

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 202
Week 31
07.08.06
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 29.07.06 until 04.08.06 (both dates inclusive) and covers the revolutions 463 and 464.

2 Summary of Activities

The operations were performed according to the planning inputs from ISOC combined with some manual commanding by MOC.

The targets of these revolutions consisted of a GPS observation and of raster dithers of Field_9 (RA 03:14:20.00, DEC +17:39:13.0), of the Mid-latitude North (RA 16:18:13.65; DEC -14:13:46.6), and of Taurus-Auriga (RA 04:30:0.00; DEC +26:25:60.0).

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

2 slews were lost during the observation period, due to problem on REDU station.

The fuel consumption over the period between 27/07/2006 and 04/08/2006 was 0.1805 kg. The remaining propellant is in the order of 152.6926 Kg.

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

3.1.2 Power

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

3.1.3 Thermal

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

3.1.4 OBDH

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

3.1.5 RFS

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

3.2 Payload

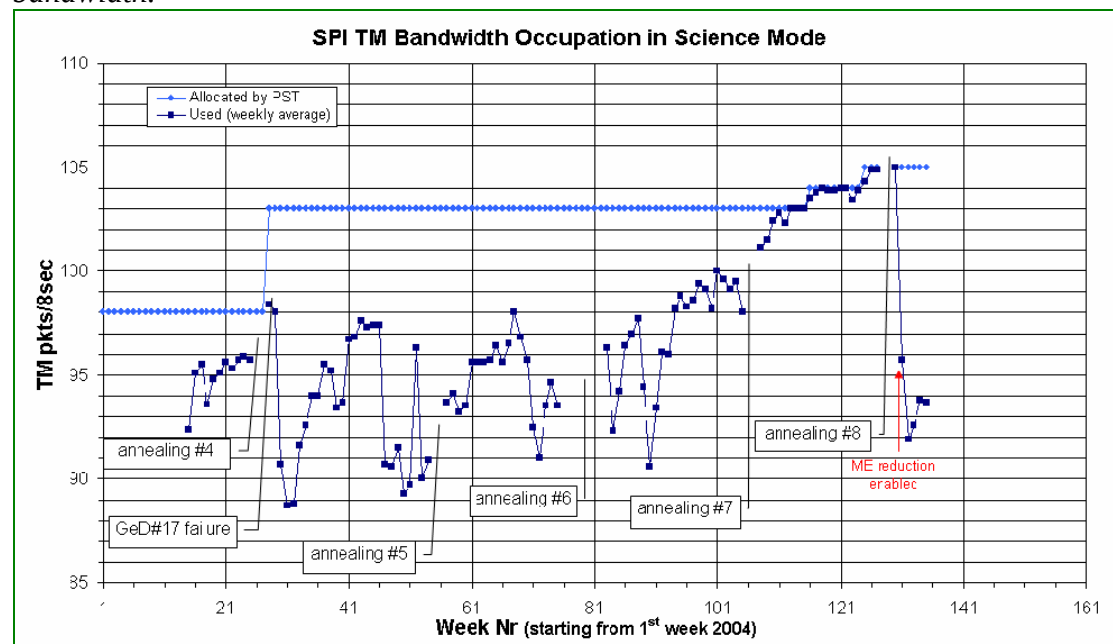
3.2.1 SPI

Following the 8th annealing, which ended on 26th June, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detectors #4 and #12 which are showing a slightly degraded energy resolution. The energy resolution of GeD#15 has been recovered with this annealing. Detector #2 is failed since 06.12.2003 and detector #17 since 17.07.2004.

The Stirling compressors are working nominally, maintaining the Germanium detectors at 82 +/-1K.

During science operations, the instrument was kept in photon-by-photon mode with spectra TM enabled. The assigned TM bandwidth in the science observation windows was 105 pkts/cycle. The average telemetry occupation was 93.7 packets/cycle.

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



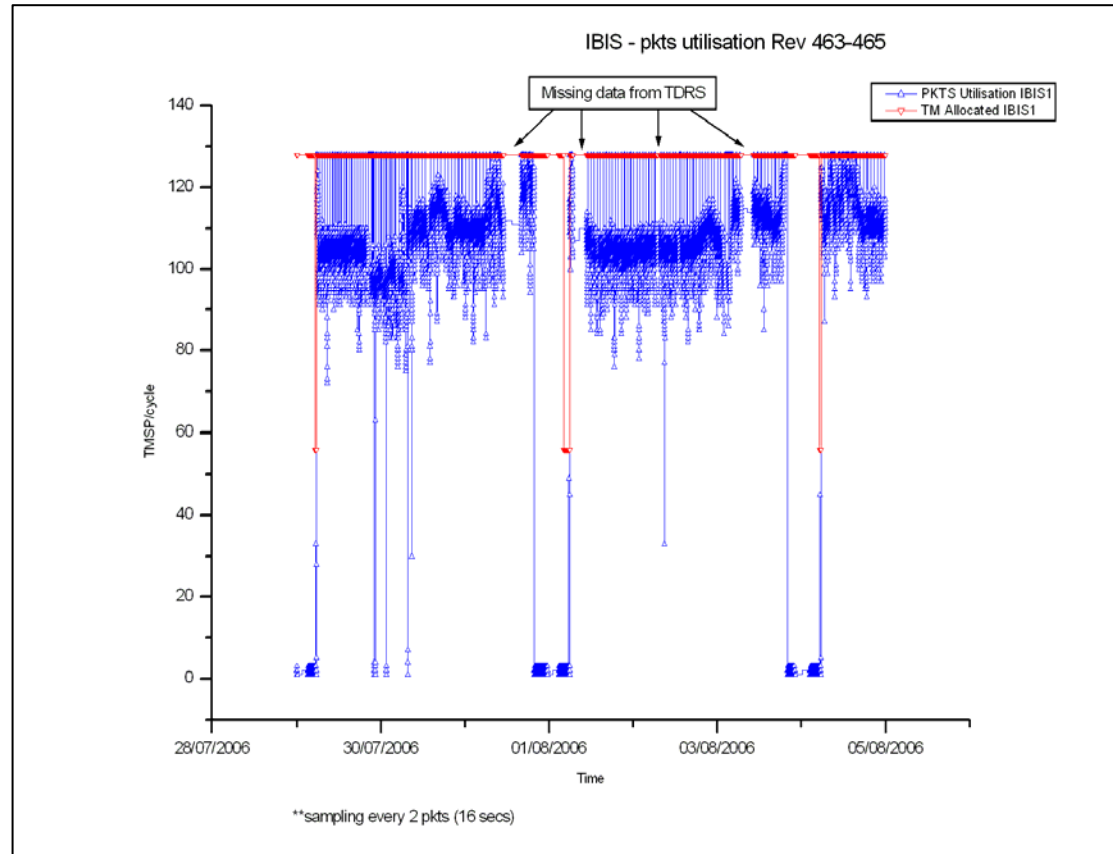
Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

The overall status of the unit is nominal.

During the reporting period, the PST allocation to IBIS was 128 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 109.45 TMPS/cycle, up 0.55 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 (DPE OFF) with no TM slots allocated.

Due to high count rates, several OOLs were received on the TM parameters K5136 BUFFER LOSS; K5449 HARDWARE TRIGGER and K5119 SOFTWARE TRIGGER during the week.

In addition, on 2006-08-04 at 14:11Z JEM-X1 transitioned to Safe mode autonomously due to the Software Trigger Limit. JEM-X1 was recovered back to Data Taking mode at 15:42Z.

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, 149 of the 151 planned science pointings for OMC were executed nominally. One pointing (4630029) was interrupted due to the execution of a CCCF and one pointing (4630068) was missed due to a brief loss of TM.

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

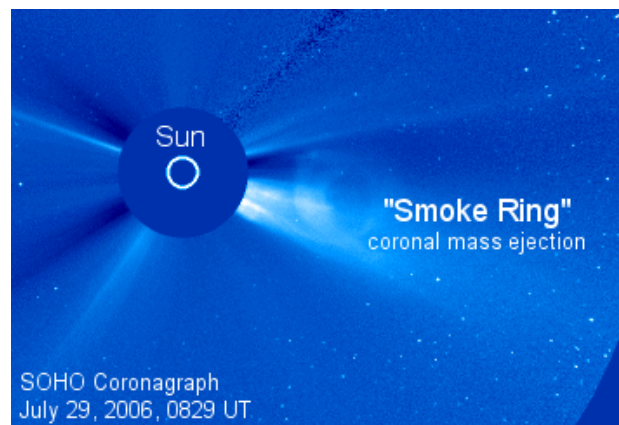
3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity.

A Coronal Mass Ejection was reported on 29/07/2006, but it had no impact as it was not directed towards Earth.



The rest of the week was very quiet. Sunspots 901 and 902 posed no threat of solar flares. At the end of the observation period, the sun was blank.

Reference: www.spaceweather.com

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

4 Ground Facilities

The Operational ground facilities performance was very good this week, with 1 pointing lost due to ground problems. The overall performance was nearly 100% requirement.

4.1 Mission Operations Centre

The performance of the MOC was very good this week. However few problems with the INTEGRAL Mission control System were reported and impacted the commanding activities from the timeline. 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, however, a few occasions of bad frames and brief link drops with Redu and DSS-27. The overall performance though was nearly 100%.

Besides, on 2006-07-31 between 11:10Z and 16:10Z, on 2006-08-01 between 06:55Z and 10:45Z, on 2006-08-02 between 07:10Z and 07:50Z, and on 2006-08-03 between 07:00Z and 10:30Z, Ground Station tests were successfully performed with Weilheim (ESA G/S) from the INTEGRAL NCTRS-B.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF up to revolution 473 have been received. Mission planning was done up to revolution 472. No replanning took place but there is a significant chance a TOO will be triggered on EXO 2030+375 in the first revolutions of AO-4 (rev. 469ff) as the source is still bright.

2. Observation status

ECS have been received and processed up to revolution 454.

3. ISOC science data archive

The ISDA Visualisation Tool prototype can read and display simple light curves and various energies. A demo to ISOC scientists is planned for 11 August. The initial analysis of SCREW's marked for inclusion in ISDA 2.6 is underway. The copying of data from ISDC is seriously delayed by INGEST problems. The priority task for the archive scientist next week is to fix this.

4. ISOC system

Version 12.6 of the ISOC system has been thoroughly tested and remaining issues have been fixed. The installation on the operational system is slated for Monday, 07 August.

5. AO 4

The observers of TOO proposals have been informed about the details of the TOO and dataright strategies.

6 Extra AO for AO 5 Key programme

No news.

7. Problems

No new problems, but continuing problems in ingesting data from ISDC.

4.3.2 ISDC

Status of ISDC observation processing on 07/08/2006:

- Latest Standard Analysis completed: observation 03700020001 (4U 0142+61, Revolution 454) on 05/08/2006.
- Latest products archived: observation 03201080011 (Field_11, Revolution 452-453) on 06/08/2006.
- Latest observation products sent to the observer: observation 03201090063 (Galactic Bulge, Revolution 426) on 01/06/2006.

5 Special Events

From revolution 464 onwards, the Belts Entry and Exit altitudes have been changed according to corresponding INTGSCCR-85:

- belts exit altitude from 40000KM to 45000KM,
- belts entry altitude from 60000KM to 56000KM.

Accordingly the Belts Entry and Exit times in the broadcast packet have been changed.

6 Anomalies

The following problems impacted operations this week:

- On DoY 210 (29/07/2006), at 22:10Z, the Command Verifier crashed. Consequently several commanding activities were missed from the timeline. Slew #0025 was manually updated, and all missed TC were manually uplinked. The recovery was completed at 22:38Z.
- On DoY 212 (31/07/2006) at 14:11Z due to a drop in links, the commanding of slew #0068 from the timeline failed. It was hence manually updated.
- On DoY 215 (03/08/2006) at 21:49Z due to a drop in links, the commanding of slew #0073 from the timeline failed. It was hence manually updated.

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

AR id	Date Created	Subject	Segment	Status
INT-2868	2006-07-26	TM VC7 Onl-COM Link from Redu in "BLOCKED" mode on intra	IMCS	Pending
INT-2869	2006-07-28	IMCS: no limits edit possible for parameter type (6,1) with FIX check	IMCS	Open

7 Future Milestones

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 463

The observations in revolution 463 consisted of a raster dithering observation of Field_9 (RA 03:14:20.00; DEC +17:39:13.0) lasting ~14.5 hours followed by a GPS observation lasting ~9 hours. A raster dithering observation of the Mid-latitude North (RA 16:18:13.65; DEC -14:13:46.6) was then performed for the remaining ~35 hours of observation time.

Revolution 464

The observations in revolution 464 consisted of a raster dithering observation of Taurus-Auriga (RA 04:30:0.00; DEC +26:25:60.0) lasting ~44 hours followed by a raster dithering observation of the Mid-latitude North (RA 16:18:13.65; DEC -14:13:46.6), performed for the remaining ~15 hours of observation time.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 for which the DPE was OFF. The TM allocation was IBIS 128; SPI 105; JEM-X1 8; JEM-X2 0; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2006-07-21T14:50:13.000Z	153.0321	F	Automatic TM processing.
2006-07-22T21:03:54.000Z	152.9929	F	Automatic TM processing.
2006-07-23T00:07:46.000Z	152.9747	F	Automatic TM processing.
2006-07-23T04:14:50.000Z	152.9556	F	Automatic TM processing.
2006-07-23T19:33:16.000Z	152.9396	F	Automatic TM processing.
2006-07-24T14:57:02.000Z	152.9342	F	Automatic TM processing.
2006-07-25T20:51:37.000Z	152.9143	F	Automatic TM processing.
2006-07-25T23:49:54.000Z	152.9056	F	Automatic TM processing.
2006-07-26T03:59:46.000Z	152.8887	F	Automatic TM processing.
2006-07-27T14:07:42.000Z	152.8731	F	Automatic TM processing.
2006-07-29T20:32:19.000Z	152.8213	F	Automatic TM processing.
2006-07-31T23:12:33.000Z	152.7870	F	Automatic TM processing.
2006-08-02T13:30:04.000Z	152.7278	F	Automatic TM processing.
2006-08-03T03:47:18.000Z	152.7045	F	Automatic TM processing.
2006-08-04T03:09:44.000Z	152.6926	F	Automatic TM processing.

This report was generated Fri Aug 4 08:00:37 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, 29/07/2006 – 04/08/2006

AOCS operations were executed from the Automatic Timeline.

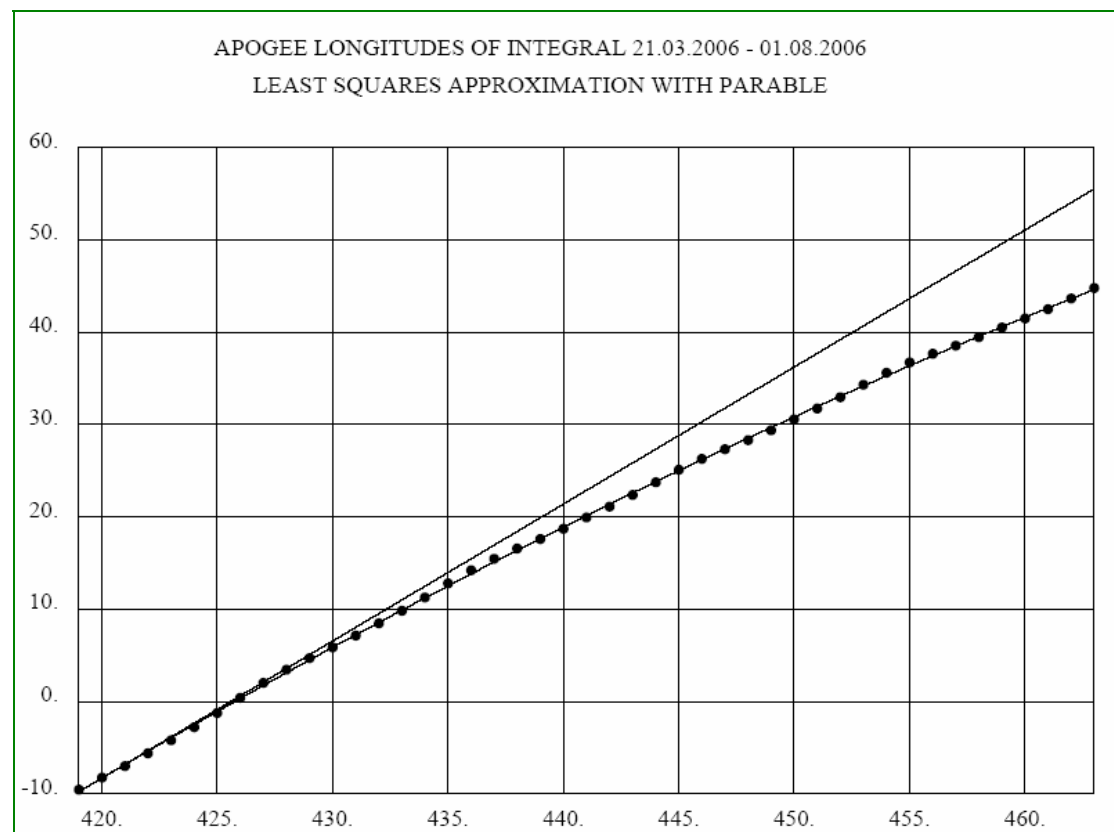
During this period, 90 Open Loop Slews, 77 Closed Loop Slews and 5 Momentum Biases were executed.

2 slews were lost during the observation period, due to problem on REDU station (power brake and drop on TM link).

This is equivalent to a ~ 1.1 % of the total number of slews planned (167).

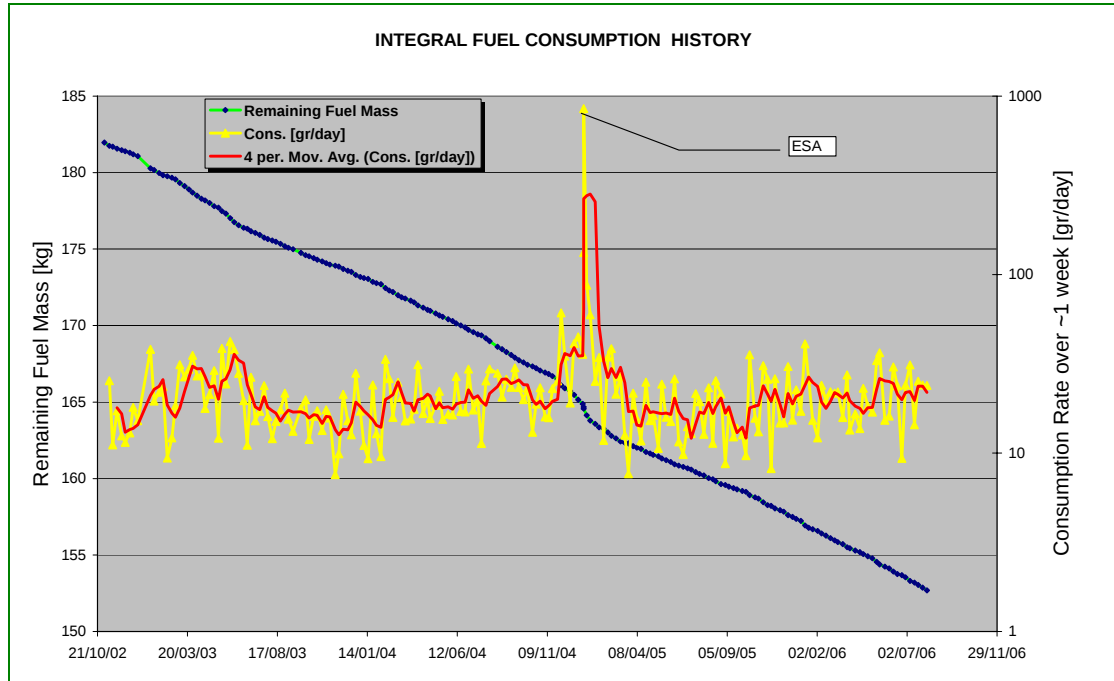
Orbit Control

The attached plot shows the apogee longitude of Integral as a function of the orbit number. From the approximation of the apogee longitudes with a parabola, the average semi-major axis increase, due to momentum dumping manoeuvres, is estimated to have been 596 m per orbital revolution.

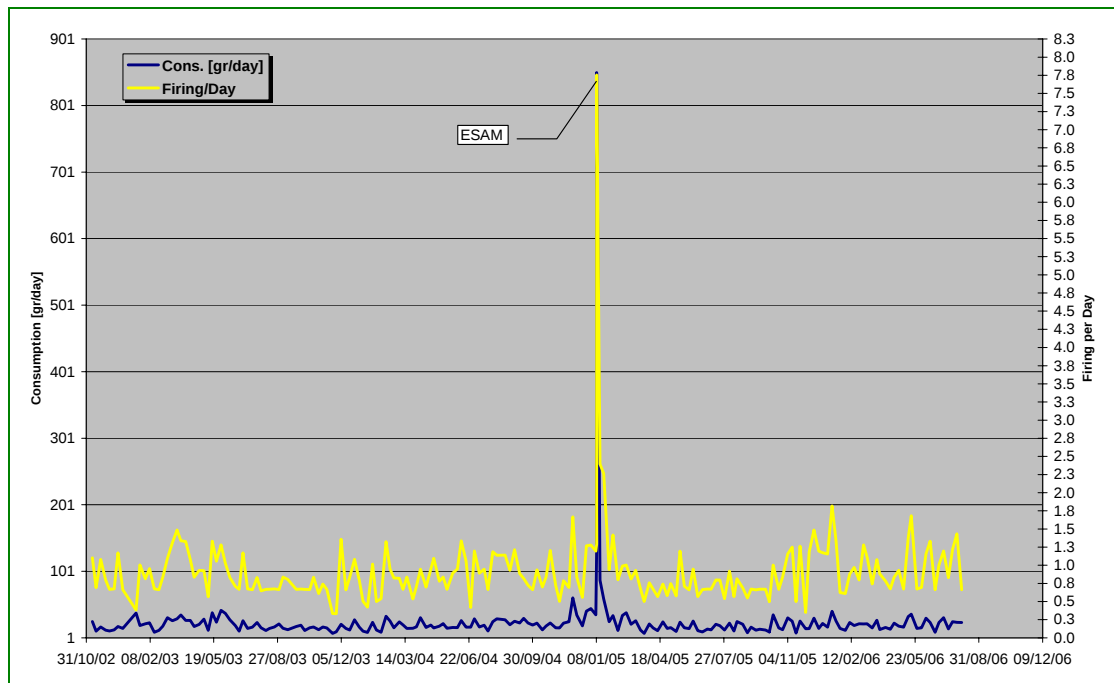


Fuel consumption

The fuel consumption (total, grams/day) over the period between 01/11/2002 and 04/08/2006 is reported in the plot below.

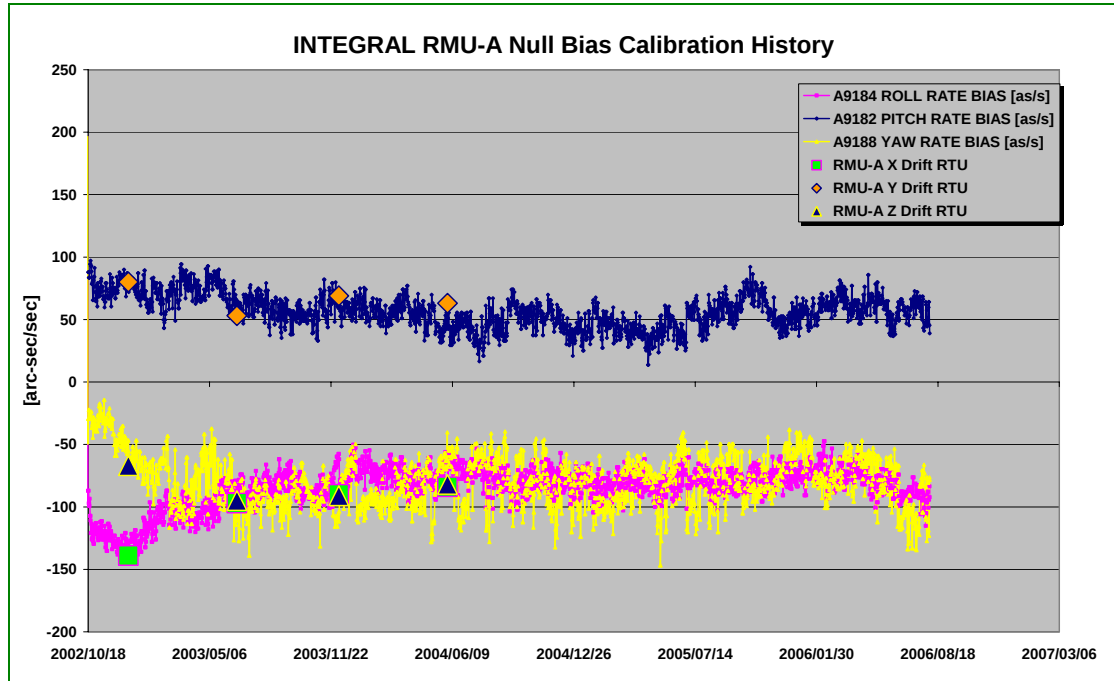


The firing\day over the period between 01/11/2002 and 04/08/2006 is reported in the plot below.

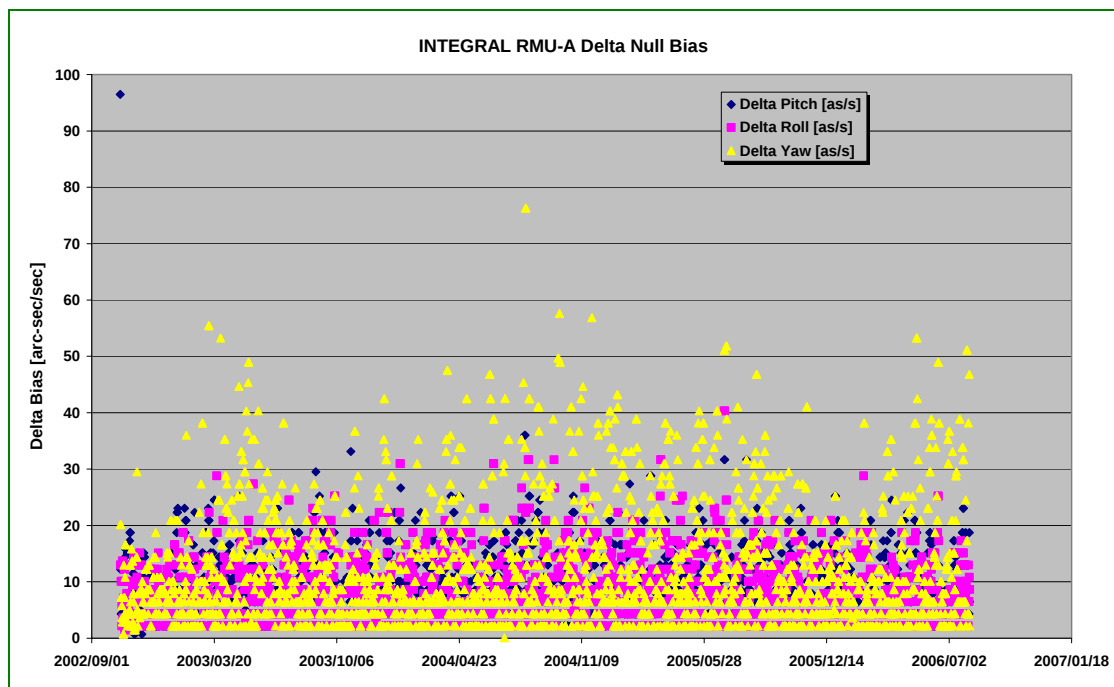


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 04/08/2006 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 04/08/2006 is reported in the plot below.



29/07/06 (Day of Year 210, Revolution 462-463)

Problem on IMCS Command Verifier: at 22:10z due to a problem on the IMCS Command Verifier Task, the mapping after slew 04630024 was not successful.

A recovery was then started at 22:22z and the next slew in TL (04630025) manually updated.

No impact reported on TL.

30/07/06 (Day of Year 211, Revolution 463)

ACC Pitch Error: at 06:11 due to an accumulated error on pitch angle after OSL 04630035.

The OTF for the PID 04630035 was not reached.

ACC STR threshold exceeded: at 08:49:04z the STR SEU threshold was exceeded, during the execution of OSL ID 04630039. Because the maneuver timer was still running (416 sec left) no IMU was activated.

No recovery was performed. No impact reported on TL.

31/07/06 (Day of Year 212, Revolution 463)

Problem on TM link at REDU station: at 14:10z due to a problem on the TM link with REDU station (see AR INT-2868), the sequence for slew ID 04630068 failed release.

A manual recovery was then started at 14:30z, from attitude of PID 04630067 to the attitude of PID 04630068. The next slew in TL (04630069) was manually updated at 14:48z.

The following slew was not executed from TL: ID 04630068 (OSL).

Limited divergence for Wheel 3 speed value: at 22:04z was reported for short time a limited divergence (~67 rpm) on wheel 3 speed wrt the prediction, that caused the exceeding of the relevant soft limit while in pointing.

No impact on TL.

01/08/06 (Day of Year 213, Revolution 463-464)

FDS failed update of slew: at 07:10z the FDS failed the planned update of slew 04640006. The reason is likely an unexpected drop on TM link on NCTRS-A when disconnecting the VC-0 link on NCTRS-B for the parallel test with Weilheim station.

A manual recovery was then started at 07:12z and the next slew in TL (04640006) was manually updated at 07:26z.

No impact on TL.

02/08/06 (Day of Year 214, Revolution 464)

Nothing to report.

03/08/06 (Day of Year 215, Revolution 464)

Drop in TM link on REDU station: at 21:49z due to a problem on the REDU station, the CSL ID 04640073 failed release.

A recovery was then started at 22:05z, from attitude of PID 04640072 to the attitude of PID 04640073. The next CGS in TL was not updated, after consultation with AOCS SOE and FD on-call, due to continuous drops on TM links with DSS 27 station, after handover REDU-DSS 27. It was decided therefore to end the revolution with no further recovery of the AOCS s/s

The following slew was not executed from TL: ID 04640073 (OSL).

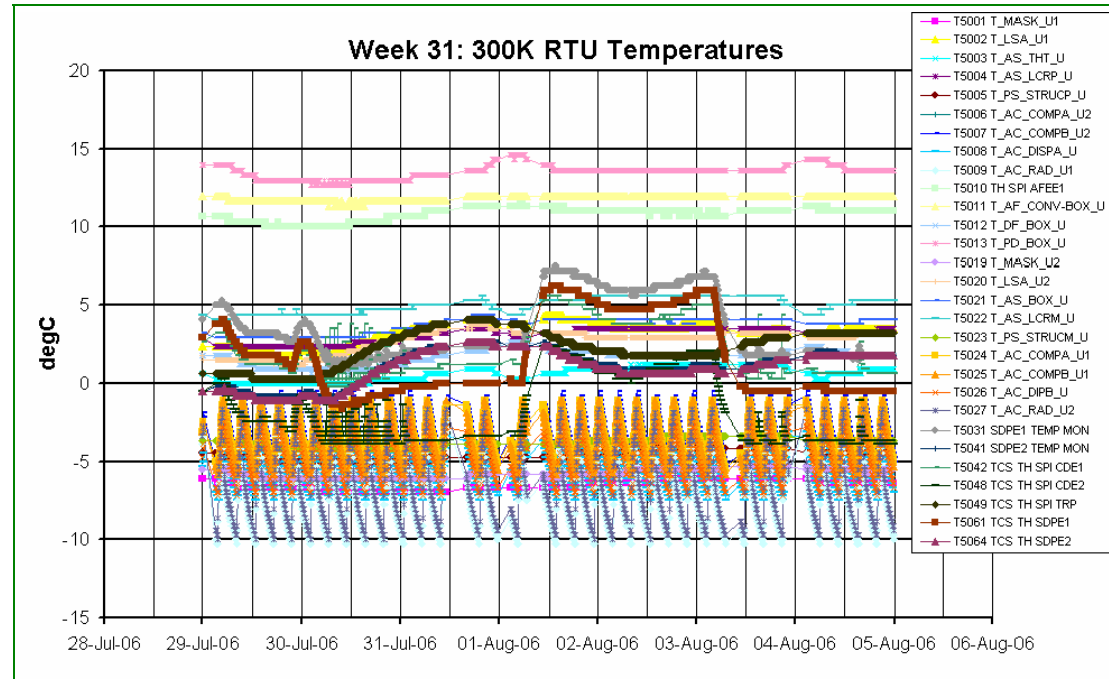
The last CGS of the revolution 464, as planned in TL, was not executed.

04/08/06 (Day of Year 216, Revolution 464-465)

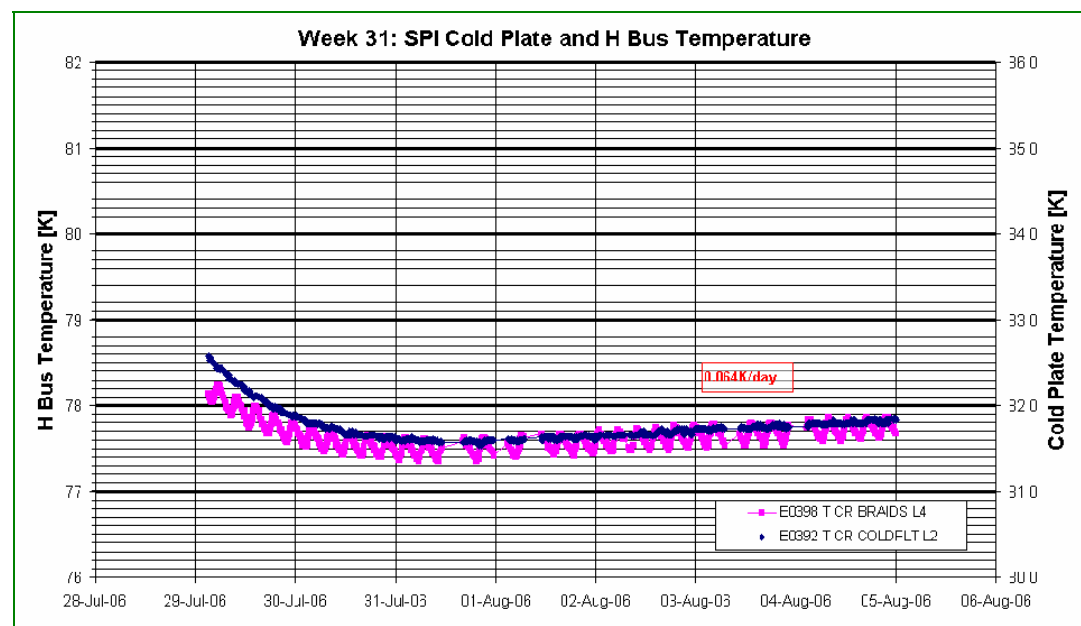
Nothing to report.

8.3.2 SPI Operations

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



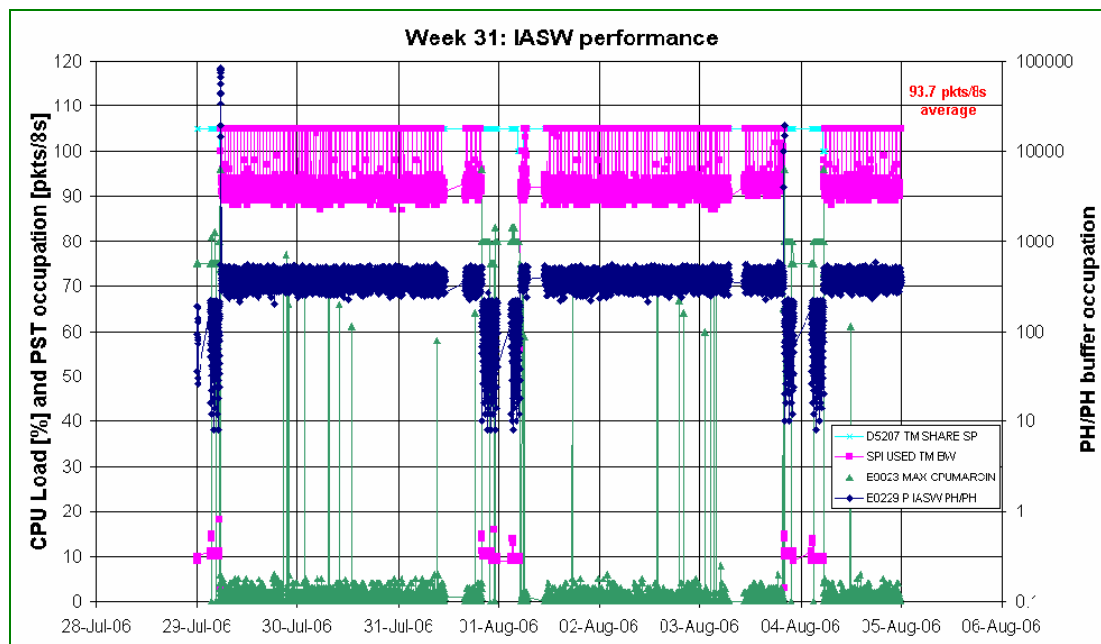
Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range to 82K +/-1K. Towards the end of the week, the temperature drift was positive with a rate of 0.064deg/day. The following plot shows the evolution of the cold plate and H bus temperatures during the reporting period.



DPE & IASW: The DPE health and IASW performance is nominal. The current IASW version installed is 432.

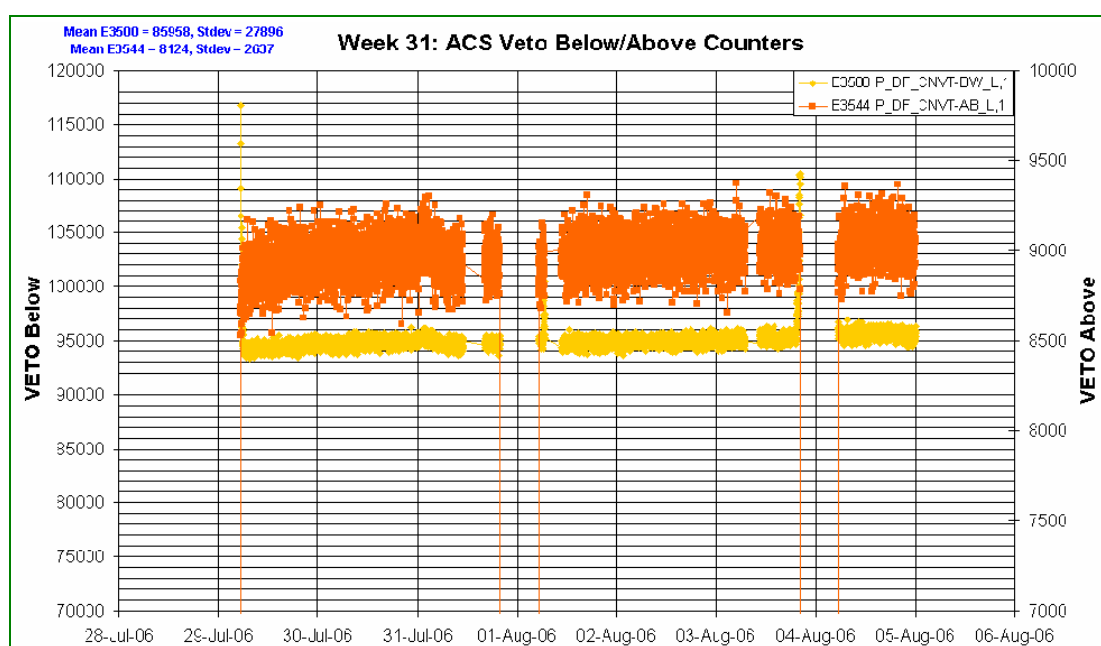
The average TM bandwidth occupation of SPI is 93.7 packets/cycle over the science window.

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



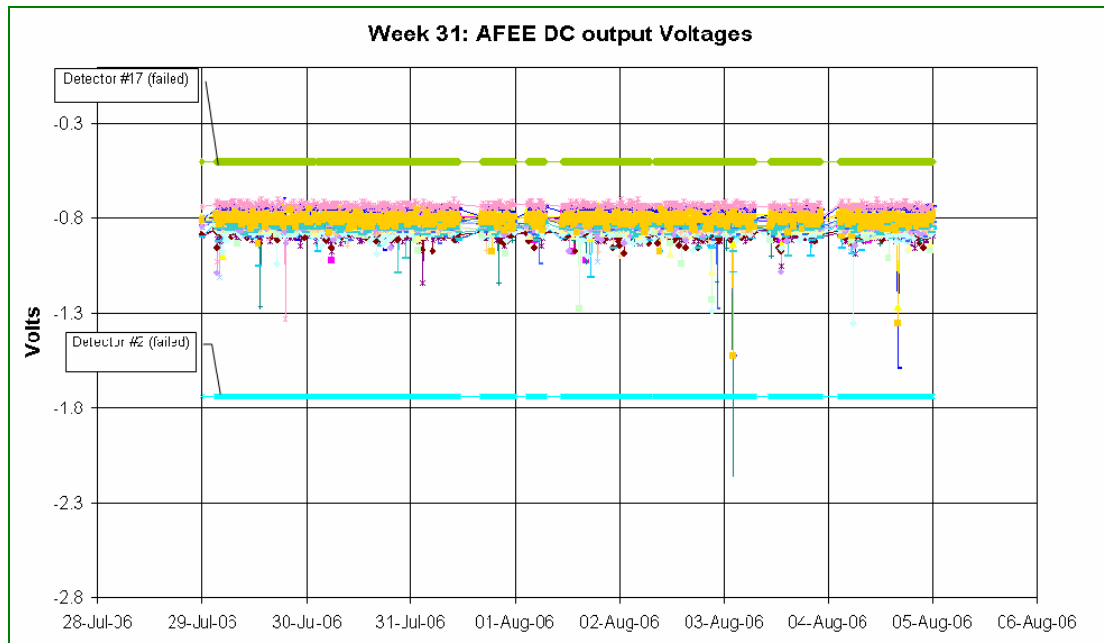
ACS: The performance of the ACS is nominal.

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

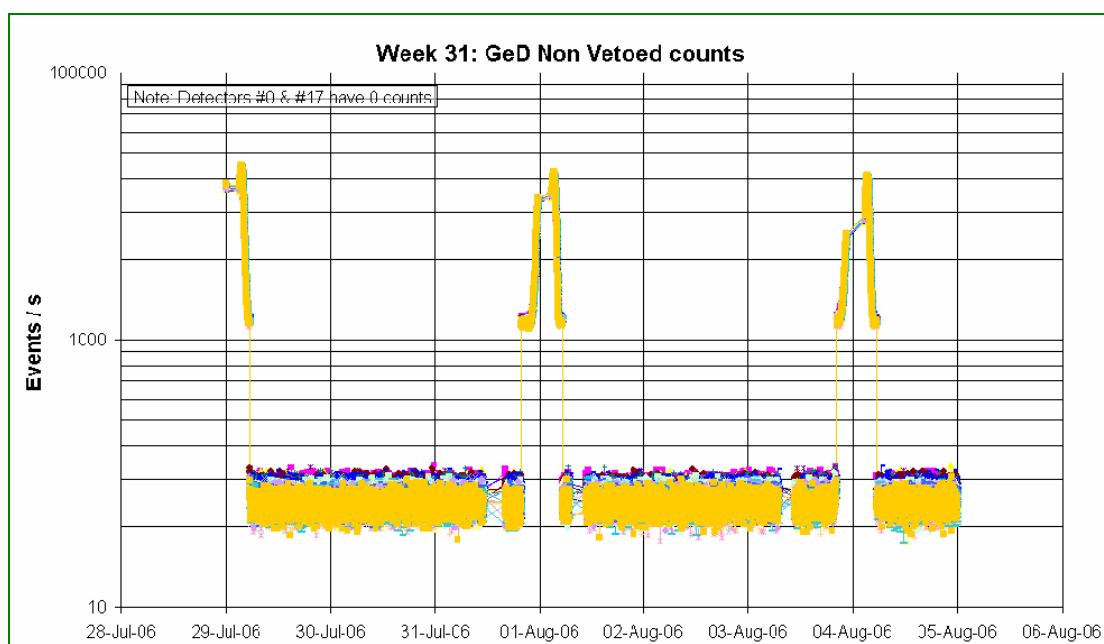


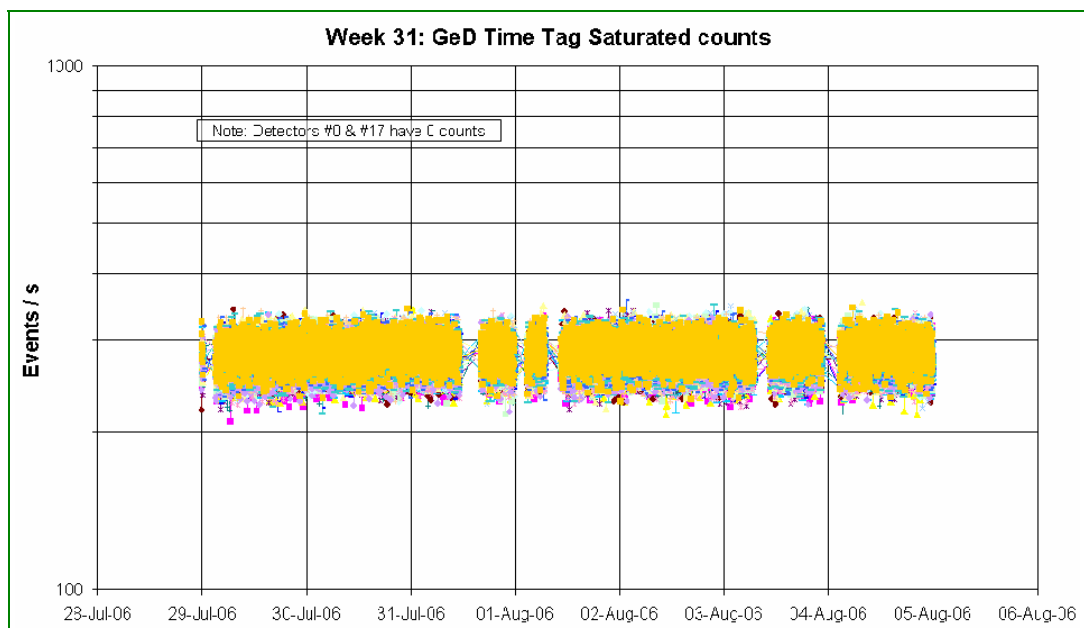
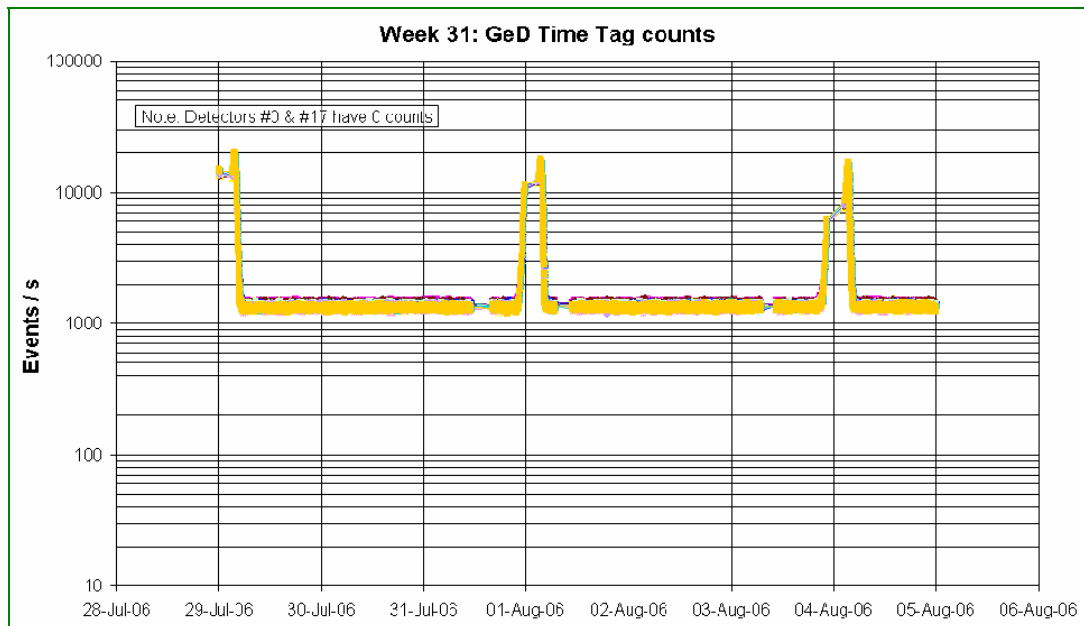
AFEE: The health of the AFEE is nominal. The performance of the AFEE and the detectors is nominal, except for the Ge detectors #4 and #12 which are showing a slightly degraded energy resolution. The energy resolution of GeD#15 was recovered with this annealing.

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

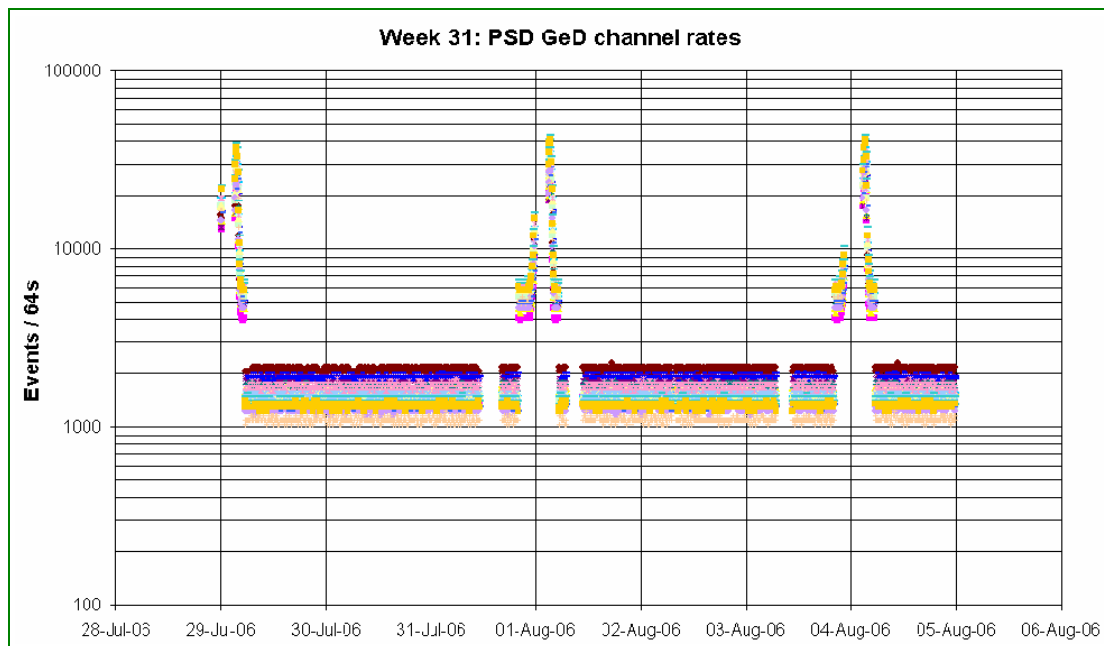


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period.





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



Event Log:

The following non-nominal OOLs were received from SPI during the reporting period:

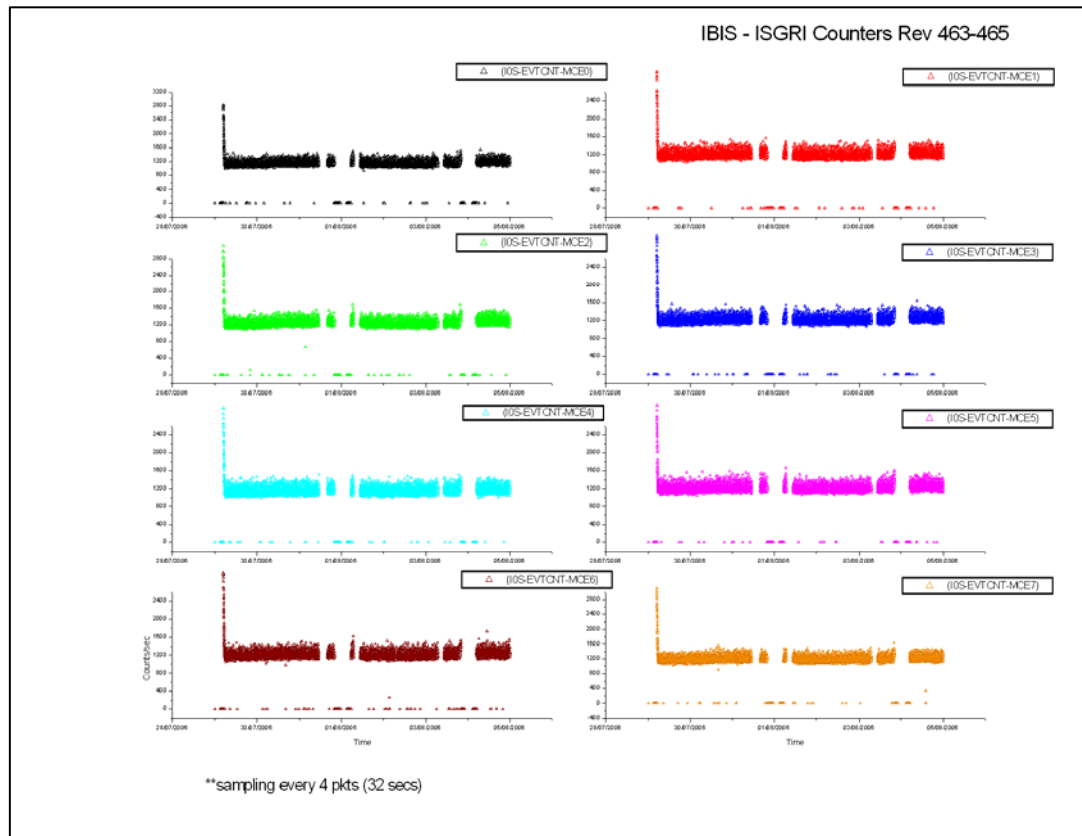
- On 2006-07-31 at 07:20:19Z TM parameter E2337 went OOL Low (value = PARAM > SPEC). This is the ACS FEE analogue status 5 V #87. It returned within limits when the next packet was received at 07:30:59Z.
- On 2006-07-31 at 12:29:39Z TM parameter E3241 went OOL Low (value = NO EXIST VAL). This is the ACS FEE temperature status #77. It returned within limits when the next packet was received at 12:40:19Z.
- On 2006-08-01 at 13:12:19Z TM parameter E2014 went OOL Low (value = PARAM > SPEC). This is the ACS FEE HV status #12. It returned within limits when the next packet was received at 13:22:59Z.

8.3.3 IBIS Operations

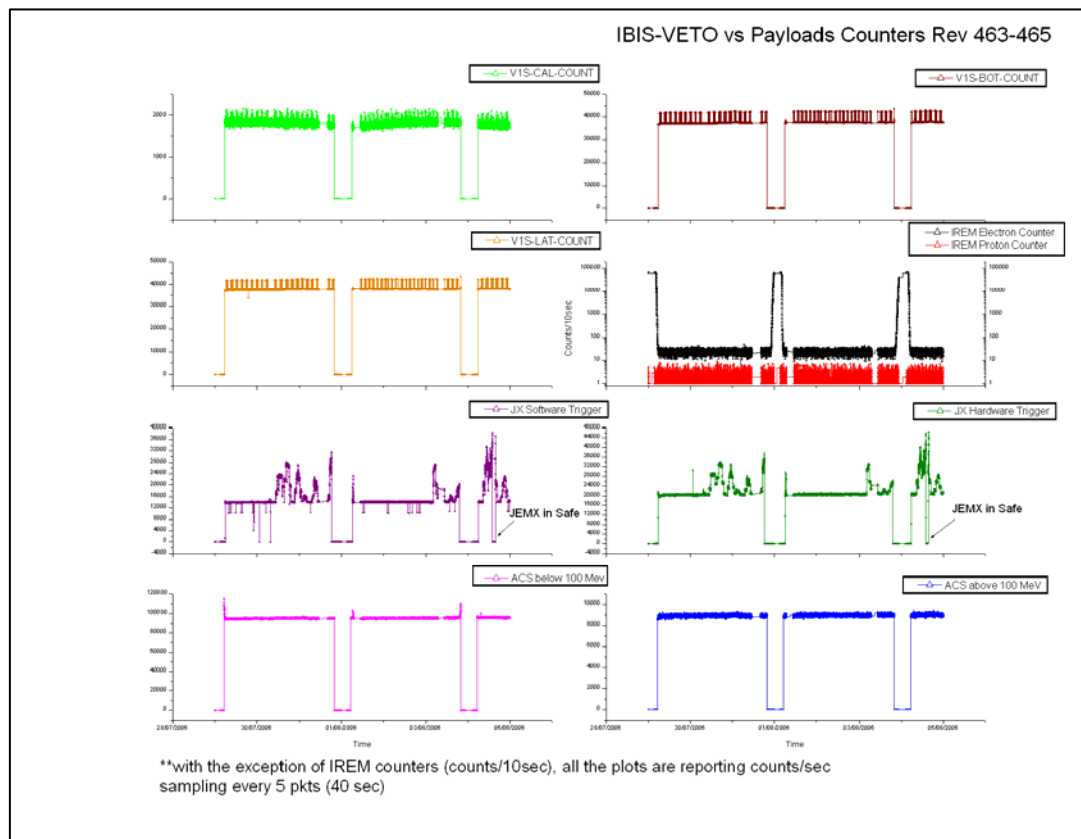
IBIS Event Counters Plots

Due to Ground Station test (Weilheim) on NCTRS-B, gaps are reported on TDRS data on 2006-07-31 between 11:10Z and 16:10Z, on 2006-08-01 between 06:55Z and 10:45Z, on 2006-08-02 between 07:10Z and 07:50Z, and on 2006-08-03 between 07:00Z and 10:30Z.

ISGRI Counters:

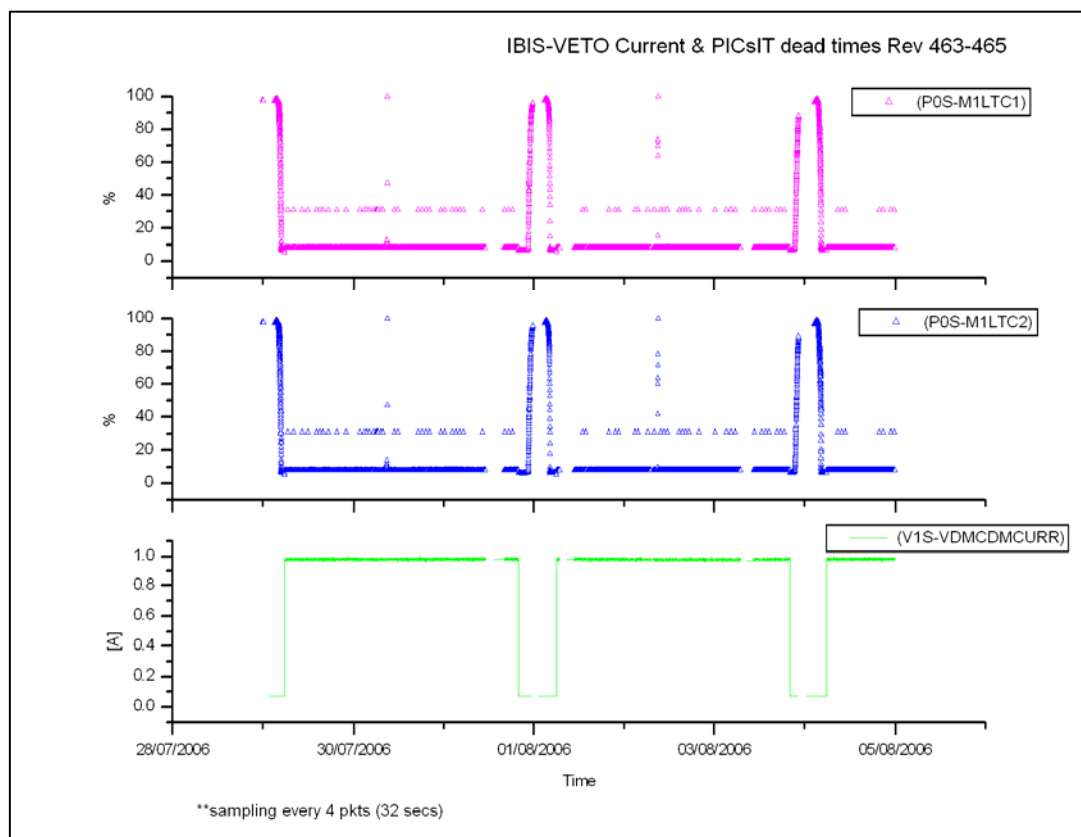


VETO vs Payloads Counters:

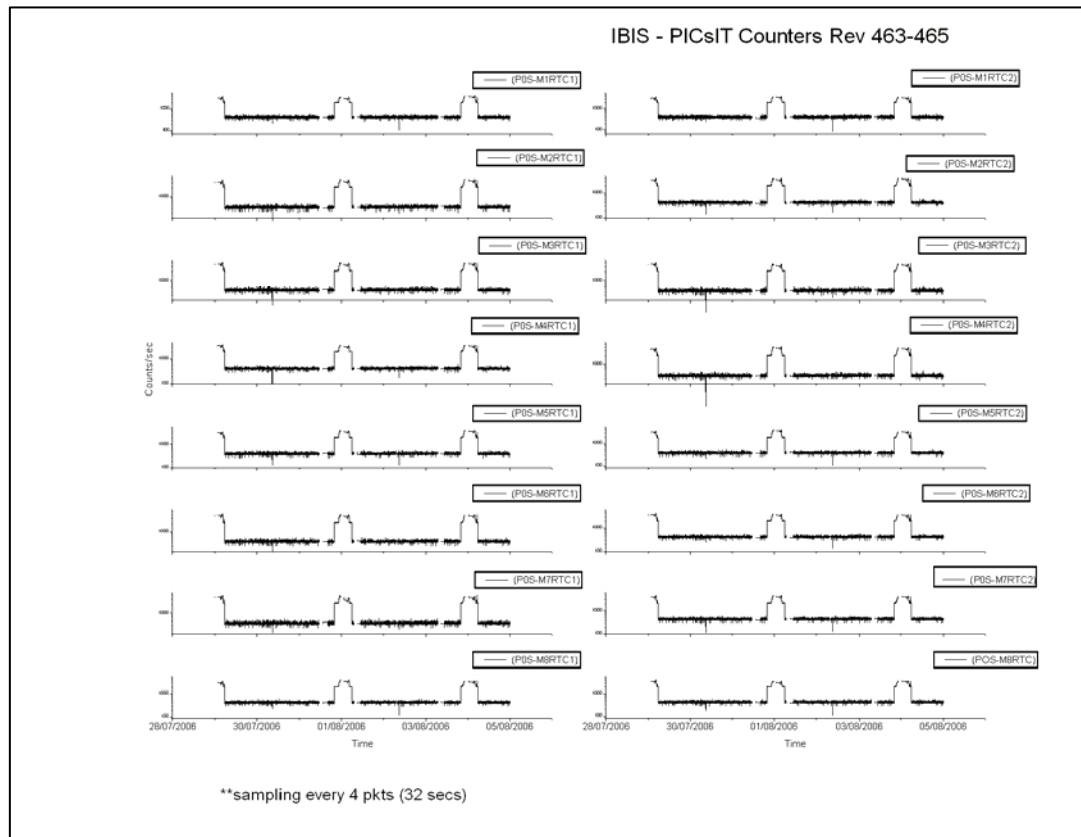


The week was characterised by low radiation.

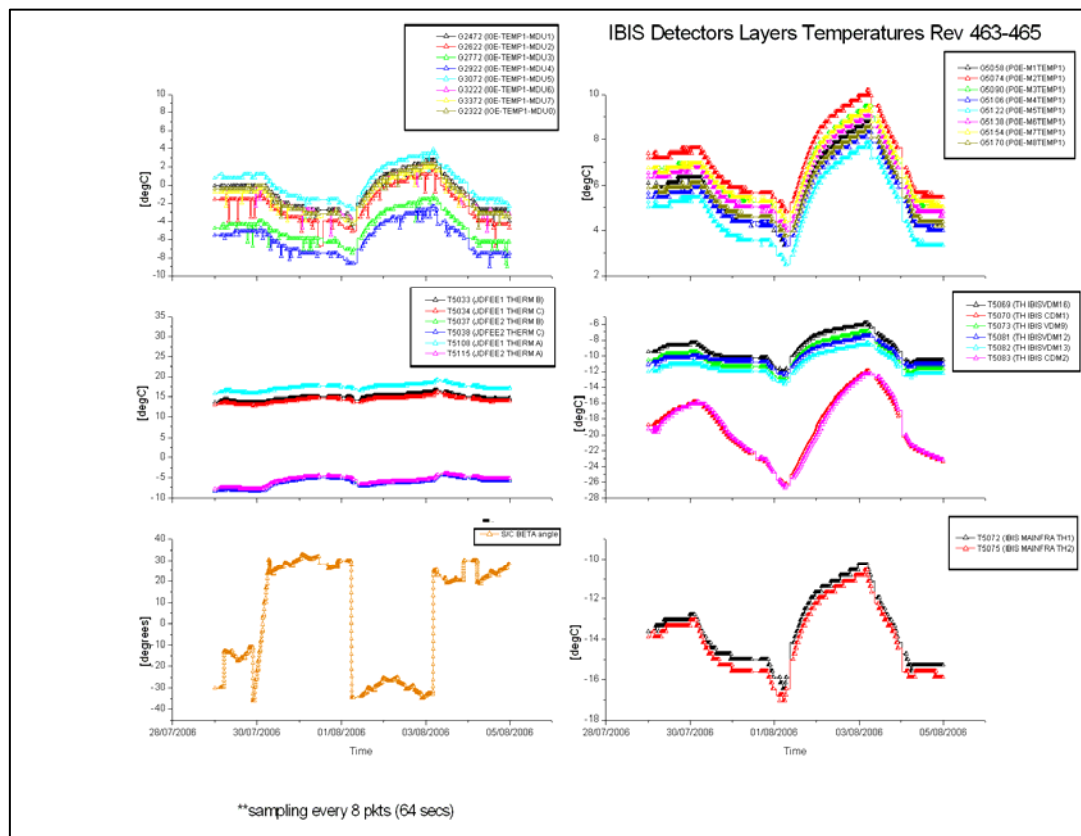
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report:

DoY 210 (29/07/2006):

On DoY 209 at 20:11Z, TM parameter G8015 (S1E-A2 PMT V) was reported Out Of Limit high. It went back inside limit on DoY 210 at 05:39Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

During the Belts, several TM parameters from families G5002 (P0S-Mi RTC1) and G5003 (P0S-Mi RTC2) went OOL High and back. According to P-CNT-1, no action was taken.

