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

INTEGRAL
Mission Report

INT-MOC-SYS-RP-1001-OPS-OF

No. 163
Week 44

07.11.05

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 29.10.05 until 04.11.05 (both dates inclusive) and covers the revolutions 372 & 373.

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 the Galactic Plane; Field_6 (RA 21:46:58.00; DEC +17:49:40.0); GRS 1915+105 (RA 19:15:11.50; DEC +10:56:44.0) and GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9). The activities consisted of raster and hexagonal dithering and GPS 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.

As part of the AOCS preparation for the winter eclipse season, the onboard AMD thresholds were set to their eclipse season values on 30/11/2005, during rev 372.

The eclipse season started on 02/11/2005 with a lunar eclipse. The eclipse passage was nominal from an AOCS point of view. Afterwards, the ACC/FDE/FCE Eclipse Timers were stopped, during rev 373.

8 slews (5 CSL, 3 OSL) were lost from the Timeline during this period due to problem on IMCS and FDS

The fuel consumption over the period between 01/09/2005 and 03/11/2005 was 0.2406 kg. The remaining propellant is in the order of 158.4560 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.

01/11/2005: Battery recharge rate C/13 was selected in preparation for the lunar eclipse on 02/11/2005 and the upcoming eclipse season starting on 11/11/2005. As only minimal battery discharge was expected, the MRU EOC Timer circuit was left enabled.

02/11/2005: Lunar eclipse, during the lunar eclipse the fraction of the visible sun disk remained sufficient to power the Satellite via the arrays without the assistance of the batteries, throughout the eclipse. Hence there was no battery discharge. Similarly the array output current did not drop low enough to trigger the PDU ECL(s/e) sequences.

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.

01/11/2005: The On-board monitoring table for the eclipse season was loaded in preparation for the lunar eclipse on 2/11/2005 and the upcoming eclipse season starting on 11/11/2005.

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

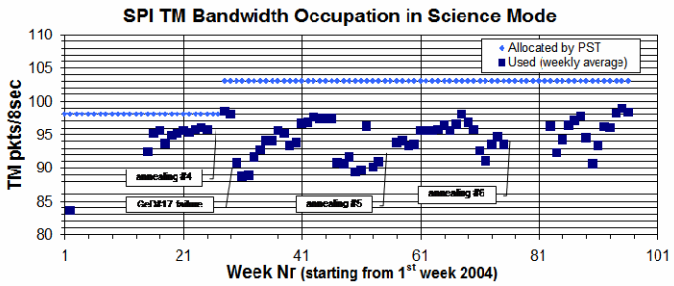
The overall status of the instrument is nominal.

During science operations, the instrument was kept in photon-by-photon mode, with spectra TM enabled, an assigned TM bandwidth in the science observation windows of 103 pkts/cycle and an average occupation of 98.3 pkts/cycle.

On 2nd November between 02:41z and 03:13z the spacecraft went through a lunar eclipse, which was handled as a full eclipse: the instrument subassemblies were switched off and on again at eclipse exit.

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.

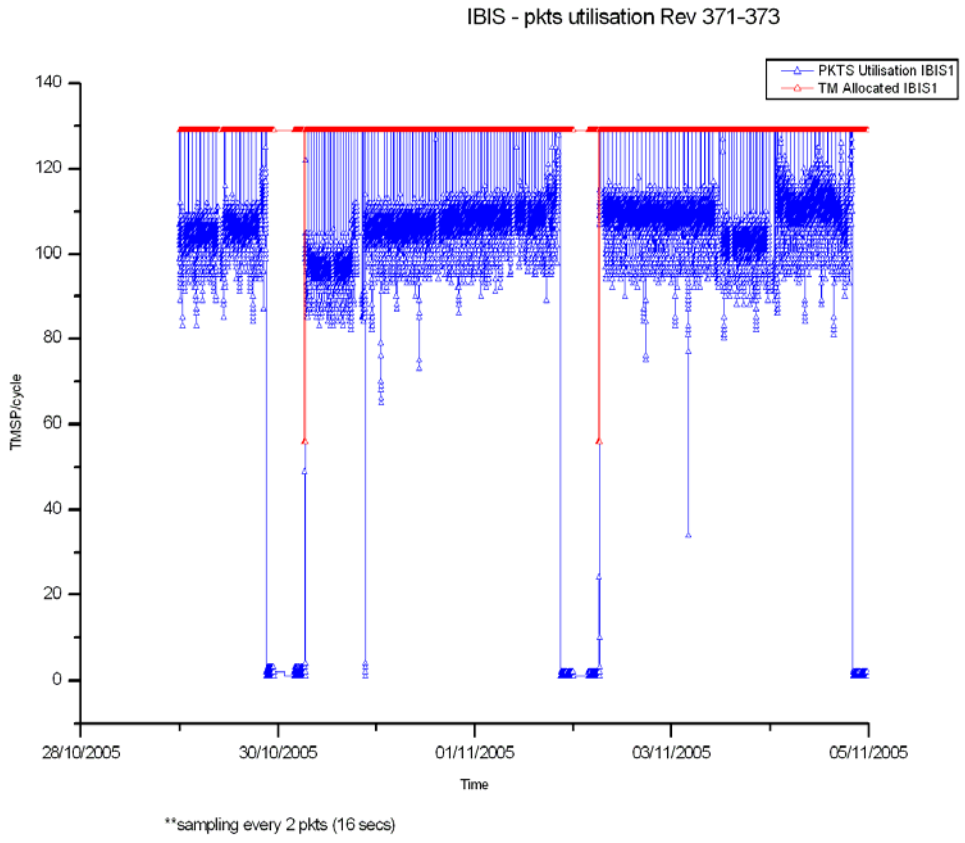
3.2.2 IBIS

The Overall status of the unit is Nominal.

The Eclipse season started with the lunar eclipse passage on 02/11/2005. The eclipse was completed on 02/11/2005 at 03:13:57Z. The eclipse passage was nominal from the unit point of view.

During the reporting period, the PST allocation to IBIS was 129 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 108.2 TMPS/cycle, up 2.2 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.

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, 154 of the 160 planned science pointings for OMC were executed nominally, 6 were lost to various 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.

The solar activity was low this week, the sun appeared blank during most of the observation period.

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 was good this week, 7 pointings were lost (1 was manually executed at the nominal time). The overall performance was well above the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week, although 2 pointings were lost to the Packet Distribution Service not running, 3 pointings were lost to TM Cache and other imcs problems, FDS problems led to the loss of 2 pointings, and several

occasions where automatic TPF updates were not received, and had to be manually generated. There were also several minor incidents of icons turned red on the Global MMI, and also where there were brief interruptions on the link with ISDC, but these had no operational impact. The overall performance was well above the 95% requirement.

4.2 Ground Stations & Network

The performance of the ground stations and Network was excellent this week There were a couple of instances where there was a 1 second interruption from DSS-16, and a four minute interruption from Redu, due to a hit on the line, there was no impact on any occasion. The overall performance though was well above the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

PSF's for revolutions 376 to 380 were received this week. Planning of the revolutions 376 to 379 has been performed in ISOC. Urgent re-planning had to be performed due to the problem mentioned since long related to differences between the constraint checks in ISOC and MOC/Flight Dynamics. No ToO request were received. TSF for revolution 374 was received.

2. Observation status
One ECS for revolution 360 was received. The corresponding OCS's were generated and sent to ISDC. No extra time credited.

3. ISOC science data archive
Nothing to report this short working week.

4. ISOC system
The version 11.2 has been in use this week without problems. A patch to version 11.2.2 was introduced to overcome a detected minor problem.

5. Problems
No new problems, however the previously reported problem related to the difference in ISOC and MOC/FD constraint checks is still not resolved. This problem has occurred several times lately and need an urgent resolution.

4.3.2 ISDC

Status of ISDC observation processing on 07/11/2005:

- Latest Standard Analysis completed: observation 02201330004 (Gal.Center field, Revolution 349-359) on 04/11/2005

- Latest products archived: observation 02201330004 (Gal.Center field, Revolution 349-359) on 04/11/2005

- Latest observation products sent to the observer: observation 02297000020 (galactic disk l<0, Revolution 347) on 03/10/2005

5 Special Events

Lunar eclipse (penumbra only) during perigee on 2/11/2005.

6 Anomalies

There were a number of problems that impacted the operations:

- On DoY 302, at 03:41, the message: Error sending data to ISDS, followed a minute later by the message: Link-MADDS-ISDS TM Flow, was seen. These messages continued every minute or so. Several attempts were made to clear the problem, which was eventually cleared at 07:05 after a reboot of the ISDS and IFRD.
- At 09:30, after the PDS TM, SEGS server and HFA TM tasks were stopped and restarted on the imcsa, VC-0 TM drops were seen. This caused Slew 03710056 to fail. After the recovery, the timeline was rejoined at 11:28. The impact was the loss of pointings 03710056 & 03710057.
- At 12:46 the TC D4005 report BCPKT G2 was unverified, there was no impact.
- At 21:21, 21:26, 21:53, 22:05 and 22:21 there were errors sending data to the isds. The isds was restarted at 22:20 clearing the problem, there was no impact.
- From 22:42 to 22:43, and again at 22:48, the VC0 & VC7 TM from DSS-16 dropped, perhaps due to the on-going imcs maintenance. The impact was that 2 TCs (D4005 & D4001) failed and had to be re-sent.
- On DoY 303, at 04:17, the timeline on both A & B chains had to be aborted and re-loaded, as TC D3301 had a static PTV of No-Go on both systems, there was no impact.
- On DoY 304, at 09:09, a message on the Global MMI indicated sun128 had disconnected, also the display on sun125 appeared to be frozen. At 09:51, the display appeared to have recovered.
- At 13:45, the FD update-slew task failed to generate the TPF. At 13:59, the SOE tool also failed. The fault was traced to the FD TM processing task, which had crashed. This was restarted, and a recovery performed, the timeline being rejoined at 15:06. the impact was the loss of pointing 03720045.
- On DoY 305, at 6:27, the update for CSL 03720066 failed, a manual mapping was performed, and the slew updated, there was no impact.
- At 09:41, the same thing happened for CSL 03720070, and again the recovery was performed in time, there was no impact.
- At 11:20, the NCTRS-B MMI went red for a few seconds, there was no immediate impact.
- At 11:38, the TC 2564 (RC STAR BRGH TH), and A3131 (RP SLEW MAN) had an unverified completion, this was followed by A7192 (START MAN TIMER) failing release. After the recovery, the timeline was rejoined at 12:31, the impact was the loss of pointing 03720072.
- At 20:29, and 23:28, there were 1 second drops in the VC-7 TM from DSS-16, there was no impact.

- On DoY 306, at 02:12, the idda was yellow, on the MCCM MMI, with the PSRV task using about 25% of the cpu. This task was then restarted. A minute later there were 9 occurrences of the message CHISfile – idda – Cannot get notification data from CPD. There was no further impact.
- At 04:37, it was observed that the FDS was not receiving TM. FD were called in, and restarted the GTP tasks, which cured the problem. The impact was the scheduled RWB was not sent. This was later manually executed at 06:43. The impact was the loss of slew 03730002.
- At 09:43, the FDS failed to update the slew 03730006, it was manually updated at 09:59 without impact.
- From 12:40 to 12:41, the TCO Server Time Correlator on imca was invalid, there was no impact.
- From 13:07 to 13:09, the icon for inctra on the Global MMI turned red, again there was no impact.
- On DoY 307 from 07:00 to 07:04, the VC0 & VC7 TM from Redu was down, after a hit on the line. There was no impact.
- At 10:14, the CPD_TM on imca died, it was restarted at 10:15, the impact was at 11:09, the AOCS TC A3619 (Enable PP Filter) had an unknown acceptance, and uncertain completion. This caused the next AOCS command, A3691 (Load IMU Timers), to fail release. The impact was the loss of pointings 03730030 and 03730031.
- At 16:09, the idda icon on the global MMI turned red for a few seconds, later, at 17:29, 18:22, 19:04, and 21:05, the nctrs-b icon did the same, then at 22:20, the imca icon turned red and back to green. There was no impact.
- On DoY 308, at 01:43, the OMC command M1329 (Imaging BX) sent from ISDC failed on-board acceptance. The impact was OMC was not switch to Normal mode at this time, but was switched 9 minutes later to Normal, by the timeline.

The following anomaly report was entered into the ARTS system.

AR id	Date Created	Subject	Segment	Status
INT-2804	04/11/2005	TMPH + OBEH reported sequence of on-board event not correctly sorted	IMCS	Open

7 Future Milestones

A patch of the IMCS is planned for November, which should fix a couple of problems.

