

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 164
Week 45
14.11.05
Routine Phase

Prepared by: M. Walker (OPS-OFO)

LIST OF CONTENTS

1	General.....	3
2	Summary of Activities.....	3
3	Satellite Status.....	3
3.1	Platform.....	3
3.1.1	AOCS.....	3
3.1.2	Power.....	3
3.1.3	Thermal.....	4
3.1.4	OBDH.....	4
3.1.5	RFS.....	4
3.2	Payload.....	4
3.2.1	SPI.....	4
3.2.2	IBIS.....	5
3.2.3	JEM-X.....	5
3.2.4	OMC.....	6
3.2.5	IREM.....	6
4	Ground Facilities.....	6
4.1	Mission Operations Centre.....	6
4.2	Ground Stations & Network.....	6
4.3	Science Ground Segment.....	7
4.3.1	ISOC.....	7
4.3.2	ISDC.....	7
5	Special Events.....	8
6	Anomalies.....	8
7	Future Milestones.....	9
8	Appendix.....	10
8.1	Overview of Revolutions.....	10
8.2	Consumables.....	10
8.2.1	Detailed Fuel Book-keeping.....	10
8.3	Detailed Satellite Information.....	11
8.3.1	AOCS SUMMARY OPERATIONS REPORT, 05/11/2005 – 11/11/2005.....	11
8.3.2	SPI Operations.....	16
8.3.3	IBIS Operations.....	18
8.3.4	JEM-X Operations.....	23
8.3.5	OMC Operations.....	25
8.3.6	IREM Operations.....	26

DISTRIBUTION LIST

Addressees	Copy	Addressees	Copy
D/OPS		ESA HQ	
G. Winters D/OPS	1	D. Southwood D/SCI	1
W. Frank OPS-O	1		
A. Smith OPS-OF	1	ESTEC	
J. F. Kaufeler OPS-G	1	J. Louet SCI-P	1
N. Bobrinsky OPS-ON	1	A. Gimenez-Canete SCI-S	1
		ESTEC / PG	
M. Schmidt	1	G. Sarri	1
R. Southworth	1		
F. Di Marco	1		
F. Cordero	1		
M. Walker	1		
P. Lippi	1	ESTEC/RSSD	
R. Lemme	1	M. Kessler SCI-SD	1
S. Fahmy	1	C. Winkler	1
SPACONs	1	A. Parmar	1
O. Bergogne	1	L. Hansson	1
I. Bayliss	1	E. Kuulkers	1
G. Di Girolamo	1		
F. Dreger	1		
G. Gienger	1	ESTEC/SCI-A	
S. Pallaschke	1	Nicola Rando	1
W. Hell	1		
K.J. Schulz	1	ISDC	
M.A. Larsen	1	T. Courvoisier	1
K. Capelle	1	R. Walter	1
M. Butkovic	1	N. Mowlavi	1
D. Heinzer	1	ISDC Shift Team	1
		D. Texier	1
Shift - Coord	1		
Scheduling Office	1	ALENIA	
T. Beck	1	M. Montagna	1
J. Wardill	1	F. Ravera	1
M. Unal	1		
P. Maldari	1	PI / Instrument Teams	
		J. P. Roques – SPI	1
Redu		G. La Rosa – IBIS	1
B. Demellenne	1	P. Ubertini – IBIS	1
		S. Brandt – JEM X	1
Vilspa		E. De Miguel - OMC	1
P. Kretschmar	1	W. Hajdas – IREM	1
		JPL / Goldstone	
		D. Holmes	1
		J. Valencia	1

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 05.11.05 until 11.11.05 (both dates inclusive) and covers the revolutions 374, 375 and 376.

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 Field_12 (RA 00:41:52.00; DEC -41:13:55.0); GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9) and the Galactic Plane. The activities consisted of raster 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.

After the end of the Lunar eclipse, the AMD thresholds were set to their non-eclipse values on 5/11/2005, at the beginning of rev 374.

As part of the AOCS preparation for the winter eclipse season, the onboard AMD thresholds were set to their eclipse season values on 8/11/2005, at the beginning of rev 375.

The Eclipse season started with the eclipse passage on 11/11/2005. The eclipse passage was nominal from an AOCS point of view.

No slews were lost from the Timeline during this period.

The fuel consumption over the period between 03/11/2005 and 11/11/2005 was 0.1867 kg. The remaining propellant is in the order of 158.2693 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.

10/11/2005: In preparation for eclipse #1 of the current eclipse season, the MRU timer threshold was set to 19 (1h 33m).

11/11/2005: Eclipse #1 of the current eclipse season took place, total eclipse duration was 00:34:01, of which the Umbra duration was 00:29:50.
 The battery Discharge Depth was 2.95Ah, recharge time was 1h 45m. Both figures were in line with expectations, the behaviour of the EPS was in all respects nominal.

11/11/2005: In preparation for eclipse #2 of the current eclipse season, the MRU timer threshold was set to 28 (2h 16m).

3.1.3 Thermal

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

3.1.4 OBDH

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

3.1.5 RFS

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

3.2 Payload

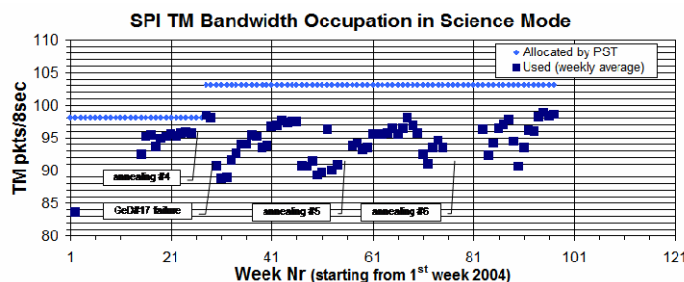
3.2.1 SPI

The overall status of the instrument is nominal.

During 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 98.6 pkts/cycle.

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

The following plot shows the TM bandwidth occupation information.



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

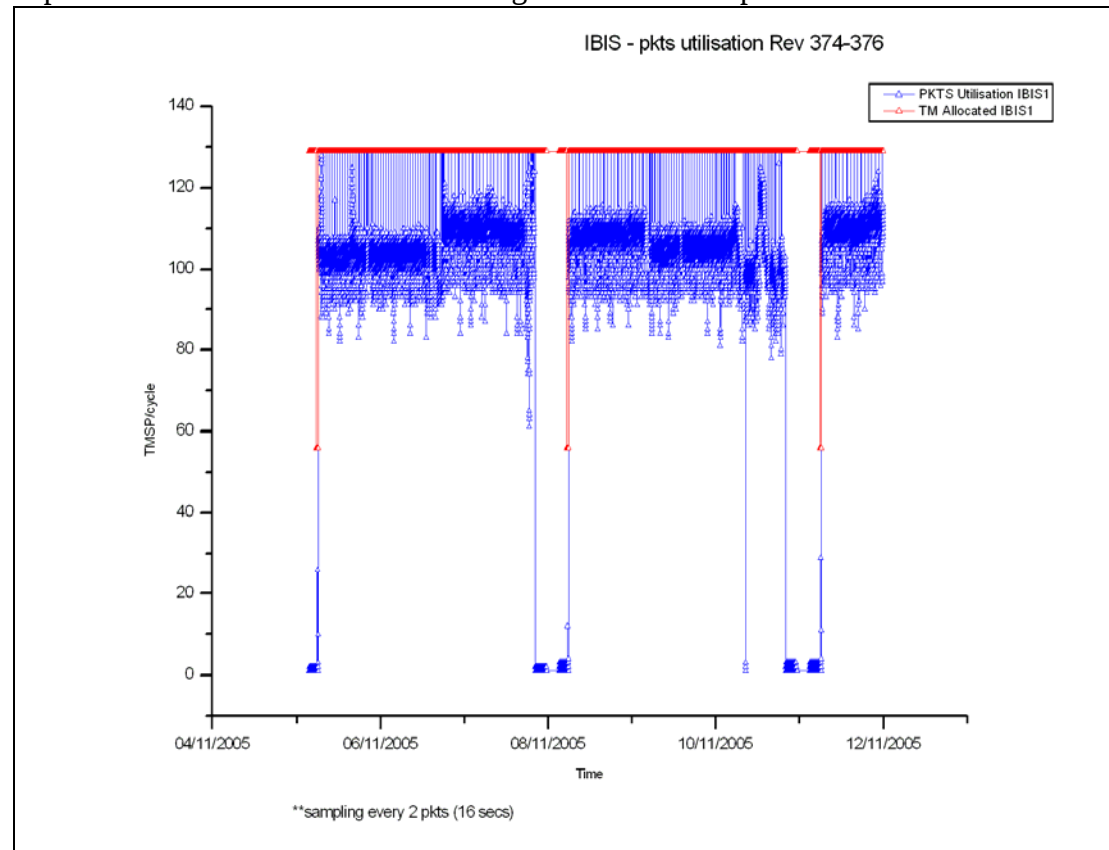
3.2.2 IBIS

The Overall status of the unit is Nominal.

The Eclipse season started with the Moon eclipse passage on 02/11/2005. This week the first solar eclipse occurred on the 11/11/2005. It was completed at 04:00Z. The eclipse passage was nominal from the unit point of view. However during the post-eclipse reconfiguration, commands from the VETO patch (ED GEVESP01) failed and the patch had to be uplinked manually.

During the reporting period, the PST allocation to IBIS was 129 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 107.36 TMPS/cycle, down 0.84 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, 155 of the 155 planned science pointings for OMC were executed nominally, none were lost.

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

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity.

The sun was very quiet this week. Only tiny sunspots were reported at the beginning of the week. They did not pose any threat of Solar Flare. At the end of observation period, the sun was blank.

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 excellent this week, no pointings were lost. The overall performance was well above the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was very good this week, although there were several minor incidents of icons turning 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 minor instances where there were communication interruptions with Redu, however, there was no impact. 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 381 to 383 were received this week. PSF's for revolutions 377 and 378 were resent by MOC due to changed station handovers due to station maintenance at Redu. Planning of the revolutions 380 to 383 has been performed in ISOC and sent to MOC. Revolutions 377 had to be re-planned due to the new PSF that arrived. The re-planning of revolution 378 had to be iterated with MOC due to placing the extra handover windows in periods not allowed in the ISOC system. This could be overcome by MOC resubmitting the PSF with the handover windows moved. No ToO request was received. TSF for revolutions 375 to 378 were received.

2. Observation status

No ECS received this week.

3. ISOC science data archive

After installation of the new disk arrays recently the back up procedure is now adjusted to cater for the new hardware configuration. The first release of ISDA with the 2nd ISGRI catalogue was re-discussed this week. It is reconfirmed to release the next IDA version 2.5 before end of this year.

4. ISOC system

The version 11.2 has been in use this week without problems.

5. AO 4 preparation

The preparation has now started according to schedule. All AO 3 documentation "source code" is retrieved after the ISOC move to ESAC. It is also intended to use MS Word instead of Framemaker to ease future maintenance. The translation has successfully been tried on some of the documents.

5. Problems

The above mentioned problem with placing of handover windows will be investigated if software change is necessary or not. The previously reported problem related to the difference in ISOC and MOC/FD constraint checks is still not resolved. There has been quite some activities during the week to resolve the issue.

4.3.2 ISDC

Status of ISDC observation processing on 14/11/2005:

- Latest Standard Analysis completed: observation 03201090035 (Gal. Bulge, Revolution 362) on 09/11/2005
- Latest products archived: observation 03201090035 (Gal. Bulge, Revolution 362) on 10/11/2005
- Latest observation products sent to the observer: observation 02297000020 (galactic disk $l < 0$, Revolution 347) on 03/10/2005

5 Special Events

6 Anomalies

There were a number of problems that impacted the operations:

- On DoY 309, at 00:13, the TC D3301 had a static PTV of Go, instead of the expected No Go. The Multiplexer, Verifier, Releaser and Autostack tasks were all stopped and restarted, but the problem persisted, after AOS at Redu, the command reverted to the expected status of No Go, there was no impact..
- On DoY 310, at 08:04, there was 1 data unit bad frame received from Redu, there was no impact.
- At 17:16 there was 1 missing source packet from Redu, there was no impact.
- On DoY 311, at 01:29, there was 1 missing source packet (apid 1281), then at 01:43, there were 2 missing source packet. There was no impact.
- At 08:06, there was a data gap on VC0 onl.COMP from RED1_IP, this was followed by 19 bad frames, there was no impact..
- At 18:08, after the handover from Redu to DSS-24, the ED DEBPG200 failed to uplink as bit lock had not been achieved, the handover was completed at 08:15, and the ED manually uplinked at 08:18. The corresponding DR# is G106238, there was no impact.
- On DoY 312, at 09:02, the icon for idda on the Global MMI went red for about 10 seconds, there was no impact.
- At 17:47, the MADDS/AUX stopped, it was restarted at 17:52, there was no impact.
- At 19:34, the imca icon on the Global MMI went yellow due to the maximum archive file size being exceeded, the file size was 600248320, SWS were informed, but it was not deemed urgent, there was no impact.
- On DoY 313, at 09:35, the message “idda: MADDS/AUX is not extracting THF files -> Production stopped, please restart AUX and ARCH.” appeared in the event log, the tasks were restarted, there was no impact.
- At 11:55, the message ERROR sending data to ISDS was seen, this was followed at 11:56 by the message Link MADDS-ISDS TM Flow, there was no impact.
- At 12:33, the idda icon on the Global MMI went red for a few seconds, there was no impact.
- On DoY 314, at 09:12, there was an error sending data to the ISDS, there was no impact.
- At 11:30, the message idda: MADDS/AUX is not extracting THF files. The AUX and ARCH tasks were restated at 11:55, there was no impact.
- At 17:34, the event log message: “ERROR – CMD-Link status set to: TC RDTCE1_IP TM No TM Flow” was seen. Also the TM tabs on both the Auto and Manual stacks was showing red. At 17:38, the connection on the Reception tab in the TM-Spacon task was disabled and enabled, afterwards a test command worked, there was no impact.
- At 22:22, the MADDS-ISDS link toggled between connected and TM Flow, by 22:26, it was back to TM flow permanently. There was no impact.

- On DoY 04:24, commands GU0613TC & GU0614PA failed release, they were successfully uplinked at 04:26, there was no impact.
- At 06:11, there was a missing source packet with an apid of 1280.
- At 16:00, the following messages were received: “First Data received on Bad Frame link (1 Data Unit)”, then “Trying to deregister TMVerCheck on non-existing packets”, then “Drop on TM link ‘Bad Frame’ Onl-Com from Redu”. The packet ids in question were 152712 and 152722. There was no impact.
- At 17:37, there was a missing source packet, there was no impact.

The following anomaly report was entered into the ARTS system.

AR id	Date Created	Subject	Segment	Status
INT-2805	11/11/2005	Problem with placement of HANDOVER interval in 0378_08.POS	ISOC	Open
INT_SC-130	11/11/2005	IBIS: VETO TC rejected during the execution of VETO patch 3.2	Payload	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.

We are currently in eclipse season #7.

Preparation is on-going for the earth observation, currently planned to take place in January.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 374

The observations in revolution 374 consisted of a raster dithering observation of Field_12 (RA 00:41:52.00; DEC -41:13:55.0) lasting ~34.5 hours, followed by a raster dithering observation of GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9), performed for the remaining ~25.5 hours of observation time.

Revolution 375

The observations in revolution 375 began with a raster dithering observation of GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9) lasting ~22 hours, followed by a raster dithering observation of Field_12 (RA 00:41:52.00; DEC -41:13:55.0) lasting ~24 hours. A GPS observation was then performed for the remaining ~11 hours of observation time.

Revolution 376

In revolution 376 a raster dithering observation of GRO J0852-4642 (RA 08:51:38.31; DEC -46:41:50.9) was performed throughout the available observation time (~60.5 hours).

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

2005-10-30T13:31:46.000Z	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.
2005-11-05T04:10:49.000Z	158.4394	F	Automatic TM processing.
2005-11-06T14:49:48.000Z	158.4157	F	Automatic TM processing.
2005-11-08T04:10:32.000Z	158.4131	F	Automatic TM processing.
2005-11-09T04:21:47.000Z	158.3927	F	Automatic TM processing.
2005-11-09T14:33:48.000Z	158.3520	F	Automatic TM processing.
2005-11-10T15:32:47.000Z	158.3331	F	Automatic TM processing.
2005-11-10T20:32:07.000Z	158.2907	F	Automatic TM processing.
2005-11-10T22:56:40.000Z	158.2769	F	Automatic TM processing.
2005-11-11T04:50:24.000Z	158.2693	F	Automatic TM processing.

This report was generated Fri Nov 11 08:00:35 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, 05/11/2005 – 11/11/2005

AOCS operations were executed from the Automatic Timeline.

During this period, 79 Open Loop Slews, 92 Closed Loop Slews and 9 Momentum Bias were executed (TL + manual recovery). No slews were lost from the Timeline during this period.

This is equivalent to a 100 % of the total number of slews planned (171).

The AOCS eclipse operations were nominal. For the first winter eclipse season 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
2005-11-11	23:28:00	03:02:00	02:26:27	03:08:27	03:17:22	03:18:06	03:26:07	03:27:39	03:28:02	03:57:52	03:58:17	04:00:08	04:03:46	04:09:50
														0:34:01

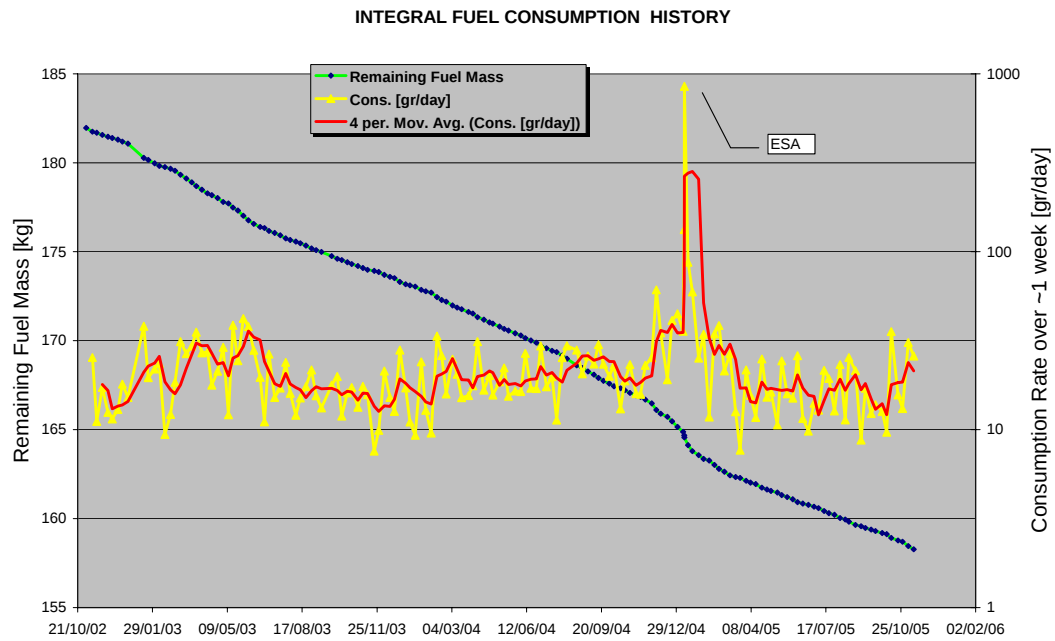
IMU Usage during Eclipse Season						Winter 2005
IMU On	IMU Off	From Health Check		From Auto Calibration	On Time	Accumulated On Time
		Noise Roll [as/s]	Drift Roll [as/s]	Drift Roll [as/s]		
2005-11-02 21:06:21	2005-11-03 03:25:57	0.2272	0.2300	NA	6:19:36	6:19:36
2005-11-10 21:47:48	2005-11-11 04:12:08	0.1930	0.2841	NA	6:24:20	12:43:56

Orbit Control

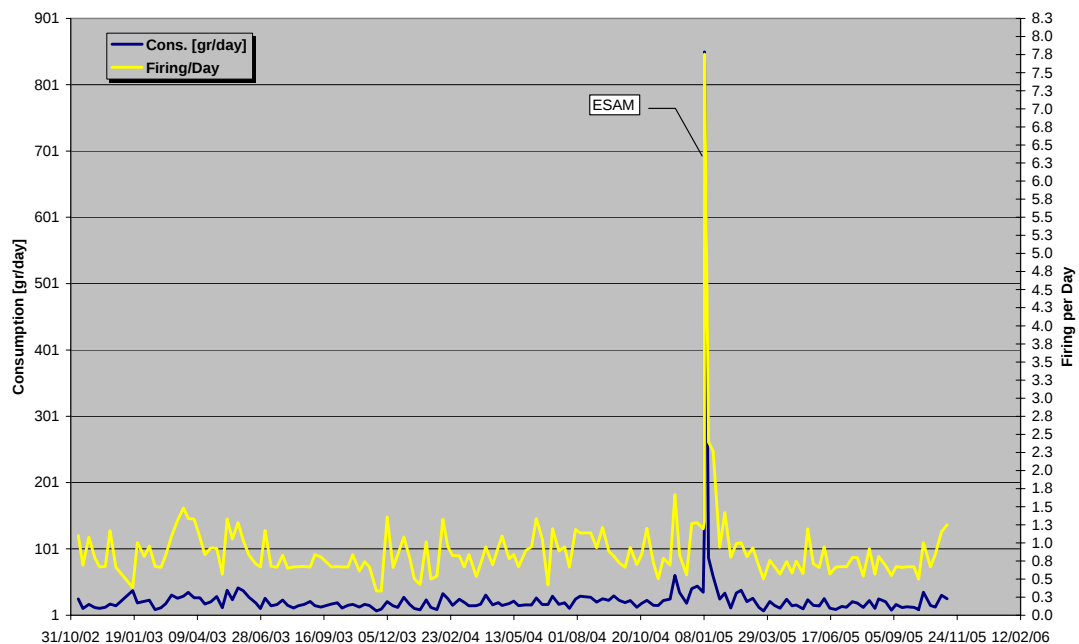
N.A. this week, provided on monthly basis

Fuel consumption

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

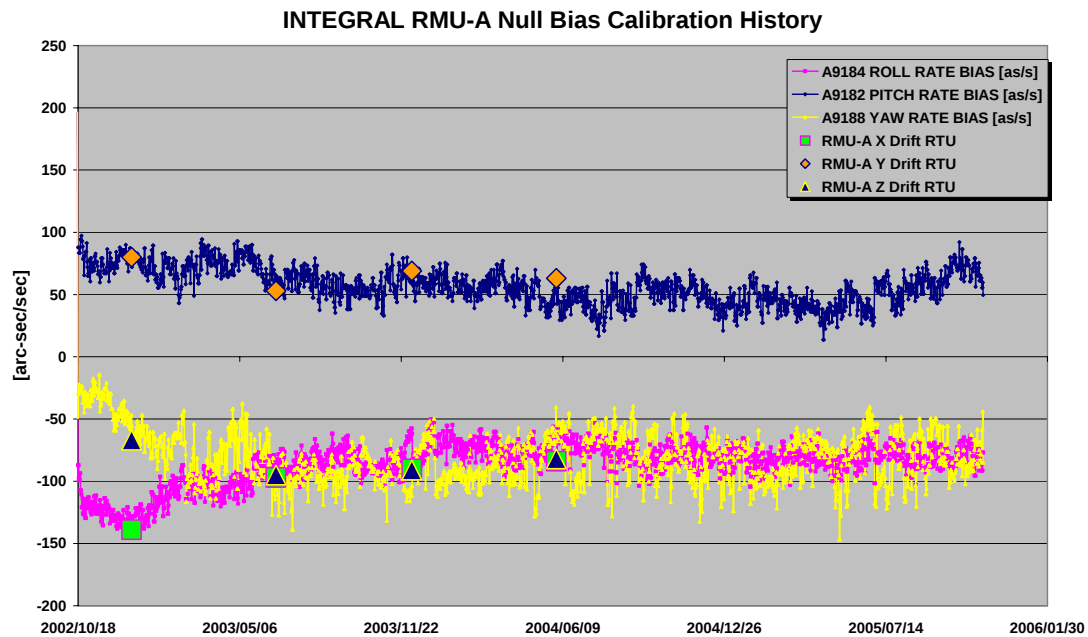


The fuel consumption (grams/day) over the period between 01/11/2002 and 11/11/2005 is reported in the plot below.

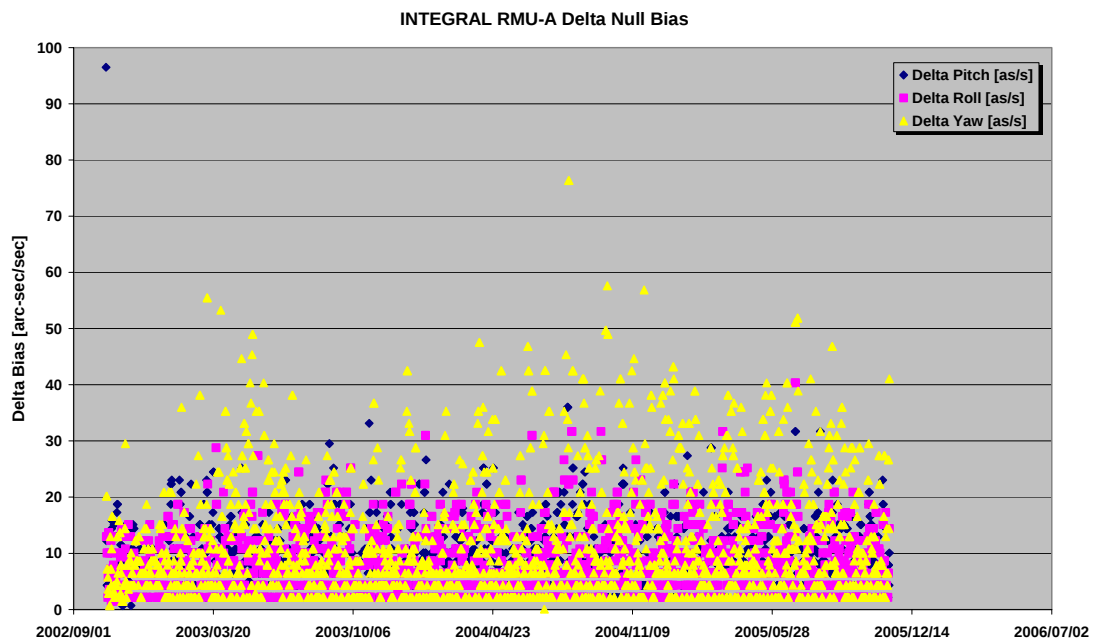


The RMU-A null bias calibration

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



05/11/05 (Day of Year 309, Revolution 373-374)

Reconfiguration of the AOCS after the Lunar eclipse: With the end of the Lunar eclipse, the AMD thresholds were set back to their non-eclipse values (according to FCP_AOC_0522). The manual operation started at 04:05z 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	

06/11/05 (Day of Year 310, Revolution 374)

Nothing to report.

07/10/05 (Day of Year 304, Revolution 374)

Nothing to report.

08/11/05 (Day of Year 305, Revolution 374-375)

Loading of the Eclipse Season AMD thresholds: In preparation of the winter eclipse season (according to FCP_AOC_0524), 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

Doc. Title : INTEGRAL Mission Report #164
 Doc. Ref. : INT-MOC-SYS-RP-1001-OPS-OF
 Date : 14/11/05

Issue : 1
 Rev. : 0
 Page : 15

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

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.

The activity was performed at 08:07z.

09/11/05 (Day of Year 306, Revolution 375)

Nothing to report

10/11/05 (Day of Year 307, Revolution 375)

OOl in measured wheel speed RW#4, no impact on Timeline: a problem was observed at 03.29z on the measured speed of RW#4 (measured value = 629 rpm) exceeding the warning high limit set to 630, due to a limited divergence (~60 rpm). The set AMD threshold, for RW#4, in eclipse season sunlight part is 469, well away from the value reported in TM. No action was taken but only monitoring the wheels speeds evolution during the last part of the revolution 375.

11/11/05 (Day of Year 308, Revolution 375-376)

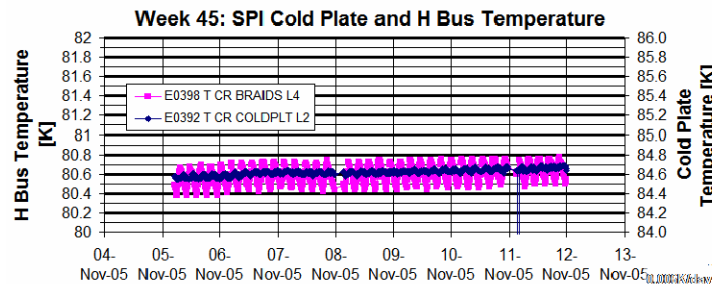
Nothing to report.

8.3.2 SPI Operations

Stirling compressors and Cryostat

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

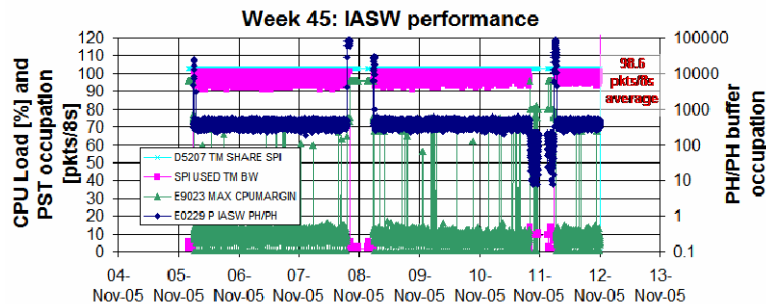
The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.



DPE & IASW

The IASW performance is nominal.

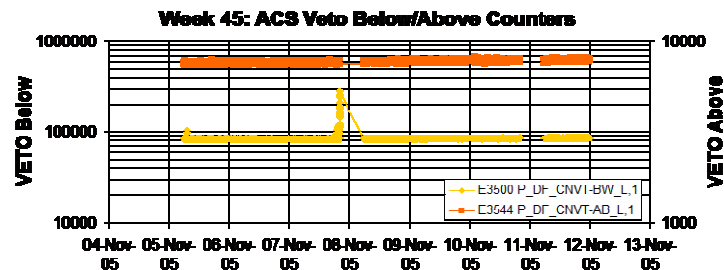
The following plot shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period



ACS

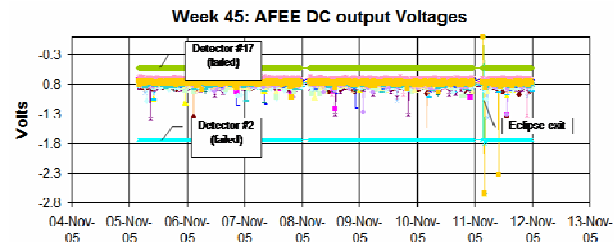
The performance of the ACS is nominal.

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



AFEE:

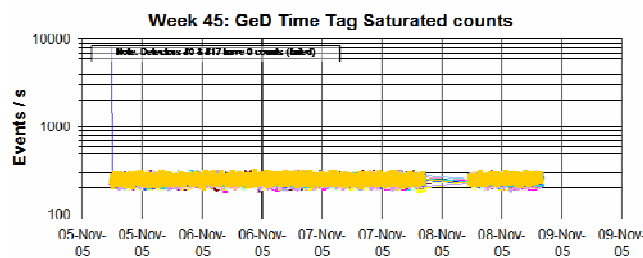
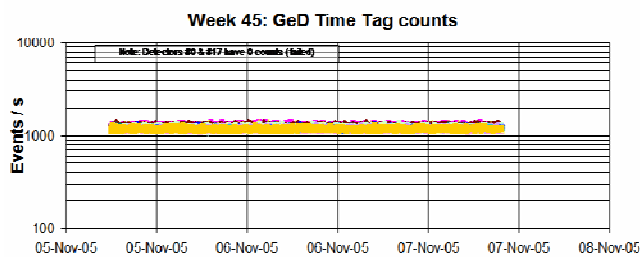
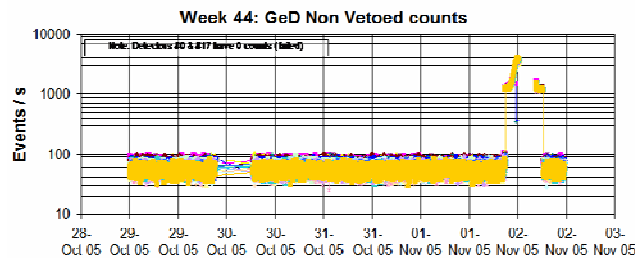
The performance of the AFEE and the detectors is nominal except for the detector #2, failed since 06.12.2003, and detector #17, failed since 17.07.2004. The following plot shows the dc voltage offset of the detector channels during the reporting period.



DFEE:

The performance of the unit is nominal

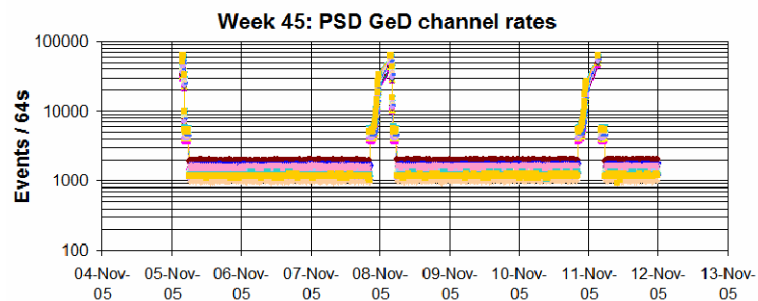
The following plots show the count rates of the detectors during the reporting period (due to problems in the data retrieval tool, some gaps could be present).



PSD:

The performance of the unit is nominal

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



SPI EVENTS LOG

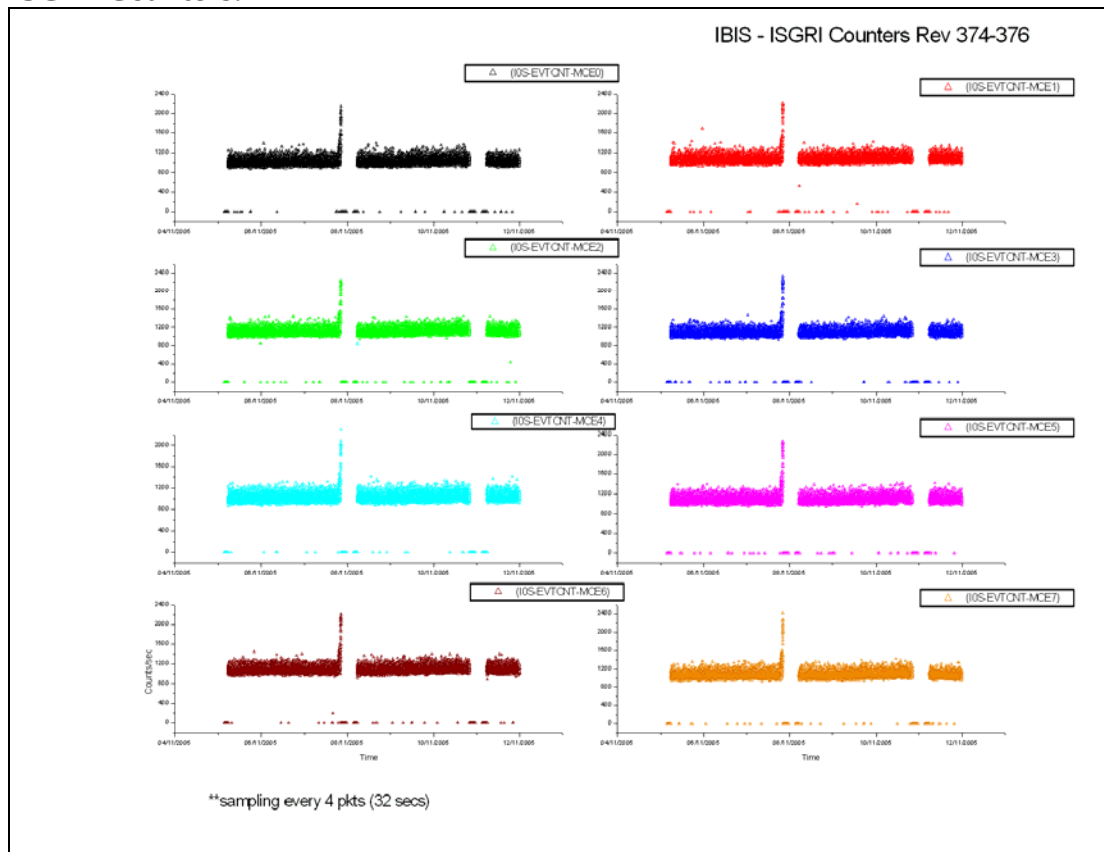
NOTE: The events log is extracted from the revolution pass summaries (courtesy of the Integral Analysts).

DOY Time	Event
309 - 12:51	TM E2295 00L, back in limits @ 13:03
311 - 19:23	TM E3500 00L, back in limits @ 19:24
311 - 19:29	TM E3500 00L, back in limits @ 19:33
315 - 03:23	EV: SPI1 failure in analyzing HSL data

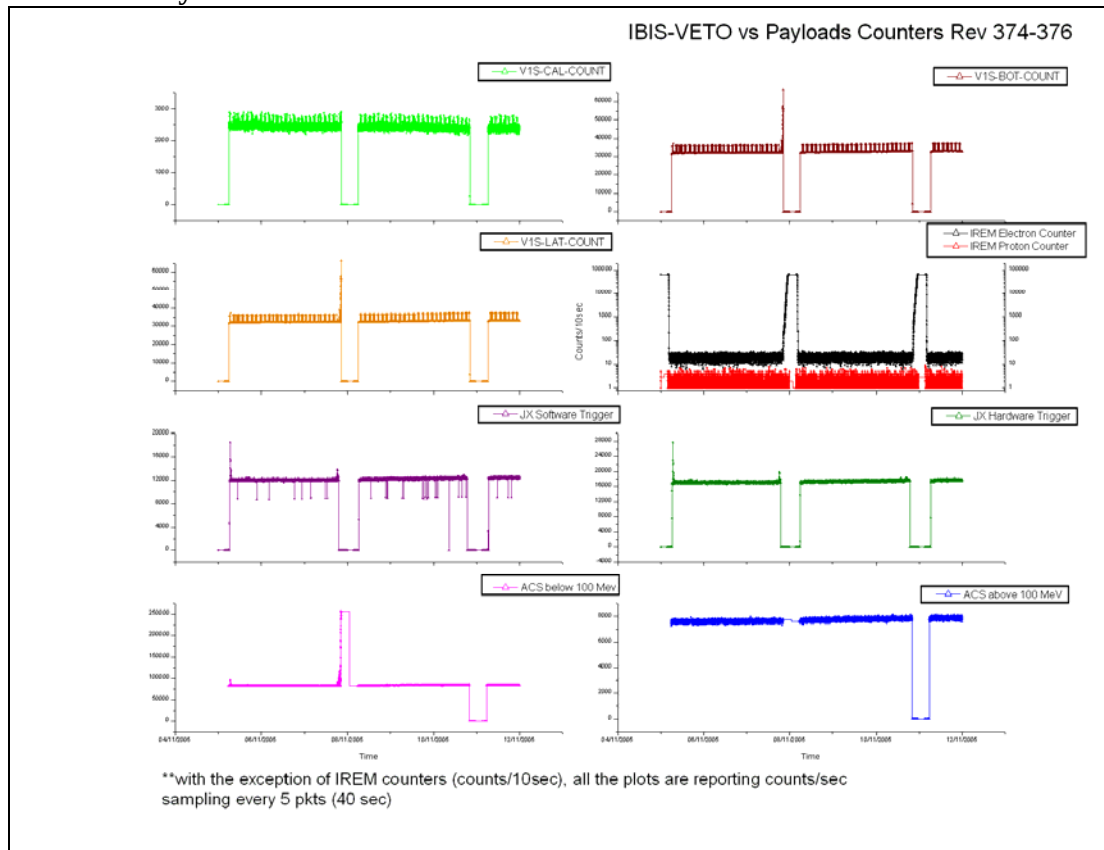
8.3.3 IBIS Operations

IBIS Event Counters Plots.

ISGRI Counters:

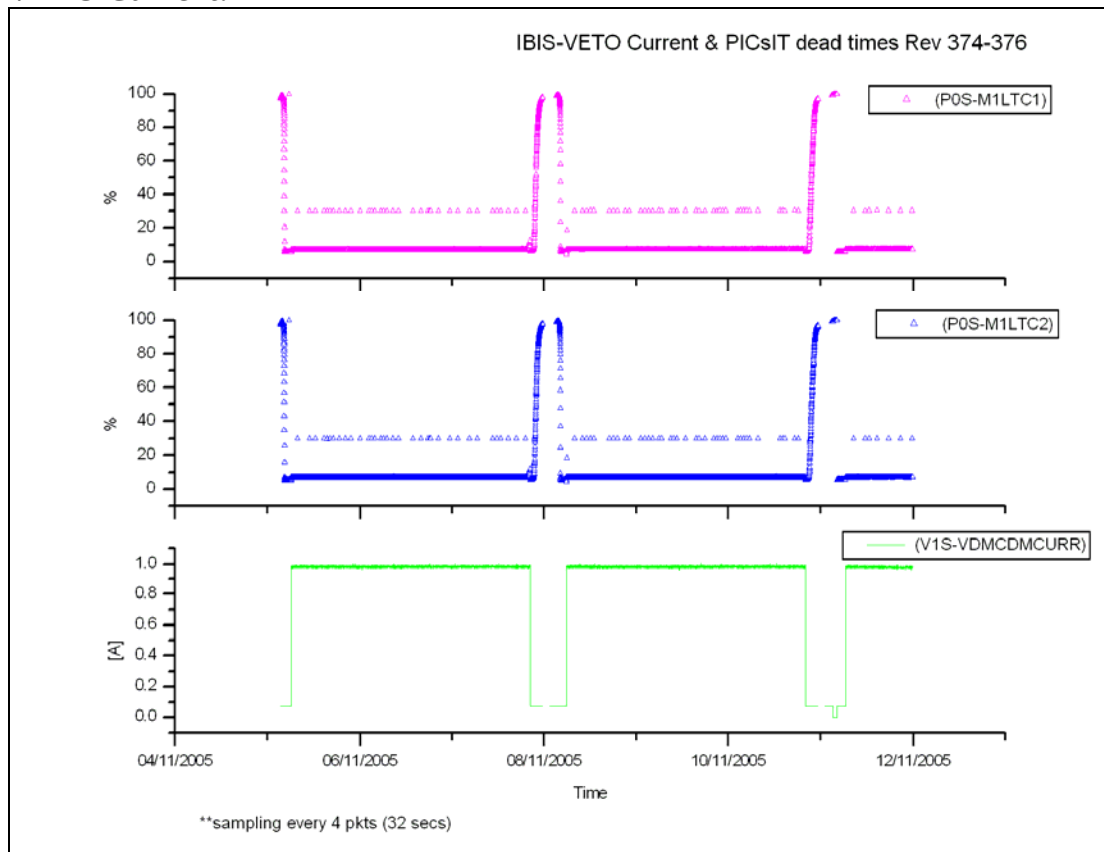


VETO vs Payloads Counters:

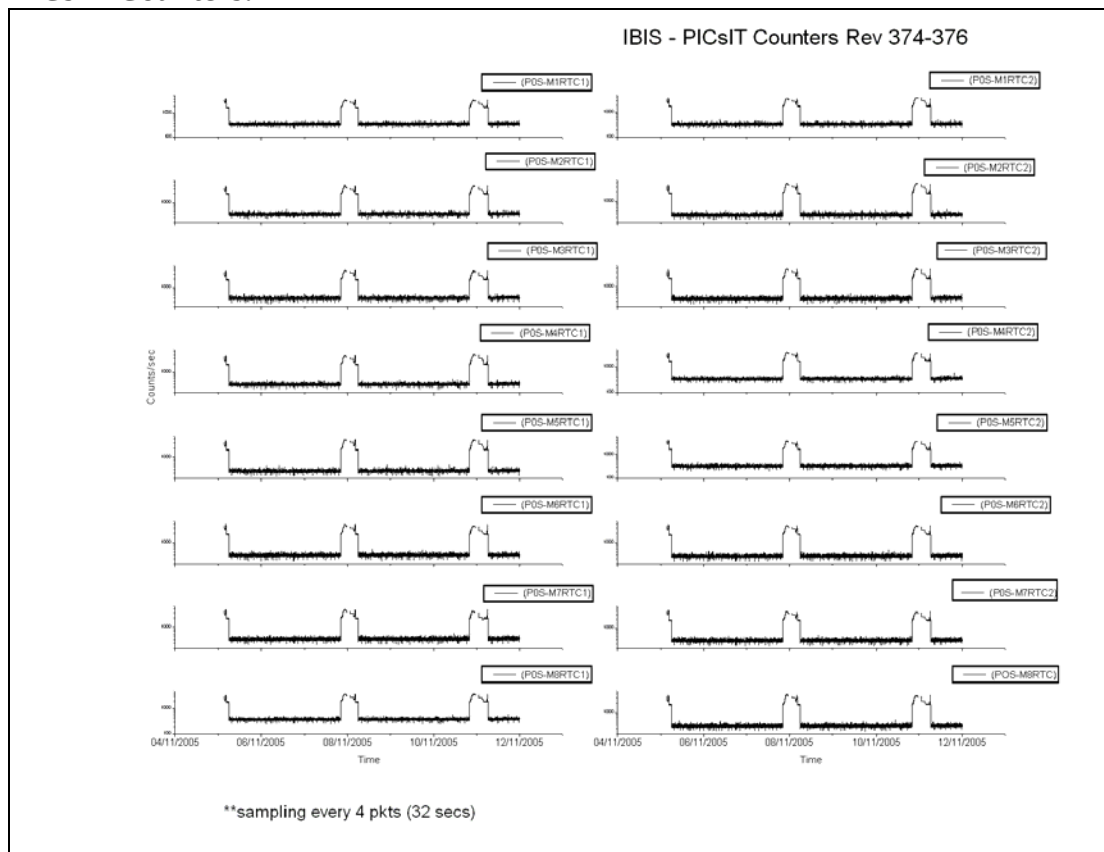


The week was characterised by low radiation.

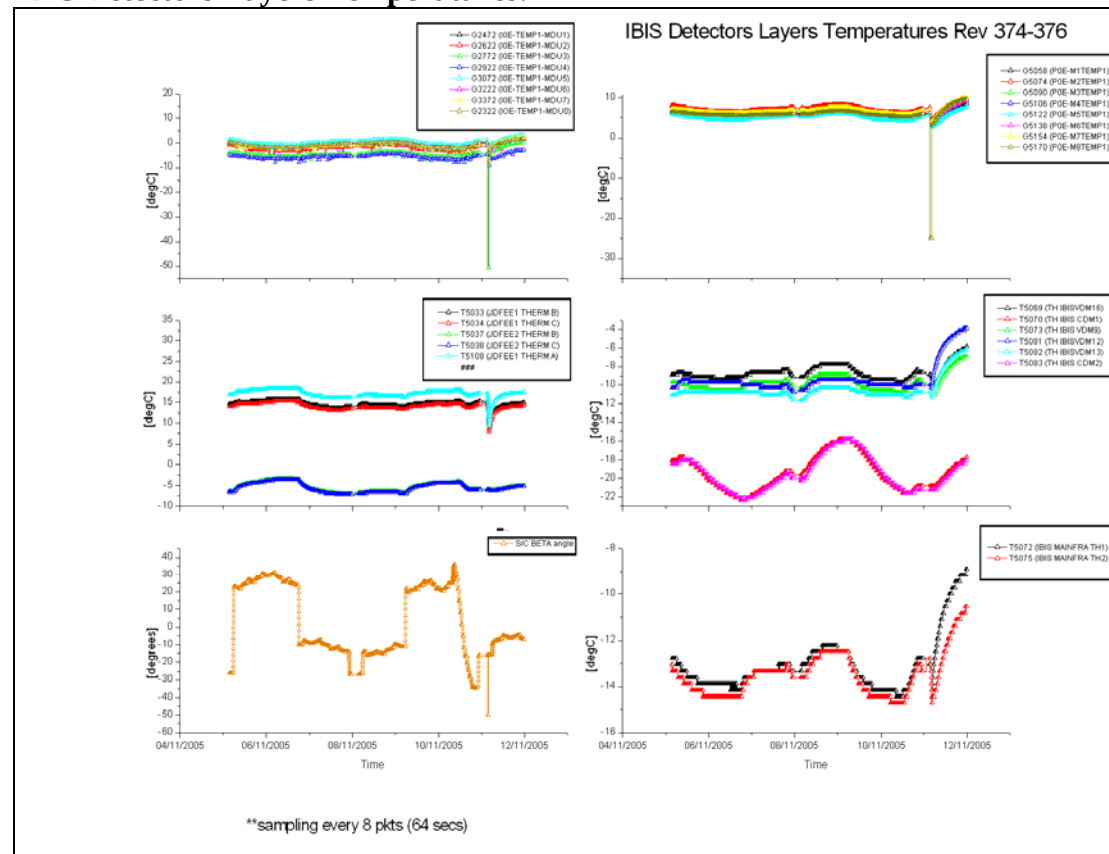
VETO Current:



PICsIT Counters:



IBIS Detectors Layers Temperatures:



IBIS daily report

DoY 2005.309 (05/11/2005)

Since DoY 308 at 20:10Z TM parameter G8015 (S1E-A2_PMT_V) was reported Out Of Limit high. It went back inside limits on DoY 309 at 06:09Z. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

At 04:14Z TM parameters G5033 (POS_M7RTC2), G5002 (POS_M1RTC1) and G5027 (POS_M6RTC1) were toggling OOL High until 04:25Z. According to reaction P-CNT-1, as this happened inside the Radiation Belts, no action was taken.

DoY 2005.311 (07/11/2005)

At 20:18Z TM parameters G6062 (V1S-BOT-COUNT) and G6063 (V1S-LAT-COUNT) went OOL High. At 20:22Z TM family G2013 (IOS-EVTCNT-MCEi) went OOL High as well. These are due to high radiations as the spacecraft was approaching the radiation belts. At 20:24Z, all above OOL disappeared as IBIS went into Safe mode. According to respectively V-BOT-1, V-LAT-1 and I-CNT-1, no action was taken.

At 20:24Z as well, TM parameter G8015 (S1E-A2_PMT_V) was reported Out Of Limit high. It went back inside limits on DoY 312 at 05:54Z. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

At 22:12Z TM parameter G5007 (POS_M2RTC1) went OOL High until 22:16Z; at 22:18Z TM parameter G5012 (POS_M3RTC1) went OOL High until 22:51Z. As this happened inside the radiation belts, according to P-CNT-1, no action was taken.

DoY 2005.312 (08/11/2005)

At 04:10Z TM parameter G5012 (POS_M3RTC1) went OOL High until 04:15Z. As this happened inside the radiation belts, according to P-CNT-1, no action was taken.

At 05:27Z TM parameter G2084 (IOE_OVFWPXADD_M6) failed SCC and back. According to I-OVF-1, no action was taken.

DoY 2005.314 (10/11/2005)

At 20:11Z as well, TM parameter G8015 (S1E-A2_PMT_V) was reported Out Of Limit high. It went back inside limits on DoY 315 at 03:23Z when the ECLIPSE_ENTRY was planned. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

At 22:18Z TM parameter G5017 (POS_M4RTC1) went OOL High for 30 min. As this happened inside the radiation belts, according to P-CNT-1, no action was taken.

DoY 2005.315 (11/11/2005)

At 04:18Z, while the ED GECLEX02 was being executed to reconfigure IBIS after the eclipse passage, lots of PICsIT OOL were reported for 1 min (TM families G5058 to G5065). According to P-TMP-1, P-VLT-1, P-VLT-2 and P-THR-1, no action was taken.

At 04:19Z TM parameter G8015 (S1E-A2_PMT_V) went Out Of Limit high again. It went back inside limits at 06:24Z when VETO was switched back ON again with ED GEBEXT01. As this happened inside the radiation belts, according to V-VLT-1 no action was taken.

At 06:33Z, typical VETO OOLs (V0E-VDMiVC5P, V0E-VDMiVC5M, V0E-VDMiVM5P, V0E-VDMiVM5M, V0E-VDMiHPVS, V0E-VDMiBGO, V0E-VDMiVME) after eclipse were reported as VETO was switched to Nominal mode via ED GEBEXT01. They went back inside limits at 06:44Z. No action was taken.

At 04:24Z when GEVESP01 command failed (see below), TM parameter G8012 (Watchdog status VEB set by IASW (bi-level channel 4)) failed SCC and turned to ON until DoY 318 at 03:11Z when next eclipse started. However no problem was found in VETO telemetry after the recovery performed with the ED GEVESP01 (see below). **(Investigation on-going)**

DoY 2005.315 (11/11/2005) VETO patch TC rejected

At 04:24:40Z during eclipse reconfiguration the following events were reported:

- at 04:24:40Z, TC GU0613TC (TC-V-DUMP-31) failed acceptance
- at 04:24:41Z OEM ID 129 class 2 "IASW TIME-OUT LSL DATA",
- at 04:24:41Z OEM ID 134 class 3 "IASW EXTERNAL TC REJECTED COULD NOT BE EXECUTED",
- at 04:24:45Z OEM ID 129 class 2 "IASW TIME-OUT LSL DATA".

The OEMs flagged an on-board problem during the execution of the patch from the ED GEVESP01. They reported an interruption of the Low Speed Line (TC/HK) communication between DPE and peripherals.

In addition both CDM01 and CDM02 status were ON. Actually TM parameter G6030 (V1S_CDM02STAT) failed SCC at 04:24Z, when the OEMs occurred, showing CDM02 ON.

VETO seems to have reset itself.

The operator re-uplinked the failed TC and let GEVESP01 run from the timeline.

However since the configuration of VETO was wrong, after this, under the guidance of the SOE, the following was performed:

- at 04:50Z, TC G0102 was sent to restore the VETO CTX table from DPE (this restarted VETO with the right configuration meaning CDM02 OFF)
- at 04:53Z, ED GEVESP01 was resent completely.

At 06:24Z following the timeline, VETO was switched to Nominal mode with ED GEBEXT01.

Since then no further anomaly was reported.

This problem has been reported in the ARTS system: INT_SC-130, and it re-opens the issue of this VETO Patch sequence. Actually similar problems already happened in the past and are referenced as INT_SC-86 and INT_SC-102. **(Investigation required on PIs side)**

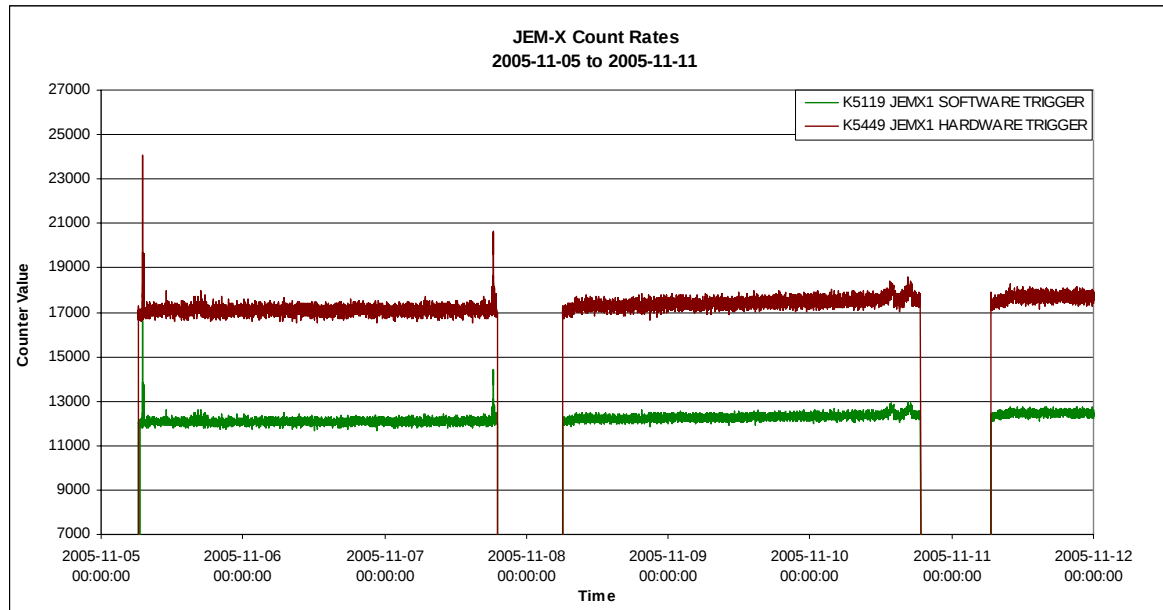
For the next eclipses, the operator and on-call SOE will be informed of the recovery procedure to execute in case of reoccurrence of this anomaly.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

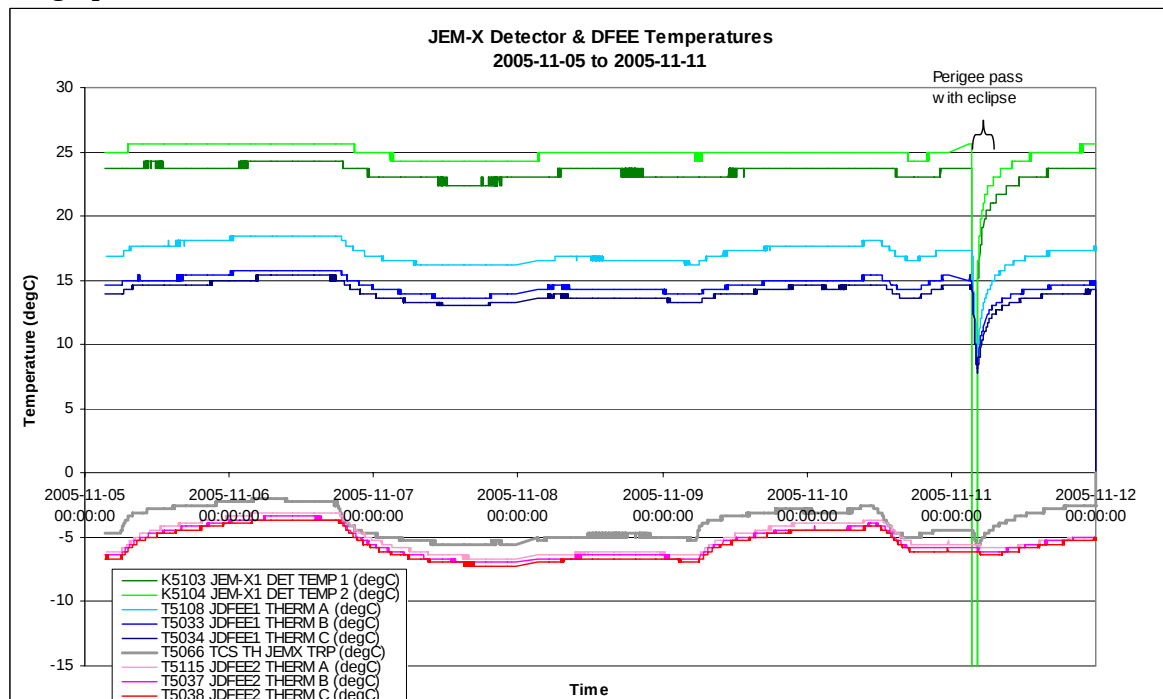
JEM-X count rates over the reporting period are displayed in the following graph¹.

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



8.3.4.2 JEM-X Temperatures

JEM-X Detector and DFEE temperatures, along with the temperature on the detector bench between the two units, over the reporting period are displayed in the following graph².



8.3.4.3 JEM-X Daily Report

2005-11-05 (DOY 309, Rev 373-374) to 2005-11-11 (DOY 315, Rev 375-376)

Nothing to report

² Data sampled (1 frame in 8)

8.3.5 OMC Operations

2005-11-05 (DOY 309, Rev 374)

Nothing to report

2005-11-06 (DOY 310, Rev 374)

From 11:05, to 11:11 the OMC Lens Temp1 (T5016) went out-Of-Limits, there was no impact.

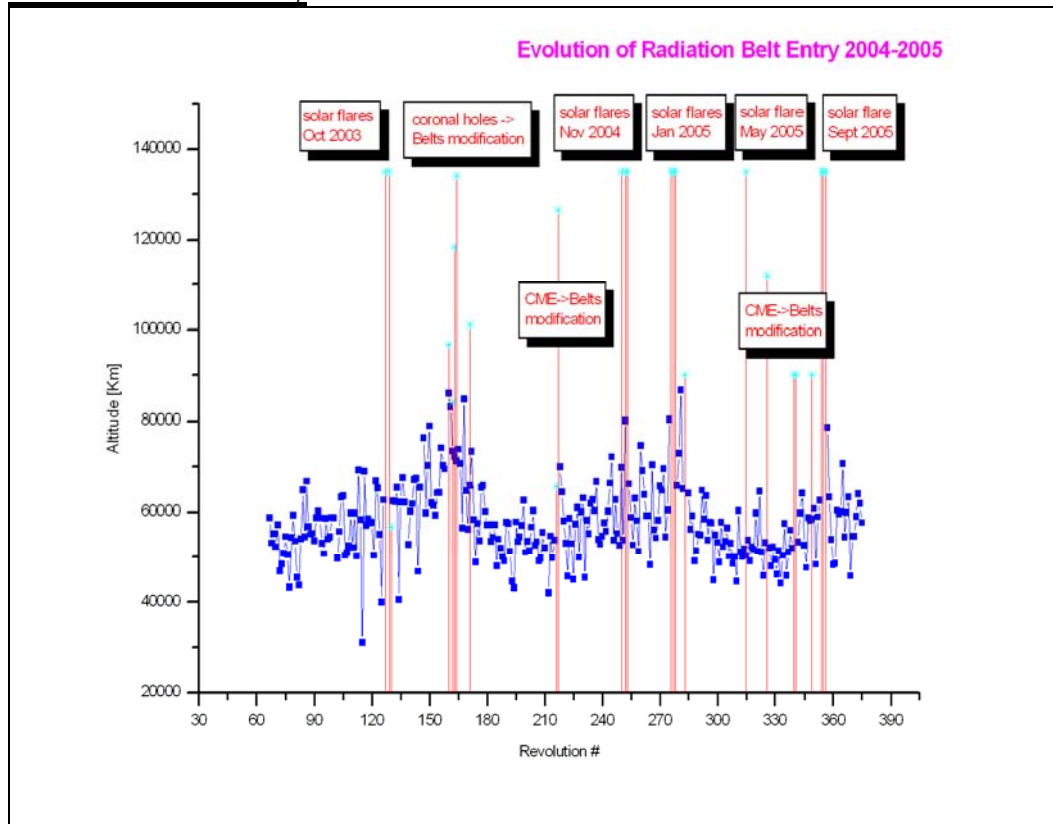
2005-11-07 (DOY 311, Rev 374) to 2005-11-11 (DOY 315, Rev 376)

Nothing to report

On DoY 311 at 20:24:02 and DoY 314 at 20:11:14 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]
374	RAD_EXIT R 2005-11-05T05:55:23Z	2005-11-05 04:45:41	>24964.4	2005-11-05 04:54:27	30616
374	RAD_ENTR R 2005-11-07T20:23:57Z	2005-11-07 20:09:06	61836.7	2005-11-07 21:26:33	51809
375	RAD_EXIT R 2005-11-08T05:41:07Z	2005-11-08 04:38:58	>28143.0	2005-11-08 04:46:33	31575
375	RAD_ENTR R 2005-11-10T20:11:08Z	2005-11-10 20:31:30	57672.5	2005-11-10 21:16:33	51431
376	RAD_EXIT R 2005-11-11T05:28:18Z	2005-11-11 04:23:38	29739.9	2005-11-11 04:26:33	30425

Reference

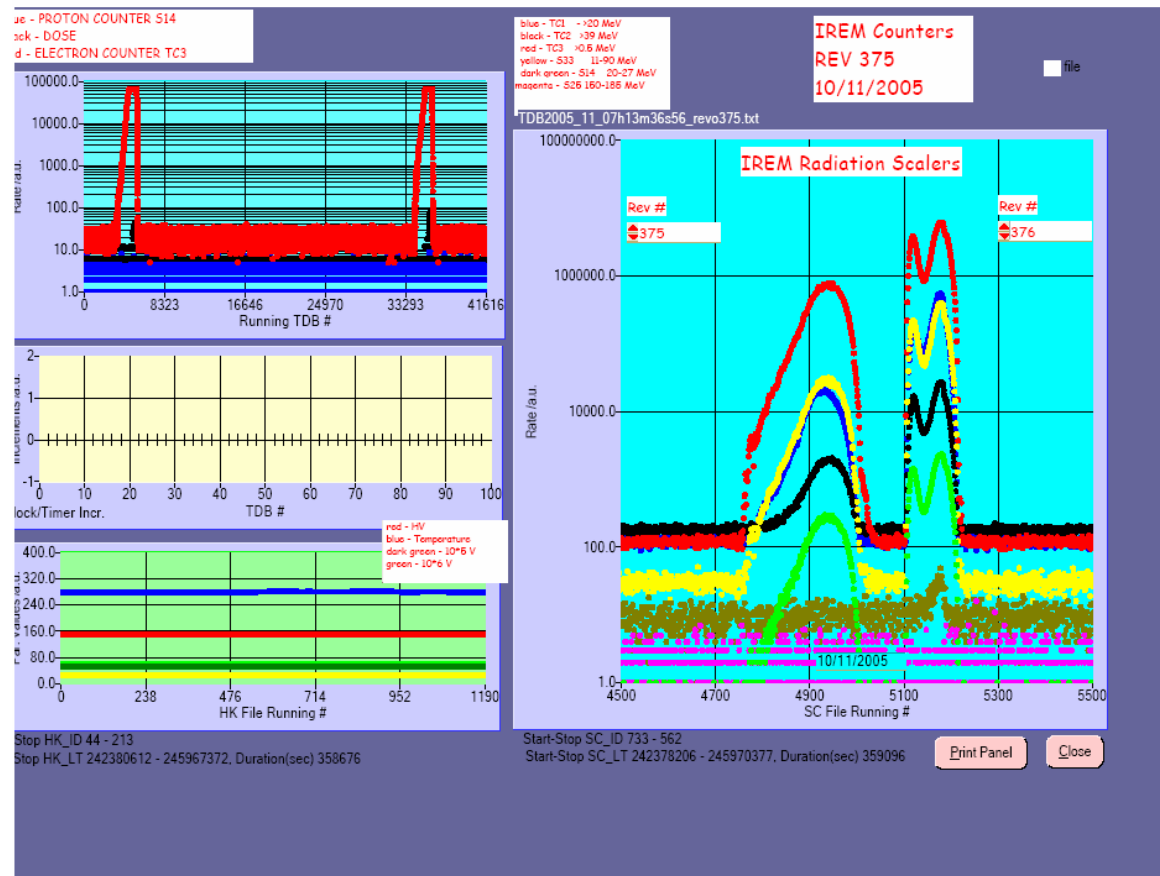
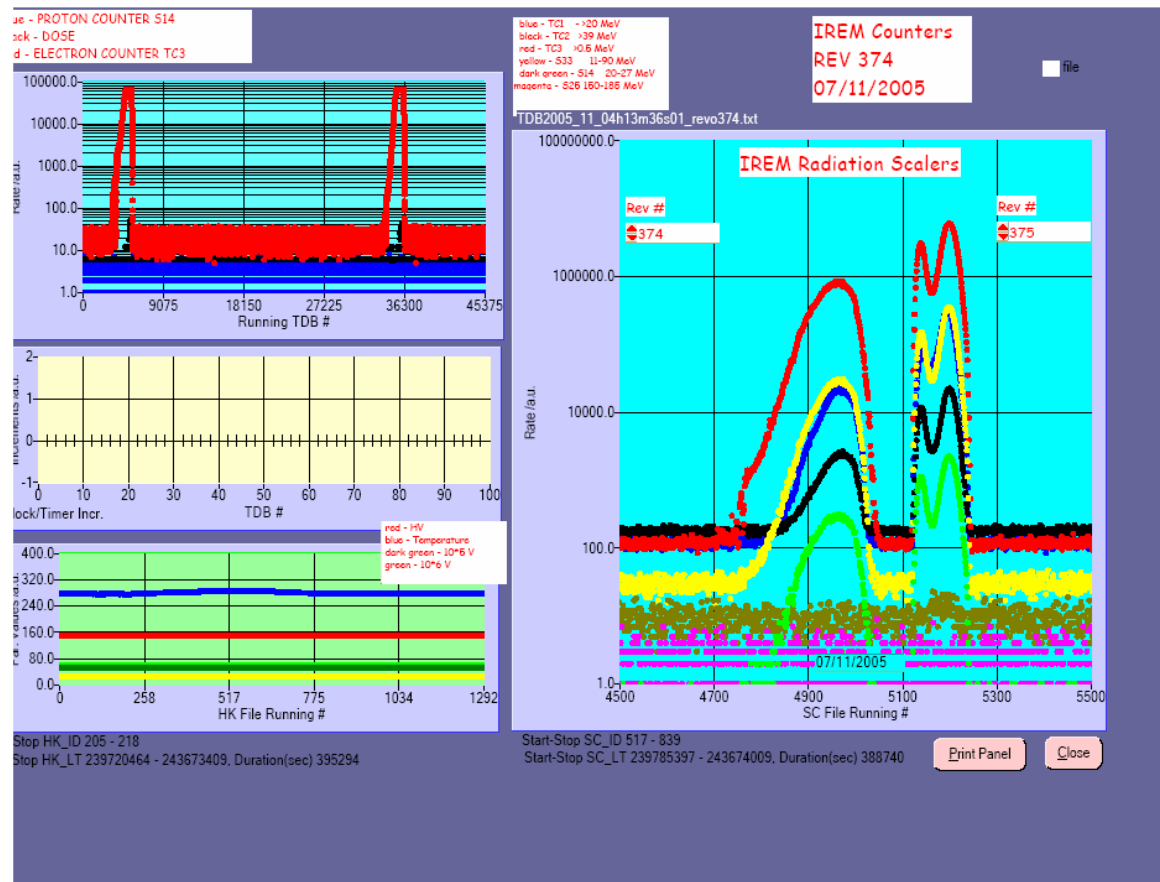
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

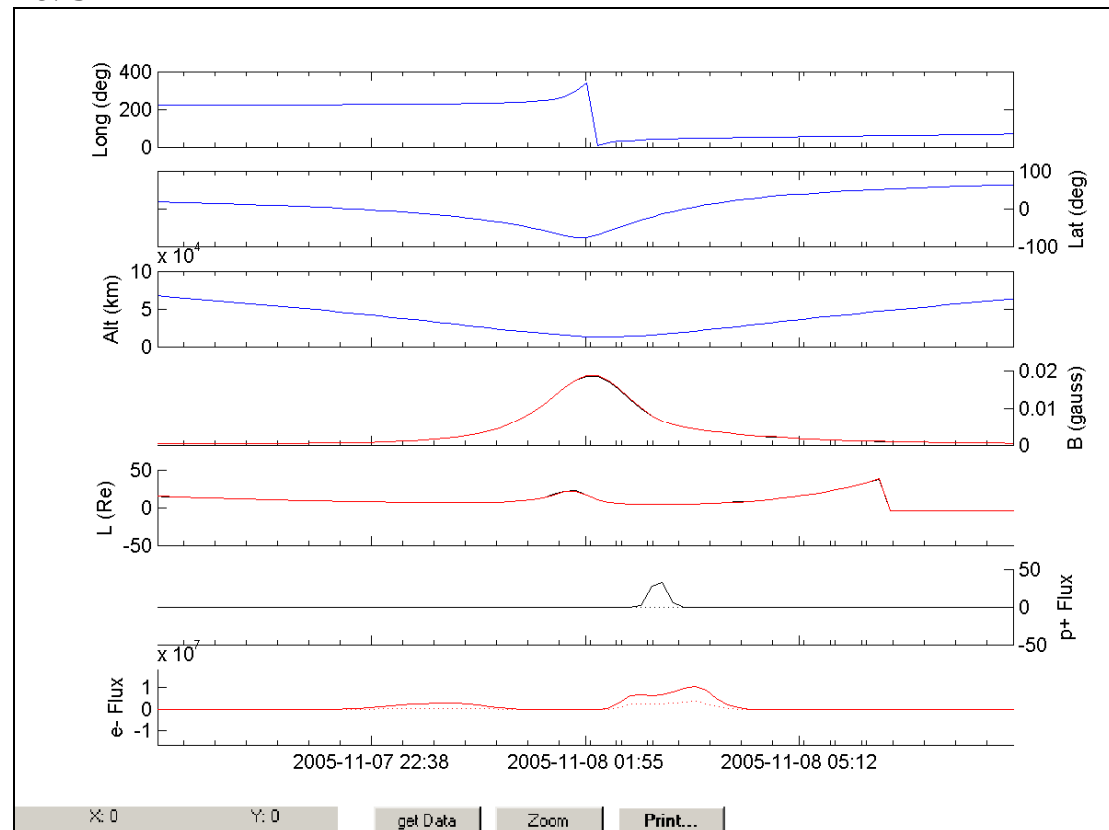
Radiation Spike

IREM radiation counters:

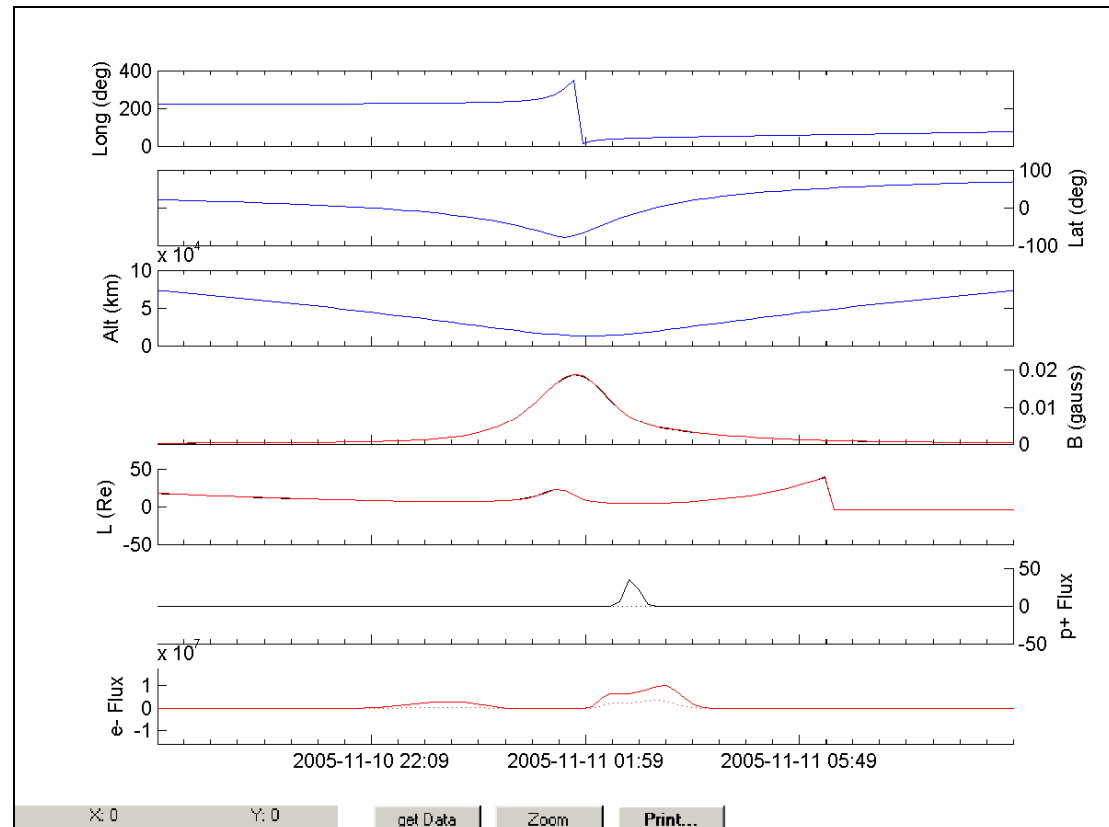


IREM Predicted Radiation Belt Passages:

Rev 374



Rev 375



SEC-GOES Observed Particles Fluxes:

