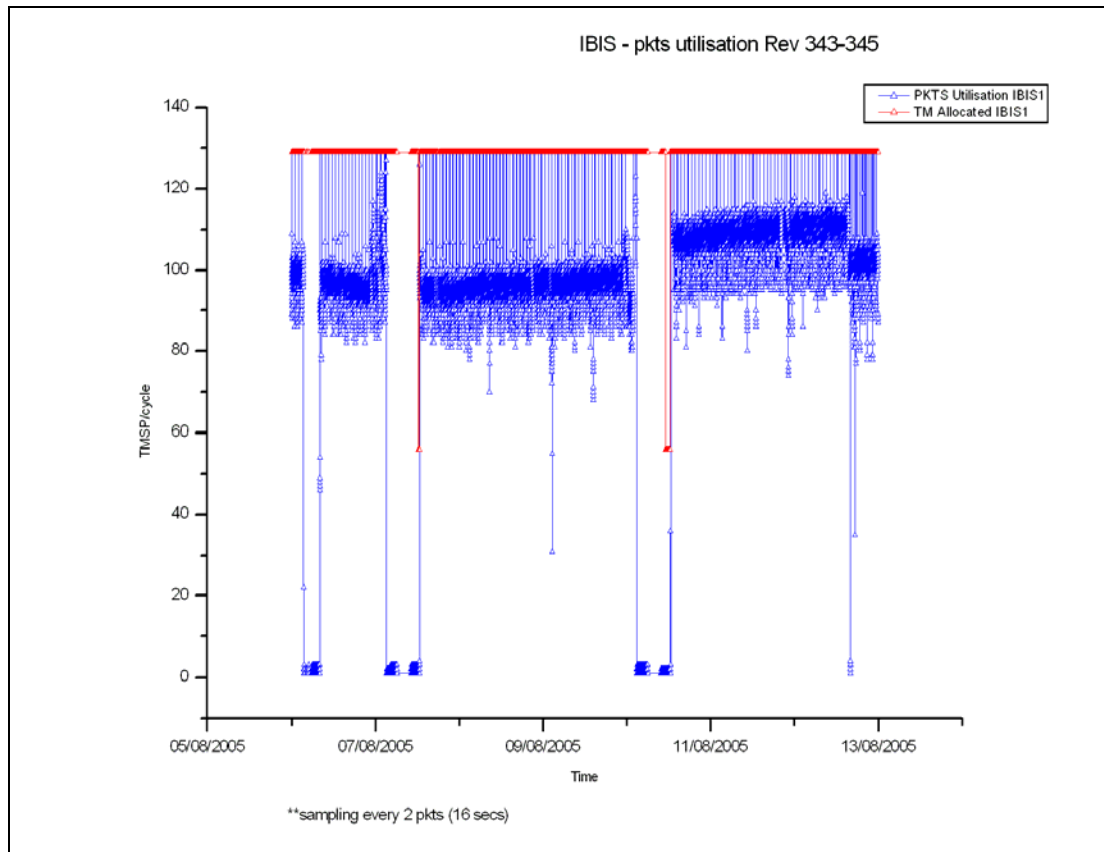
3.2.2 IBIS

The Overall status of the unit is Nominal.

The week was characterised by low solar activity.

During the reporting period, the PST allocation to IBIS was most of the time 129 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 102.29 TMPS/cycle, down 13.42 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 and JEM-X2 was dormant (DFEE OFF) with a TM allocation of 1 packet/cycle.

On 2005-08-06 at 03:31Z JEM-X1 was commanded to Safe mode, due to an upcoming ground station outage, and was recovered back to Data Taking mode at 08:43Z.

Several OOLs were received on the TM parameter K5136 BUFFER LOSS throughout the week and from 2005-08-11 at ~07:00Z spikes were observed on the JEM-X1 count rates. This, associated to a hot spot on the detector plate, stopped on 2005-08-12 at ~01:30Z without any action being taken.

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, 142 of the 153 planned science pointings for OMC were executed nominally, 1 was interrupted, 2 were delayed, and 8 lost to ground problems.

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

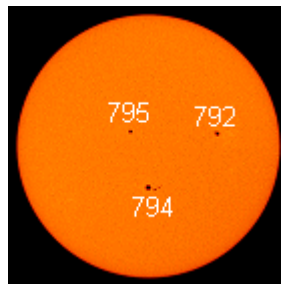
3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity.

On the 6th August, sunspots 792 and 794 posed a threat for M-class solar flares as shown on the picture below. From the 7th till the end of the observation period, the sun activity remains quiet; sunspots were disappearing.



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 performance of the Operational ground facilities very good this week, 162 slews were executed correctly, 10 were lost, and 3 either cut short, or started late.

4.1 Mission Operations Centre

The performance of the MOC was average this week, 3 pointings were lost when the command verifier crashed, and a further one was lost when an AOCS command failed release.

4.1.1 Upgrade of IMCS.

Next week, the upgrade to the B-chain is planned.

4.2 Ground Stations & Network

The performance of the ground stations and Network was impacted this week by a continuation of the problem at Redu from last week, an explanation for which is given below. There were a number of incidents with bad frames, and link problems with Redu, a total of 7 pointings were lost due to these problems. The overall performance though was nevertheless still above the 95% requirement.

During the last weekend, the ES/No value of Redu-1 was intermittently degrading reaching low values around -6dBm. Although the CDSAs would drop, the tracking receiver didn't loose lock. This morning (DOY220), to isolate the problem we have performed the following checks and tests without success: IFMS 1& 2 reboot, LDC 1 & 2 output levels check, LNA switch over from 1 to 2 and vice versa, SDC LO switch over from A to B and vice versa, TTML and TTLL with RFTG attenuation of -58dBm to emulate the last received Integral signal level (on TRRX at -72 dBm). Only when the RFTG was off and while moving the antenna we noted that the tracking receiver would intermittently lock on a spurious carrier. After connecting an analyzer to the s-band signal, while the antenna was pointing at 297 deg. Azimuth, 45 deg. elevation, we discovered the presence of a carrier at about -32 dBm at 2220 MHz. Performing a 360 degree revolution, the level of the carrier would fluctuate between -32 dBm and -58 dBm. Philippe traced the signal to the uplink centre frequency of the IOT portable test station TMS-S. The IOT team was convinced that the SSPAs of the system were in Stand-by and that uplink was not available, however after requesting an EIRP measurement they found that the system was radiating at high power. The remote Stand-by command without generating any error couldn't stop the uplink and the mute switch apparently could be activated. It was not possible to set the SSPA in Stand-by using the Local Switch located on the unit's front panel. The system was then powered down and the carrier disappeared from the Redu-1 analyzer while the ES/No value in TTLL with -58 dBm attenuation went to +6 dBm and CDSAs showed lock. Redu-1 was then reconfigured for Integral and TM acquisition was successful. Although difficult to confirm, it is possible that the interference we had last week was due to the same problem. From now on the TMS-S system will be completely powered off during the Integral passes.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF's have been received up to revolution 352.

Planning has been done up to revolution 348. Rev 346 up to 348 had to be replanned due to problems originating from the IODB import last week.

The ToO potentially planned for revolution 345 was executed since the source state met the triggering criteria. No further ToO request was received.

The coordinated observation with Suzaku (Astro-E2) is delayed until further inputs are received from the Suzaku team.

The new IODB that has been used since revolution 343 includes an optimised JEMX switch on giving around 20 minutes more JEMX data at the nominal high voltage setting as well as ISOC control of an additional parameter in JEMX (software trigger limit).

The TSF's for revolutions 344 to 346 were received.

2. Observation status

ECS's have now been received up to revolution 333 except for revolutions 324 and 330. No extra time has been credited.

3. ISOC science data archive

The data ingestion has now reached a state where the nominal procedure to automatically transfer and ingest data is used. Also the data rate provided between ISDC and ESAC is now sufficient to support the procedure. A meeting was held this week with the IBIS team. This resulted in a series of agreements, e.g. to include in the ISDA data from the 2nd ISGRI catalogue. This will mean that via the ISDA browser the user will be able to see light curves and broad band spectra in a very similar way as in the XMM-Newton archive (XSA). Also bibliography of INTEGRAL sources will be accessible through the ISDA browser.

4. ISOC system

The current version is still 11.0 is still in use, except for a database patch to fix ED parameter settings in the POS.

Version 11.1 is now planned for early next week. In light of the problems encountered the functionality of this version has been slightly refined to basically allow the users to at all times get a correct observation split without any manual intervention. This version will also allow to undo a split of observation which has turned out to be a highly desirable feature. Therefore the implementation of the HEX pattern COP move is deferred to version 11.2.

5. Problems

The problem around IODB import that was reported last week is now fully understood. Besides a couple of technical problems there were also some procedural errors. This can be linked to the fact that this is the first time such IODB import was performed with the partially new team in ISOC since the move to ESAC. There will be some software enhancement as well as some clarifications and modifications to the existing procedures.

4.3.2 ISDC

Status of ISDC observation processing on 15/08/2005:

- Latest Standard Analysis completed: observation 02201540001 (Coma Cluster, Revolution 315-319) on 26/07/2005
- Latest products archived: observation 02201540001 (Coma Cluster, Revolution 315-319) on 26/07/2005
- Latest observation products sent to the observer: observation 02201540001 (Coma Cluster, Revolution 315-319) on 28/07/2005

5 Special Events

6 Anomalies

There were a number of problems that impacted the operations:

- On DoY 218, at 03:46 the TC through Vilspa dropped, at 03:40, the TM also dropped. Network reported this was due to masking. At 04:09, intermittent TM was connected from Redu (due to an ongoing problem at Redu from last week). The Timeline was stopped at 04:19. At 05:55, the TM was successfully reconnected at Redu, and operations could continue. The details are given above in section 4.2. The impact was the interruption of pointing 03430043, and the loss of pointings 03430044 through to 03430048.
- At 22:47, there were Reed-Solomon alarms at Redu, and 12 bad frames were received, there was no impact.
- From 23:30 to 23:31, there were errors sending data to the isds, there was no impact.
- On DoY 219, at 00:20, after the handover from Redu to DSS-24, the TM briefly dropped when Network tried to connect the bad frame link, there was no impact.
- At 17:11, bad frames were received from Redu, by 17:18, 973 bad frames had been received. At 17:30, the TM dropped altogether, and a Star Mapping command failed release. At 17:38, the up-link carrier was brought down, which restored the TM, at 17:45, the TC was back, and a manual mapping performed. No slews were lost!!
- At 18:01, bad frames were again received from Redu, at 18:02, the TM from Redu dropped completely, and Network reported both CDs were hanging and could not be restarted. At 18:14, the TM was restored using VIL2, with the TC available at 18:17. There was no impact.
- On DoY 220, at 02:08, the TM & TC from VIL2 dropped due to a hit on the line. At that time, an AOCS star mapper command failed release. The links returned at 02:14, and the command was manually sent, there was no impact.
- At 02:41, there was a short TM drop from VIL2, there was no impact. It was observed at that time, that the 'Rate' indicated on nctrs-b stayed on 0 for about 5 seconds before registering a positive value.
- On DoY 222, at 11:46, the Command Verifier died, it was restarted and connected at 11:54. The impact was the loss of slews 03450002 & 03450003 (neither of these pointings were for science), also the OMC pointing 03450004 was lost.
- At 21:59, 25 bad frames were received from Redu, there was no impact.
- On DoY 223, at 20:54, due to a problem during the file archive, the TM was interrupted, and an AOCS command failed release. The TM was back by 20:59. The impact was that pointing 03450035 had to be manually recovered after a 27 minute delay.
- On DoY 224, at 15:56, due to an attitude determination problem, the commands for slew 03450054 failed release. The timeline was recovered at 16:24, the impact was the loss of pointing 03450054.
- At 18:36, the AOCS TC A3189 Start Guide star failed release, the AOCS was disabled in the autostack, and a manual recovery performed. The impact was the loss of slew 03450059 and a delay in the start of 03450060.

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

AR id	Date Created	Subject	Segment	Status
INT-2778	08/08/2005	Disc space problem on IMCB	IMCS	Pending
INT-2779	08/08/2005	NCTRS-A non operational	NCTRS	Pending
INT-2780	09/08/2005	REDU station non operational	ESA Stations	Pending
INT-2781	10/08/2005	Incorrect JEM-X1 Data Taking EDs in 0346_06.POS	ISOC	Open

7 Future Milestones

Change of communication protocol to ESA Station from X25 to TCP IP: The testing has been performed. The release is not yet operational because an upgrade of the communications set-up is required.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 344

In revolution 344 a raster dithering observation of 3C120 (RA 04:33:11.10; DEC +05:21:15.6) was performed throughout the available observation time (~60 hours).

Revolution 345

The observations in revolution 345 consisted of a hexagonal dithering observation of the Target of Opportunity SWIFT J1753.5-0127 (RA 17:53:28.30; DEC -01:27:09.3) lasting ~51 hours, followed by a Norma Arm Survey performed for the remaining ~10.5 hours of observation time.

Throughout these observations all instruments were in their nominal science modes, except for JEM-X2 for which the DFEE remained off, and the TM allocation was IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2005-07-23T11:39:34.000Z	160.2919	F	Automatic TM processing.
2005-07-24T21:42:17.000Z	160.2683	F	Automatic TM processing.
2005-07-27T22:17:05.000Z	160.2299	F	Automatic TM processing.
2005-07-28T05:01:46.000Z	160.2103	F	Automatic TM processing.
2005-07-29T11:18:13.000Z	160.2065	F	Automatic TM processing.
2005-07-30T18:51:08.000Z	160.1577	F	Automatic TM processing.
2005-08-01T11:06:44.000Z	160.1440	F	Automatic TM processing.
2005-08-02T21:08:40.000Z	160.1245	F	Automatic TM processing.
2005-08-04T04:20:11.000Z	160.0694	F	Automatic TM processing.
2005-08-04T10:48:52.000Z	160.0634	F	Automatic TM processing.
2005-08-04T19:44:05.000Z	160.0337	F	Automatic TM processing.
2005-08-07T10:36:59.000Z	160.0224	F	Automatic TM processing.
2005-08-08T21:23:19.000Z	159.9946	F	Automatic TM processing.
2005-08-10T10:25:55.000Z	159.9780	F	Automatic TM processing.
2005-08-11T20:35:11.000Z	159.9539	F	Automatic TM processing.

This report was generated Fri Aug 12 08:00:29 GMT 2005

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, 06/08/2005 – 12/08/2005

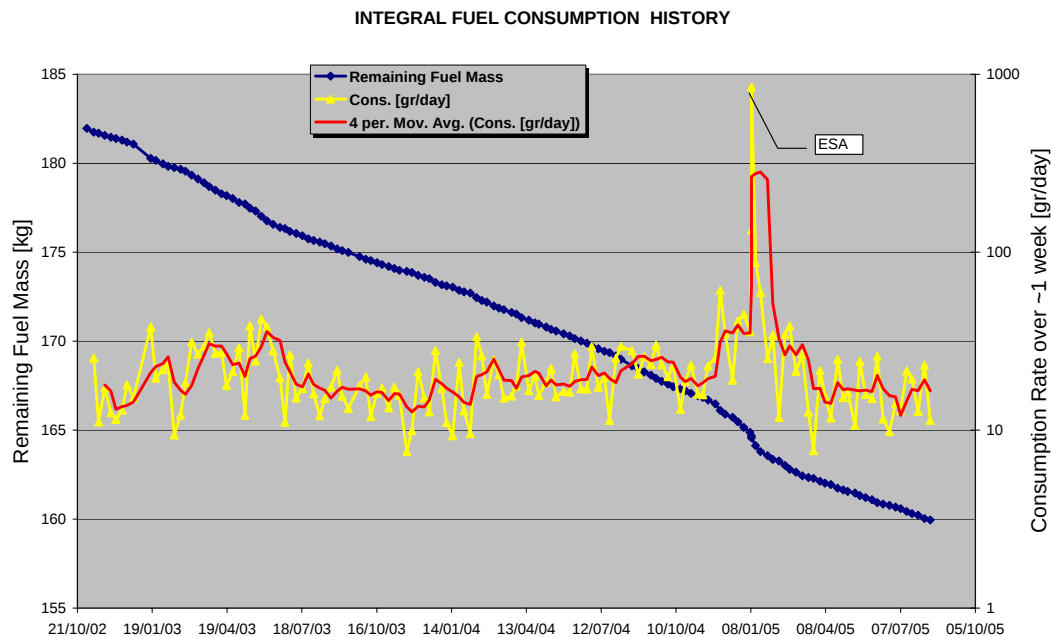
AOCS operations were executed from the Automatic Timeline.

During this period, 62 Open Loop Slews, 92 Closed Loop Slews and 4 Momentum Bias were executed (TL + manual recovery). 13 slews (6 CSL, 7 OSL) were not executed from the Timeline during this period, due to problems with the REDU

station ((modulation lost on Downlink, tracking receiver locked on spurious carrier), IMCS (CMD verifier task reported problem) and FDS (Test and Validation processes for the TPF update failed due to problem in the attitude reconstruction process).

This is equivalent to a ~8 % of the total number of slews planned (162).

The fuel consumption over the period between 01/11/2002 and 11/08/2005 is reported in the plot below.



06/08/05 (Day of Year 218, Revolution 343)

Slew missed from the Timeline: on DoY 217 due to a problem on REDU station (modulation lost on Downlink, the tracking receiver was intermittently locked on a spurious carrier, see AR INT-2780) the slew ID 03430036 (CSL) was missed and the AOCS s/s disabled in TL at 19:38z. In order to continue the scheduled activities and perform in parallel an investigation on REDU problem (REDU CDSs did not work and on-call engineer called out), was requested the support of VILSPA2 station at 20:04z. A manual recovery (CSL) was successfully performed to the attitude of PID 03430036. The next slew (CSL) for PID 03430037 was manually updated and executed from the TL.

The AOCS s/s was re-enabled in TL at 20:58z. The support of VILSPA2 station continued until DoY 218 at 03:36z and after for the period 05:10->05:50z. The AOCS s/s was disabled at 03:42z and the TL stopped.

Due to the discontinued station coverage, the RMU calibration expected for the 05:03z was missed. At 06:09Z both TC\TM links were active again from REDU station and the RMU calibration was executed manually. A manual recovery (CSL) was then successfully performed from the attitude of PID 03430043 to the attitude of PID 03430048. The next slew (CSL) for PID 03430049 was manually updated and executed from the TL.

The following slews were not executed from TL while recovering the AOCS s/s:
03430044(OSL)-45(OSL)-46(CSL)-47(OSL)-48(OSL)

07/08/05 (Day of Year 219, Revolution 343-344)

Nothing to report.

08/08/05 (Day of Year 220, Revolution 344)

Nothing to report.

09/08/05 (Day of Year 221, Revolution 344)

Nothing to report.

10/08/05 (Day of Year 222, Revolution 344-345)

Slews missed from the Timeline: Due to a problem on IMCS (CMD verifier task reported problem) the slew ID 03450002 (OSL) was missed and the AOCS s/s was disabled in TL at 11:48z. A first manual recovery (CSL) was successfully performed to the attitude of PID 03450004. The next slew (CSL) for PID 03450005 was manually updated and executed from the TL.

The AOCS s/s was re-enabled in TL at 13:00z.

The following slews were not executed from TL while recovering the AOCS s/s:
03450002(OSL)-03 (OSL)-04(CSL).

11/08/05 (Day of Year 223, Revolution 345)

Slew missed from the Timeline: Due to a problem on IMCS (segmentation update of the system archive caused drop in TM) the slew ID 03450035 (OSL) was missed. A first manual recovery (OSL) was successfully performed to the attitude of PID 03450035. The next slew (CSL) for PID 03450036 was manually updated and executed from the TL.

The following slew was not executed from TL while recovering the AOCS s/s:
03450035(CSL).

12/08/05 (Day of Year 224, Revolution 345)

Slews missed from the Timeline: Due to a problem on FDS (Test and Validation processes for the TPF update of slew ID 03450054 failed due to problem in the attitude reconstruction process) the slew ID 03450054 (OSL) was missed and the AOCS s/s was disabled in TL at 15:57z.. A first manual recovery (OSL) was successfully performed to the attitude of PID 03450055. The next slew (OSL) for PID 03450056 was manually updated and executed from the TL.

The AOCS s/s was re-enabled in TL at 16:24z.

The following slews were not executed from TL while recovering the AOCS s/s: 03450054(CSL)-55(OSL).

Slews missed from the Timeline: Due to a problem during the Search and Track process for slew ID 03450059 (guide star to be tracked on slot# 2 not found, guide star ID 7867-1110 at CCD location Y=772 Z=10017), the TC A3189 (Start Guide Star) failed release at 18:36z due to static PTV failure.

The AOCS s/s was disabled in TL at 18:43z

A first manual recovery was attempted to the attitude of PID 03450059 but being the recovery manoeuvre generated a CSL, using the same slew star ID 7867-1110, it failed again for the reason mentioned above (star in slot # 2 not found). A second attempt to manual recover to the attitude of PID 03450060 was successfully performed, by an OSL. The next slew (OSL) for PID 03400061 was manually updated and executed from the Timeline.

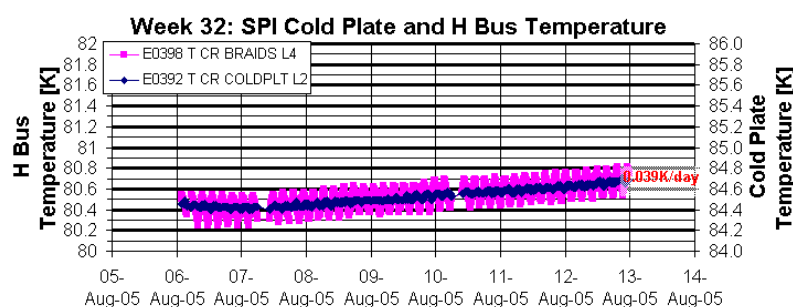
The AOCS s/s was re-enabled in TL at 19:33z.

The following slews were not executed from TL while recovering the AOCS s/s: 03450059(CSL)-60 (CSL).

8.3.2 SPI Operations

Stirling compressors and Cryostat:

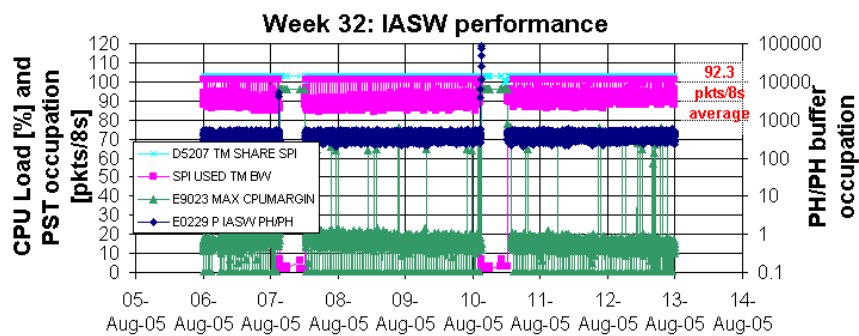
The performance of the compressors is nominal. The cold plate temperature was maintained at 85K $\pm$ 1K showing the usual positive drift with the expected slope
 The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.



DPE & IASW:

The IASW performance is nominal.

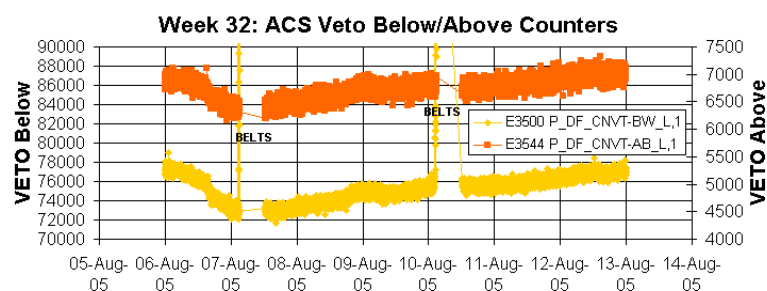
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS:

The performance of the ACS is nominal.

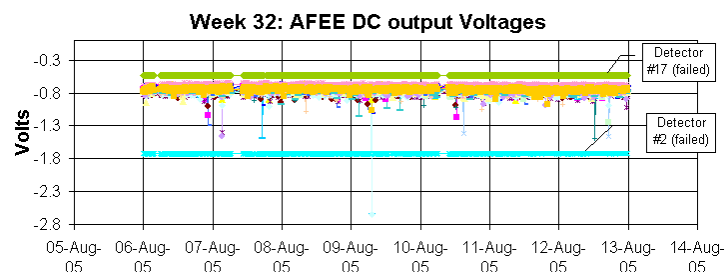
The following plot shows the ACS overall count rate evolution during the reporting period.



AFEE and Germanium Detectors:

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.

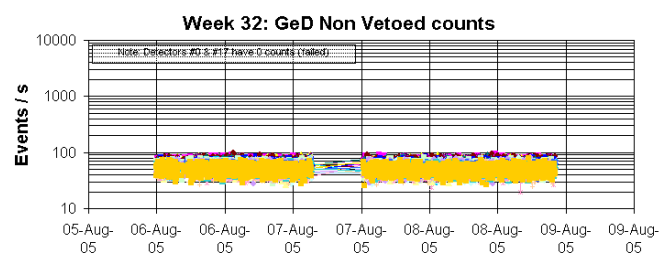
The following plot shows the dc voltage offset of the detector channels during the reporting period.

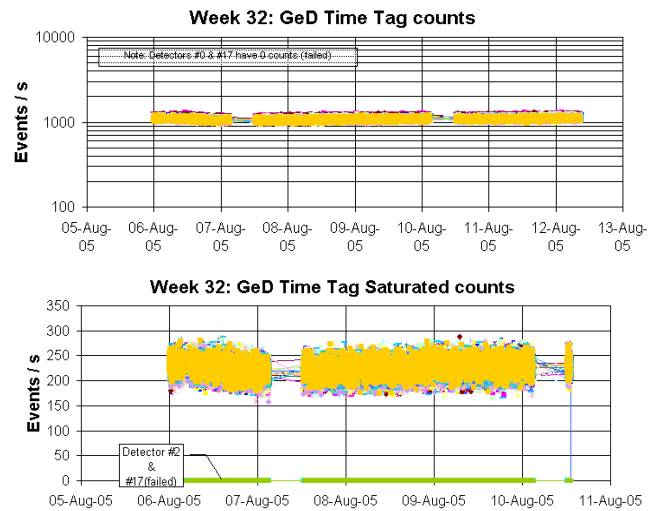


DFEE:

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 are presents).





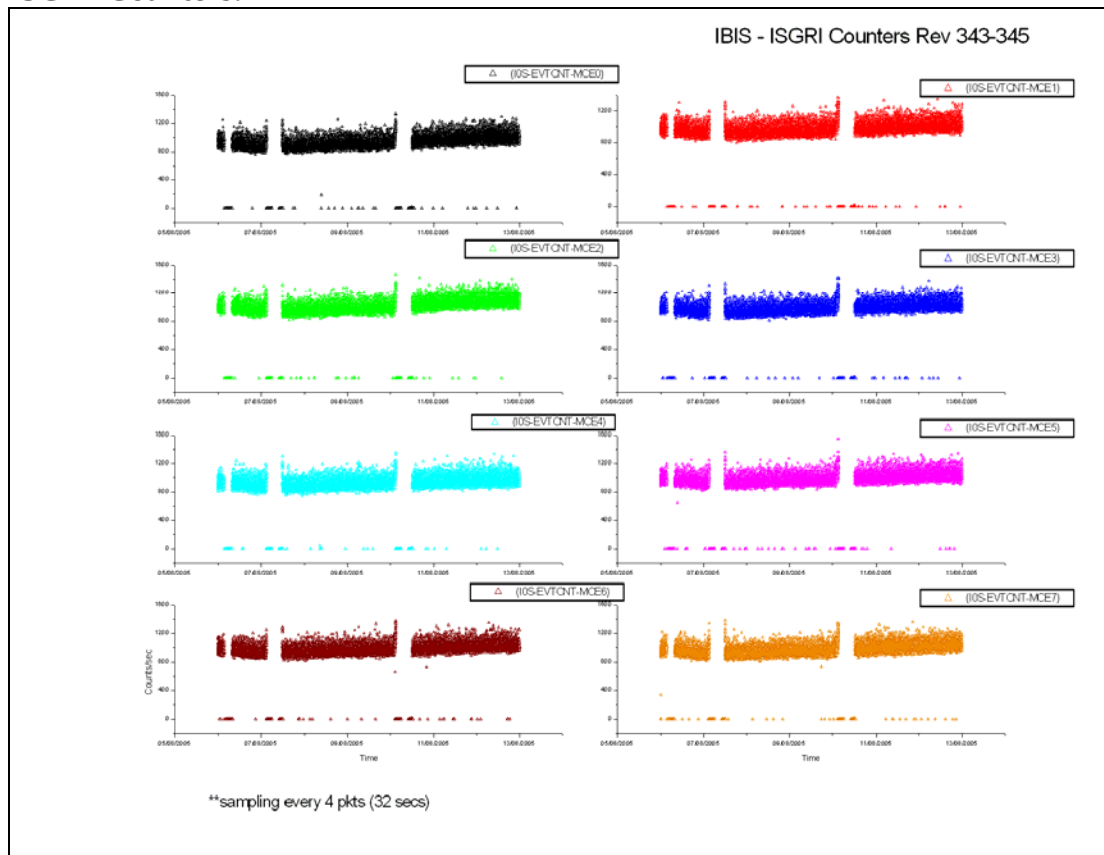
PSD:

The performance of the unit is nominal.

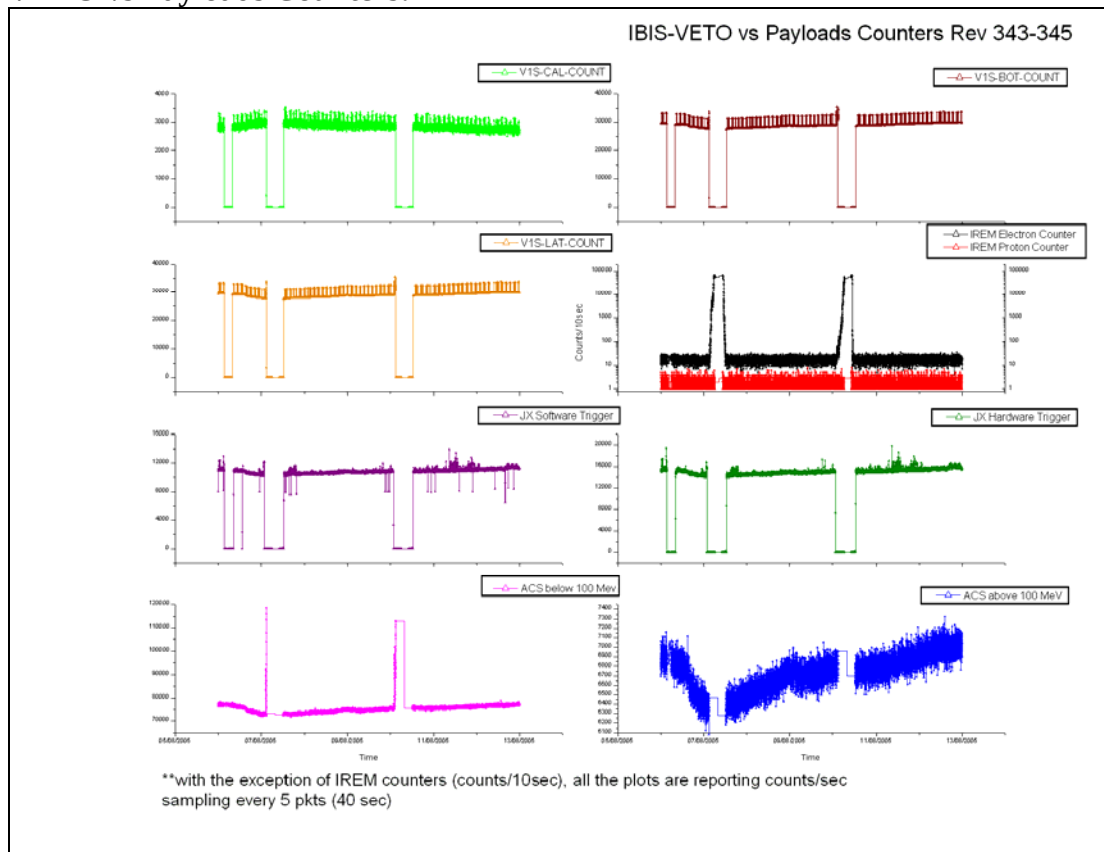
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

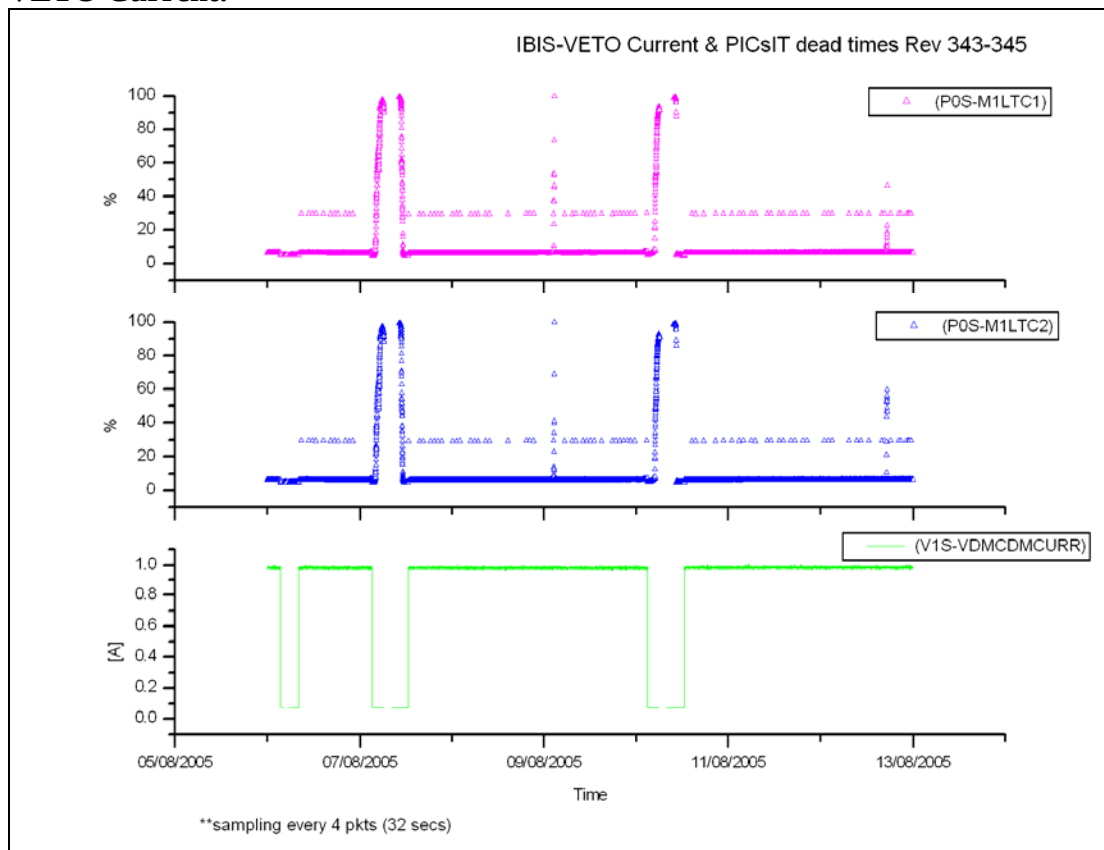


VETO vs Payloads Counters:

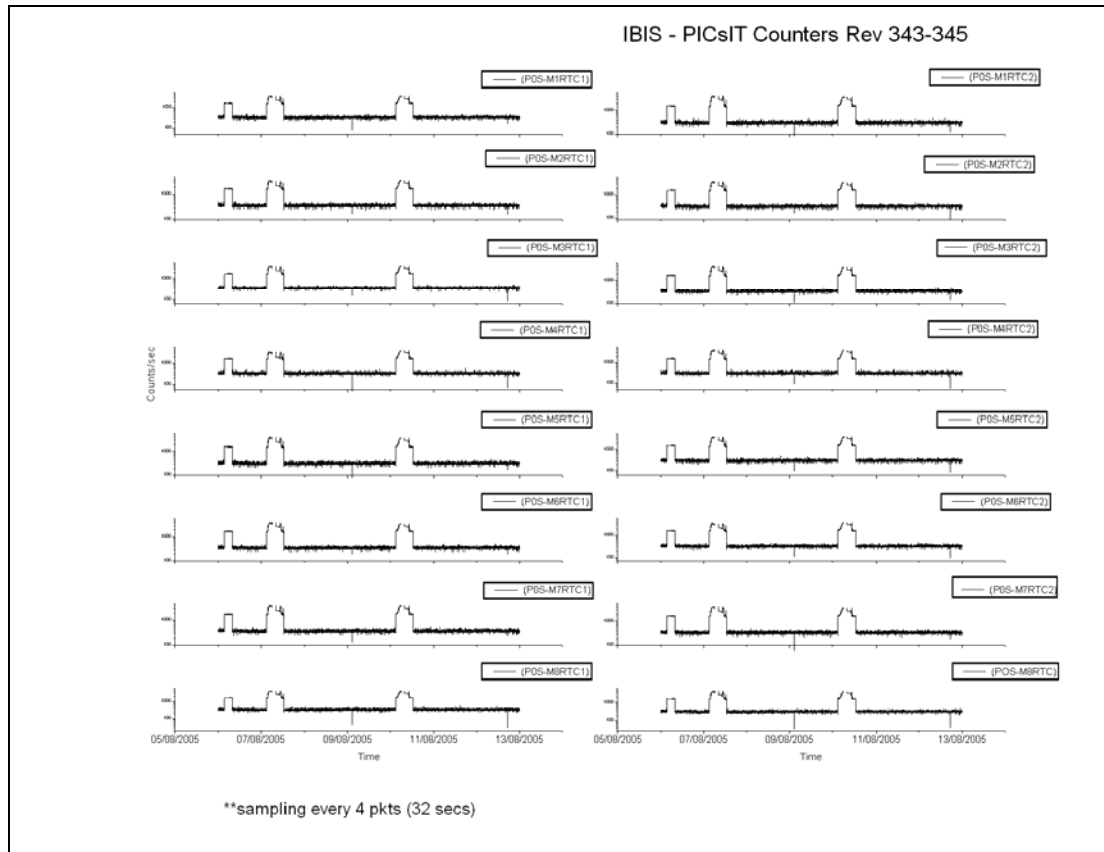


The week was characterised by low radiation.

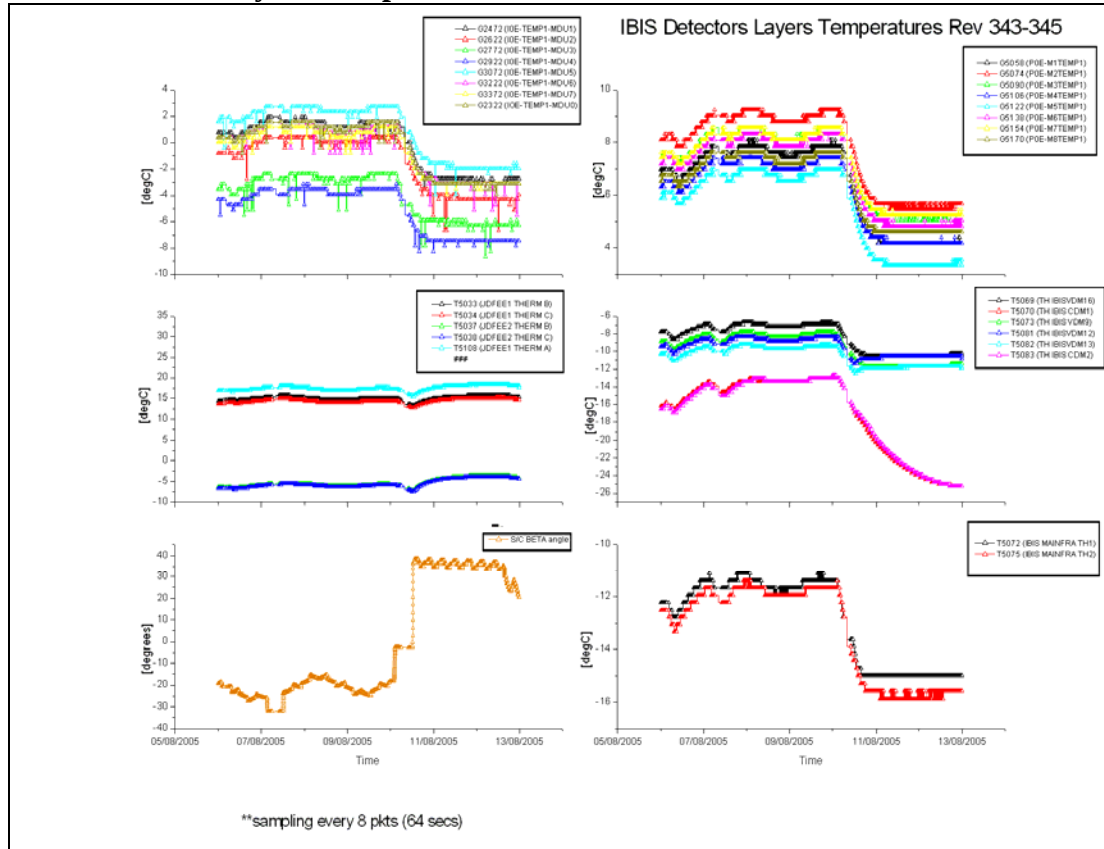
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2005.218 (06/08/2005)

From 03:25Z to 08:08Z, IBIS was set into Safe Mode due to Ground Station problem. In coincidence with this event, at 03:28Z, TM parameter G8015 (S1E-A2 PMT V) went OOL high with the value of 29.4V (= limit), and kept toggling until 08:06Z.

DoY 2005.219 (07/08/2005)

At 03:11Z, TM parameter G8015 (28V PMT set by IASW) went OOL High with the value 29.4V. It went back inside limit at 12:37Z. As this happened inside the Radiation Belts, according to V-VLT-1, no action was taken.

At 05:06Z, TM parameters G5003 (P0S-M1RTC2), G5027 (P0S-M6RTC1), G5022 (P0S-M5RTC1) and G5018 (P0S-M4RTC2) were toggling OOL High until 06:18Z. At 10:51Z TM parameter G5018 (P0S-M4RTC2) went OOL High and back. According to P-CNT-1, as this happened inside radiation belts, no action was taken.

At 12:09Z G2098 (I0E-OVFWPXADD-M7) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 2005.221 (09/08/2005)

At 02:33Z, TM families G5068 and G5072 (POS-MiF #1 and #2 ERRF) failed SCC. At 02:39Z, TM families G5002 and G5003 (POS-MiRTC #1 and #2) went OOL 'low-low'. At 02:42Z, the OEM id 132 class 0 "IBIS1 IASW HEPI RESYNCHRONISED" was reported. According to reaction P-CNT-1 that describes the coincidence of these 3 events outside Radiation Belts, no action was taken. IBIS was monitored for 15 minutes during which all the parameters returned within their limits.

DoY 2005.222 (10/08/2005)

At 02:59Z, TM parameter G8015 (28V PMT set by IASW) went OOL High with the value 29.4V until 06:05Z, and then with the value 29.54V. It went back inside limit at 12:36Z. As this happened inside the Radiation Belts, according to V-VLT-1, no action was taken.

At 05:31Z, TM parameter G5018 (P0S-M4RTC2) was toggling OOL High until 05:40Z. At 10:26Z TM parameter G5028 (P0S-M6RTC2) went OOL High and back. According to P-CNT-1, as this happened inside radiation belts, no action was taken.

At 12:27Z G2014 (I0E-OVFWPXADD-M7) failed SCC and back. According to I-OVF-1, no action was taken.

At 11:49Z due to problems with the Command Verifier Task, the Event Designator ED GEISCL03 failed release. Following the guidelines to recover IBIS ED, GEISCL03 was re-uplinked at 12:09Z. Consequently to this recovery, EDs GEBEXT01, GEBENT02 and GESTAN02 were missed as well and up-linked later. GEBEXT01 was up-linked at 12:36Z, GESTAN02 at 12:40Z and GEBENT02 at 12:52Z. IBIS was re-enabled in the timeline at 12:59Z.

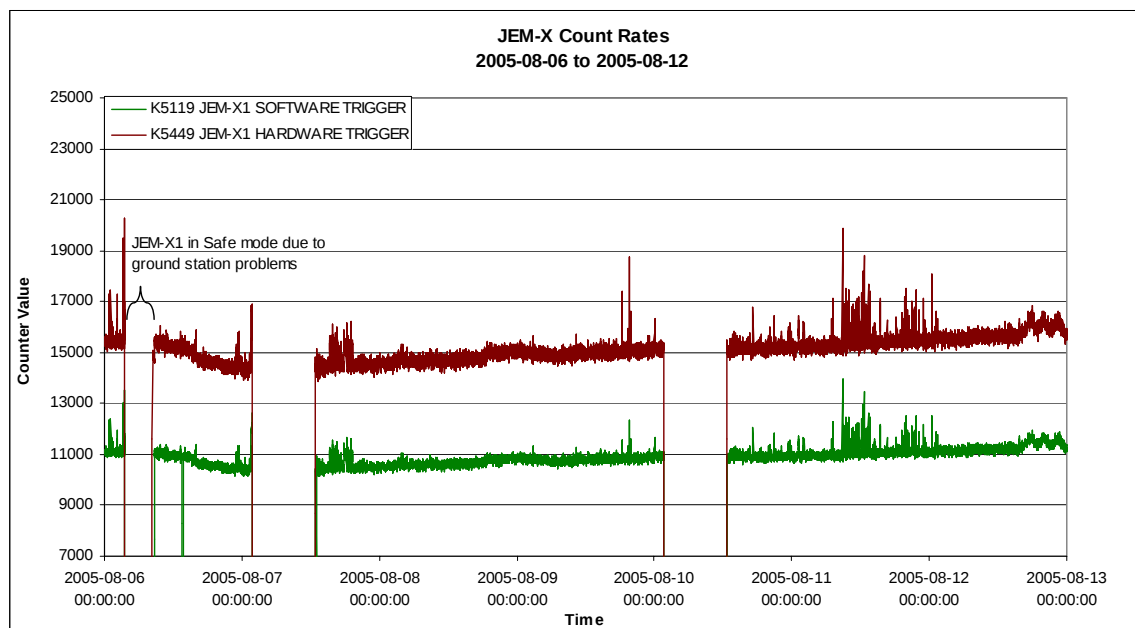
DoY 2005.224 (12/08/2005)

At 17:08Z, TM families G5068 and G5072 (POS-MiF #1 and #2 ERRF) failed SCC.
At 17:14Z, TM families G5002 and G5003 (POS-MiRTC #1 and #2) went OOL 'low-low'.
At 17:18Z, the OEM id 132 class 0 "IBIS1 IASW HEPI RESYNCHRONISED" was reported.
According to reaction P-CNT-1 that describes the coincidence of these 3 events outside Radiation Belts, no action was taken. IBIS was monitored for 15 minutes during which all the parameters returned within their limits.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

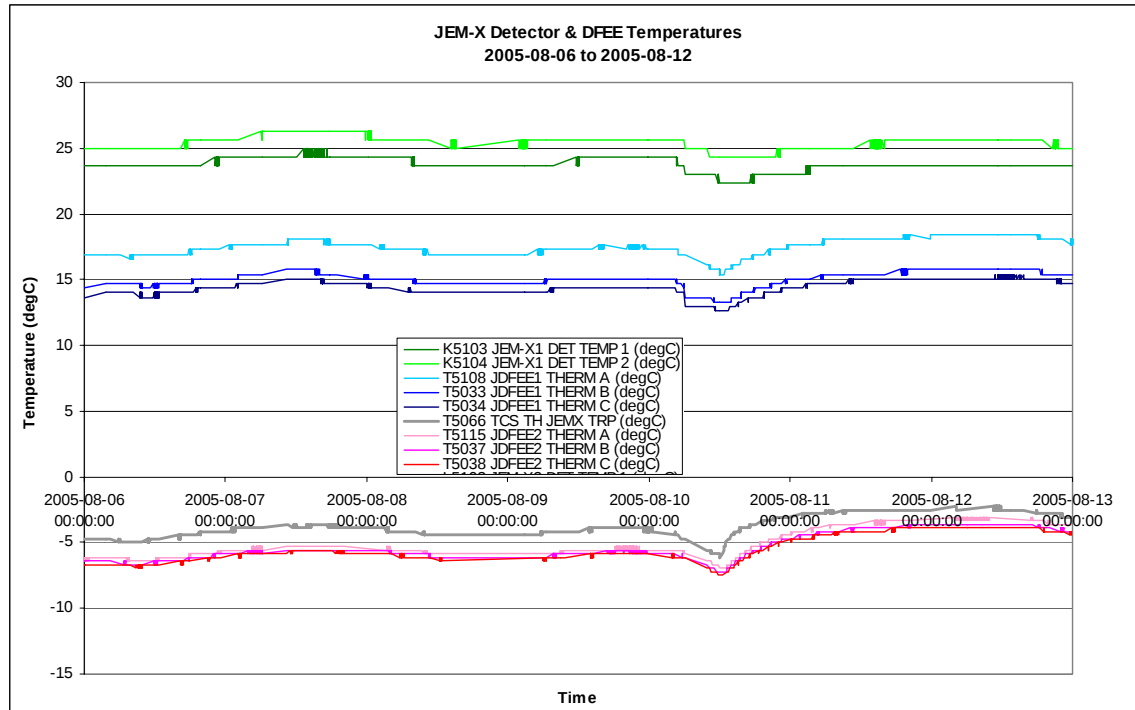
JEM-X count rates over the reporting period are displayed in the following graph¹.



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

2005-08-06 (DOY 218, Rev 343)

Between 01:05Z and 03:30Z the TM parameter K5136 BUFFER LOSS went Out of Limits High on several occasions, returning within limits after 1 or 2 TM cycles on each occurrence.

Due to an upcoming ground station outage as a result of problems with the Redu station (see Anomaly Report INT-2780), JEM-X1 was commanded to Safe mode via FCP_JEM1_0040 at 03:31:35Z and commanding to JEM-X1 from the Timeline was then disabled. Once Redu had been recovered and stable TM and TC links established, the recovery of JEM-X1 was performed as follows:

- At 08:12:56Z FCP_JEM1_0041 executed to put JEM-X1 in Setup mode
- At 08:16:12Z FCP_JEM1_1010 JEM-X1 Configuration Setting for Science Ops started
- At 08:43:15Z JEM-X1 returned to Data Taking mode via FCP_JEM1_0044 and commanding to JEM-X1 from the Timeline was then re-enabled.

At 13:24:31Z JEM-X1 was commanded to Setup mode and back to Data Taking mode at 13:42:23Z to ensure that the commanded observation parameters were the correct ones for the ongoing observation.

² Data sampled (1 frame in 8)

JEM-X1 operations then continued nominally.

2005-08-07 (DOY 219, Rev 343-344) to 2005-08-08 (DOY 220, Rev 344)

Nothing to report

2005-08-09 (DOY 221, Rev 344)

The TM parameter K5136 BUFFER LOSS went Out of Limits briefly two occasions, as follows:

- At 16:00:51Z K5136 OOL High (value = 193) for 1 TM cycle
- At 19:26:11Z K5136 OOL High (value = 366) for 1 TM cycle

2005-08-10 (DOY 222, Rev 344-345)

Nothing to report

2005-08-11 (DOY 223, Rev 345)

Between 10:43Z and 13:21Z the TM parameter K5136 BUFFER LOSS went Out of Limits High on several occasions, returning within limits after 1 or 2 TM cycles on each occurrence. In addition, spikes started to be observed on the JEM-X1 count rates from ~07:00Z onwards, as can be seen in the plot in Section 8.3.4.1 above. After consultation with the JEM-X PI, it was decided to take no action as the spikes and buffer losses were probably due to increased activity of a known hot spot and the situation would rectify itself.

2005-08-12 (DOY 224, Rev 345)

The spikes in the JEM-X1 count rates, reported above, stopped at ~01:30Z and JEM-X1 operations then continued nominally.