DSS-16 is to be decommissioned, and replaced by DSS-27, initial testing of DSS-27 was performed in October. A final test including ISDC will take place during November.

The next eclipse season starts on November 11th.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 372

The observations in revolution 372 consisted of a GPS lasting ~12.5 hours followed by a raster dithering observation of Field_6 (RA 21:46:58.00; DEC +17:49:40.0), performed for the remaining ~47 hours of observation time.

Revolution 373

The observations in revolution 373 began with a hexagonal dithering observation of GRS 1915+105 (RA 19:15:11.50; DEC +10:56:44.0) lasting ~28.5 hours, followed by a raster dithering observation of Field_6 (RA 21:46:58.00; DEC +17:49:40.0) lasting ~12 hours. A raster dithering observation of GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9) was then performed for the remaining ~18.5 hours of observation time.

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

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

```
2005-10-21T05:28:10.000Z     158.7752    F   Automatic TM processing.
2005-10-24T05:11:46.000Z     158.7535    F   Automatic TM processing.
2005-10-26T13:49:44.000Z     158.7324    F   Automatic TM processing.
2005-10-26T22:48:00.000Z     158.7211    F   Automatic TM processing.
2005-10-27T00:04:49.000Z     158.6991    F   Automatic TM processing.
2005-10-27T04:53:37.000Z     158.6966    F   Automatic TM processing.
2005-10-28T16:02:38.000Z     158.6789    F   Automatic TM processing.
2005-10-29T22:29:37.000Z     158.6670    F   Automatic TM processing.
2005-10-30T04:56:17.000Z     158.6481    F   Automatic TM processing.
2005-10-30T13:31:46.000Z     158.6219    F   Automatic TM processing.
2005-10-30T19:24:19.000Z     158.5785    F   Automatic TM processing.
2005-10-31T15:13:25.000Z     158.5486    F   Automatic TM processing.
2005-11-02T06:48:33.000Z     158.5335    F   Automatic TM processing.
2005-11-03T14:51:49.000Z     158.5165    F   Automatic TM processing.
2005-11-03T23:52:46.000Z     158.4560    F   Automatic TM processing.

This report was generated  Fri Nov 4 08:00:44 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, 29/10/2005 – 04/11/2005

AOCS operations were executed from the Automatic Timeline.

During this period, 66 Open Loop Slews, 104 Closed Loop Slews and 8 Momentum Bias were executed (TL + manual recovery). 8 slews (5 CSL, 3 OSL) were lost from the Timeline during this period due to problem on IMCS and FDS

This is equivalent to a ~4.6% of the total number of slews planned 174.

The AOCS eclipse operations were nominal. For the lunar eclipse passage, the Eclipse Timers and the Time-Tagged sequence to re-enable the IMU Auto Switch-Off function of the ACC were loaded from the Timeline and the pre-eclipse IMU health checks were performed at the planned times. Some information regarding the eclipse times and IMU usage up to this stage of the eclipse season are provided below:

AOCS Eclipse Times — Winter 2005

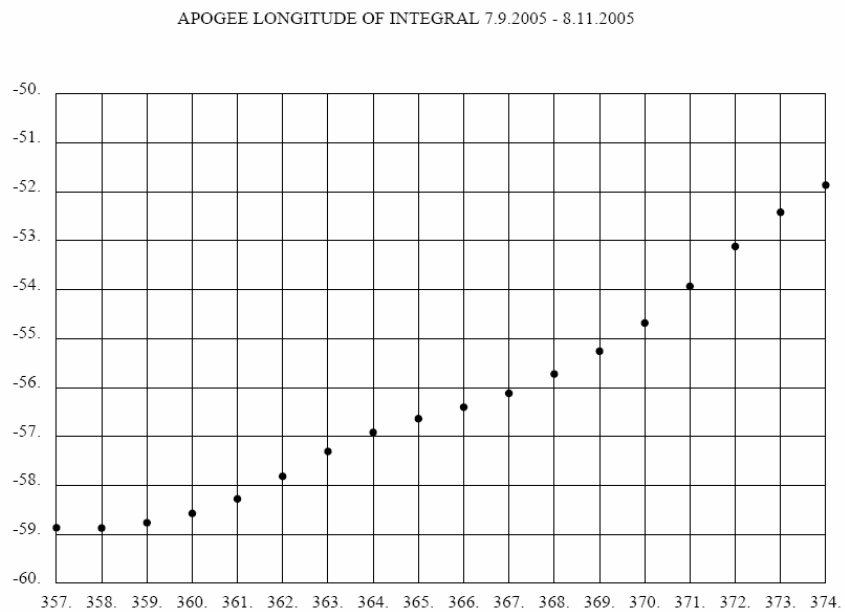
Date	LOS	AOS	ACC Eclipse Imminent	Eclipse Start						Eclipse End					Eclipse Duration
				ACC	FDE	FCE	Penumbra	FSS Sun Out	Umbra	Umbra	FSS Sun In	Penumbra	FDE/FCE	ACC	
2005-11-02	23:56:00	03:44:00	01:42:13	02:24:16	02:32:58	02:33:40	02:41:53	no	00:00:00	00:00:00	no	03:13:57	03:17:52	03:23:42	0:32:04

IMU Usage during Eclipse Season — Winter 2005

IMU On	IMU Off	From Health Check		From Auto Calibration	On Time	Accumulated On Time
		Noise Roll [as/s]	Drift Roll [as/s]	Drift Roll [as/s]		
2005-11-02 21:06:21	2005-11-03 03:25:57	0.2272	0.2300	0.0005	6:19:36	6:19:36

Orbit Control

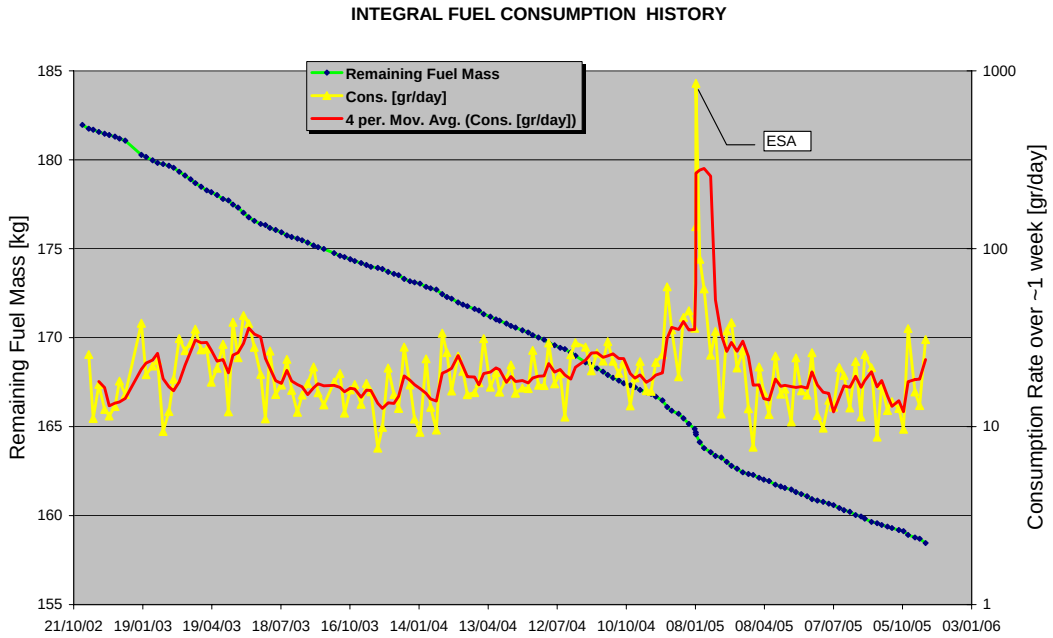
The apogee longitude as function of orbit number is reported below.



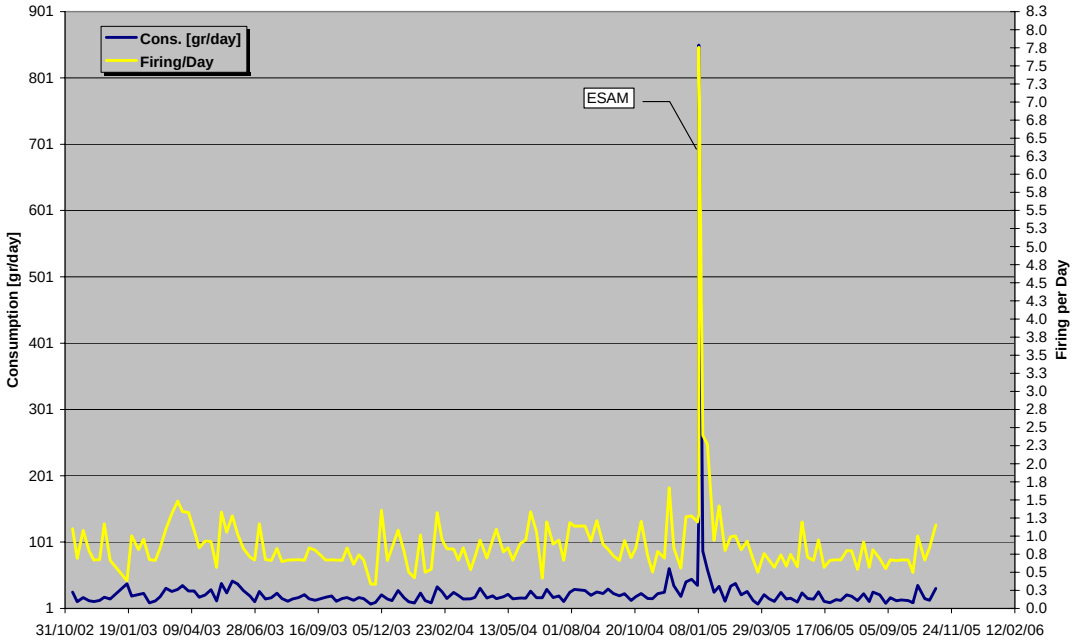
The average semi-major axis decrease, caused by the increased momentum dumping strategy, has been 567 m per orbit in the last two months.
The "Redu only" situation could then be reached in the second half of 2006. The apogee longitude would then be ~ 36 deg East.

Fuel consumption

The fuel consumption (total, grams/day) over the period between 01/11/2002 and 03/11/2005 is reported in the plot below.

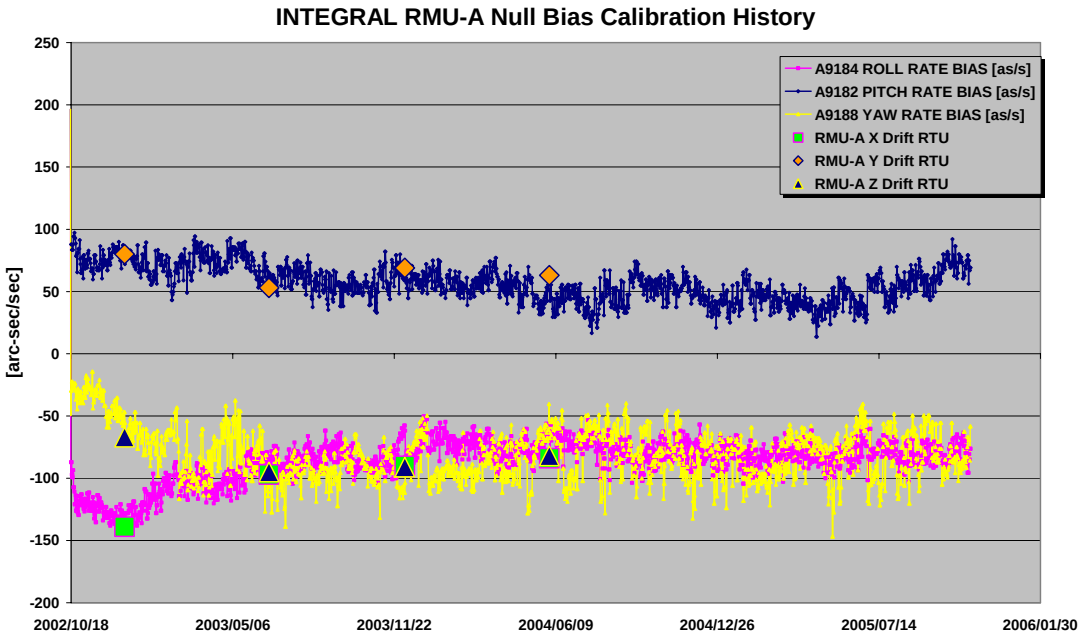


The fuel consumption (grams\day) over the period between 01/11/2002 and 03/11/2005 is reported in the plot below.

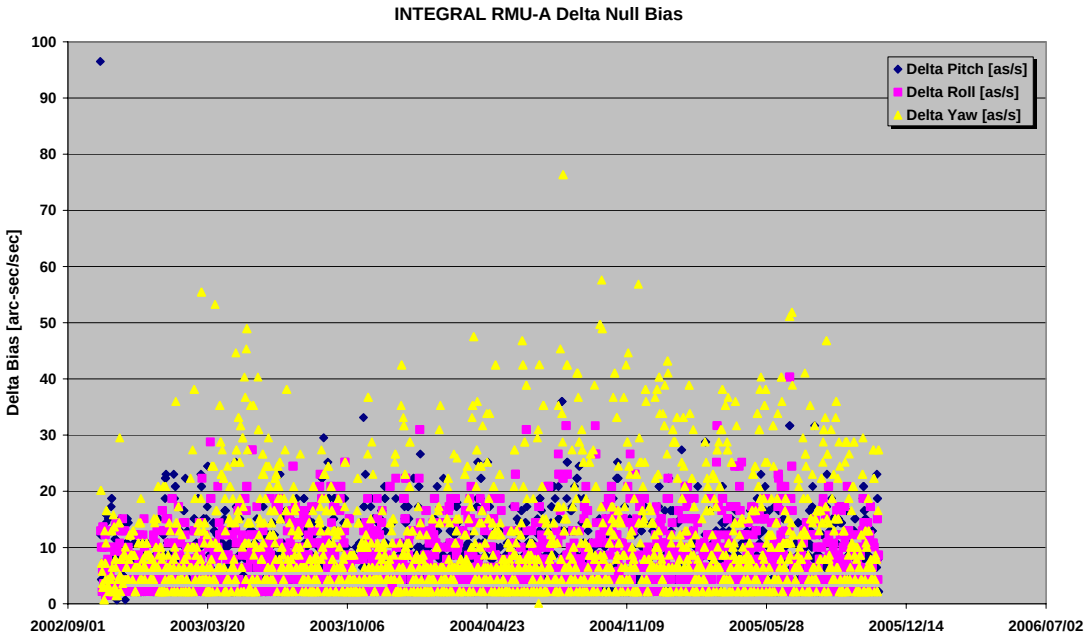


The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 04/11/2005 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 04/11/2005 is reported in the plot below.



29/10/05 (Day of Year 302, Revolution 371)

Slews missed from the Timeline: Due to a problem on IMCS-A chain (PDS and HFA tasks restarted because not running), the slew ID 03710056 failed the execution.

The AOCS s/s was disabled in TL at 09:47z.

A manual recovery was attempted from attitude of PID 03710055 to the attitude of PID 03710057. The next slew (CSL) for PID 03710058 was manually updated and executed from the Timeline.

The AOCS s/s was re-enabled in TL at 11:28z.

The following slews were not executed from TL while recovering the AOCS s/s: 03710056(CSL)-57(CSL).

30/10/05 (Day of Year 303, Revolution 371-372)

Loading of the Eclipse Season AMD thresholds: In preparation of the winter eclipse season (according to FCP_AOC_0524) and with the start of the lunar eclipse, the on-board AMD thresholds were set to their eclipse season values:

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

Eclipse Season:

	Subset 1		Subset 2	
WSMAX	39.5	Nms	35.9	Nms
WSMIN	1.2	Nms	4.8	Nms

WSMAX	To Uplink:				In rpm:	
	X1		X2		X1	X2
RW#1:	411.458333	rd/s	373.958333	rd/s	3929	3571
RW#2:	404.507960	rd/s	367.641411	rd/s	3863	3511
RW#3:	406.078637	rd/s	369.068939	rd/s	3878	3524
RW#4:	404.508374	rd/s	367.641788	rd/s	3863	3511

WSMIN	To Uplink:				In rpm:	
	X1		X2		X1	X2
RW#1:	12.500000	rd/s	50.000000	rd/s	119	477
RW#2:	12.288849	rd/s	49.155398	rd/s	117	469
RW#3:	12.336566	rd/s	49.346265	rd/s	118	471
RW#4:	12.288862	rd/s	49.155448	rd/s	117	469

The uplink was performed at 04:20z.

In the same time frame were verified the AMD dead band value, the IMU timers, the load of the TT sequence to re-enable the IMU Auto Switch-Off function in the ACC and the Eclipse ACC\FDE\FCE timers.

OTF low during PID 03720020: Due to star lost on STR, when the guide star was Mi 8.3 at CCD location [-18772, -22271], the OTF went low and the pointing not reached. The reason of the star lost is likely due a false event and\or to the position of the guide star, about at the edge of the STR FOV in Z.

No impact on TL

31/10/05 (Day of Year 304, Revolution 372)

FDS failed slew update: at 13:45z the FDS failed to generate the update for slew ID 03720045 because the TM processors in the FDS were not running and the system was not able to perform the attitude reconstruction process.

After the TM processors were restarted, a manual recovery was then performed to the attitude of PID 03720045 by generating an OSL. The next RWB in TL was performed without the execution of the CGS (Change of Guide Star), because the guide star at the moment of the recovery was verified to be suitable for the Bias execution. The slew (OSL) for PID 03720046 was not updated, as requested by FD on-call, and executed from the Timeline.

The following slew was not executed from TL while recovering the AOCS s/s: 03720045 (CSL)

01/11/05 (Day of Year 305, Revolution 372)

FDS failed slew update: at 06:27z the FDS failed to generate the update for slew ID 03720066 because the FDS was running with old version of orbital file , used for the attitude determination process, being this not updated by the automatic synchronizing process.

After the manual update of the orbital file, a manual recovery was performed by updating the next slew (CSL) for PID 03720066 and executing it from the Timeline.
An anomaly report is generated by FD on this problem.

No impact on TL.

OTF low during PID 03720069: Due to star lost on STR, when the guide star was Mi 8.1 at CCD location [262, -22142], the OTF went low and the pointing not reached. The reason of the star lost is likely due a false event and\or to the position of the guide star, about at the edge of the STR FOV in Z.

No impact on TL.

Slew missed from the Timeline: Due to a problem on IMCS-A chain (CPD TM and TCO server tasks restarted), the slew ID 03720072 failed the execution.

The AOCS s/s was disabled in TL at 11:45z.

A manual recovery was attempted from attitude of PID 03720071 to the attitude of PID 03720073. The next slew (CSL) for PID 03720074 was manually updated and executed from the Timeline.

The AOCS s/s was re-enabled in TL at 12:31z.

The following slew was not executed from TL while recovering the AOCS s/s: 03720072(OSL)-73(CSL).

02/11/05 (Day of Year 306, Revolution 372-373)

FDS TM processors not running: at 04:37z the FDS TM processors were not running and the system was not able to perform the attitude reconstruction process.

The AOCS s/s was disabled in TL at 04:40z.

After the TM processors were restarted by FD on-call, the next RWB in TL failed execution because the AOCS s/s disabled for the reason above. A manual recovery was performed by updating the first slew of the revolution (OSL) for PID 03730001 and executing it from the TL.
The AOCS s/s was re-enabled in TL at 05:51z.

At 06:40z observed an error on RW#4 larger then 100 rpm, wrt the predicted value.

The AOCS s/s was disabled in TL at 06:40z.

A manual recovery was then performed by manually generating a RWB.
Due to a problem on the SOE recovery tool for the Bias generation (error in one routine invoked by the tool) the Bias did not correct completely the problem on the RW#4 speed. In agreement with FD on-call, the wheel #4 was strictly monitored along the day until the next Bias opportunity in TL, which cured the problem.

Due to the Bias execution (AOCS s/s disabled) the slew (CSL) for PID 03730002 failed release from TL. The slew (CSL) for PID 03730003 was manually updated and executed from the Timeline.

The AOCS s/s was re-enabled in TL at 07:04z.

The following slew was not executed from TL while recovering the AOCS s/s: 03730002 (CSL)

Reconfiguration of the AOCS after the lunar eclipse: with the end of the lunar eclipse the ACC, FDE and FCE Eclipse Timers were stopped. The manual operation started at 09:26z and the following steps were performed (as per FCP_AOC_0522):

– freezing the FDE Eclipse Timer in the sunlight state (by loading zero and starting the Timer);

– freezing the FCE Eclipse Timer in the sunlight state (by loading zero and starting the Timer);

– stopping the ACC Eclipse Timer task.

03/11/05 (Day of Year 307, Revolution 373)

Slews missed from the Timeline: Due to a problem on IMCS-A chain (CPD TM, PIF, SPPG and CMD Verified tasks restarted), the slew ID 03730030 failed the execution.

The AOCS s/s was disabled in TL at 11:10z.

A manual recovery was attempted from attitude of PID 03730029 to the attitude of PID 03730031. The next slew (OSL) for PID 03730032 was manually updated and executed from the Timeline.

The AOCS s/s was re-enabled in TL at 12:11z.

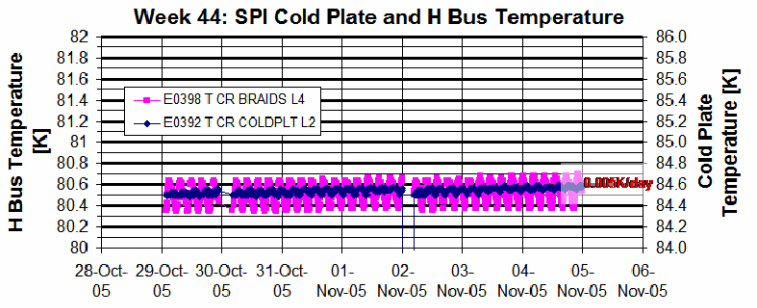
The following slews were not executed from TL while recovering the AOCS s/s: 03730030(OSL)-31(OSL).

04/11/05 (Day of Year 308, Revolution 373)

Nothing to report.

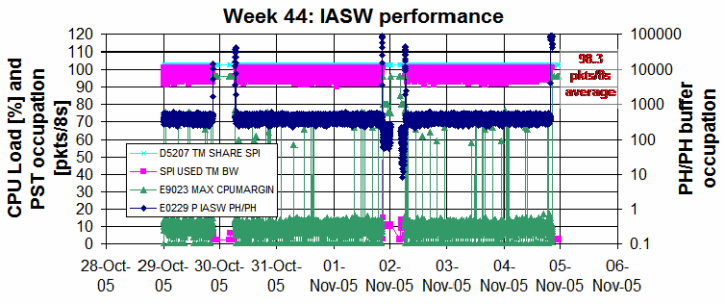
8.3.2 SPI Operations

Stirling compressors and Cryostat:
The performance of the compressors is nominal. The cold plate temperature was maintained at 85K+/-1K showing the usual positive drift with the expected slope (+0.005K/day).
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.

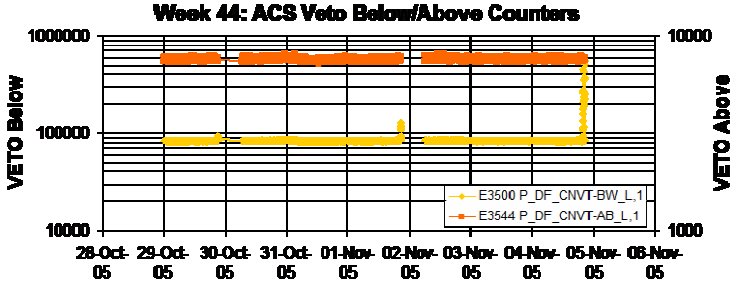
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period



ACS:

The performance of the ACS is nominal.

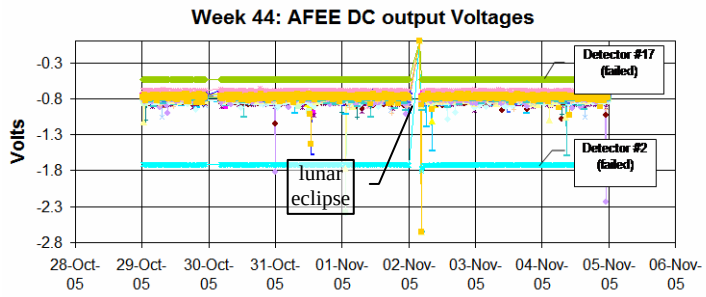
The following plot shows the ACS overall count rate evolution during the reporting period.



AFEE:

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

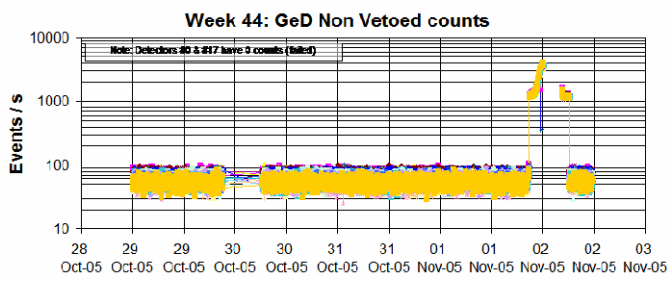
The following plot shows the dc voltage offset of the detector channels during the reporting period.

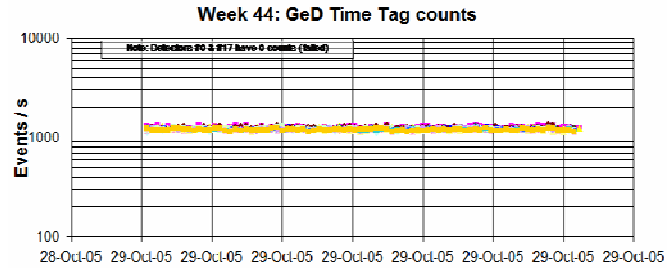


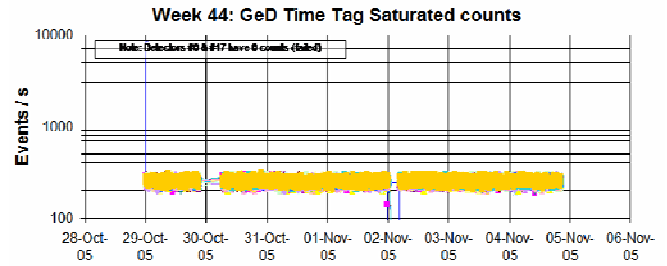
DFEE:

The performance of the unit is nominal.

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



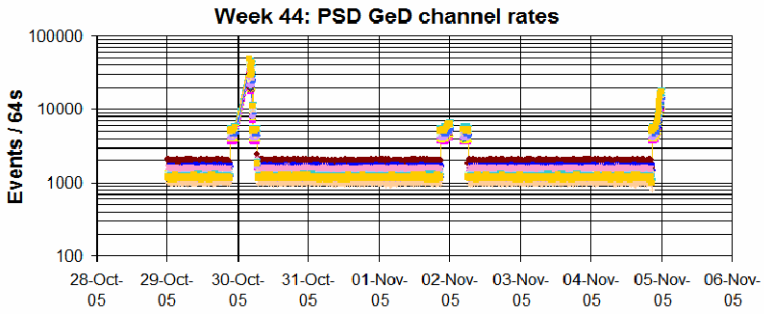




PSD:

The performance of the unit is nominal

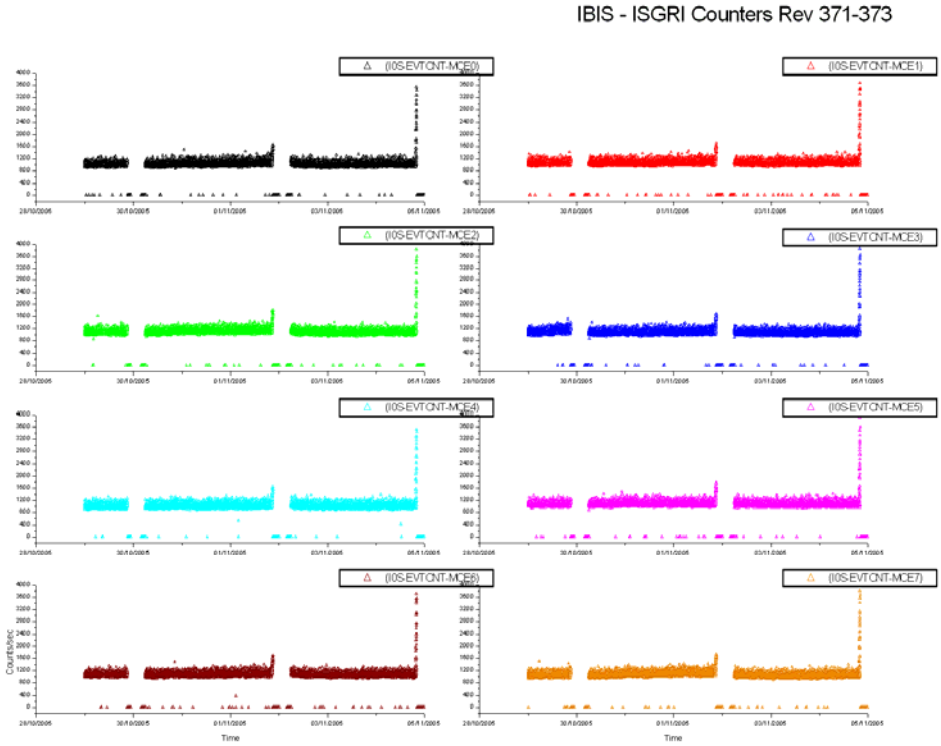
The following plots show the PSD channel rates during the reporting period



8.3.3 IBIS Operations

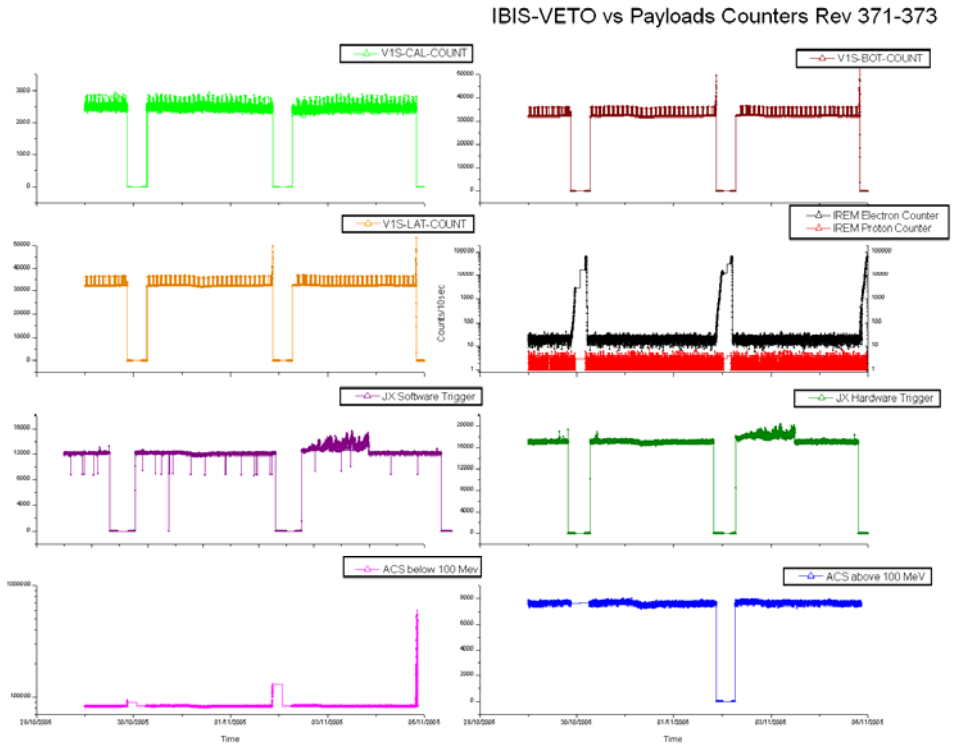
IBIS Event Counters Plots.

ISGRI Counters:



**sampling every 4 pkts (32 secs)

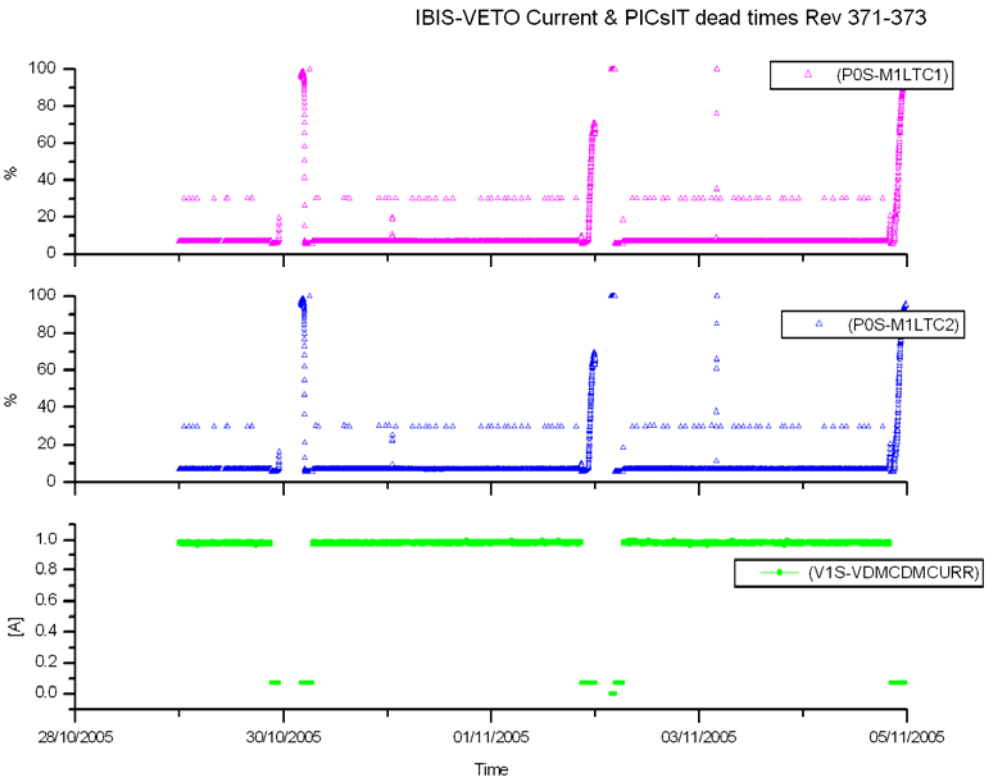
VETO vs Payloads Counters:



**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

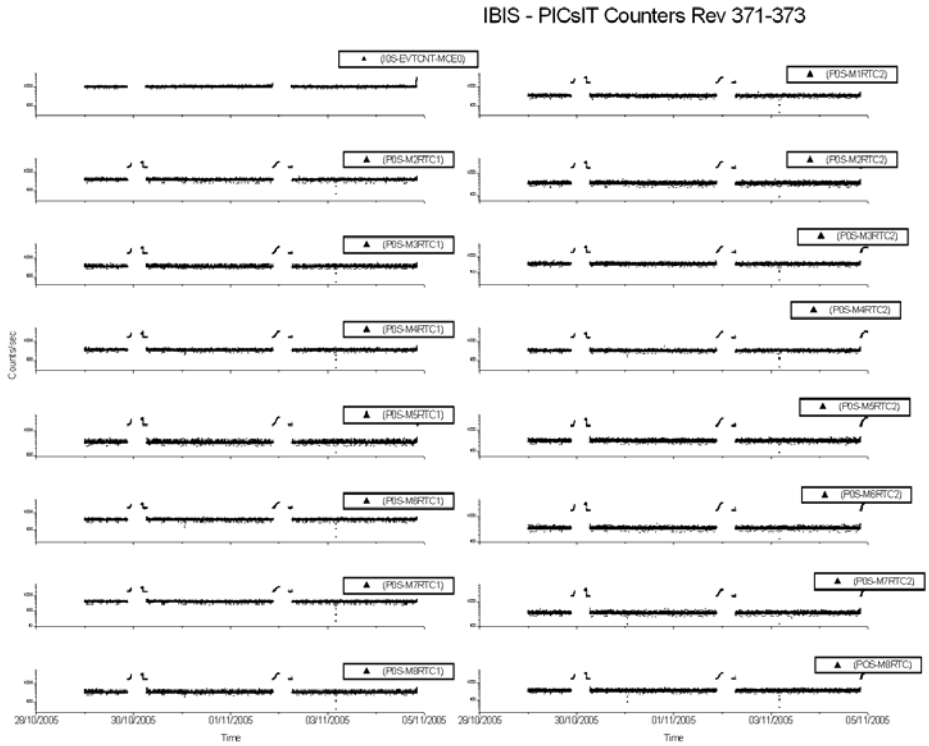
The week was characterised by low radiation.

VETO Current:



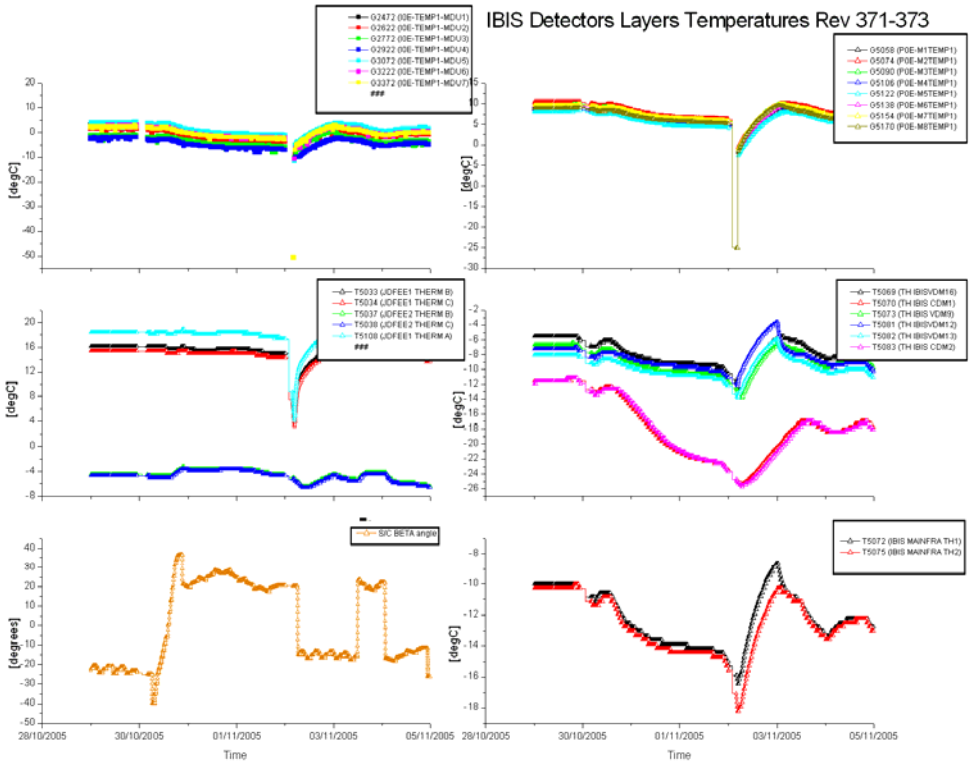
**sampling every 4 pkts (32 secs)

PICsIT Counters:



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:



**sampling every 8 pkts (64 secs)

IBIS daily report

DoY 2005.303 (30/10/2005)

Between the 29th and 30th of October, a problem on the Mission Control System forced to switch from IMCS A-chain to B-chain. At 05:17Z an operational mistake occurred when transferring the ISGRI CTX tables from IMCS chain-A to IMCS chain-B. The CTX table for MCE7 resulted corrupted and despite of the correct name, the content was then similar to CTX table for MCE6. The ISGRI calibration for MCE 7 run therefore with the CTX processed on-board during rev 371.

DoY 2005.304 (31/10/2005)

At 01:10Z G5068 family (PDMi: semi-module #1 FIFO Error flag) and G5072 family (PDMi: semi-module #2 FIFO Error flag) went OOL (SCC failure) and back. According to P-FIF-1 no action was taken.

DoY 2005.307 (03/11/2005)

At 04:07Z G5068 family (PDMi: semi-module #1 FIFO Error flag) and G5072 family (PDMi: semi-module #2 FIFO Error flag) went OOL (SCC failure). At 04:09Z G5002 family (PDMi: MiRTC1) and G5003 family (PDMi: MiRTC2) went in OOL (warning low). After 5 minutes at 04:13Z the OEM APID 1280 ID 132 CLASS 0 <<IBIS1 IASW HEPI RESYNCHRONIZED>> was generated and received on-ground. According to P-FIF-1 no action was taken.

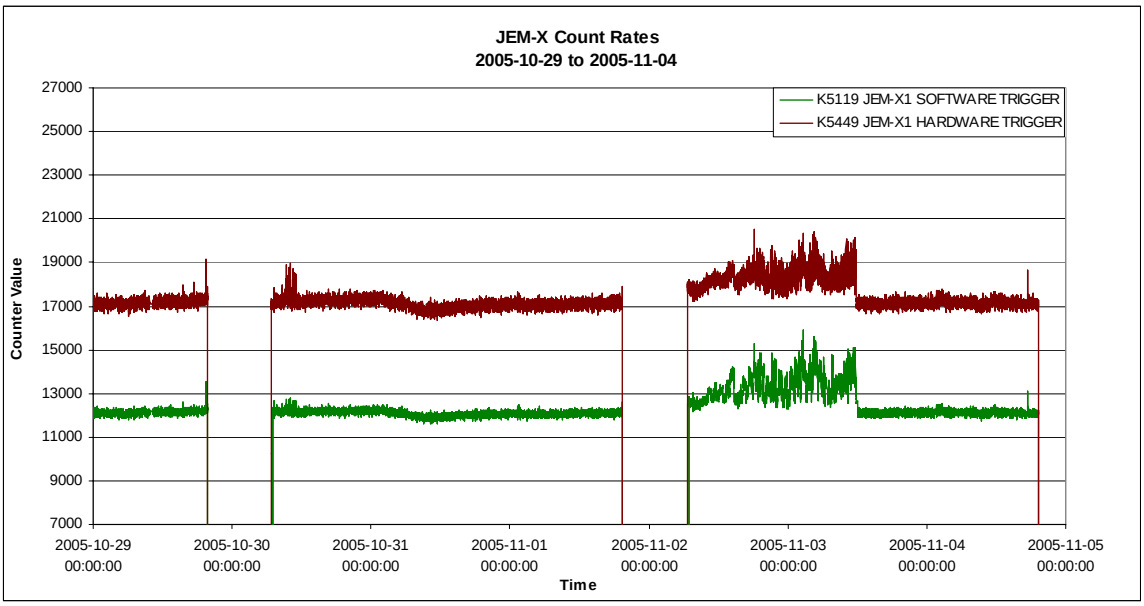
DoY 2005.308 (04/11/2005)

At 20:10Z, due to an earlier Radiation Belt entry, the unit went autonomously to Safe configuration ~30 minutes before the planned Radiation Belt Entry Time in TL(20:38Z). No impact for the unit reported.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

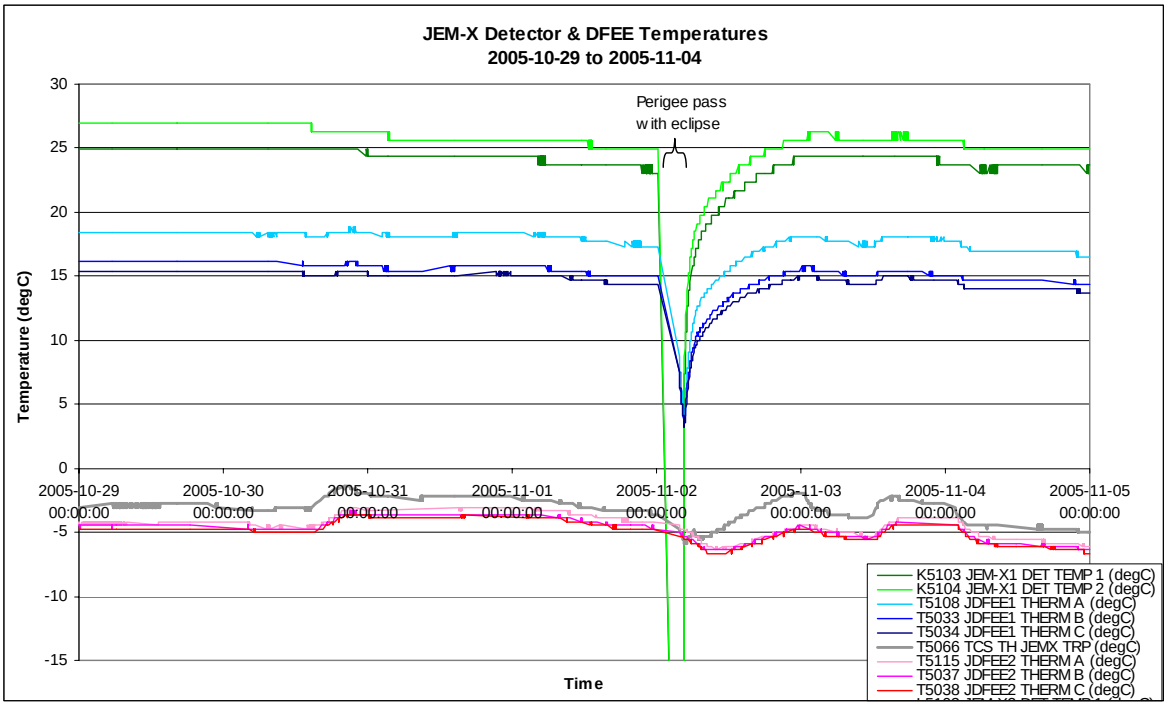
JEM-X count rates over the reporting period are displayed in the following graph[1].



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 graph[2].

[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

2005-10-29 (DOY 302, Rev 371) to 2005-11-01 (DOY 305, Rev 372)

Nothing to report

2005-11-02 (DOY 306, Rev 372-373)

A lunar eclipse occurred during the perigee passage from Rev. 372 to 373. All eclipse operations proceeded nominally.

2005-11-03 (DOY 307, Rev 373) to 2005-11-04 (DOY 308, Rev 373)

Nothing to report

8.3.5 OMC Operations

2005-10-29 (DoY 302, Rev 371)

At 09:30, a VC-0 TM drop caused the loss of slew 03710056. After the recovery, the timeline was rejoined at 11:28. The impact was the loss of pointings 03710056 & 03710057.

2005-10-31 (DoY 304, Rev 372)

At 13:45, an FD problem caused the loss of pointing 03720045.

2005-11-01 (DoY 305, Rev 372)

At 11:38, an AOCS problem caused the loss of pointing 03720072.

2005-11-02 (DoY 306, Rev 373)

At 04:37, an FDS problem prevented the scheduled RWB, which had to be manually executed at 06:43. Although the OMC switched to NORMAL mode at the scheduled time, the attitude was incorrect, so pointing 03730002 was lost.

2005-11-04 (DoY 308, Rev 373)

At 10:14, a problem with the TM Cache, caused an AOCS command to fail release. The impact was the loss of pointing 03730031.

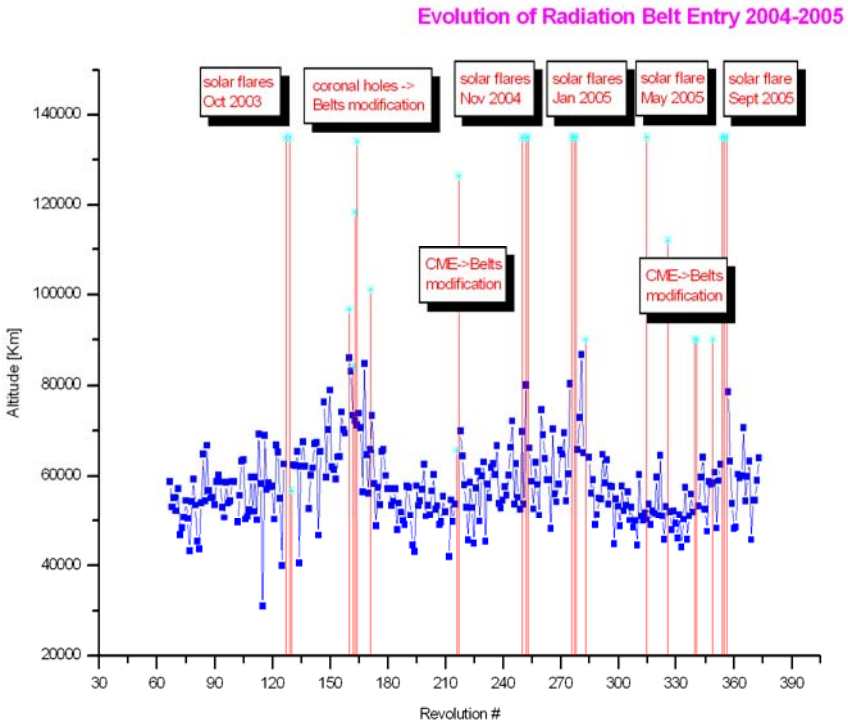
At 01:43, ISDC atempted to send the M1329 (Imaging BX) command. This was rejected as the unit was not configured to receive such a command. It was at this time the following OEM was received:

```
2005.308.01.43.03.114   2005.308.01.43.07.512   1792   RealTime   131     TC REJECT
REJECTED TC1                                          0       0    65535   PR    N
E   E
```

On DoY 302 at 21:09:37, DoY 305 at 20:53:54 and DoY 308 at 20:37:46 OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

Radiation Belts Entry



IREM daily report

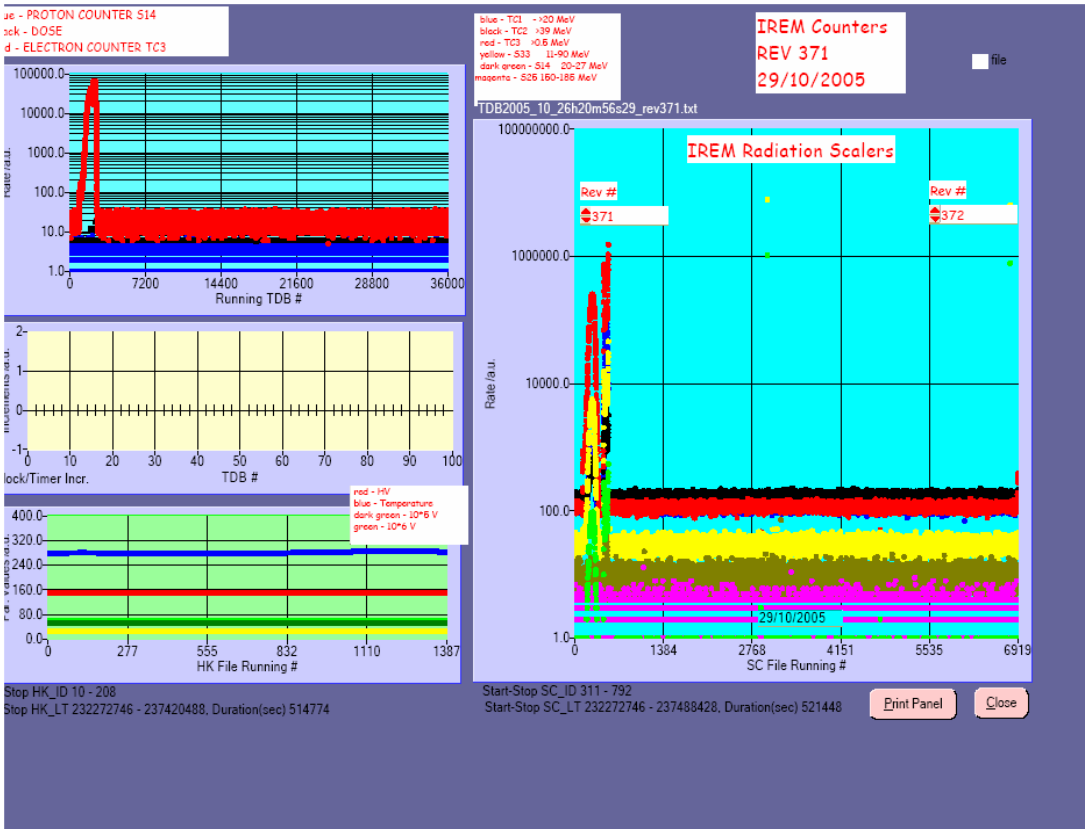
Nothing to Report.

Electron Belts

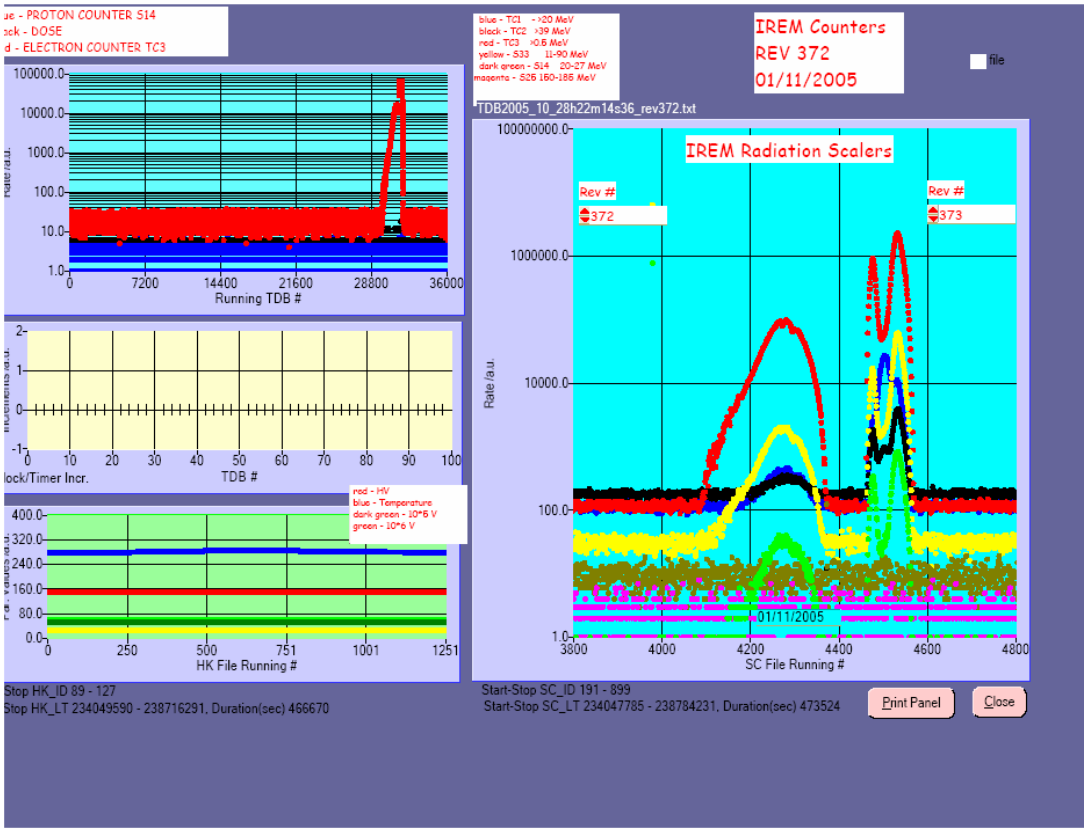
REV	S/C BCPKT (electron)	Electron CUT-OFF Observed Entry/Exit	Observed Entry/Exit Altitude [Km]	Electron CUT-OFF Predicted Entry/Exit	Predicted Entry/Exit Altitude [Km]
371	RAD_ENTR R 2005-10-29T21:09:31Z	29/10/2005 21:52:40	54625	2005-10-29 22:13:05	51502
372	RAD_EXIT R 2005-10-30T06:26:39Z	30/10/2005 05:15:04	>28143	2005-10-30 05:23:05	30322
372	RAD_ENTR R 2005-11-01T20:53:52Z	01/11/2005 20:57:44	<59041	2005-11-01 22:00:18	51334
373	RAD_EXIT R 2005-11-02T06:11:33Z	02/11/2005 04:55:52	28143	2005-11-02 05:10:18	30439
373	RAD_ENTR R 2005-11-04T20:37:44Z	04/11/2005 20:06:00	63959	2005-11-04 21:40:18	52377

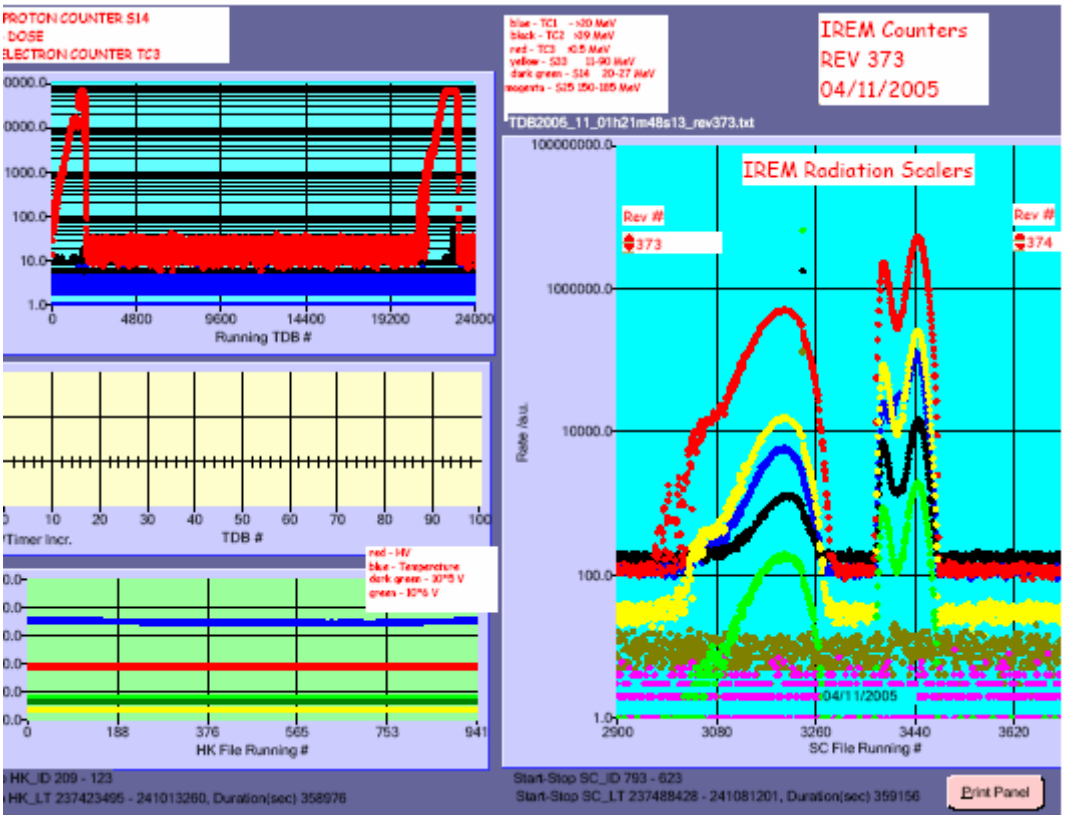
Reference
Very small error vs reference (less than 10 minutes)
Small error vs reference (between 10 and 30 minutes)
Large error vs reference (more than 30 minutes)
Radiation Spike

IREM radiation counters:



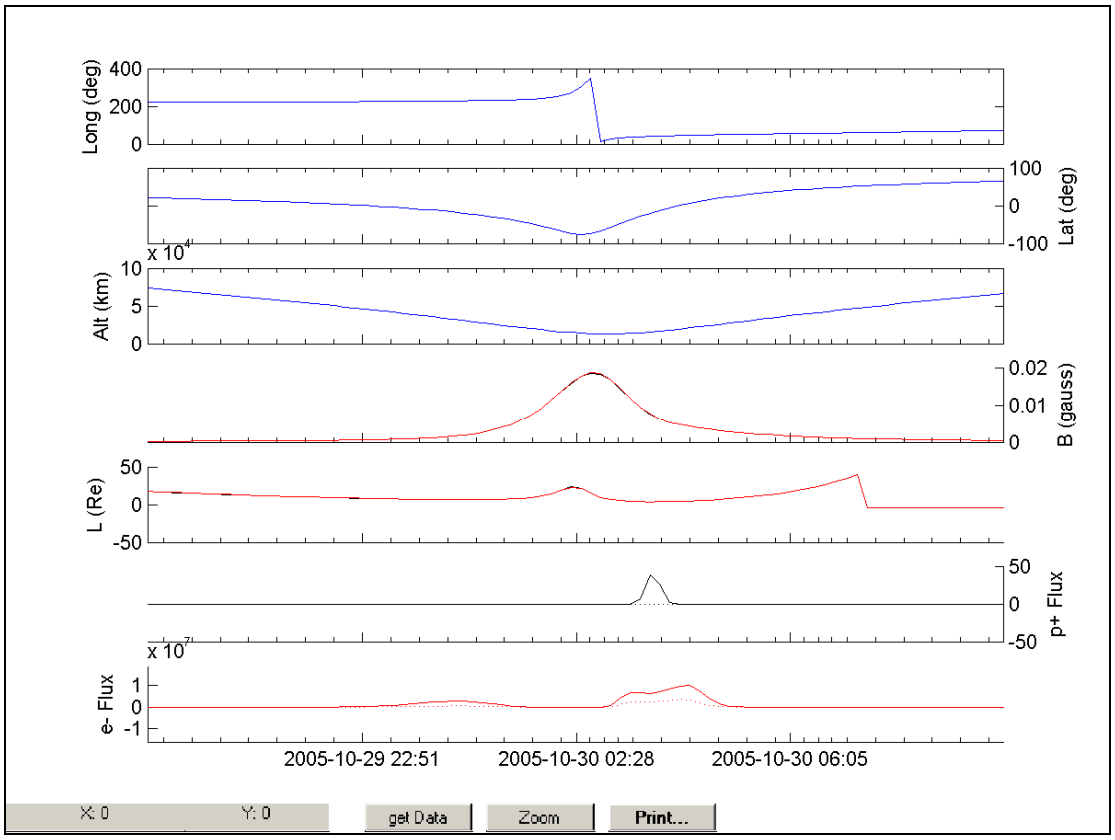
The data for Radiation Belt passage 371-372 are not complete due to a problem on the data stream distributed to the IREM ECOE.



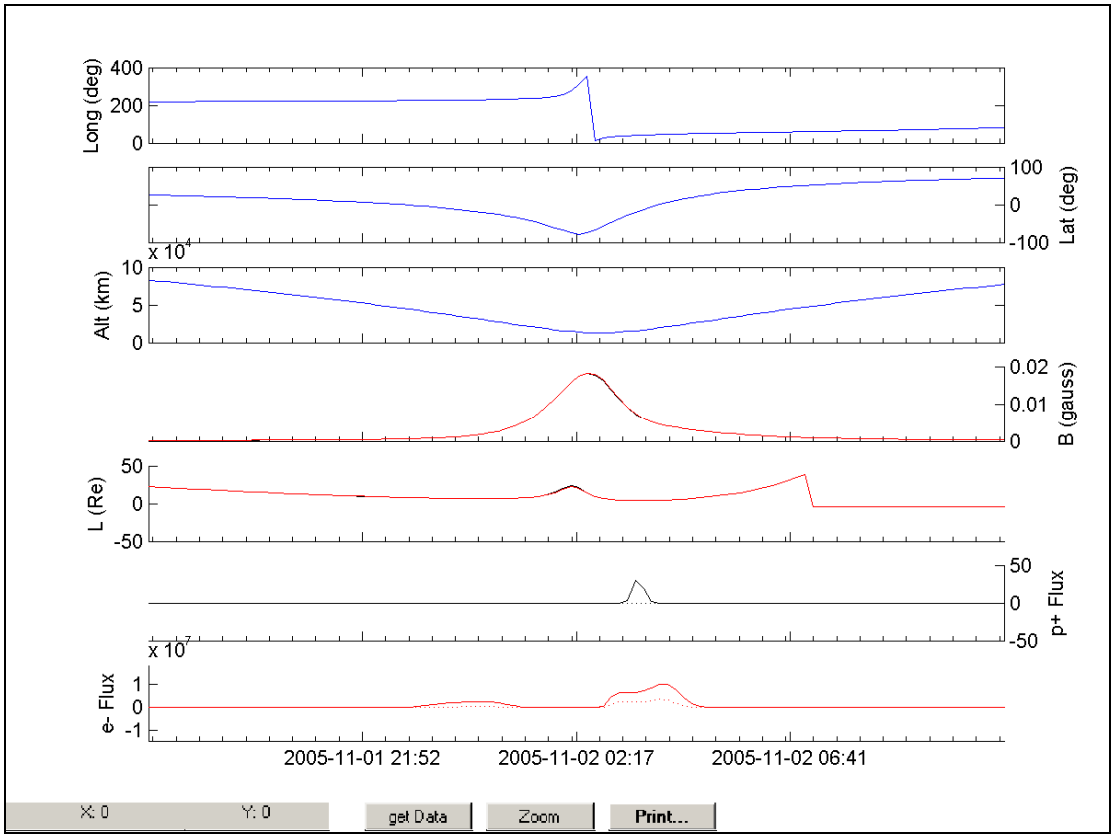


IREM Predicted Radiation Belt Passages:

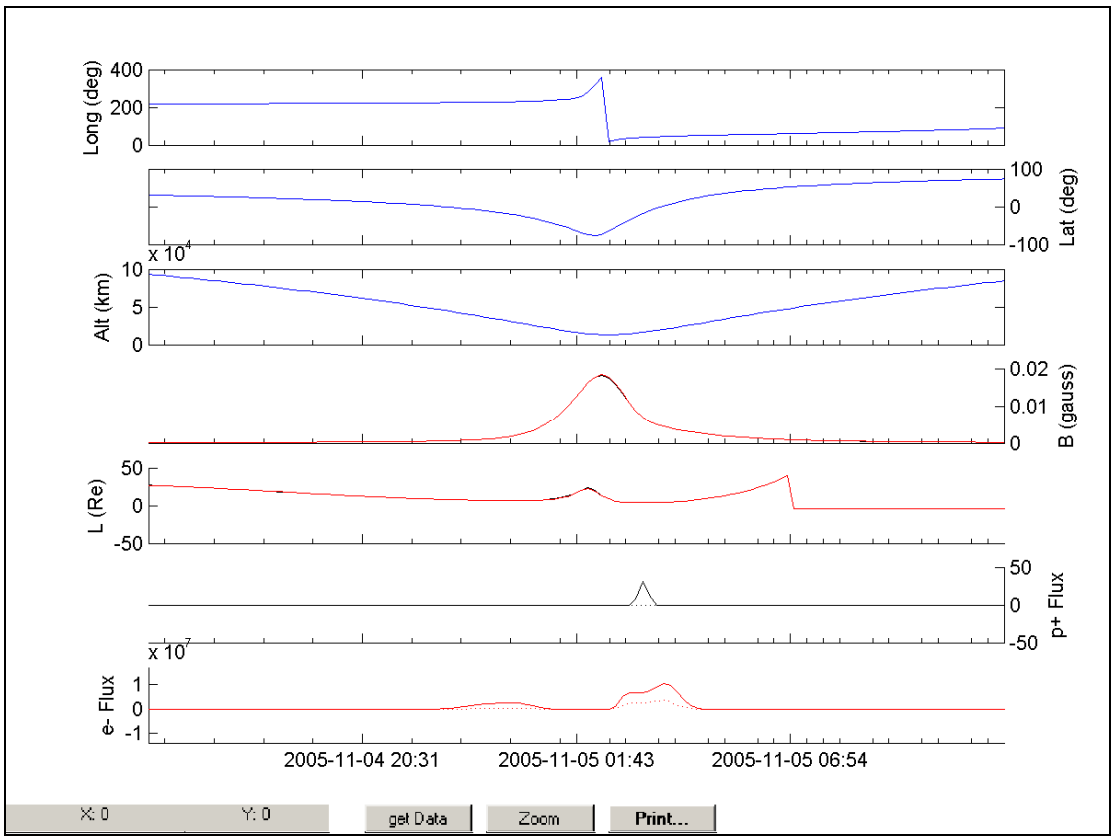
Rev 371



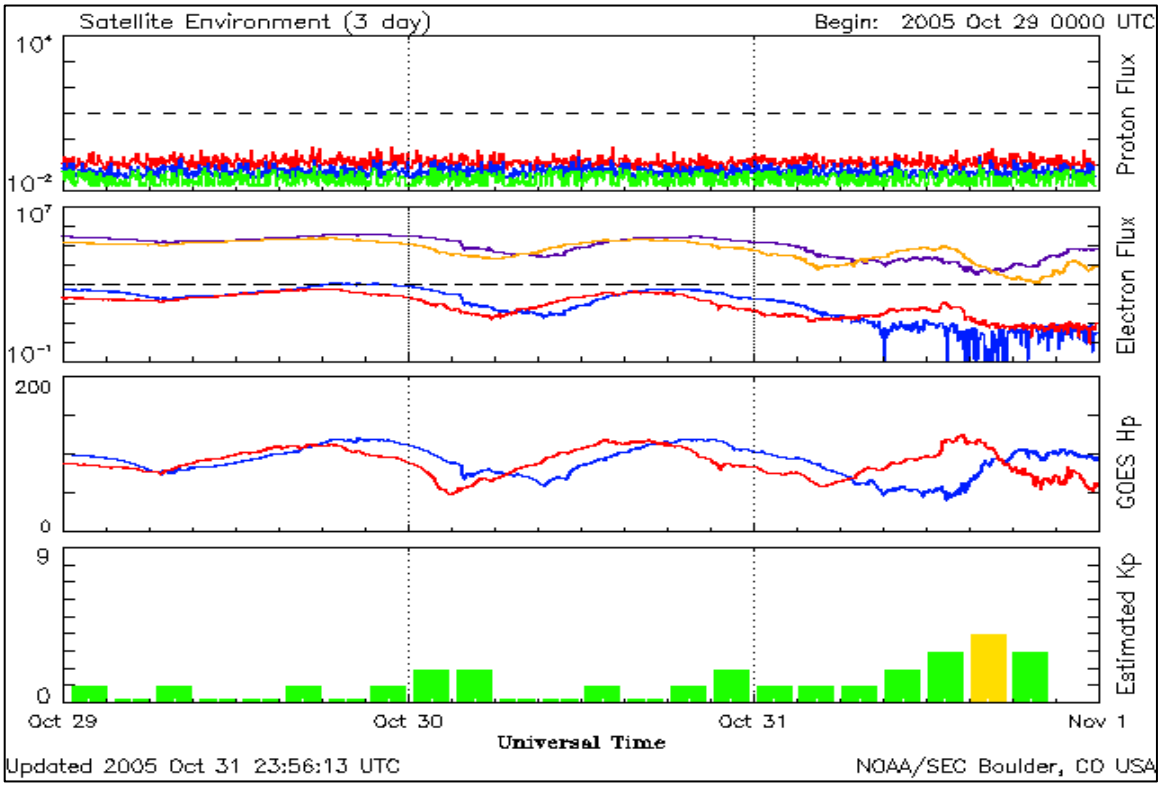
Rev 372

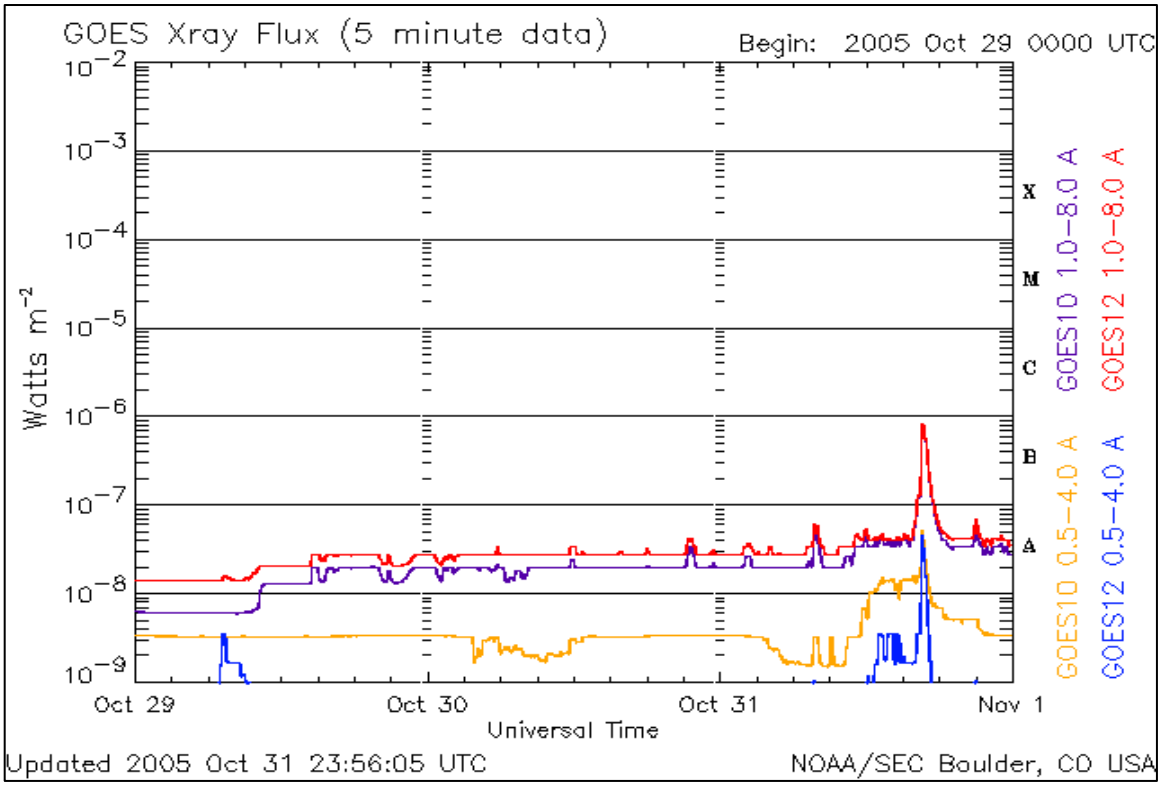


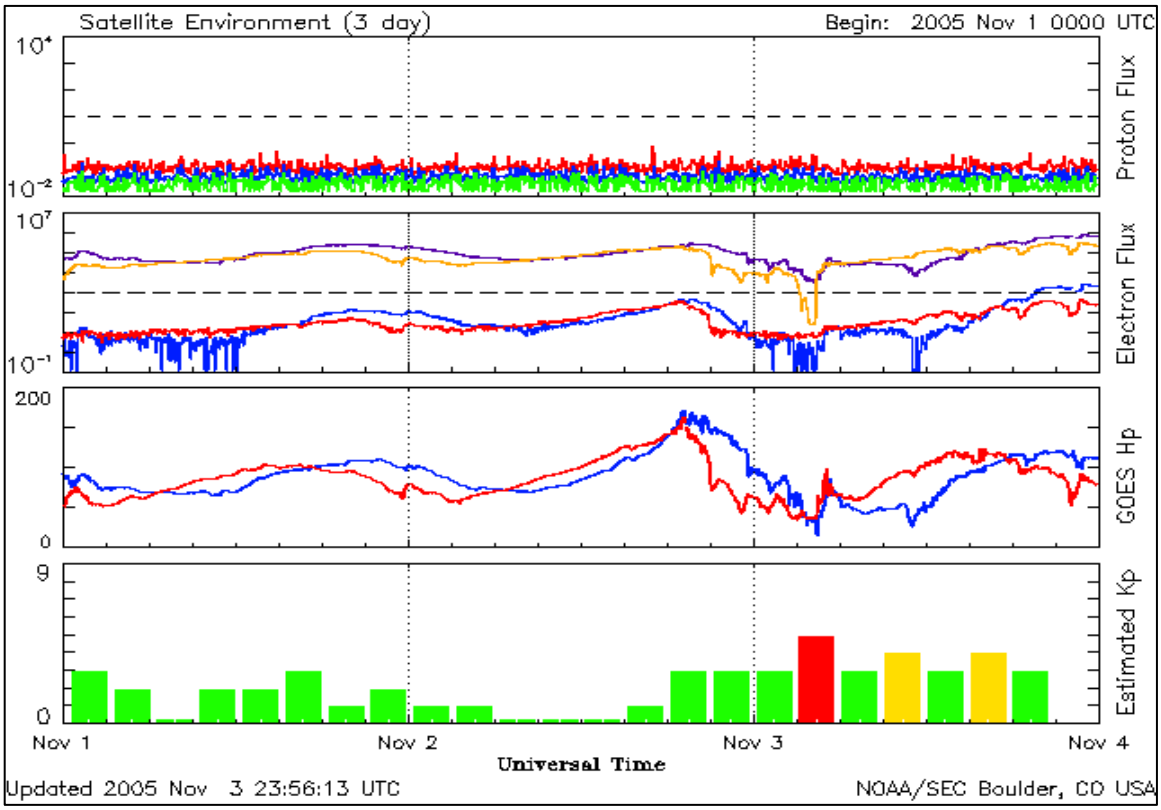
Rev 373

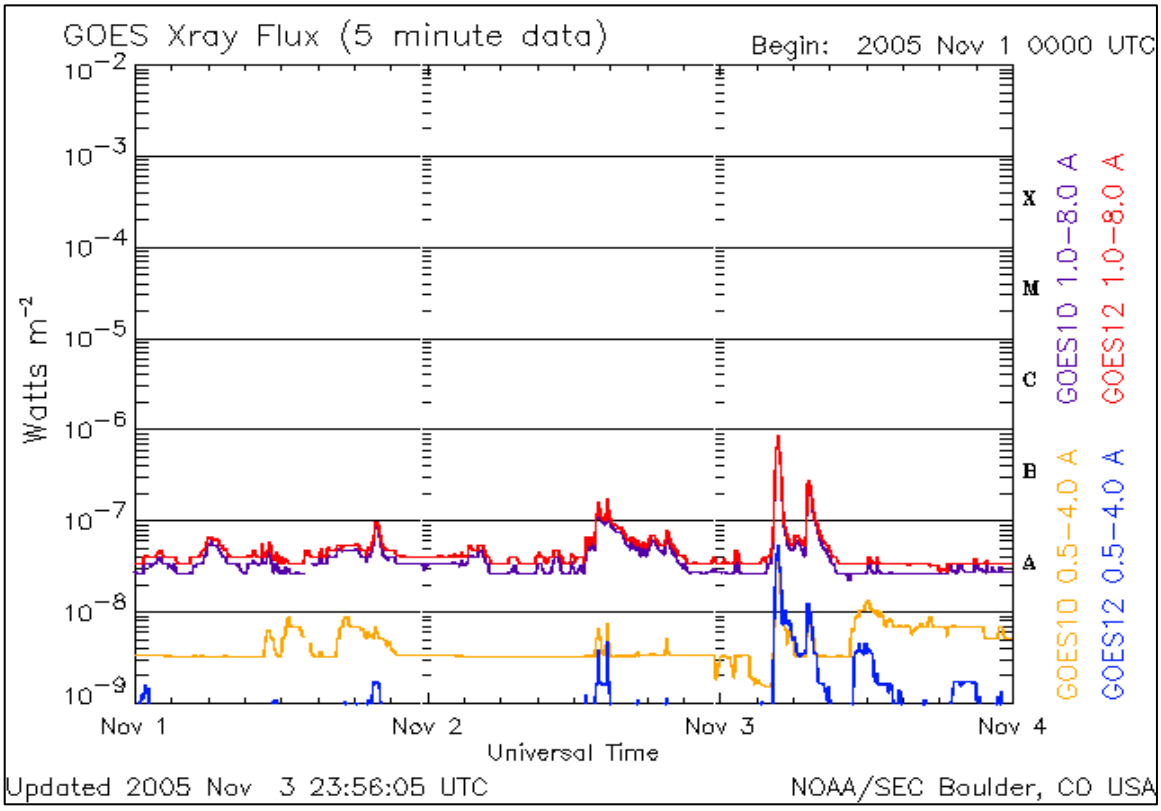


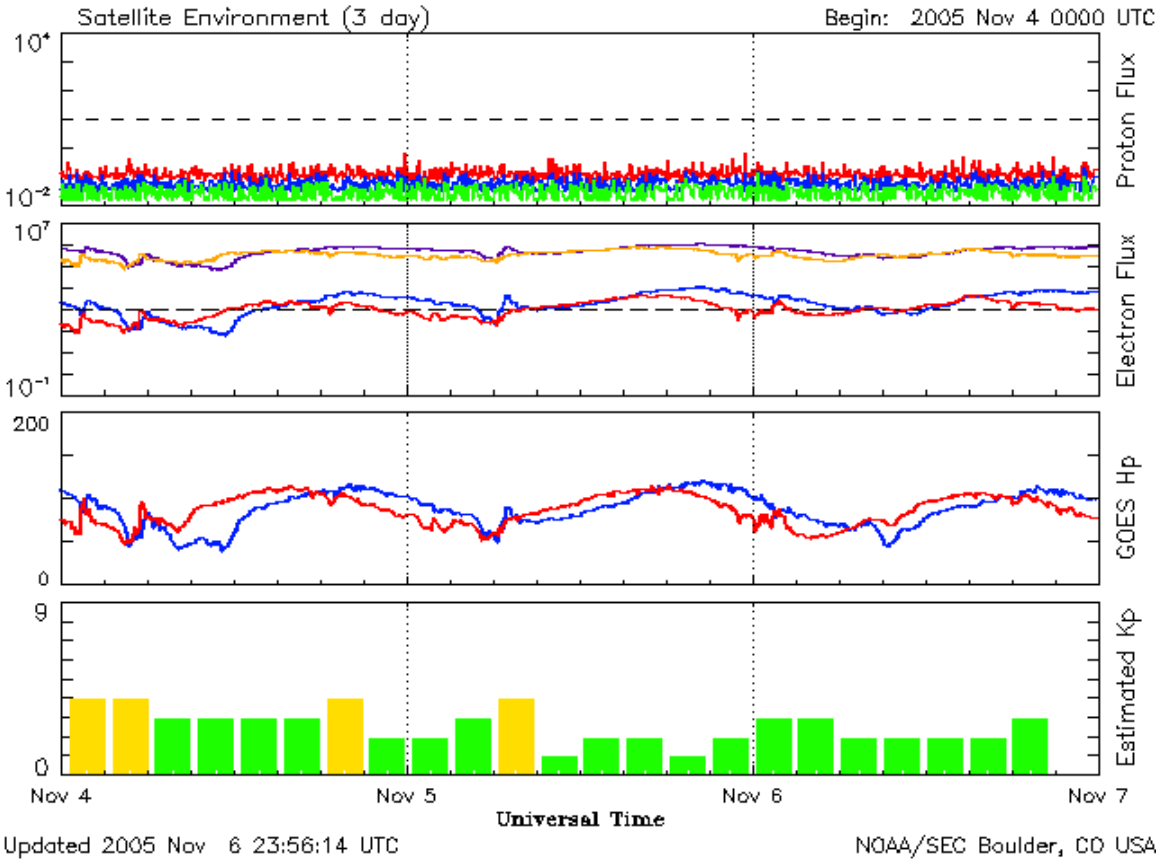
SEC-GOES Observed Particles Fluxes:

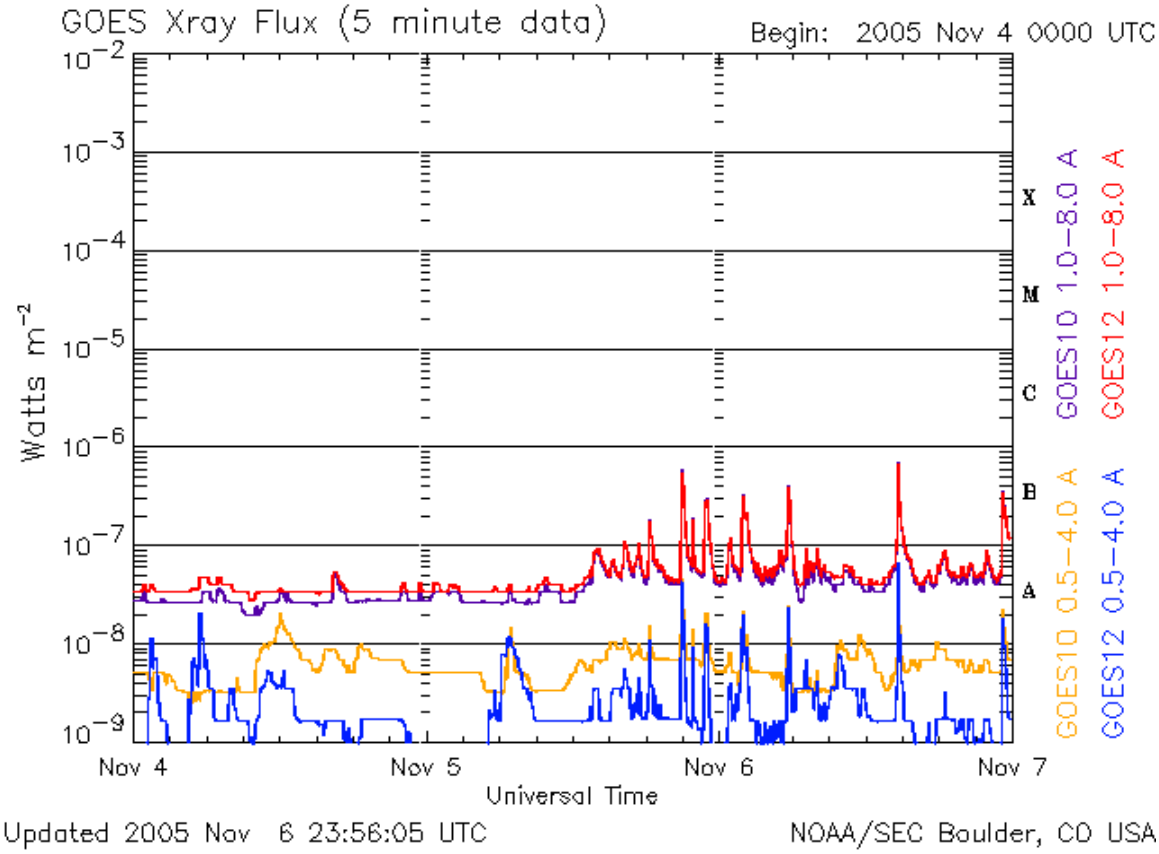





Satellite Environment (3 day)
Begin: 2005 Nov 1 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Nov 1
Nov 2
Nov 3
Nov 4
Universal Time
Updated 2005 Nov 3 23:56:13 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2005 Nov 1 0000 UTC
Watts m-2
GOES10 1.0-8.0 A
GOES12 1.0-8.0 A
GOES10 0.5-4.0 A
GOES12 0.5-4.0 A
X
M
C
B
A
Nov 1
Nov 2
Nov 3
Nov 4
Universal Time
Updated 2005 Nov 3 23:56:05 UTC
NOAA/SEC Boulder, CO USA


Satellite Environment (3 day)
Begin: 2005 Nov 4 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Nov 4
Nov 5
Nov 6
Nov 7
Universal Time
Updated 2005 Nov 6 23:56:14 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2005 Nov 4 0000 UTC
Watts m-2
GOES10 1.0–8.0 A
GOES12 1.0–8.0 A
GOES10 0.5–4.0 A
GOES12 0.5–4.0 A
X
M
C
B
A
Nov 4
Nov 5
Nov 6
Nov 7
Universal Time
Updated 2005 Nov 6 23:56:05 UTC
NOAA/SEC Boulder, CO USA