At 05:07Z and 05:13Z, TM family G2013 (I0S-EVTCNT-MCEi) was reported OOL High back. This was due to the reactivation of ISGRI after Perigee in a high radiation background due to the Belts. Hence, according to I-CNT-1, no action was taken.

At 05:22Z TM parameter G2070 (I0E-OVFWPXADD-M5) failed SCC and back. According to I-OVF-1, no action was taken.

At 22:09Z, due to Command Verifier crash, the commanding of the Event Designator GESTAN02 from the timeline failed. It was manually uplinked at 22:32Z. Consequently science in Pointing #0024 was delayed.

DoY 211 (30/07/2006):

At 08:52Z, TM families G5068 (P0S-MiF1ERRF) and G5072 (P0S-MiF2ERRF) failed SCC. At 08:56Z, TM families G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) were reported OOL low-low. At 08:59Z, OEM id 132, class 0, "IBIS1 IASW HEPI RESYNCHRONIZED" was reported.

According to F-DIR the occurrence of these 3 events flags an automatic HEPI resynchronisation, no action is required.

DoY 212 (31/07/2006):

From revolution 464, the Belts Entry and Exit time in the timeline have been changed according to corresponding OCR. Consequently IBIS deactivation occurs later, and IBIS reactivation EDs are delayed as well.

At 19:55Z, TM parameter G8015 (S1E-A2 PMT V) was reported Out Of Limit high. It went back inside limit on DoY 213 (01/08/2006) at 05:58Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

During the Belts, several TM parameters from families G5002 (P0S-Mi RTC1) and G5003 (P0S-Mi RTC2) went OOL High and back. According to P-CNT-1, no action was taken.

DoY 213 (01/08/2006):

At 05:42Z TM parameter G2070 (I0E-OVFWPXADD-M5) failed SCC and back. At 05:33Z TM parameter G2014 (I0E-OVFWPXADD-M1) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 214 (02/08/2006):

At 08:58Z, TM families G5068 (P0S-MiF1ERRF) and G5072 (P0S-MiF2ERRF) failed SCC. At 09:01Z, TM families G5002 (P0S-MiRTC1) and G5003 (P0S-MiRTC2) were reported OOL low-low. At 09:04Z, OEM id 132, class 0, "IBIS1 IASW HEPI RESYNCHRONIZED" was reported.

According to F-DIR the occurrence of these 3 events flags an automatic HEPI resynchronisation, no action is required.

DoY 215 (03/08/2006):

At 20:10Z, TM parameter G8015 (S1E-A2 PMT V) was reported Out Of Limit high. It went back inside limit on DoY 216 (04/08/2006) at 05:41Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

During the Belts, several TM parameters from families G5002 (P0S-Mi RTC1) and G5003 (P0S-Mi RTC2) went OOL High and back. According to P-CNT-1, no action was taken.

DoY 216 (04/08/2006):

At 05:16Z TM parameter G2084 (I0E-OVFWPXADD-M6) failed SCC and back. At 05:18Z TM parameter G2014 (I0E-OVFWPXADD-M1) failed SCC and back. At 05:24Z TM parameter G2014 (I0E-OVFWPXADD-M1) failed SCC and back. At 05:26Z TM parameter G2070 (I0E-OVFWPXADD-M5) failed SCC and back. According to I-OVF-1, no action was taken.

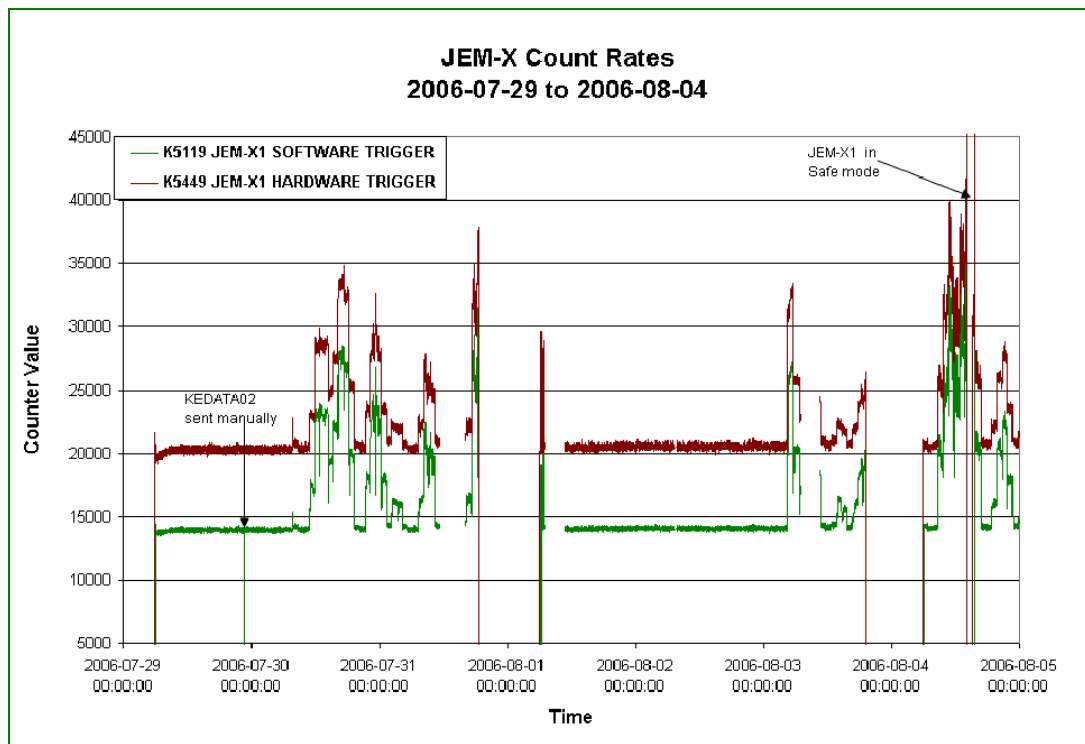
8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

JEM-X count rates over the reporting period are displayed in the following graph¹. Note that a smaller scale than normal has been used for this plot in order to display the very high count rates which were obtained during some of the pointings.

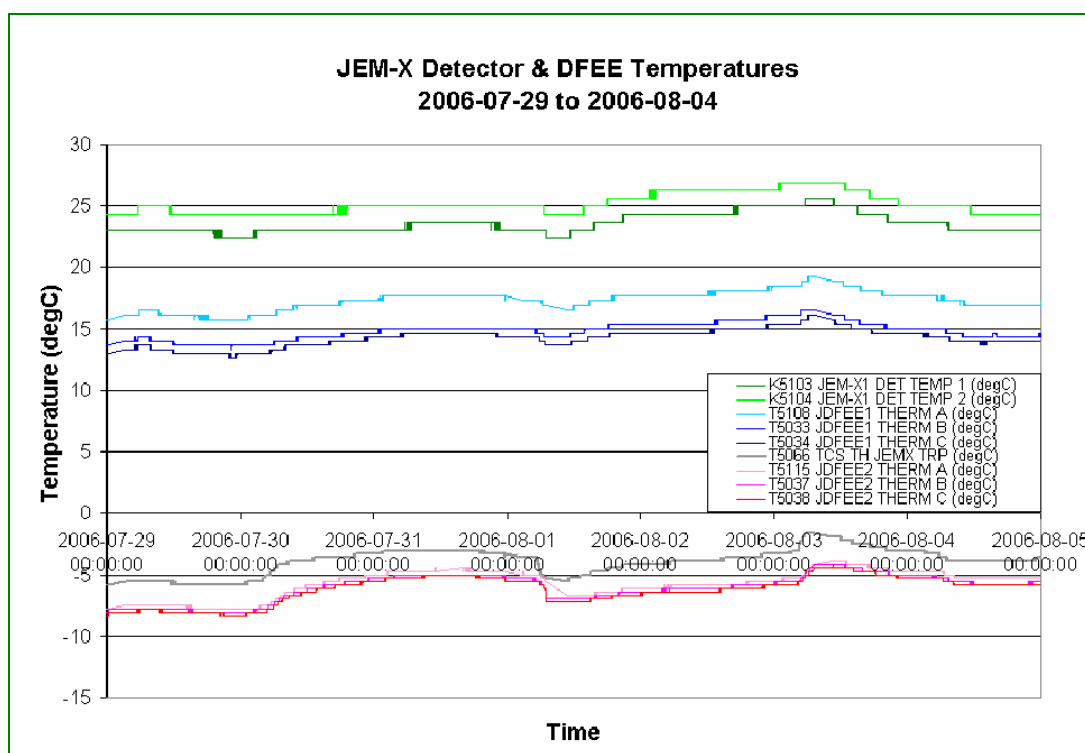
Some data gaps are present due to ground station tests on the B-chain.

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

2006-07-29 (DOY 210, Rev 462-463)

Due to a crash of the command verifier, the TCs of an ED KEDATA02 starting with TC KU0014 at 22:10:17Z had acceptance unverified (although they were in fact executed on board). Once the verifier was restarted, as part of the recovery, the ED KEDATA02 was re-uplinked at 22:34:49Z. JEM-X1 operations continued nominally.

2006-07-30 (DOY 211, Rev 463)

Due to high count rates from the observed source, from 11:51:17Z until the end of the day the TM parameters K5136 BUFFER LOSS and K5449 HARDWARE TRIGGER frequently toggled between OOL High and in limits.

2006-07-31 (DOY 212, Rev 463)

Due to high count rates from the observed source, from 08:18:29Z to 09:18:37Z the TM parameter K5136 BUFFER LOSS toggled in and out of limits High. Also, from 17:17:17Z to 18:31:09Z both TM parameters K5136 BUFFER LOSS and K5449 HARDWARE TRIGGER toggled between OOL High and in limits.

2006-08-01 (DOY 213, Rev 463-464)

Due to high count rates from the observed source, from 06:23:17Z to 06:43:17Z the TM parameters K5136 BUFFER LOSS and K5449 HARDWARE TRIGGER toggled between OOL High and in limits.

2006-08-02 (DOY 214, Rev 464)

Nothing to report

2006-08-03 (DOY 215, Rev 464)

Due to high count rates from the observed source, from 04:25:33Z to 05:39:57Z the TM parameters K5136 BUFFER LOSS and K5449 HARDWARE TRIGGER frequently toggled between OOL High and in limits.

2006-08-04 (DOY 216, Rev 464-465)

Due to high count rates from the observed source, from 08:45:17Z to 20:48:05Z the TM parameters K5136 BUFFER LOSS and K5449 HARDWARE TRIGGER frequently toggled between OOL High and in limits.

In addition, at 14:06:21Z, during pointing ID 4650010, TM parameter K5119 SOFTWARE TRIGGER went Out of Limits High and at 14:11:09Z it exceeded the Safe threshold for JEM-X1 of 40000 counts/8sec, causing JEM-X1 to make an autonomous transition to Safe mode. Two occurrences of OEM 189 JEM-X1 PROB DFEE 9 (Unexpected DFEE state reported in housekeeping) were received at this time, as the TM parameter K5462 DFEE STATE IASW was reporting state Setup

while K5022 DFEE STATUS was Safe. At 14:20Z commanding to JEM-X1 from the Timeline was disabled and at 14:24:55Z FCP_JEM1_0040 was executed to command JEM-X1 to Safe mode. K5462 DFEE STATE IASW then also went to Safe and OEM 254 ERROR OFF was received.

During the following pointing (ID 4650011) JEM-X1 was re-activated as follows:

- 15:10:15Z FCP_JEM1_0041 JEMX1 TRANSITION TO SETUP
- 15:11:45Z FCP_JEM1_1010 JEMX1 CONFIGURATION SETTING FOR SCIENCE OPS
- 15:42:18Z FCP_JEM1_0044 JEMX1 DATA TAKING executed with the planned observation parameters and commanding to JEM-X1 from the Timeline was re-enabled.

At 15:44:21Z K5119 SOFTWARE TRIGGER went Out of Limits High again, returning within limits at 15:45:17Z.

8.3.5 OMC Operations

2006-07-29 (DOY 210, Rev 462-463)

Due to a crash of the command verifier, the OMC Imaging EDs MEIMB101 at 22:10:07Z and MEIMB201 at 22:10:12Z, along with other Timeline EDs around this time, had their on-board acceptance stage unverified on the TC history. However, these TCs were accepted on board (no TC rejection OEM was received) and OMC transitioned to Science mode nominally at 22:11:20Z when the slew ID 4630024 was completed and the Broadcast Packet OTF Flag unmasked. Therefore this pointing was in fact executed nominally for OMC.

2006-07-30 (DOY 211, Rev 463)

Following the problem with the command verifier on the previous day, the next CCCF block in the Timeline was enabled 01:37Z to ensure the correct configuration of the instruments. This was during pointing ID 4630029 and caused OMC to go back to Standby mode at 01:39:20Z. In line with INT_OR_0209 the OMC Imaging EDs for this pointing were resent at 01:45:49Z and OMC returned to Science mode at 01:48:00Z.

2006-07-31 (DOY 212, Rev 463)

Due to a drop in the VC0 TM link at 14:10Z, the commanding for slew ID 4630068 failed from the Timeline and the OMC Imaging EDs scheduled at 14:15:40Z were not released. At 14:34:32Z a manual slew was started from the attitude of pointing ID 4630067 to 4630068. During this slew, at 14:36:03Z an OMC command request TC M1329 IMAGING BX was received from ISDC. However, this was rejected on-board with the OEM 131 REJECTED TC1 as OMC was in Standby at the time. Once the Timeline was rejoined, commanding to OMC from the Timeline was re-enabled and OMC operations continued nominally from slew ID 4630069 onwards.

2006-08-01 (DOY 213, Rev 463-464) to 2006-08-02 (DOY 214, Rev 464)

Nothing to report

2006-08-03 (DOY 215, Rev 464)

At 04:29:18Z an OMC command request TC M1329 IMAGING BX was received from ISDC. However, this was rejected on-board with the OEM 131 REJECTED TC1 as OMC was in Standby at the time due to the ongoing series of non-science slews between observations.

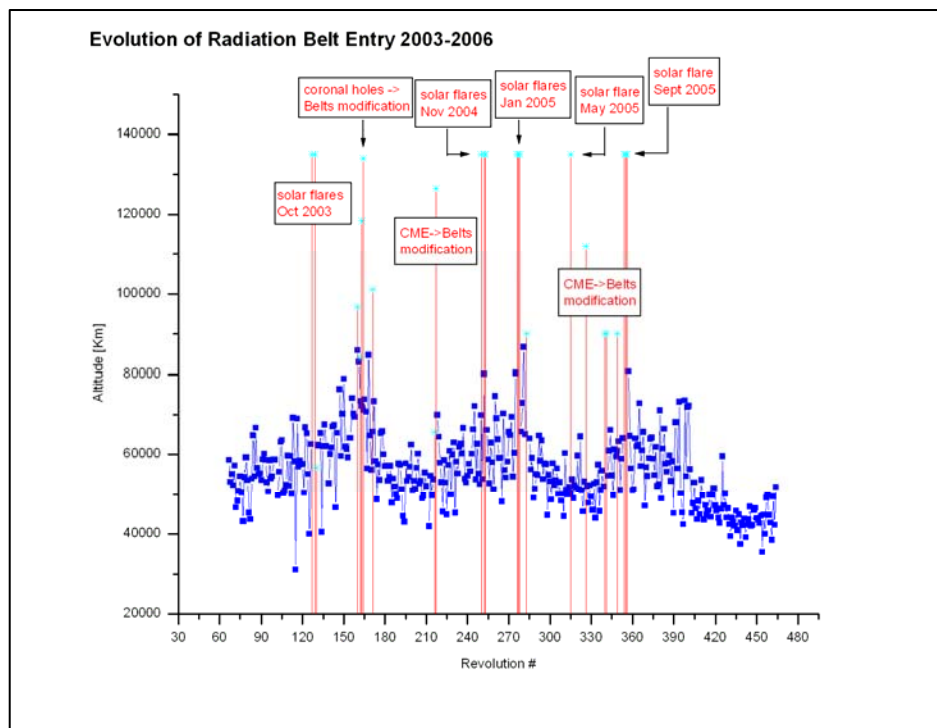
2006-08-04 (DOY 216, Rev 464-465)

Nothing to report

On DoY 212 at 19:55:21Z and DoY 215 at 20:10:01Z OMC went to SAFE mode nominally, at the radiation belt entry time as set in the Broadcast Packet.

8.3.6 IREM Operations

Radiation Belts Entry



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]
463	RAD_EXIT R 2006-07-29T05:27:58Z	2006-07-29 05:12:37	<<38441.3	2006-07-29 05:15:30	38306
463	RAD_ENTR R 2006-07-31T19:55:06Z	2006-07-31 22:04:54	42336.0	2006-07-31 21:24:29	48003
464	RAD_EXIT R 2006-08-01T05:11:29Z	2006-08-01 05:11:50	40045.4	2006-08-01 05:04:29	39026
464	RAD_ENTR R 2006-08-03T20:09:46Z	2006-08-03 20:44:46	<51800.5	2006-08-03 21:04:29	48676
465	RAD_EXIT R 2006-08-04T05:28:27Z	2006-08-04 04:38:36	<<43679.2	2006-08-04 04:44:29	38335

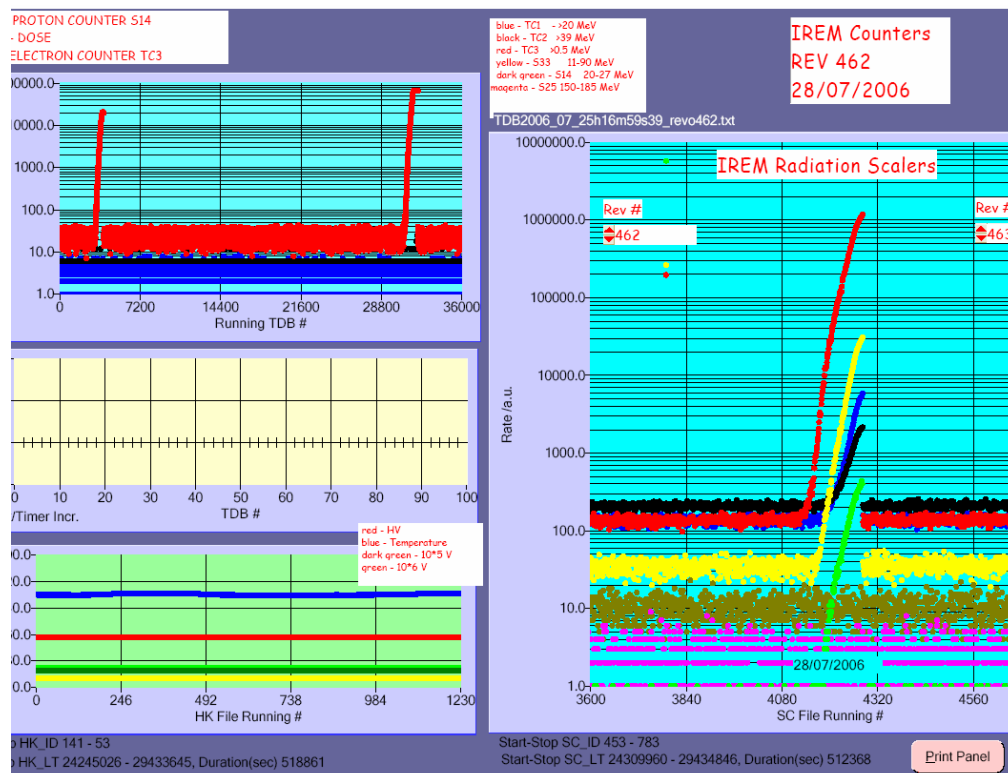
Reference

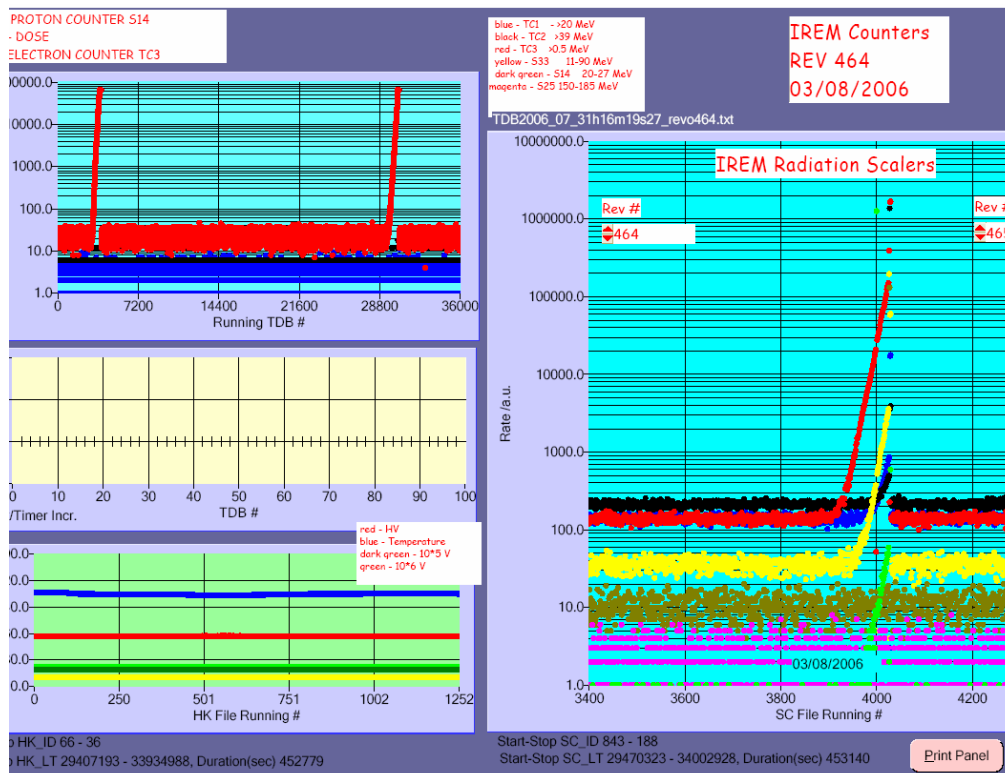
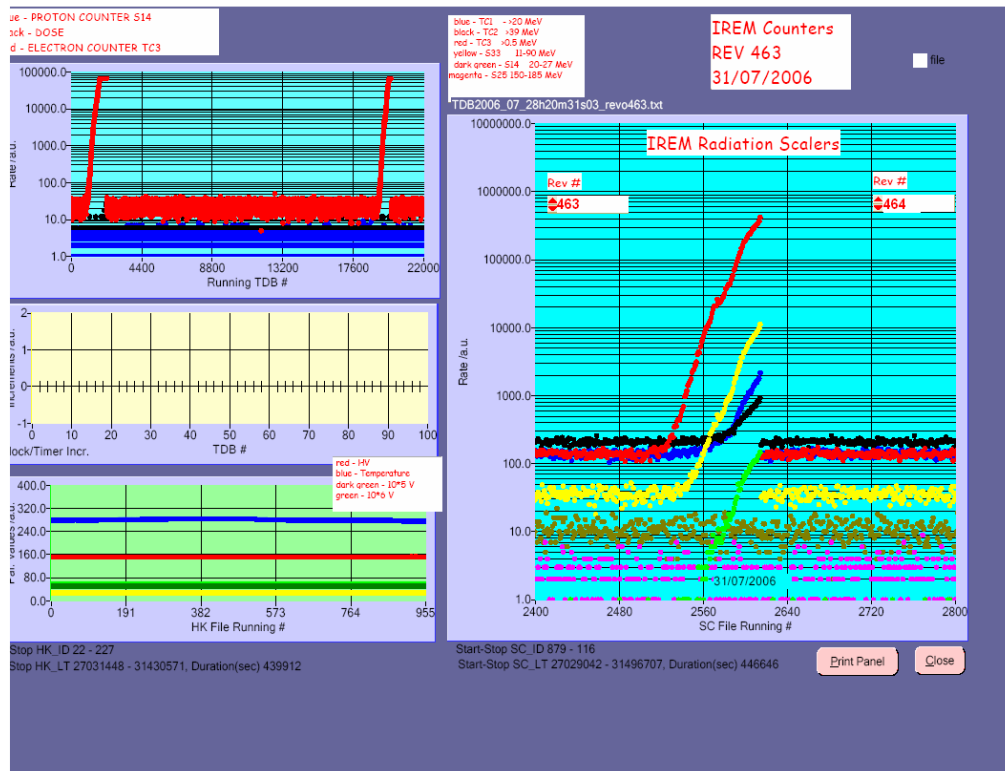
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

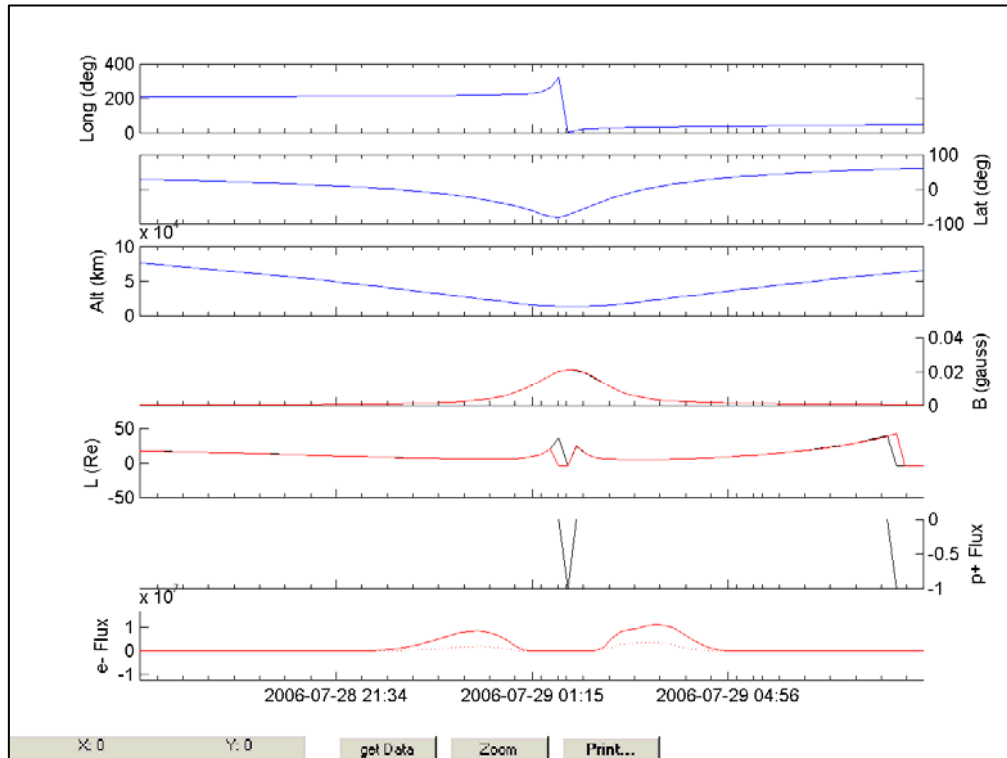
IREM radiation counters:



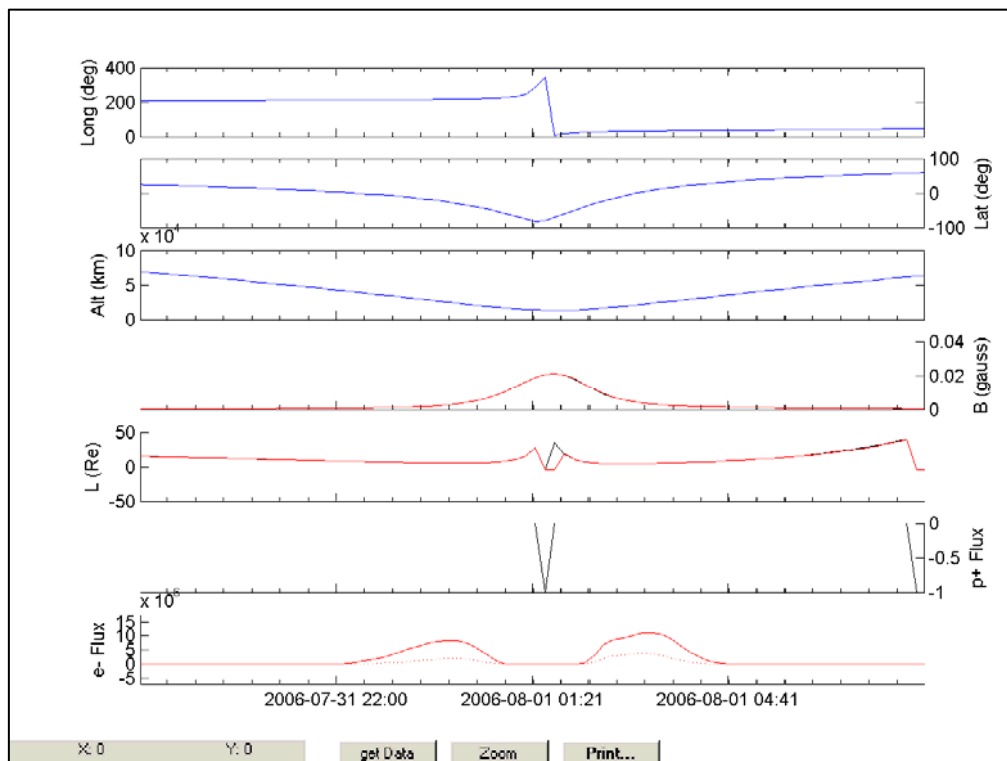


IREM Predicted Radiation Belt Passages

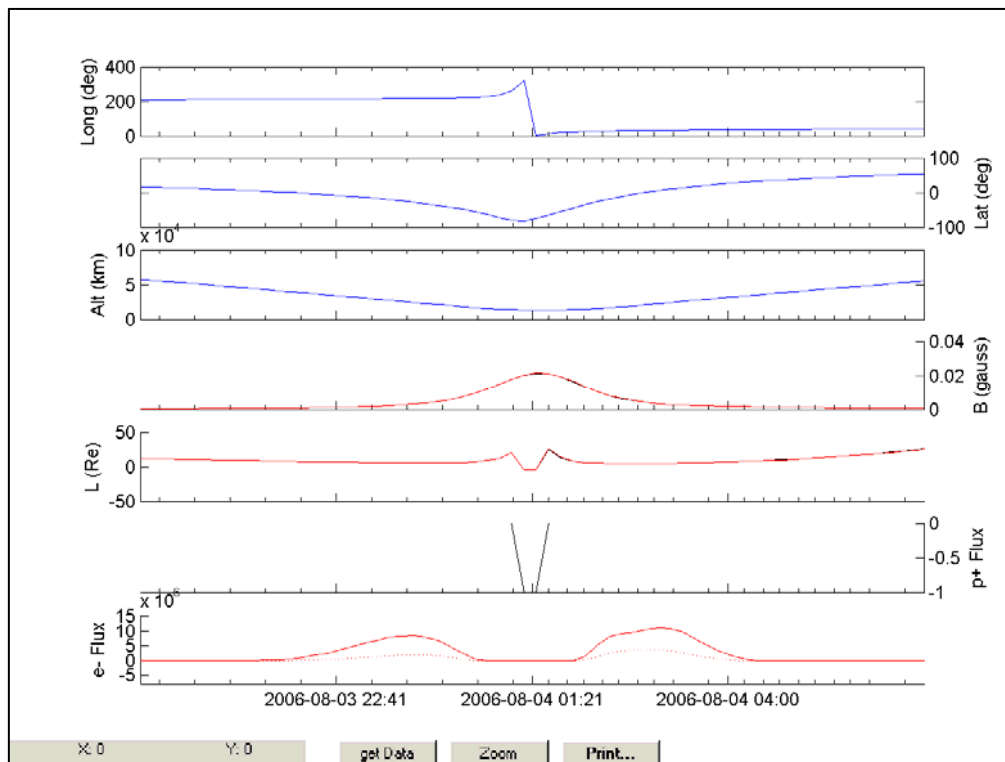
Rev 462:



Rev 463:

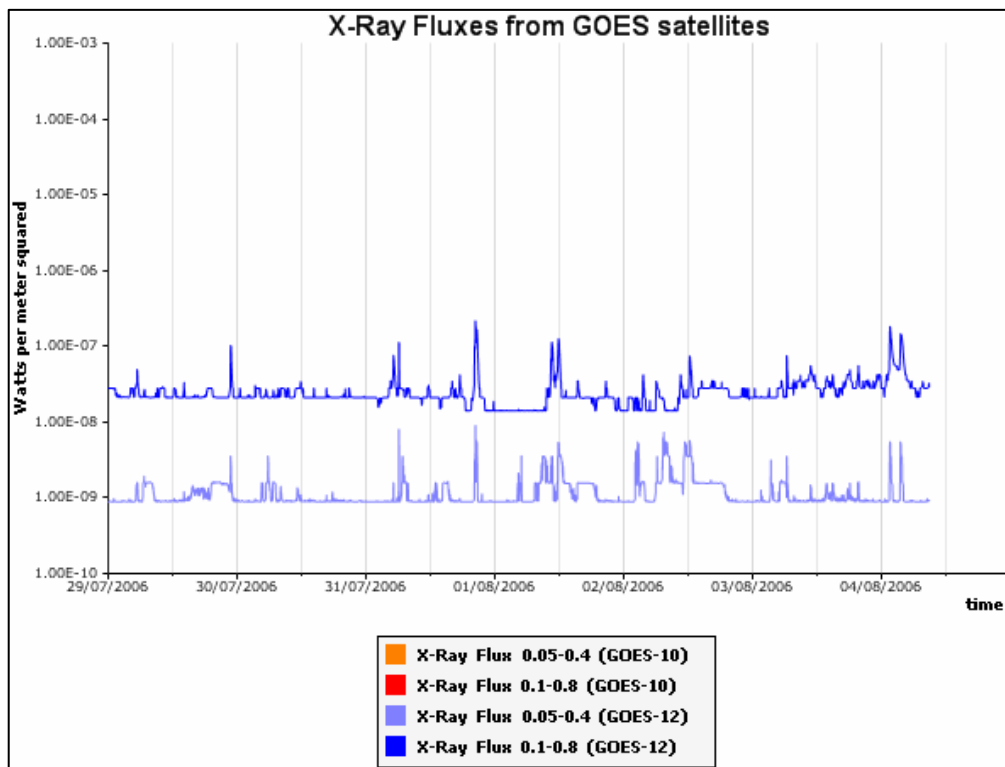


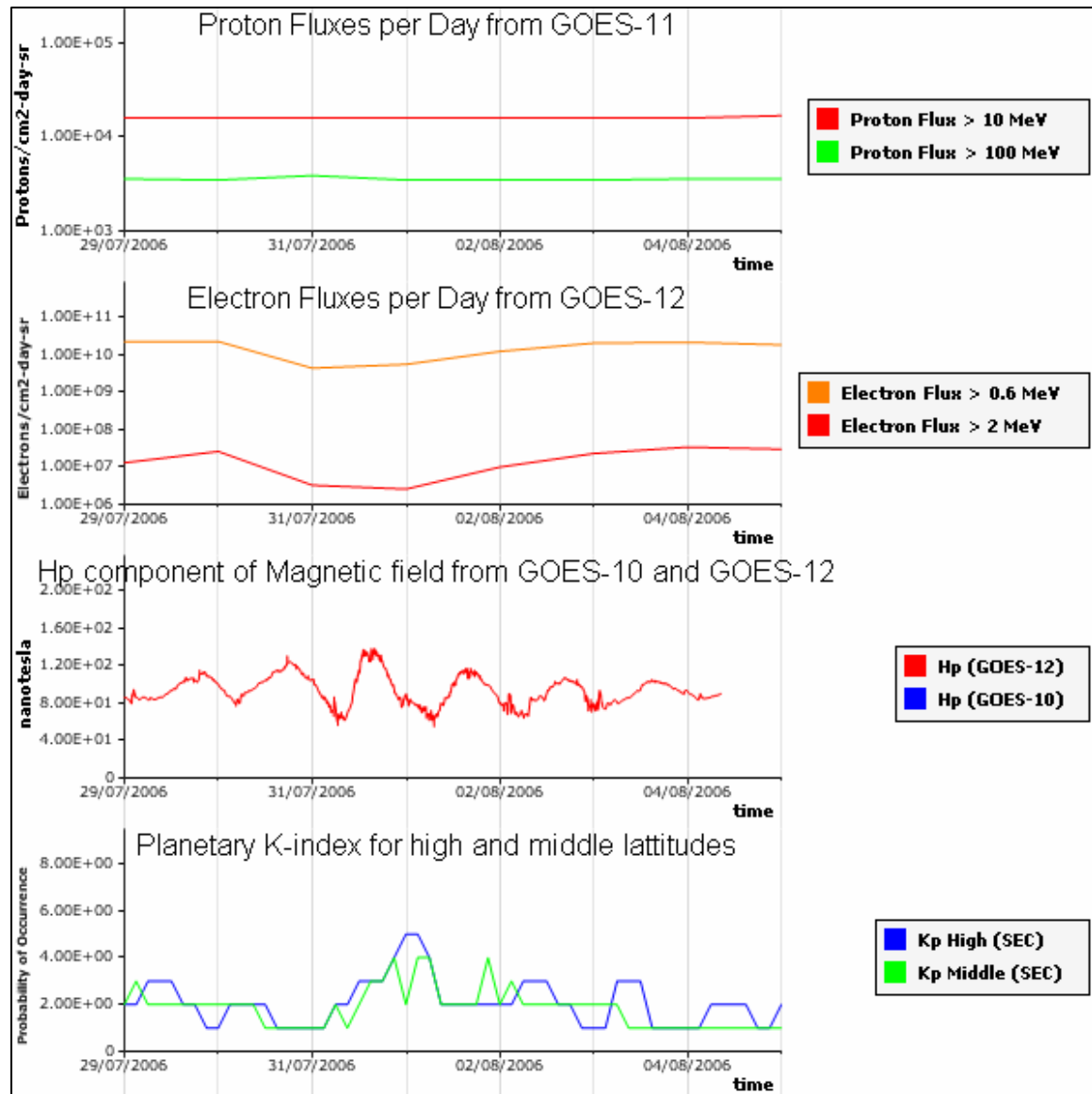
Rev 464:



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 report low radiation background.

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