8.3.5 OMC Operations

2005-08-06 (DOY 218, Rev 343)

At 03:40, the TM from Vilspa dropped, interrupting pointing 03430043 after about 2427 from a scheduled 3334 seconds. Problems at Redu prevented the resumption of operations until 05:55. The impact was the interruption of that pointing plus the loss of pointings 03430044 through to 03430048.

2005-08-07 (DOY 219, Rev 344)

At 17:30, a drop in TM caused the failure of the arrival of the expected OEM for pointing 03440007, the pointing was, however, executed correctly.

2005-08-10 (DOY 222, Rev 345)

On DoY 222, at 11:46, a problem with the Command Verifier caused the loss of pointing 03450004.

2005-08-11 (DOY 223, Rev 345)

At 01:13, an OEM was received indicating the OMC lens Temperature (T5016) was outside soft limits, there was no impact.

At 20:54, an archiving problem led to the TM being interrupted, causing an AOCS command to fail release. The TM was back by 20:59. The impact was that pointing 03450035 had to be manually recovered after a 27 minute delay.

2005-08-12 (DOY 224, Rev 345)

At 15:56, due to an attitude determination problem, the commands for slew 03450054 failed release. The OMC was switched to SCIENCE at the correct time, but the attitude was incorrect, invalidating the pointing.

At 18:36, an AOCS problem caused the Timeline to be stopped. The Timeline was recovered at 19:33. The impact was the loss of pointing 03450059 and a 10 minute delay in the start of pointing 03450060. It was at this time the following commands were rejected:

2005.224.18.41.46.015	2005.224.18.41.51.503	1792	RealTime	131	TC REJECT		
REJECTED TC1			0	0	65535	PR	N
E E							
2005.224.18.41.52.265	2005.224.18.41.59.526	1792	RealTime	131	TC REJECT		
REJECTED TC1			0	0	65535	PR	N
E E							

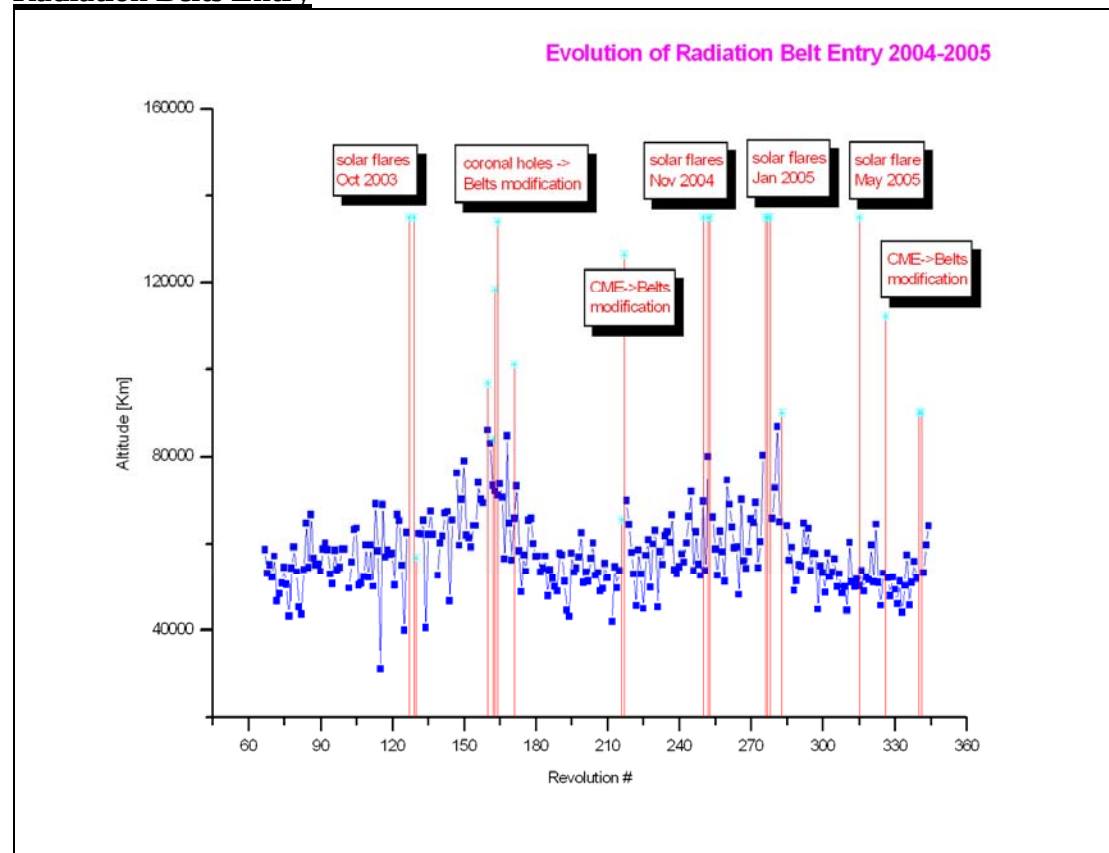
Which correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) for pointing 03450059.

On DoY 219 at 03:11:17 and DoY 222 at 02:59:01, OMC was switched by the Timeline to SAFE mode, at the nominal times.

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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]
343	RAD_ENTR R 2005-08-07T03:11:13Z	2005-08-07 03:16:45Z	59704.8	2005-08-07 04:06:11	52650
344	RAD_EXIT R 2005-08-07T12:24:44Z	2005-08-07 11:59:41Z	<<39204.0	2005-08-07 11:16:11	29364
344	RAD_ENTR R 2005-08-10T02:58:57Z	2005-08-10 02:25:33Z	64158.4	2005-08-10 03:57:56	52186
345	RAD_EXIT R 2005-08-10T12:12:36Z	2005-08-10 10:57:09Z	<<30259.5	2005-08-10 11:07:56	29874

Reference

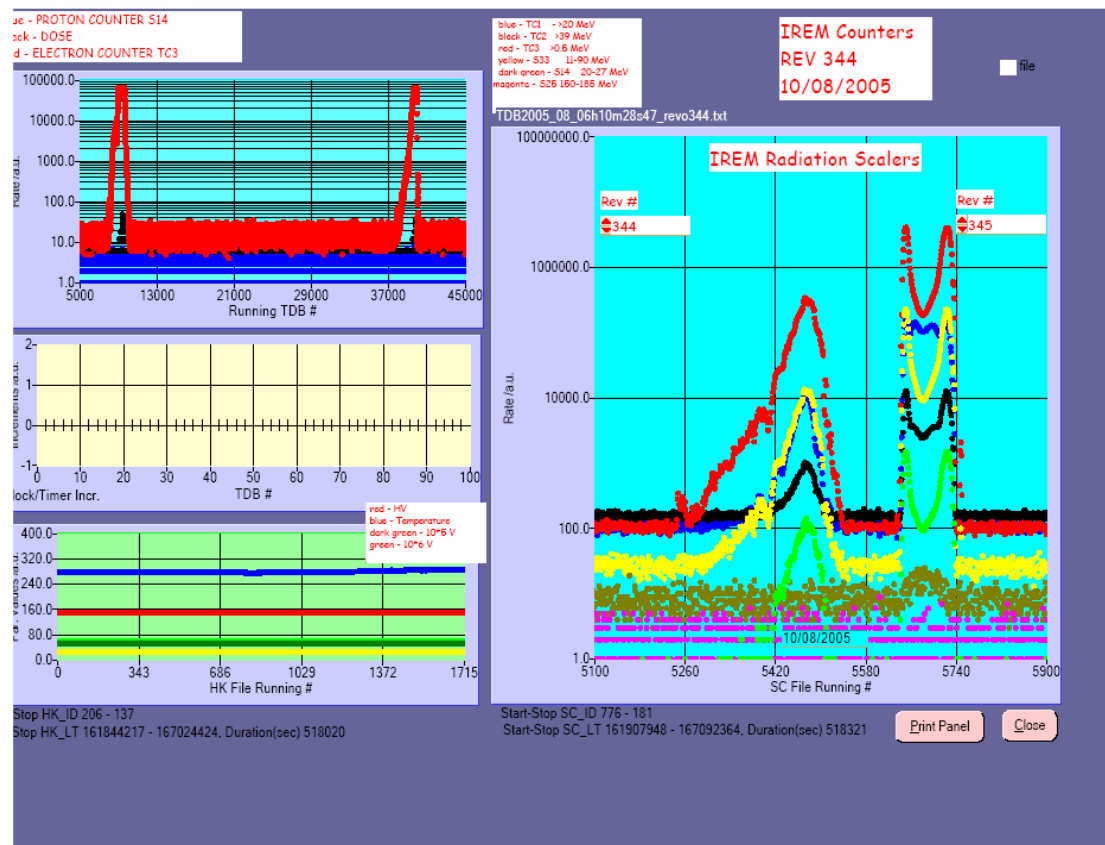
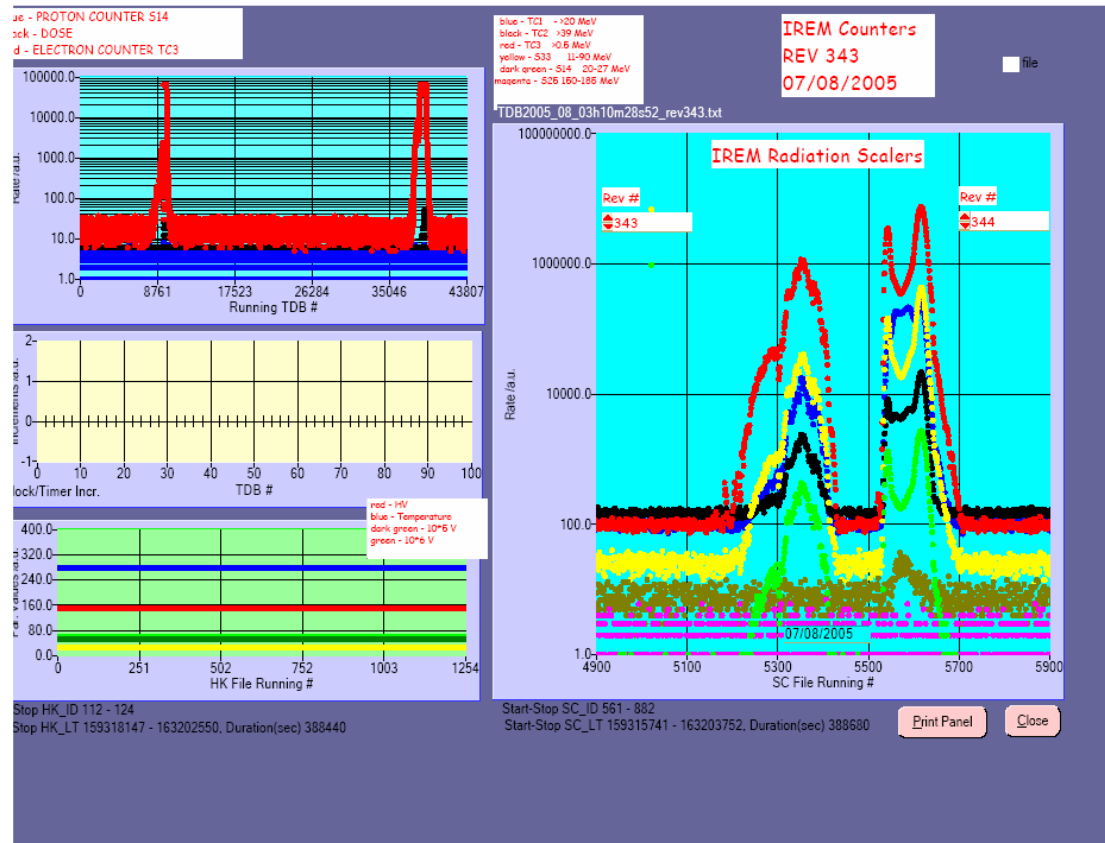
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

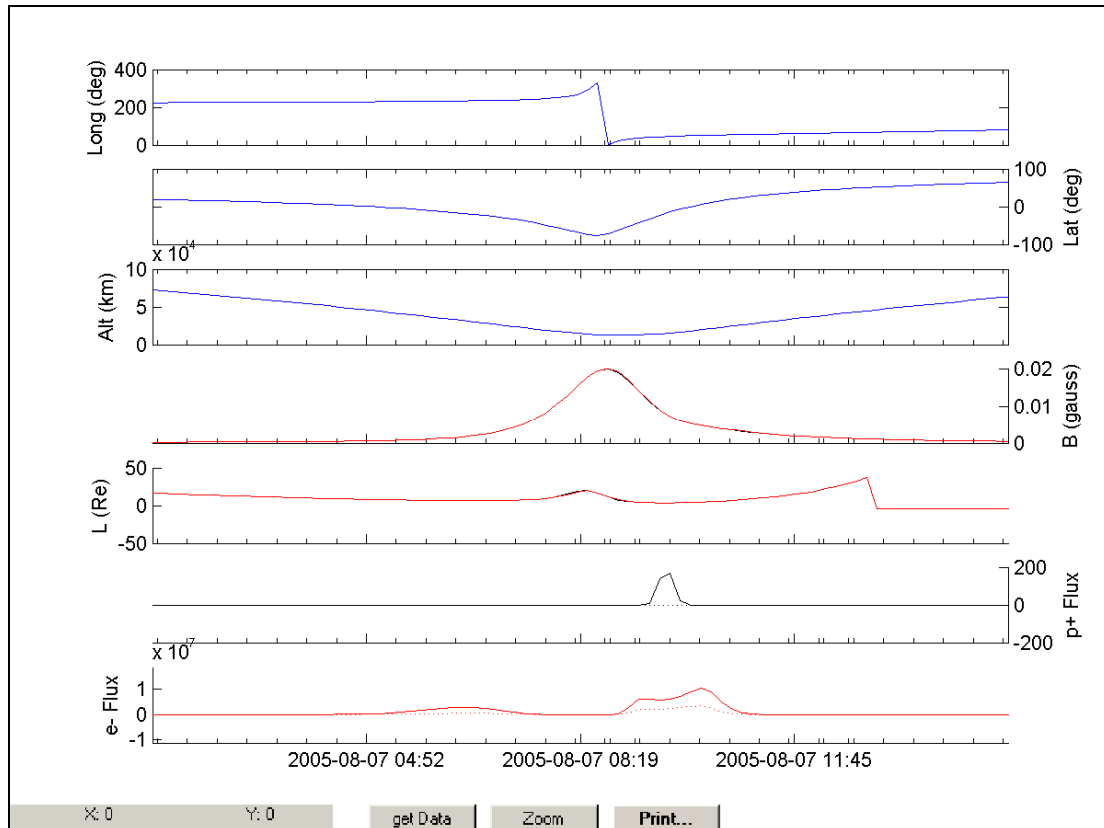
Radiation Spike

IREM radiation counters:

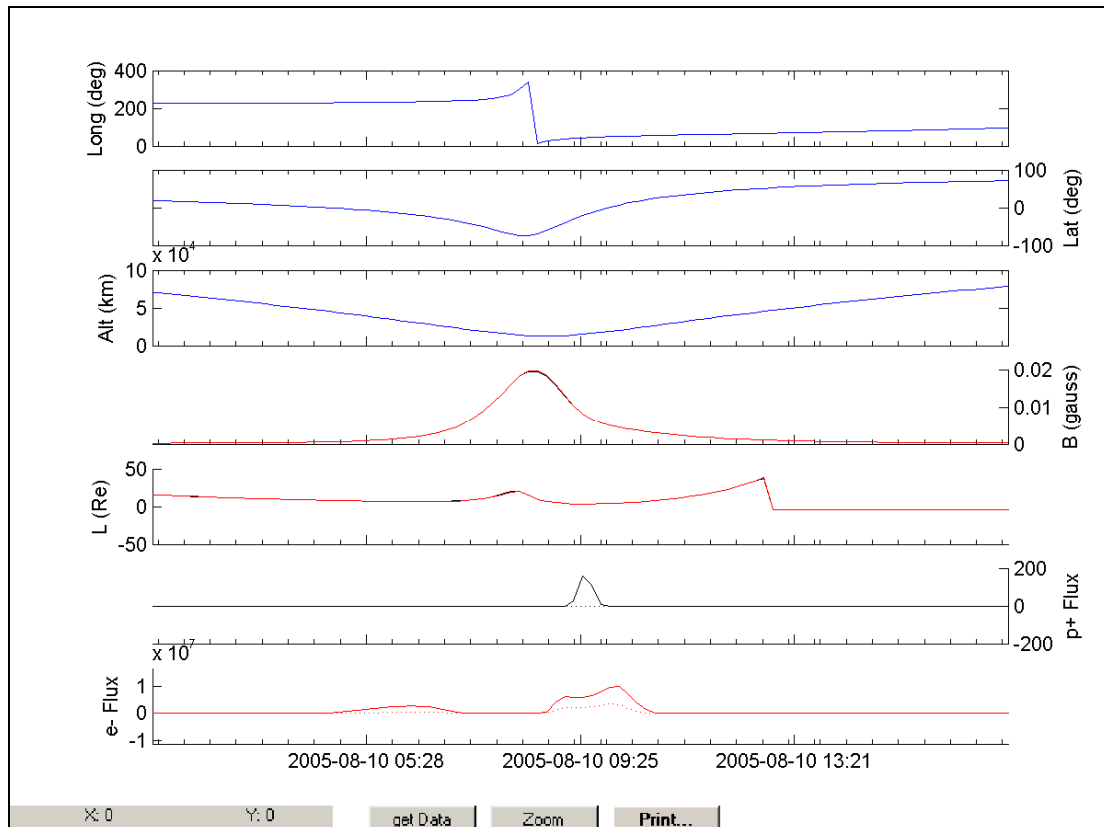


IREM Predicted Radiation Belt Passages:

Rev 343:



Rev 344:



SEC-GOES Observed Particles Fluxes:

