

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 193
Week 22
07.06.06
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 27.05.06 until 02.06.06 (both dates inclusive) and covers the revolutions 442, 443 and 444.

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 2 hexagonal dithers of 1ES 1426+428 (RA 14:28:32.60, DEC +42:40:21.0), an OMC Flat Field Calibration, 2 Galactic Centre Deep Exposures and 2 Galactic Plane Surveys.

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

The Eclipse season was completed with the last eclipse passage on 24/05/2006 (for complete eclipse report see previous issues). After the end of the season the ACC/FDE/FCE Eclipse Timers were stopped and the AMD thresholds were set to their non-eclipse season values.

1 slew was lost during the observation period due to problem on the link with REDU station.

The fuel consumption over the period between 25/05/2006 and 02/06/2006 was 0.1161 kg. The remaining propellant is in the order of 154.1310 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 almost flawlessly. No on-board communications problem has been identified, apart from the following incident:

PLM RTU-A stopped working on 30th May at 20:39:41z. The fault was signalled by OEM APID129, CLASS NON-FATAL, ID 89 from the CDMU.

The immediate effect was that no more PLM RTU HK packets TM(1,5) were acquired by the CDMU and all relevant telemetry parameters became invalid with the expired flag set. No other messages or out-of-limit were reported.

Attempted recoveries:

1) @23:04z: After checking the background of OEM 89, the initial recovery attempt was to reload RTU tables 16, 17 and 18 (empty table), i.e. those related to the PRTU interrogations.

Result : Unsuccessful. PRTU TM packet acquisition still missing from the CDMU.

2) @23:17z: The next recovery attempt was to switch over to PRTU-B.

In fact, RTU sections A and B are internally cross-strapped both at the back-end (acquisition/generation of hardwired signals) and at the front-end (interface with the OBDH). Hence, no further changes on the DHSS would be required if such a switchover were successful.

Result: First command P0219 to switch on the LCL for PRTU-B was unverified as the TM parameter was contained in the missing packet. We continued however the execution of the procedure and the second command D0501, which actually performs the switchover on the PRTU, restarted successfully the CDMU acquisition operations of packet TM(1,5).

3) 31/5/2006 @ 13.17z: After discussion with industry, we successfully switched back to PLM RTU-A, the PLM RTU TM packet continued to be generated. A commanding test on PRTU-A was then carried out by commanding a spare LCL CLOSED and OPEN. Following the successful commanding test the PRTU-B LCL was opened again.

It appears that PRTU-A is now fully functional again, the reason for the switch off is unknown. An analysis of the radiation environment was carried out, the radiation level was very low at the time of the anomaly. The most obvious possibility is a SEU affecting either the PRTU-A LCL in the PPDU (P2103), or the PRTU-A internal power supply switch (D9206), unfortunately as both these statuses are contained in the PRTU HK TM Packet which was not being acquired at the time of the anomaly it is impossible to know which.

The relevant anomaly report is INT_SC-151.

3.1.5 RFS

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

3.2 Payload

3.2.1 SPI

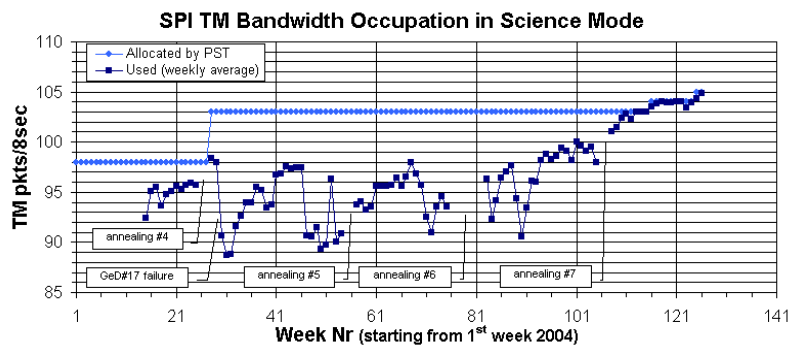
Following the 7th annealing, ended on 24th January, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #15, which is showing a slightly degraded energy resolution since 09.02.2006. Detector #2 failed on 06.12.2003 and detector #17 on 17.07.2004.

During science operations, the instrument was kept in photon-by-photon mode, with spectra TM enabled, the assigned TM bandwidth in the science observation windows of 105 pkts/cycle with the average telemetry occupation was 104.9 pkts/cycle. The telemetry downlink of SPI has therefore reached the saturation.

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

The 8th GeD Germanium Detectors annealing has been approved and planned to start on the 8th June. A summary annealing timeline is included in the future activities section of this report.

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



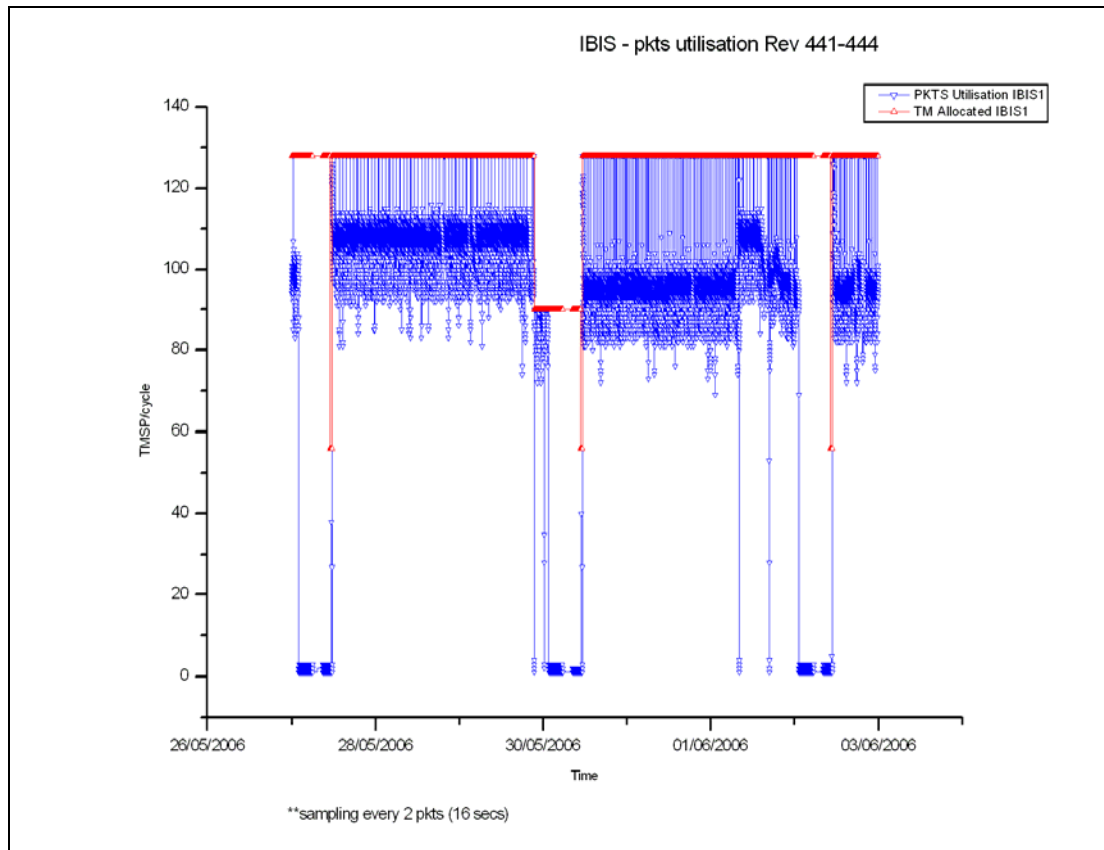
Note: Some more information concerning the SPI operations is provided in the Appendix.

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. However it was 90 TMPS/cycle between 2006-05-29 21:31:34Z and 2006-05-30 10:50:34Z due to an OMC Flat Field Calibration. The IBIS mean bandwidth utilisation during the observation period was 102.44 TMPS/cycle, down 9.76 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.

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, 164 of the 165 planned science pointings for OMC were executed nominally, 1 was lost.

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

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised low solar activity.

The observation period was quiet as the several sunspots that were present on the sun posed no threat for strong solar flares.

Reference: www.spaceweather.com

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

4 Ground Facilities

The Operational ground facilities performance was very good this week, although 1 pointing was lost after a hit on the line to Redu. There were a few other minor problems with ground stations, and the links with ISDC, but these had no impact. The overall performance was well over the 95% requirement.

4.1 Mission Operations Centre

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

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week, 1 pointing was lost after a hit on the line with Redu, and there were a few instances of bad frames and TM drops from Redu, but these had no impact on the mission. The overall performance though was well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF for revolution 450 was delivered. Mission planning of revolutions 446 to 450 was performed. Revolution 446 is the start of SPI annealing and contains an AOCS calibration. One ToO request was received but in the meantime the source did not meet the trigger criteria. So the request was not approved. TSF for revolutions 445 and 446 were received from MOC.

2. Observation status

ECS for revolution 428, 430 and 431 were received. The corresponding OCS's have been sent to ISDC. No extra time was credited. By now all revolutions up to 431 have been processed.

3. ISOC science data archive

Nothing to report this week.

4. ISOC system

The ISOC system version 12.3 has been used without modifications or problems. A version 12.4 is planned to be installed early next week.

5. AO 4

This week the TAC panels and board met in ESTEC to determine the open time program for AO 4.

6. Miscellaneous

This week there has been quite some effort spent in MOC/Flight Dynamics and ISOC in order to set up a mechanism to automate as far as possible the exchange of information required to allow the planning of the AOCS calibrations as the one included in revolution 446.

7. Problems

No new problems encountered

4.3.2 ISDC

Status of ISDC observation processing on 07/06/2006:

- Latest Standard Analysis completed: observation 03201090063 (Galactic Bulge, Revolution 426) on 29/05/2006
- Latest products archived: observation 03201090063 (Galactic Bulge, Revolution 426) on 30/05/2006
- Latest observation products sent to the observer: observation 03201090063 (Galactic Bulge, Revolution 426) on 01/06/2006

5 Special Events

6 Anomalies

The following problem impacted operations this week:

- On DoY 149, at 03:05, hits on the line to Redu caused all links to drop. The slew to the attitude for pointing 04420040 failed. A manual recovery was performed, and the timeline rejoined at 03:37. The impact was the loss of pointing 04420040

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

AR id	Date Created	Subject	Segment	Status
INT-2853	30/05/2006	TDRS Complete Format Incorrect	IMCS	Pending
INT_SC-151	31/05/2006	OBDH PLM-RTU-A FAILURE	Spacecraft	Pending
INT-2854	31/05/2006	TM drop from REDU - ISDN-Line issues	COMMS	Pending
INT-2855	31/05/2006	IMCA verifier died	IMCS	Pending
INT-2856	31/05/2006	TC/TM drop - Node Failure	COMMS	Pending
INT-2857	31/05/2006	Power outage at REDU	ESA	Pending

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			Stations	
INT-2858	31/05/2006	False TM indication on AutoStk - sun122	IMCS	Pending

7 Future Milestones

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

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 442

The observations in revolution 442 began with a hexagonal dither of 1ES 1426+428 (RA 14:28:32.60, DEC +42:40:21.0), which lasted ~54.6 hours. This was followed by an OMC Flat Field calibration, a staring observation at attitude (RA 09:52:00.00, DEC +17:06:00.0), which lasted ~3.4 hours, until the end of the revolution.

Revolution 443

The observations in revolution 443 began with a Galactic Centre Deep Exposure, which lasted ~41.7 hours. It continued with a hexagonal dither of 1ES 1426+428 (RA 14:28:32.60, DEC +42:40:21.0), which lasted ~6.9 hours. This was followed by a Galactic Plane Survey, which lasted ~7.3 hours, until the end of the revolution.

Revolution 444

The observations in revolution 444 began with a Galactic Plane Survey, which lasted ~7.3 hours. This was followed by a Galactic Centre Deep Exposure, which lasted ~48.6 hours, until the end of the revolution.

Throughout these observations all instruments were in their nominal science modes, except JEM-X2 which is switched off, and the TM allocation was IBIS 128; SPI 105; JEM-X1 8; JEM-X2 0; OMC 5, except during the Flat Field calibration from 2006-05-29T21:31:10Z until the end of revolution 442 when it was IBIS 90; SPI 84; JEM-X1 8; JEM-X2 0; OMC 63.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2006-05-14T01:20:24.000Z	154.4637	F	Automatic TM processing.
2006-05-15T04:36:27.000Z	154.4561	F	Automatic TM processing.
2006-05-16T21:25:52.000Z	154.4297	F	Automatic TM processing.
2006-05-16T22:53:12.000Z	154.3832	F	Automatic TM processing.
2006-05-19T20:45:51.000Z	154.3674	F	Automatic TM processing.
2006-05-21T04:26:50.000Z	154.3513	F	Automatic TM processing.
2006-05-22T20:56:23.000Z	154.3214	F	Automatic TM processing.
2006-05-24T02:01:14.000Z	154.3029	F	Automatic TM processing.
2006-05-24T10:14:11.000Z	154.2850	F	Automatic TM processing.
2006-05-25T20:48:31.000Z	154.2471	F	Automatic TM processing.
2006-05-27T09:25:31.000Z	154.2319	F	Automatic TM processing.
2006-05-28T19:35:35.000Z	154.2031	F	Automatic TM processing.
2006-05-30T09:08:19.000Z	154.1858	F	Automatic TM processing.
2006-05-31T19:17:42.000Z	154.1702	F	Automatic TM processing.
2006-06-02T01:46:58.000Z	154.1310	F	Automatic TM processing.

This report was generated Fri Jun 2 08:00:41 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, 27/05/2006 – 02/06/2006

AOCS operations were executed from the Automatic Timeline.

During this period, 105 Open Loop Slews, 74 Closed Loop Slews and 7 Momentum Biases were executed.

1 slew (CSL) was lost during the observation period due to problem on the link with REDU station (reported hits on the line with REDU for ~ 2 minutes).

After the end of the season the ACC/FDE/FCE Eclipse Timers were stopped and the AMD thresholds were set back to their non-eclipse season values.

Orbit Control

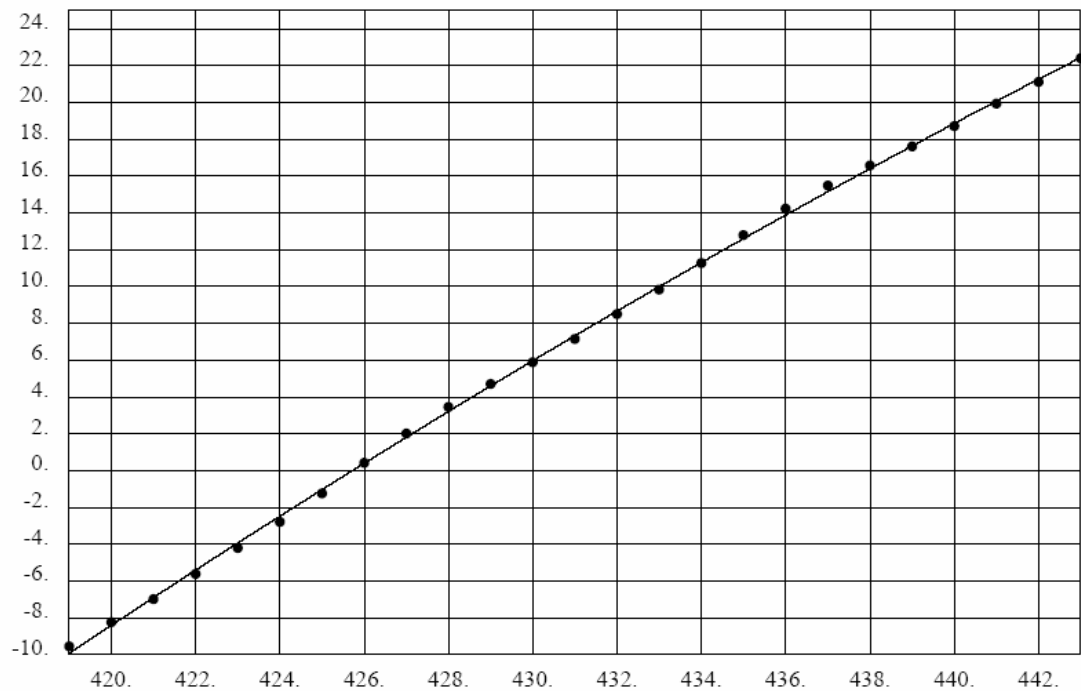
The following table shows the shortening of the necessary Goldstone pass:

Orbit number	Apogee passage date	Time from LOS Redu to 40000 km altitude
362	2005/10/01	284 min
372	2005/10/31	268 min
382	2005/11/30	244 min
393	2006/01/02	213 min
402	2006/01/29	188 min
412	2006/02/28	159 min
422	2006/03/30	122 min
433	2006/05/01	80 min
443	2006/05/31	46 min

From orbit 460 and onwards Redu will give coverage down to 40000 km altitude.

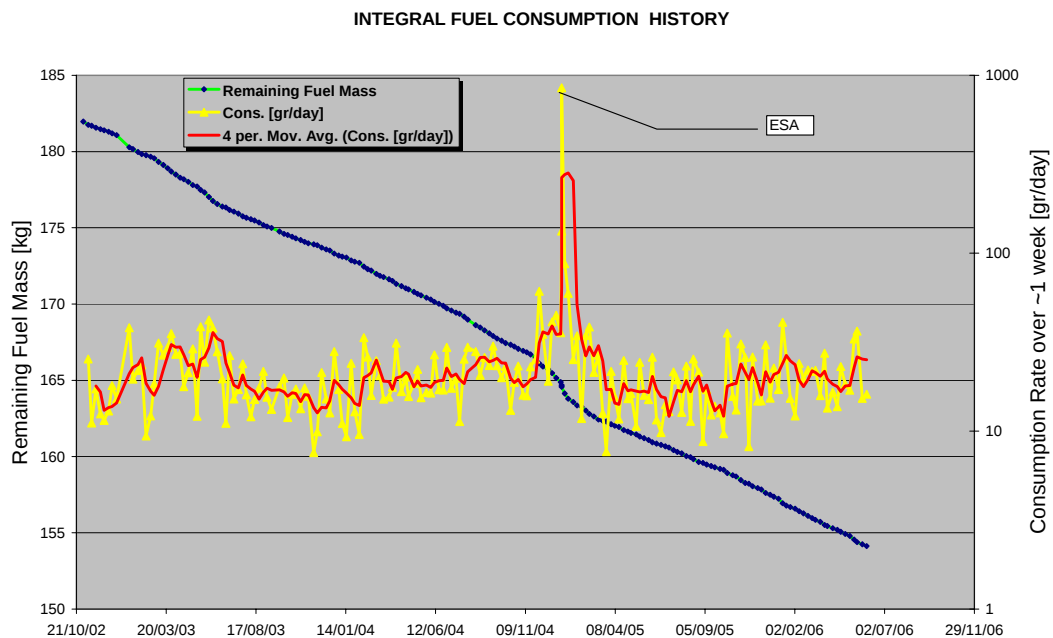
The attached plot shows the apogee longitude of Integral as a function of the orbit number. From this, an estimate of the rate of semi-major axis increase of about 800m per orbital revolution can be made.

APOGEE LONGITUDES OF INTEGRAL 21.03.2006 - 01.06.2006
 LEAST SQUARES APPROXIMATION WITH PARABLE

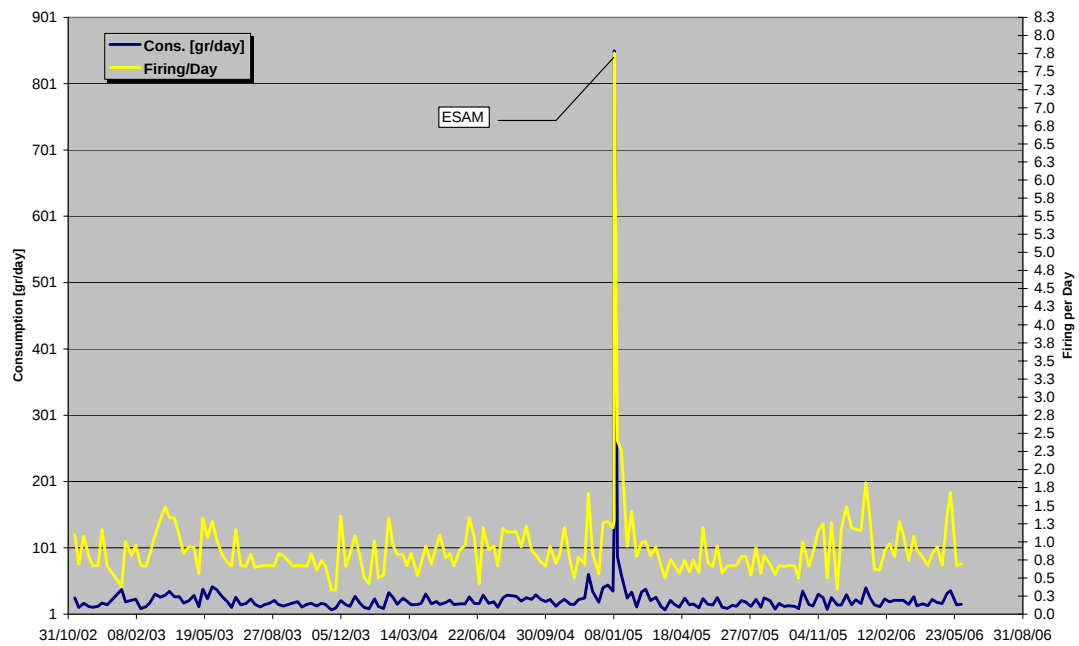


Fuel consumption

The fuel consumption (total, grams/day) over the period between 01/11/2002 and 02/06/2006 is reported in the plot below.

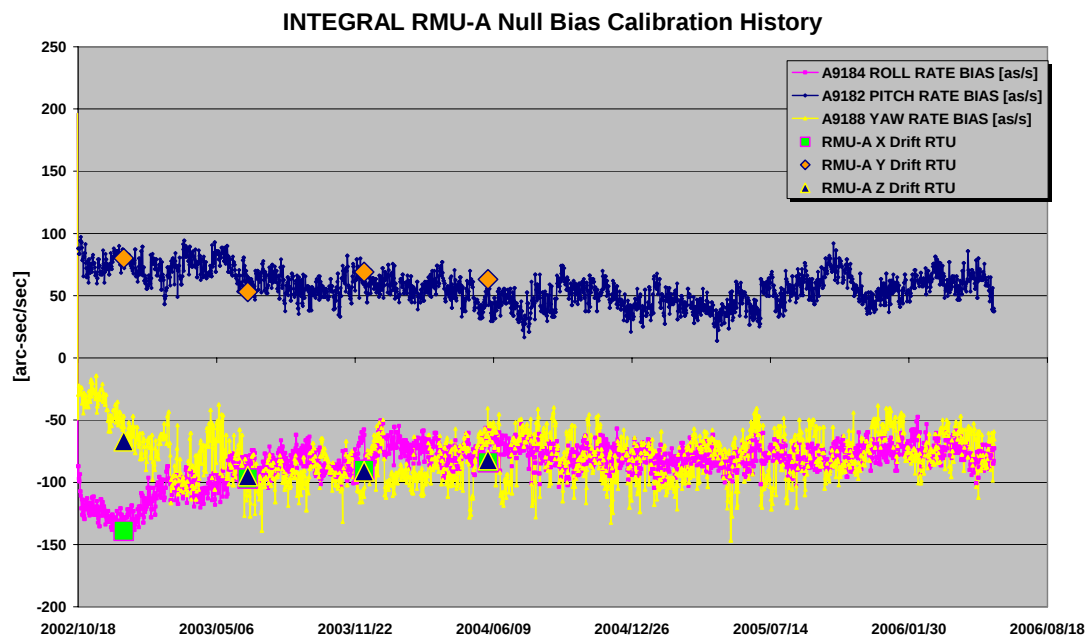


The firing\day over the period between 01/11/2002 and 02/06/2006 is reported in the plot below.

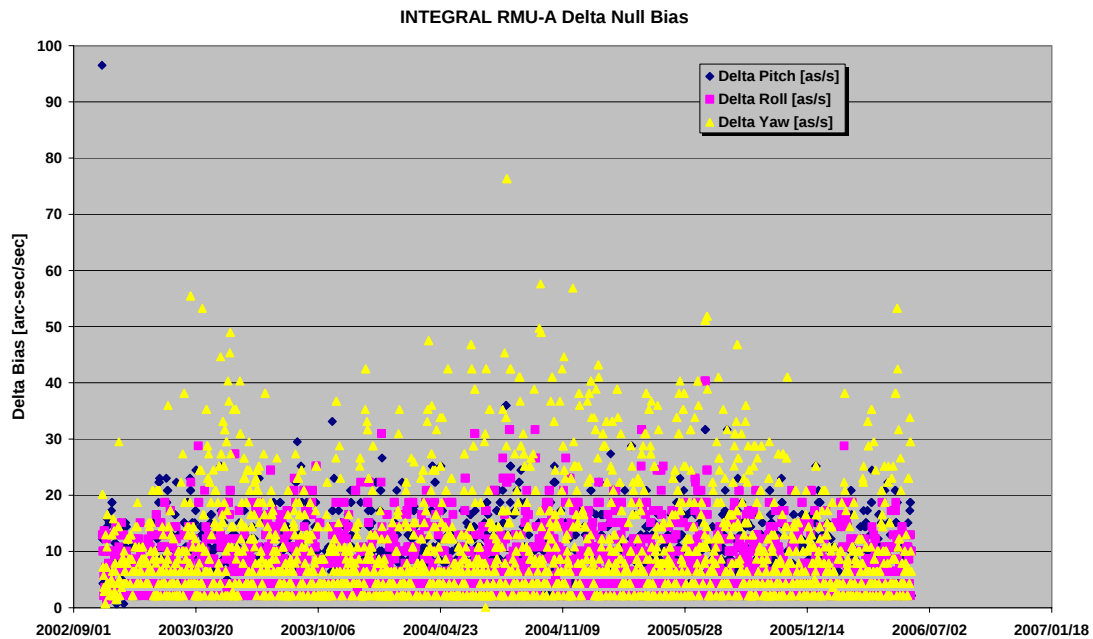


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 02/06/2006 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 02/06/2006 is reported in the plot below.



27/05/06 (Day of Year 147, Revolution 441-442)

Reconfiguration of the AOCS after the eclipse season: With the end of the summer eclipse season, the AMD thresholds were set back to their non-eclipse season values. The manual operation started at 09:03z and the following AMD thresholds were loaded:

Thresholds from INT-MA-AI-0001, 5.3.2.4.2.2, and INT-PR-MMB-0005 page 5-9, modified as per new AMD Threshold agreement for the eclipse season.							
01- Update of thresholds after uplink of new RW Inertias on 22/01/2004. 0155_0001_M.RWI							
Wheel Inertia:							
RW#1:	0.096000	Kgm**2					
RW#2:	0.097650	Kgm**2					
RW#3:	0.097272	Kgm**2					
RW#4:	0.097649	Kgm**2					
Sunlight Season:							
	Subset 1		Subset 2				
WSMAX	39		35.9				
WSMIN	2.2		4.8				
WSMAX	To Uplink:				In rpm:		
	X1		X2		X1	X2	
RW#1:	406.250000	rd/s	373.958333	rd/s	3879	3571	
RW#2:	399.387606	rd/s	367.641411	rd/s	3814	3511	
RW#3:	400.938401	rd/s	369.068939	rd/s	3829	3524	
RW#4:	399.388015	rd/s	367.641788	rd/s	3814	3511	
WSMIN	To Uplink:				In rpm:		
	X1		X2		X1	X2	
RW#1:	22.916667	rd/s	50.000000	rd/s	219	477	
RW#2:	22.529557	rd/s	49.155398	rd/s	215	469	
RW#3:	22.617038	rd/s	49.346265	rd/s	216	471	
RW#4:	22.529580	rd/s	49.155448	rd/s	215	469	

28/05/06 (Day of Year 148, Revolution 442)

Nothing to report

29/05/06 (Day of Year 149, Revolution 442)

REDU station problem on the link: at 03:05z due to a problem on the link with REDU station (hits on the line for ~2 minutes), the sequence for slew ID 04420040 failed release and the AOCS s/s was disabled in TL.

As soon the link with REDU became again stable, a manual recovery was performed from attitude of PID 04420039 to the attitude of PID 04380040. The update for the slew ID 04420041, was manually performed at 03:37z and the AOCS s/s re-enabled in TL.

The following slew was not executed from TL: 04420040(CSL)

30/05/06 (Day of Year 150, Revolution 442-443)

Nothing to report

31/05/06 (Day of Year 151, Revolution 443)

Nothing to report

01/06/06 (Day of Year 152, Revolution 443)

Nothing to report

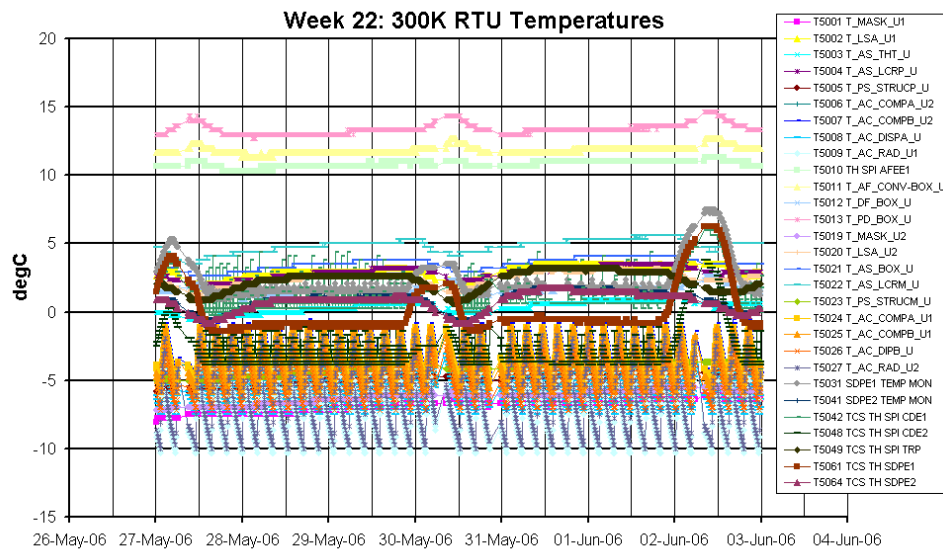
02/06/06 (Day of Year 153, Revolution 443-444)

Nothing to report.

8.3.2 SPI Operations

Unit Temperatures:

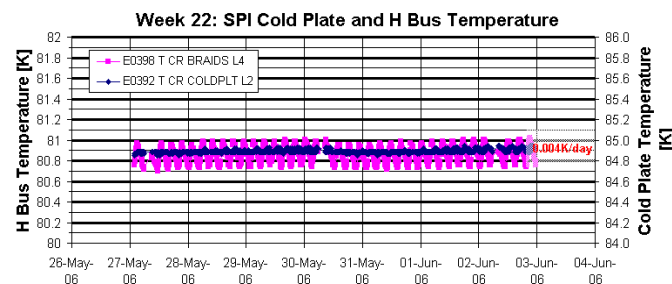
All the equipment temperatures are inside the operational limits. The following plot shows their evolution along the reporting period (due to data retrieval problems some gaps could be present).



Stirling Compressors and Cryostat:

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

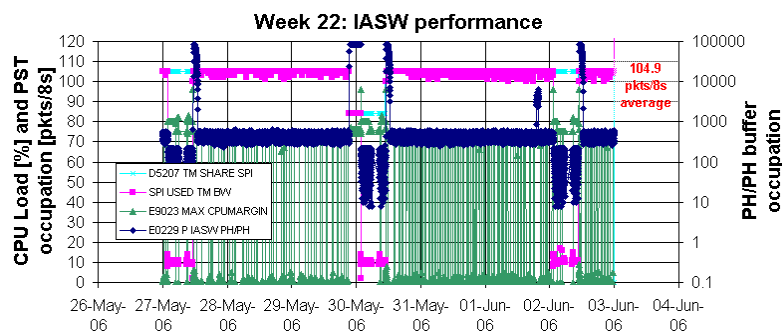
The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.



DPE & IASW:

The IASW performance is nominal. The current IASW version installed is 432.

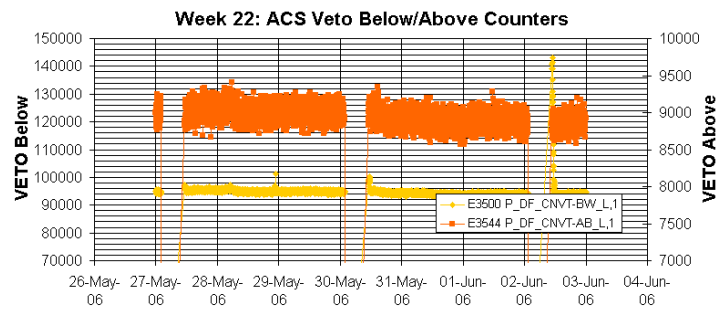
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS:

The performance of the ACS is nominal.

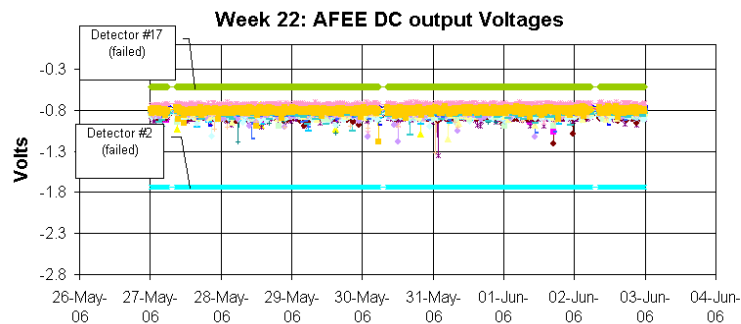
The following plot shows the ACS overall count rate evolution during the reporting period.



AFEE:

The performance of the AFEE and the detectors is nominal, except for detector #15, which shows a degraded energy resolution and for this works with a reduced bias of 3Kv (anomaly INT_SC-140).

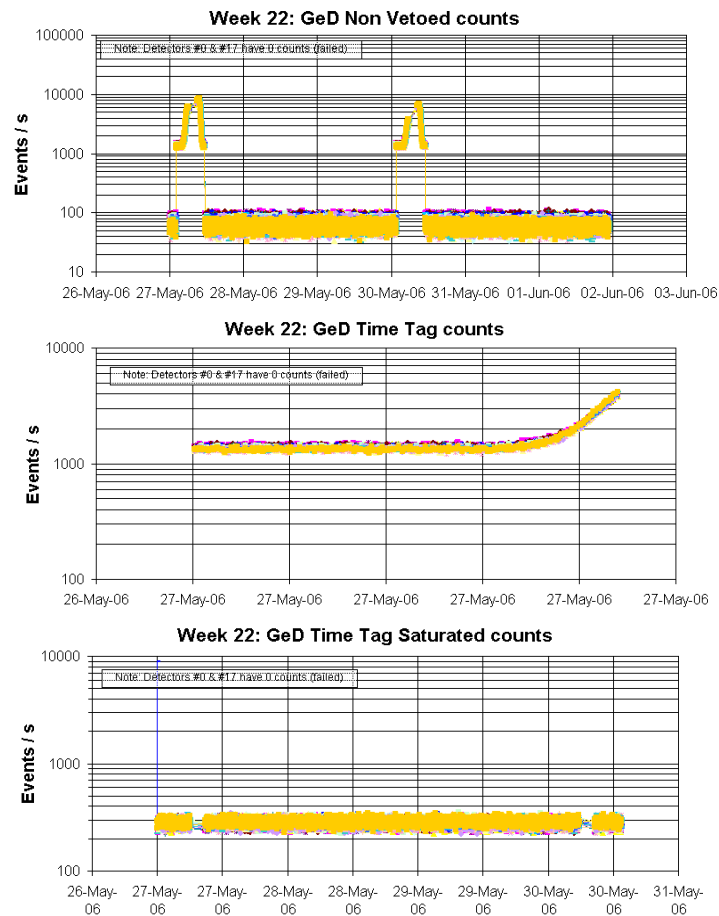
The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06.12.2003 and detector #17 is failed since 17.07.2004.



DFEE:

The performance of the unit is nominal.

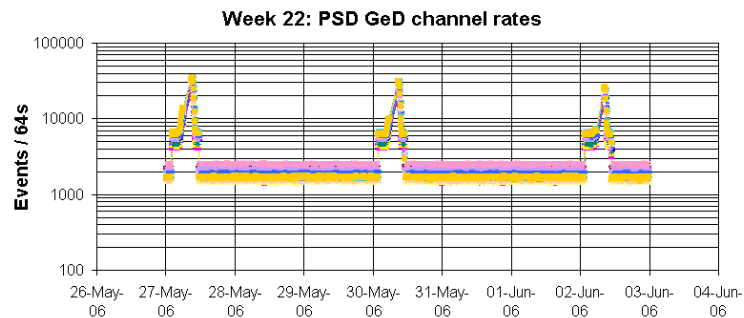
The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event Count Rates during the reporting period (due to data retrieval problems, some gaps could be present).



PSD:

The performance of the unit is nominal.

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



SPI Event Log:

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

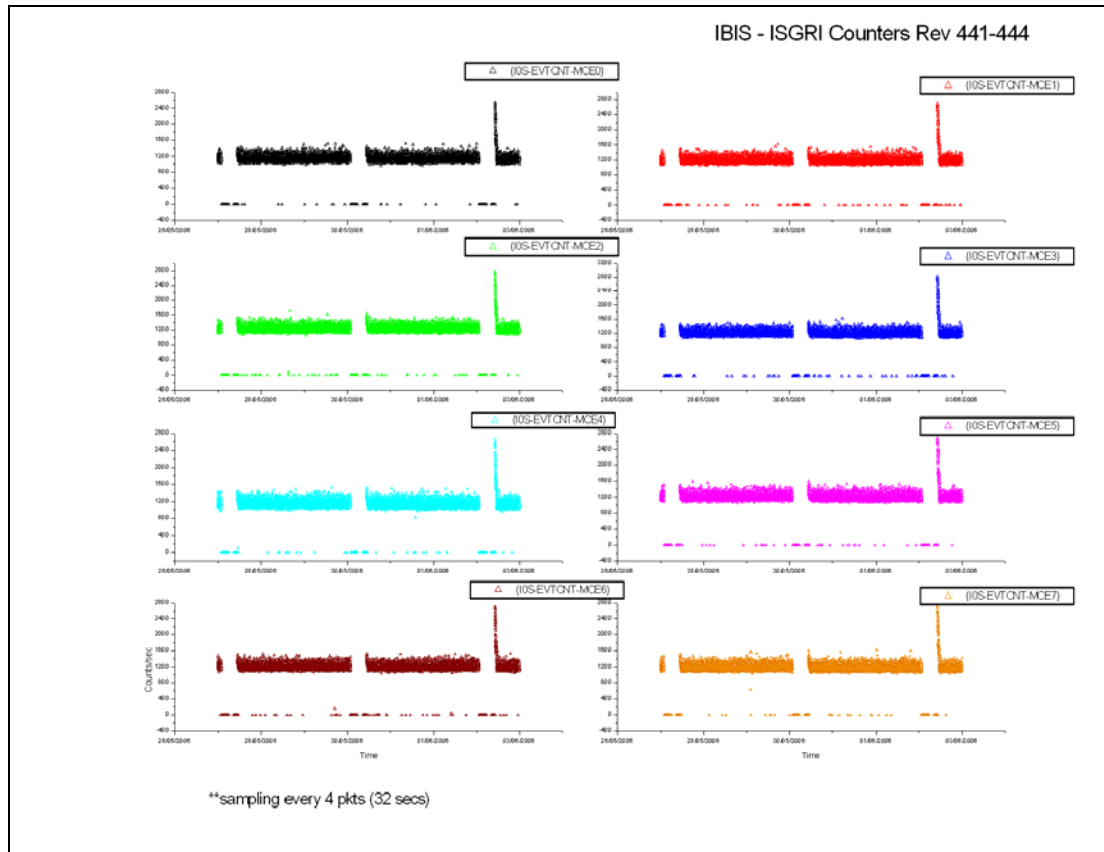
Time	Description	Analysis
147 / 11:21	TM E1293 "S AS OBT ST L" OOL Warning High for less the one minute. TM P2014 "LCL CUR ACS-A" OOL Alarm High for less then a minute.	TM E1293: One off event caused by SEU on ACS. TM P2014: Caused by re-initialisation of TM processing on ground.

147 11:26, 19:02 148 Entire Night	TM E3500 "P_DF_CNVT-BW_L,1" Toggling in and out OOL Alarm High.	Caused by high radiation background. Limit under review.
150 - 11:08	TM E3500 OOL, back in limits @ 11:54	Caused by high radiation background. Limit under review.
150 - 20:39	EV: Exception - OBIH TM RTU Aquis. Failure	SEU causes PRTU to fail. TM(1,5) is missing.
150 - 23:17	Execution of FCP_DHS_1040 - PRTU A OFF/PRTU B ON & PRTU A LCL OFF	TM(1,5) packet recovered
151 - 00:13	TM: E2115 OOL	Temporary PSAC temperature OOL.

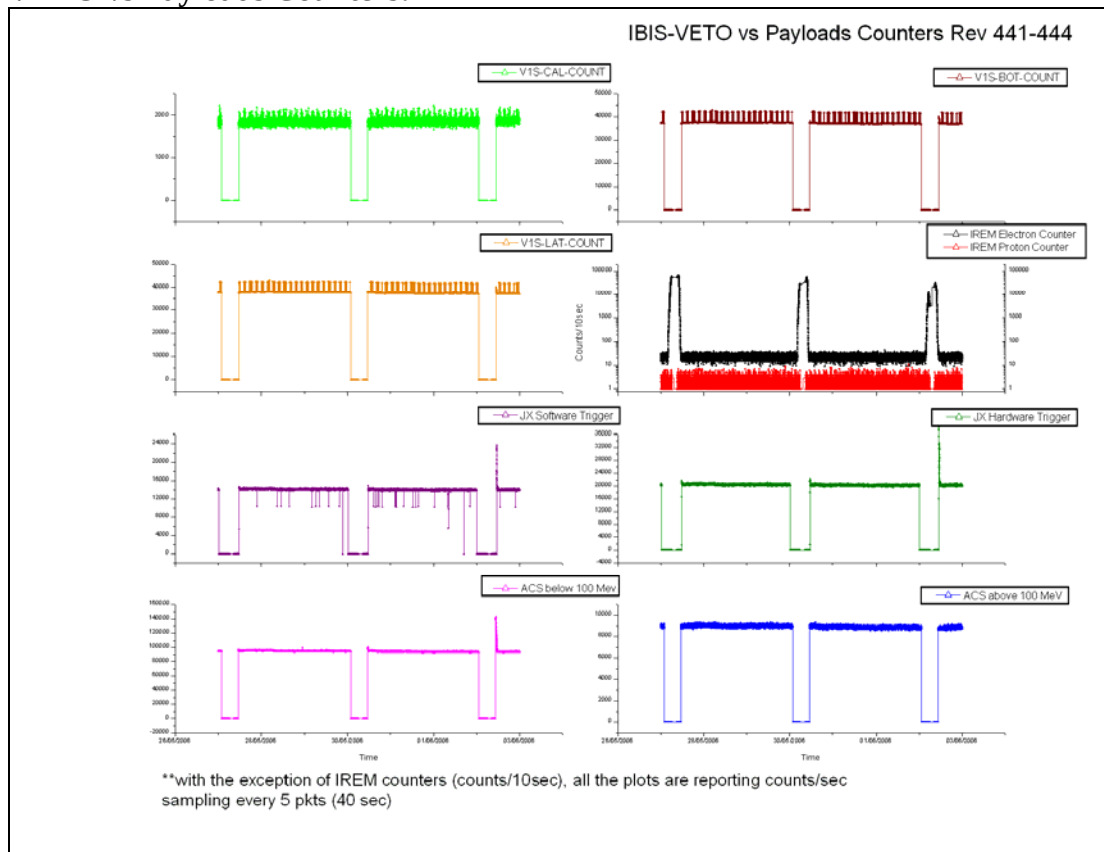
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

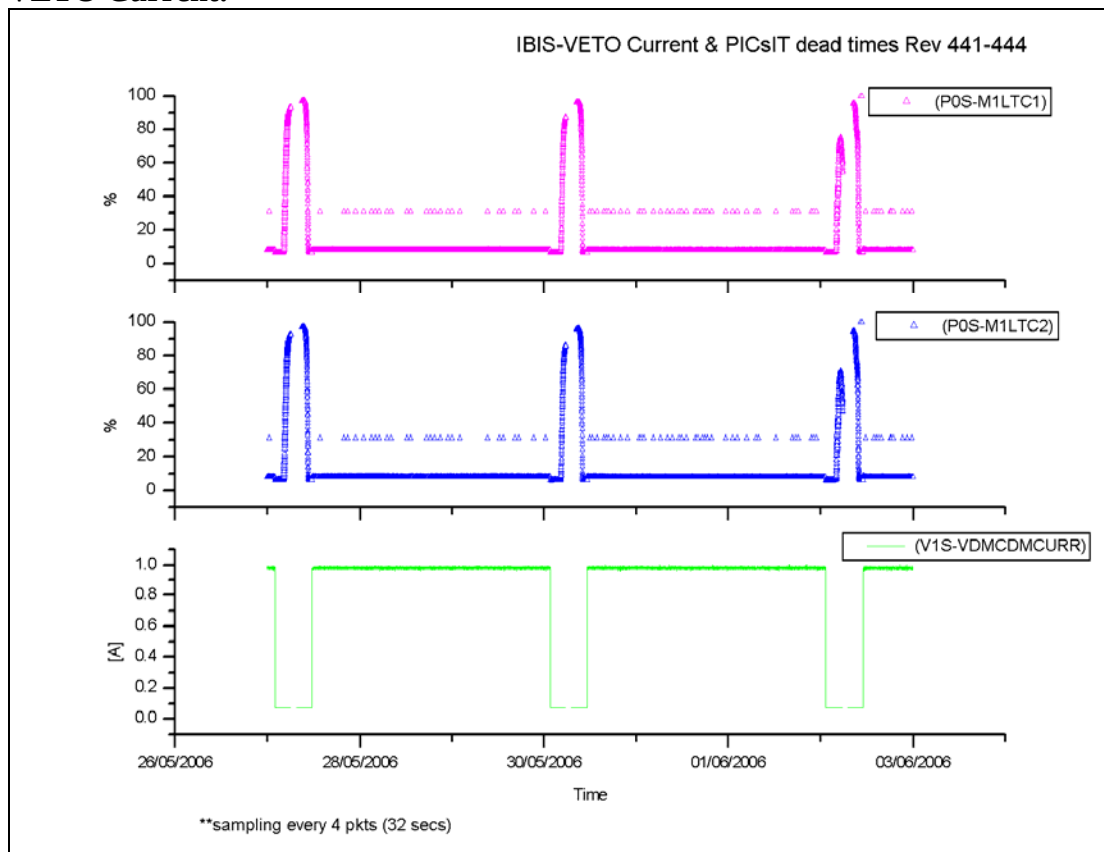


VETO vs Payloads Counters:

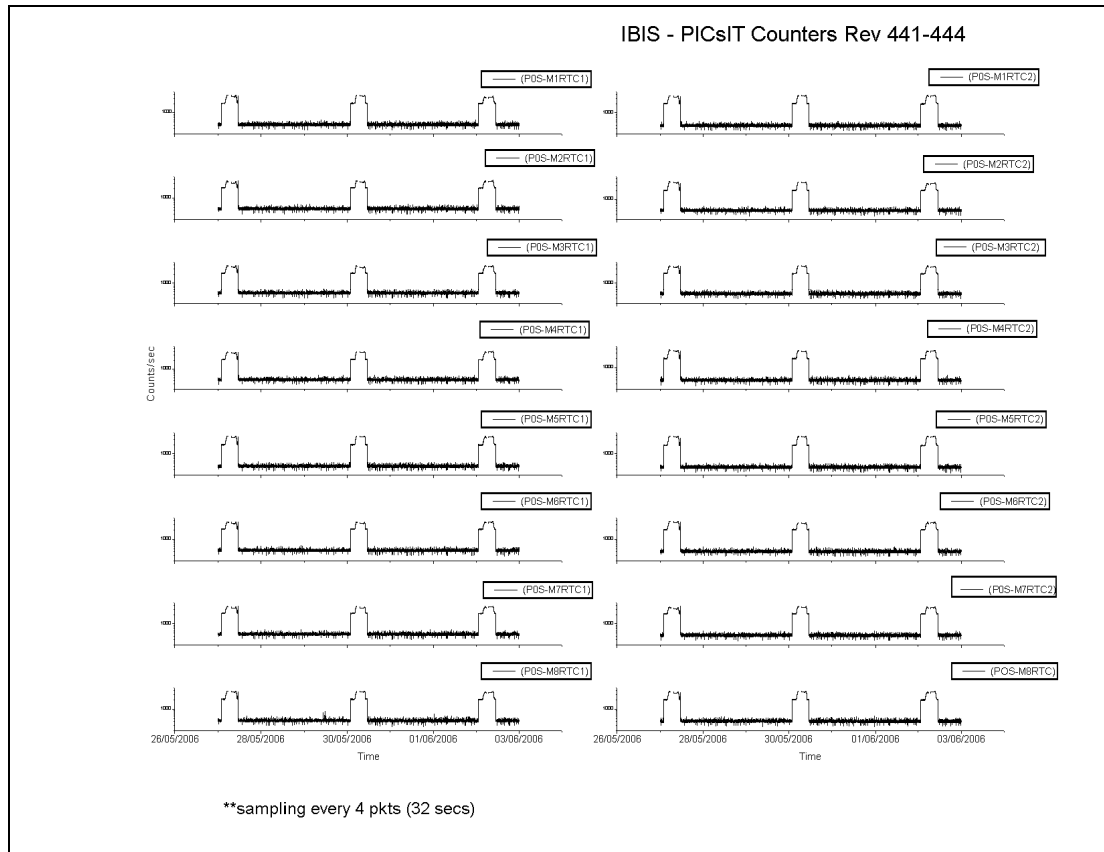


The week was characterised by low radiation.

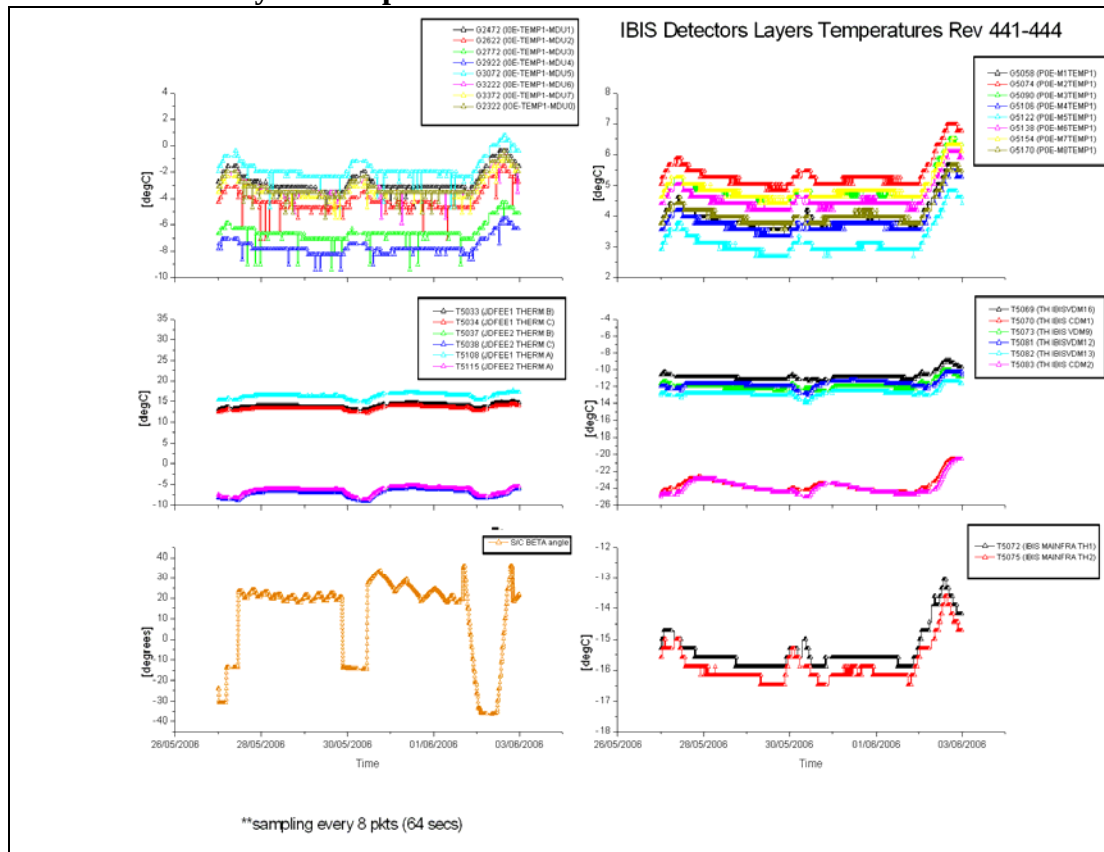
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2006.147 (27//05/2006):

At 02:01Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 11:33Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

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

At 11:04Z TM parameter G2028 (I0E-OVFWPXADD-M2) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 2006.150 (30//05/2006):

At 01:43Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 11:16Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

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

At 10:49Z TM parameters G2042 (I0E-OVFWPXADD-M3) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 2006.153 (02//06/2006):

At 01:26Z, TM parameter G8015 was reported Out Of Limit high. It went back inside limit at 10:58Z. As this happened inside the radiation belts (following VETO Stand-By mode), according to V-VLT-1 no action was taken.

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

From 10:26Z until 10:41Z, TM family G2013 (I0S-EVTCNT-MCEi) was toggling OOL High. According to I-CNT-1 in FDIR, no action was taken.

At 10:32Z TM parameters G2084 (I0E-OVFWPXADD-M6) failed SCC and back. According to I-OVF-1, no action was taken.

At 11:03Z, TM parameter G8080 (S1E-VS HBRA-RT) was toggling OOL High during 5 min. According to H-OVF-2, 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.

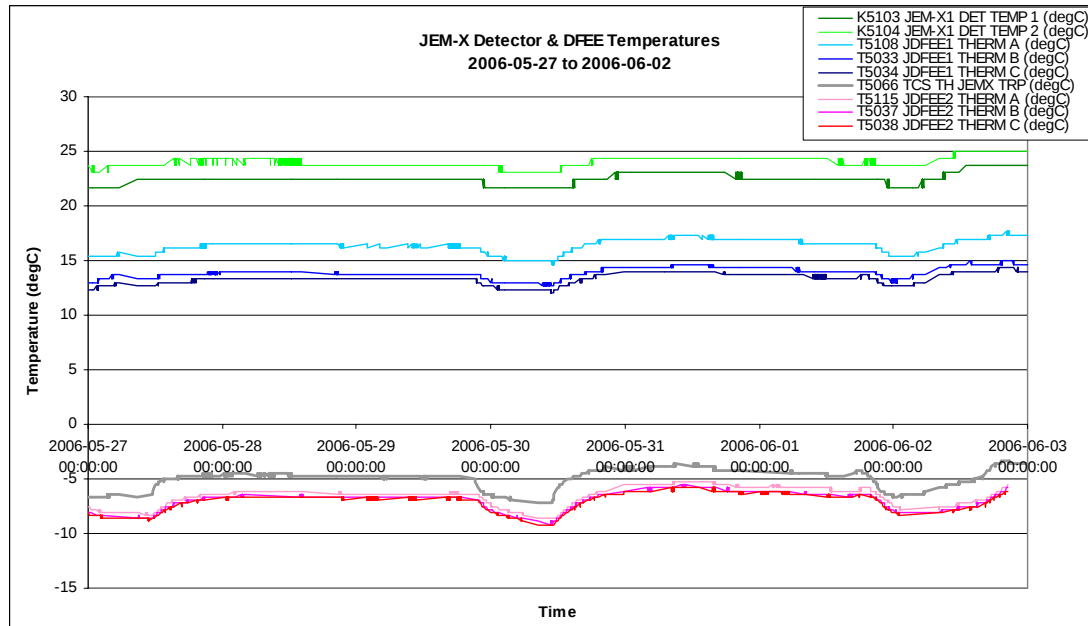


8.3.4.2 JEM-X Temperatures

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.

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

² Data sampled (1 frame in 8)



8.3.4.3 JEM-X Daily Report

2006-05-27 (DOY 147, Rev 441-442) to 2006-06-01 (DOY 152, Rev 443)

Nothing to report

2006-06-02 (DOY 153, Rev 443-444)

During the execution of the JEM-X1 activation ED KEHVAC01 from the Timeline, after the TC K0013 STATE DIAGNOSTIC was uplinked at 11:10:10Z, the following OEM was received:

11:10:30Z OEM 189 JEM-X1 PROB DFEE 9 (Unexpected DFEE state reported in HK)

as the TM parameter K5462 DFEE STATE IASW was reporting state DATA DUMP while K5022 DFEE STATUS was SETUP. This was because the DFEE output FIFO buffer was over half full at the time of termination of the diagnostic data collection (K5135 FIFO FULL LOSS = 5695 at 11:10:10Z) and thus the IASW did not recognise the autonomous transition of the DFEE back to SETUP (see JEM-X User Manual Section 3.7.5.2.3.6). The situation rectified itself when the next TC of the ED, TC K0009 STATE SETUP, was sent at 11:15:10Z, after which both TM parameters K5462 and K5022 reported SETUP and the following OEM was received:

11:15:18Z OEM 254 ERROR OFF.

Due to high background radiation conditions, the following Out of Limits were received just after radiation belt exit of revolution 444:

- K5449 HARDWARE TRIGGER: OOL Warning High between 11:08:02Z-11:11:54Z; 11:12:34Z-11:14:18Z; 11:17:38Z-11:19:30Z and at 11:21:06Z (for 1 TM cycle);
- K5136 BUFFER LOSS: OOL High between 11:16:10Z-11:16:58Z and 11:17:46Z-11:18:58Z.

However the count rates were not high enough to cause a transition of JEM-X1 to Safe mode.

8.3.5 OMC Operations

2006-05-27 (DOY 147, Rev 441) to 2006-05-28 (DOY 148, Rev 442)

Nothing to report

2006-05-29 (DOY 149, Rev 442)

At 03:05, hits on the line to Redu caused all links to drop. The slew to the attitude for pointing 04420040 failed. A manual recovery was performed, and the timeline rejoined at 03:37. The impact was the loss of pointing 04420040.

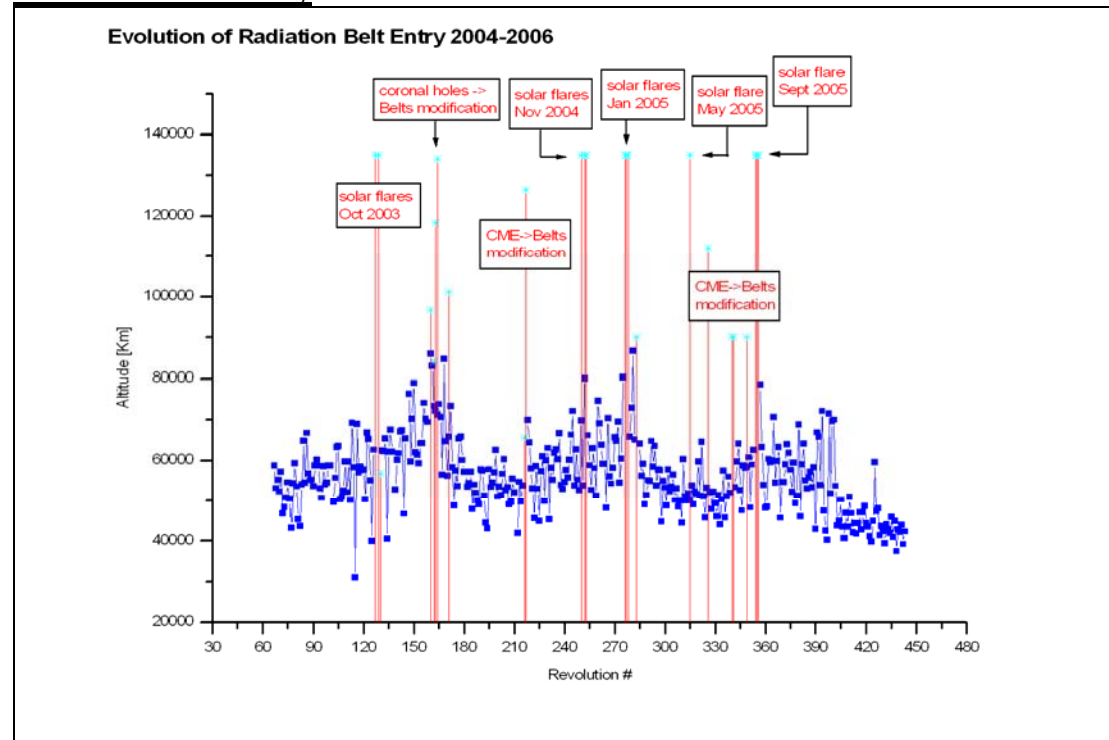
2006-05-30 (DOY 150, Rev 443) to 2006-06-02 (DOY 153, Rev 444)

Nothing to report

On DoY 147 at 02:01:08, DoY 150 at 01:43:08 and DoY 153 at 01.26.12 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]
441	RAD_ENTR R 2006-05-27T02:01:06Z	2006-05-27 04:15:15	>43914.2	2006-05-27 03:31:01	47996
442	RAD_EXIT R 2006-05-27T11:21:05Z	2006-27-05 11:10:19	<<37576.8	2006-05-27 11:01:01	37125
442	RAD_ENTR R 2006-05-30T01:43:03Z	2006-05-30 04:27:31	>39196.0	2006-05-30 03:13:04	48162
443	RAD_EXIT R 2006-05-30T11:02:41Z	2006-05-30 10:32:11	<<38231.2	2006-05-30 10:43:04	36987
443	RAD_ENTR R 2006-06-02T01:26:07Z	2006-06-02 03:52:11	>42322.3	2006-06-02 03:03:04	47491
444	RAD_EXIT R 2006-06-02T10:45:26Z	2006-06-02 10:34:51	<<37473.9	2006-06-02 10:33:04	37753

Reference

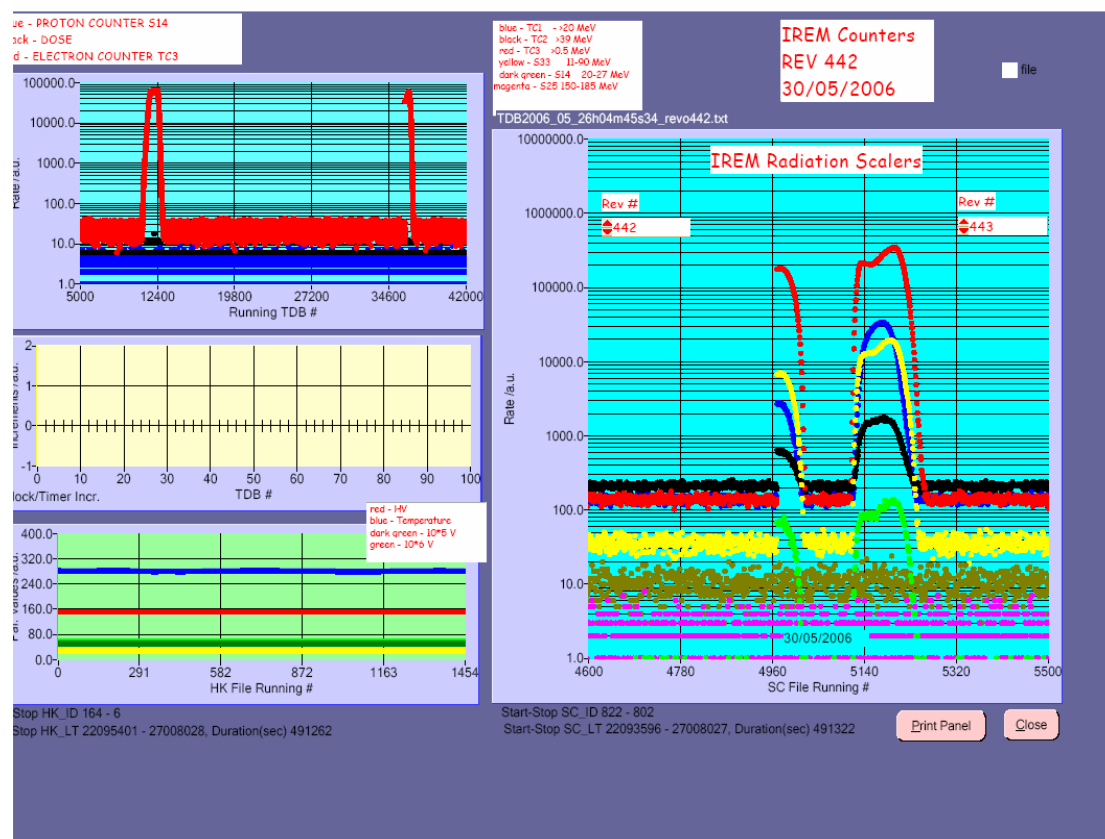
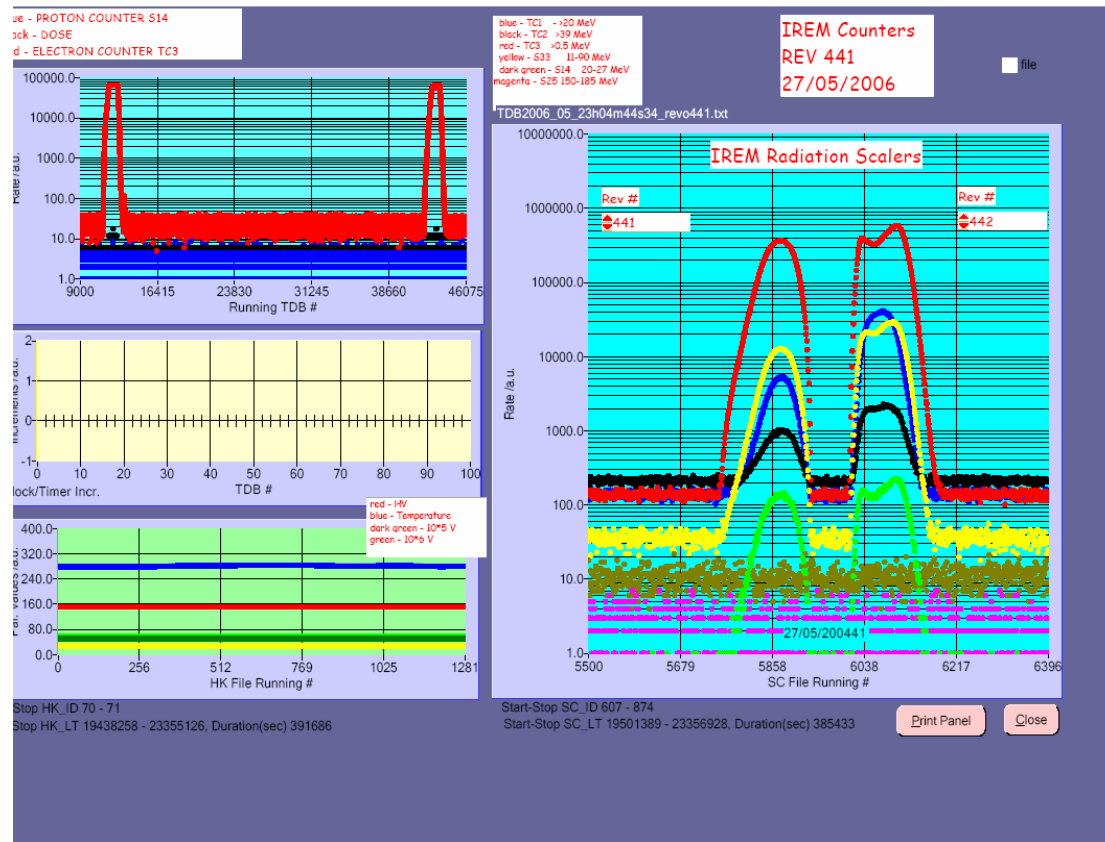
Very small error vs reference (less than 10 minutes)

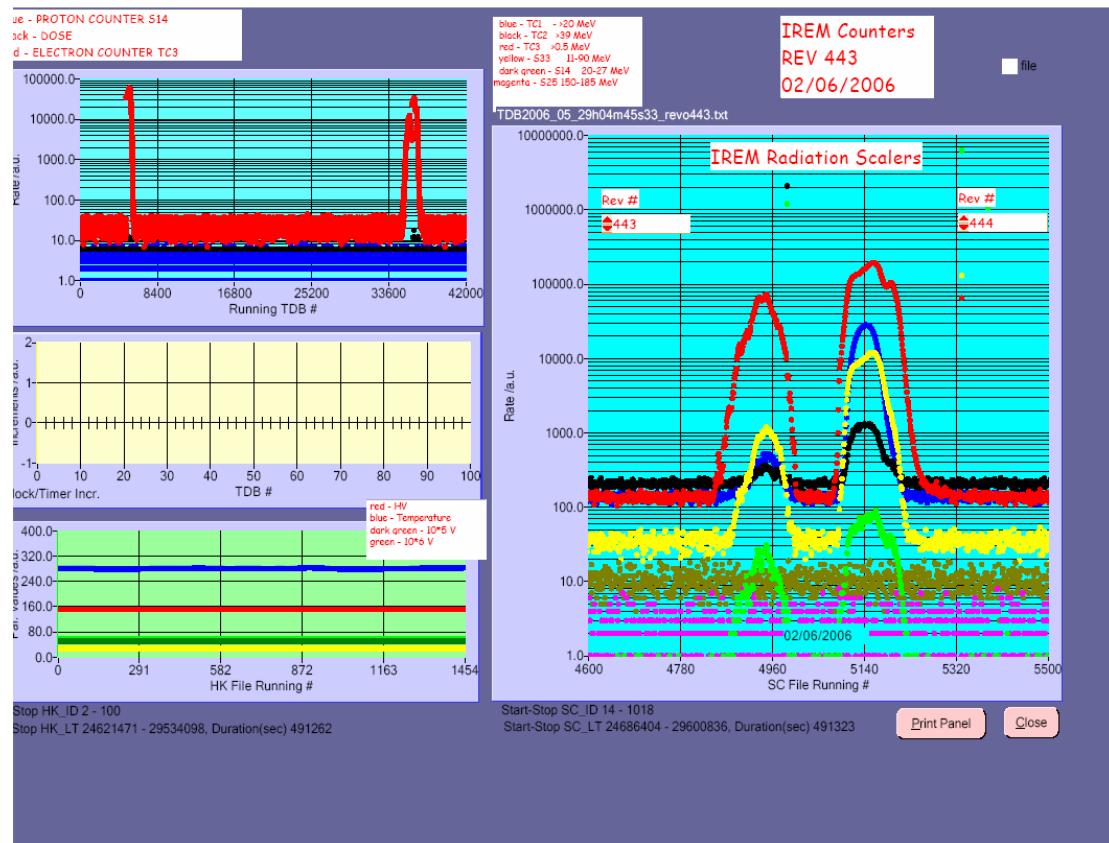
Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

Radiation Spike

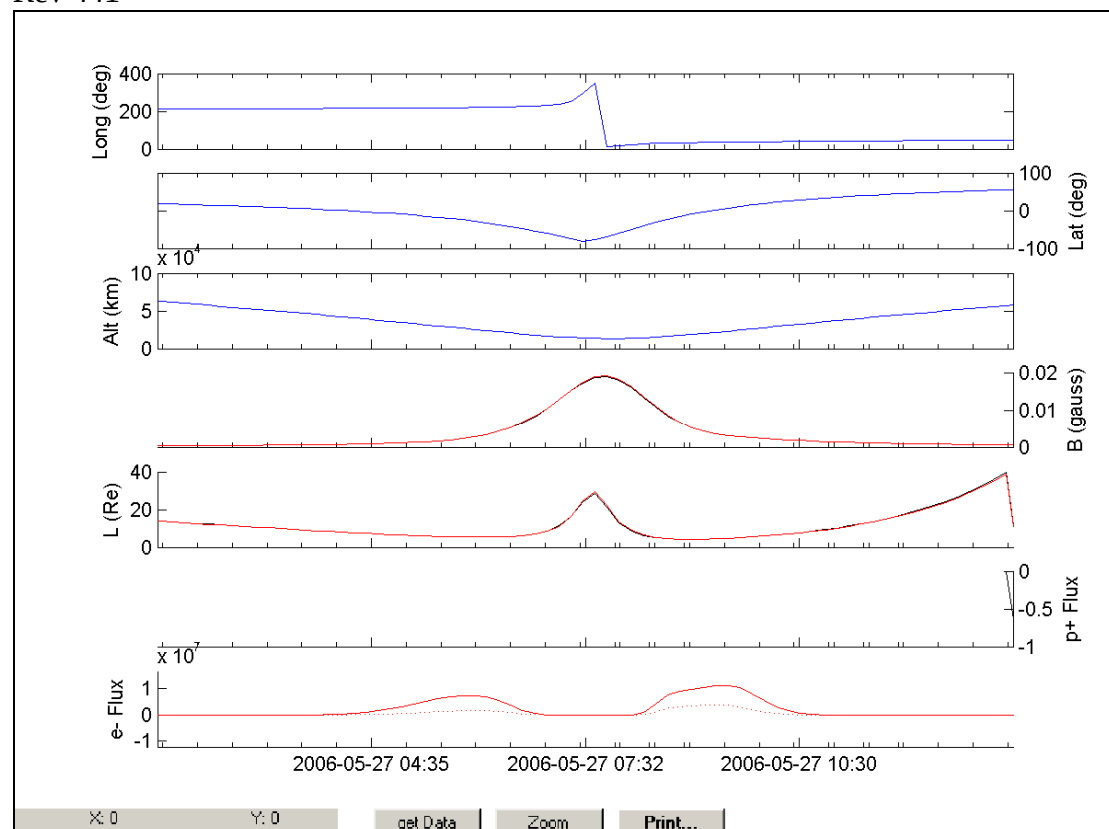
IREM radiation counters:



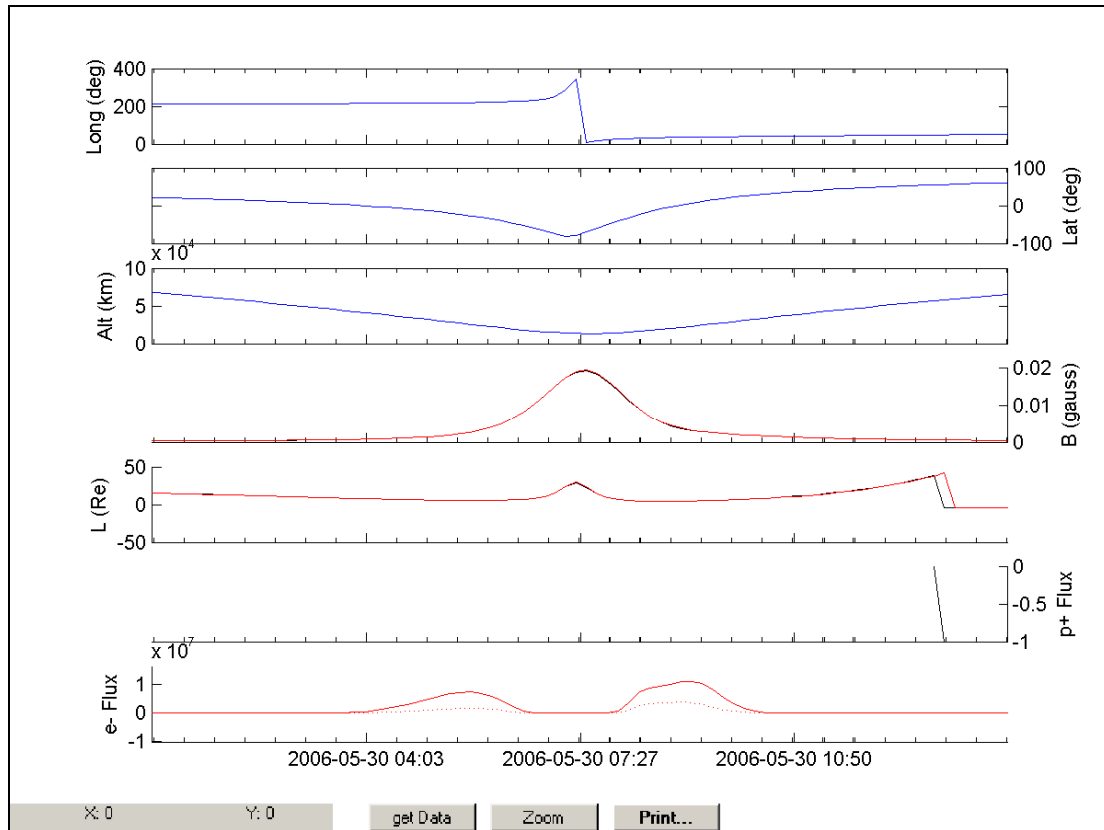


IREM Predicted Radiation Belt Passages:

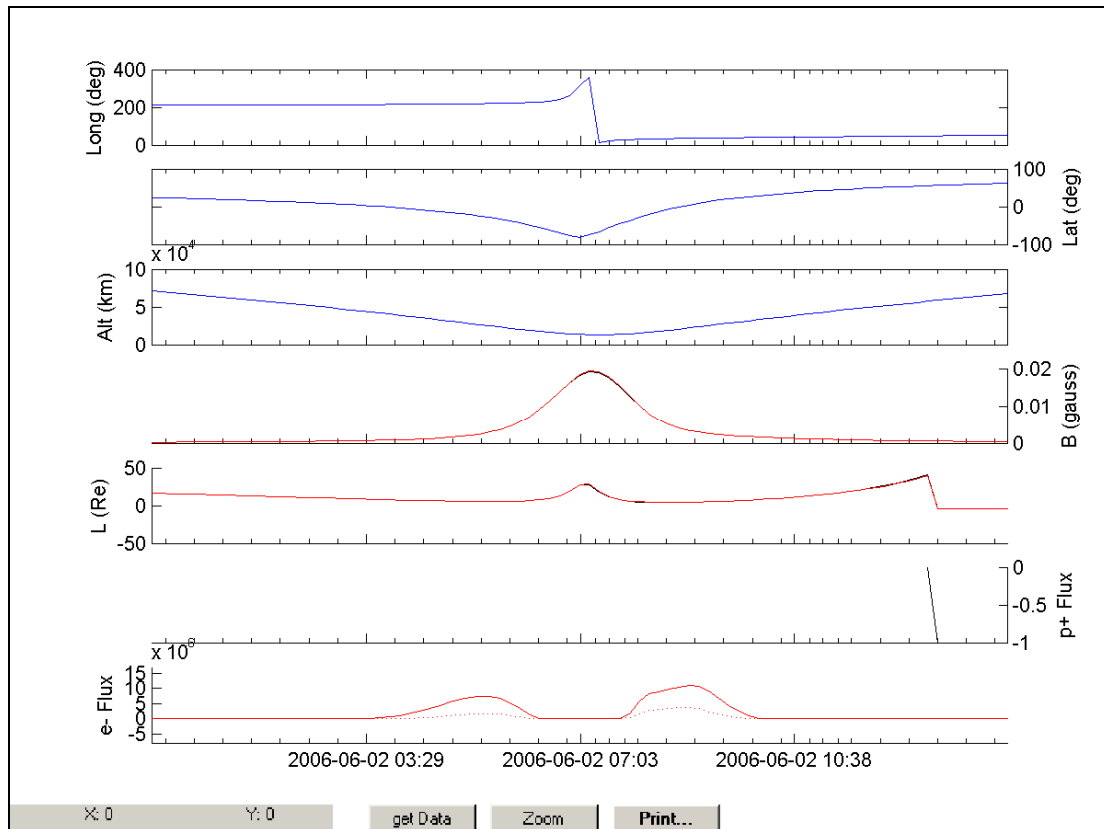
Rev 441



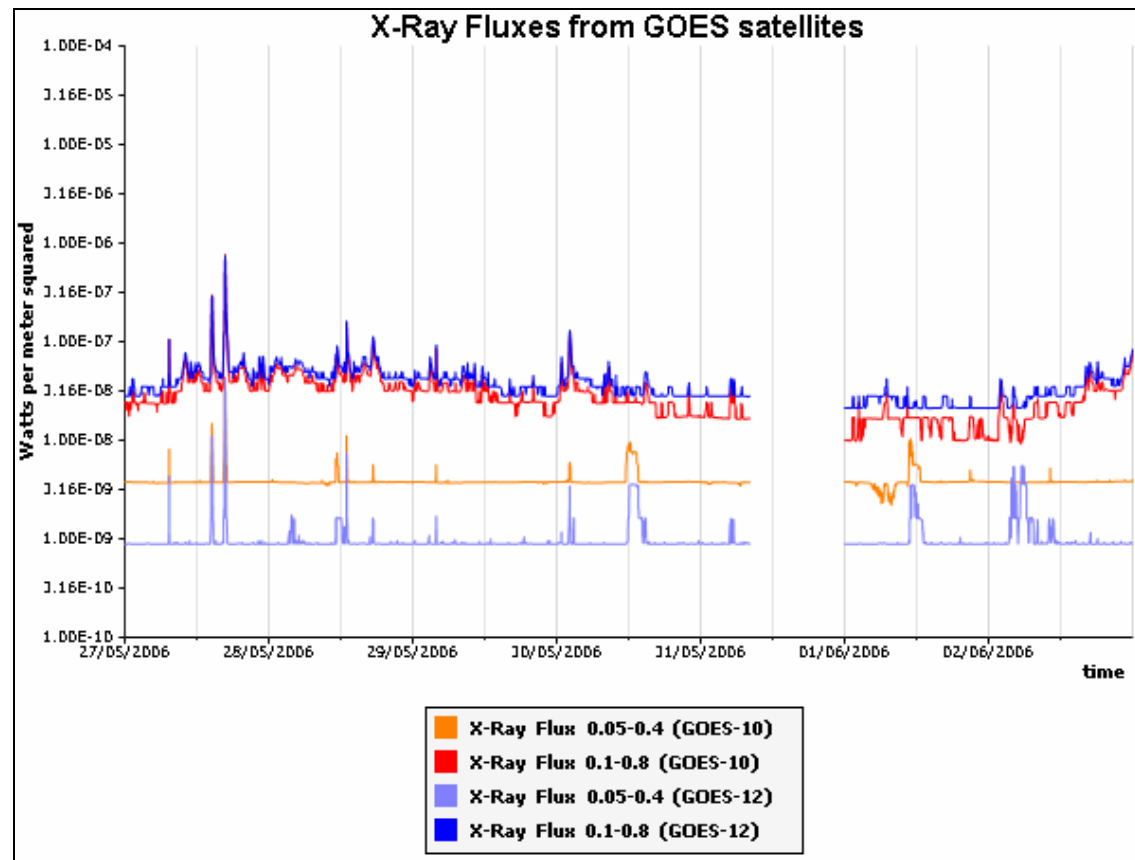
Rev 442



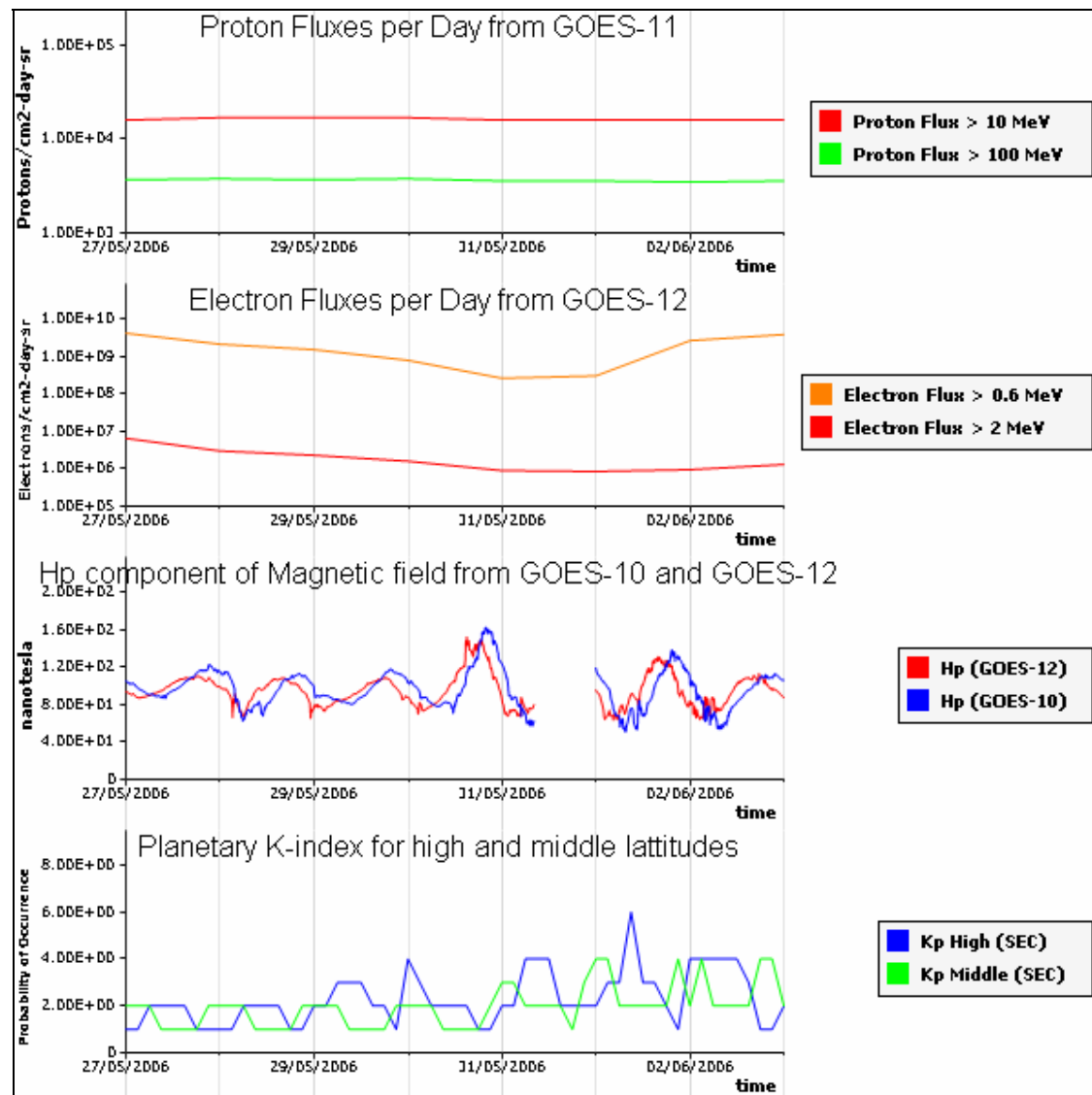
Rev 443



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



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



Proton and electron flux are rather low, reporting no high radiation background. Hp component of the Geomagnetic Field is essentially parallel to the Earth's rotation axis. A drop near 0 nT is associated with a significant variation in the magnetic field. Kp index is based on ground magnetometers. Kp ≥ 5 features storm-level geomagnetic activity.