

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OAI
No. 305
Week 30
28.07.08
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 19.07.08 until 25.07.08 (both dates inclusive) and covers the revolutions 704, 705 and 706.

2 Summary of Activities

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

The targets of these revolutions consisted of two raster dithers of Loop I-Loop IV Super (RA 13:57:10.00, DEC +07:34:37.0), a sequence of Galactic disk latitude scans (RA 14:19:16.80, DEC -58:57:36.0) twice, (RA 14:10:07.20, DEC -63:33:00.0) twice, (RA 14:27:43.20, DEC -58:33:36.0), two raster dithers of the Galactic Plane Region 3 (RA 13:09:32.98, DEC -62:47:56.4), and a raster dither of the Perseus OB2 Cloud (RA 03:32:48.00, DEC +31:26:00.0).

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

Seven slews were missed from TL, during the observation period due to problem on STR and FDS.

The fuel consumption over the period between 18/07/2008 and 25/07/2008 was 0.1406 Kg. The remaining propellant is in the order of 139.4894 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.

From the EPS point of view the eclipse passage was entirely nominal.

3.1.3 Thermal

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

3.1.4 OBDH

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

The PST was over-subscribed by 3 packets, which were allocated to SPI during the Instrument window for the entire reporting period.

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

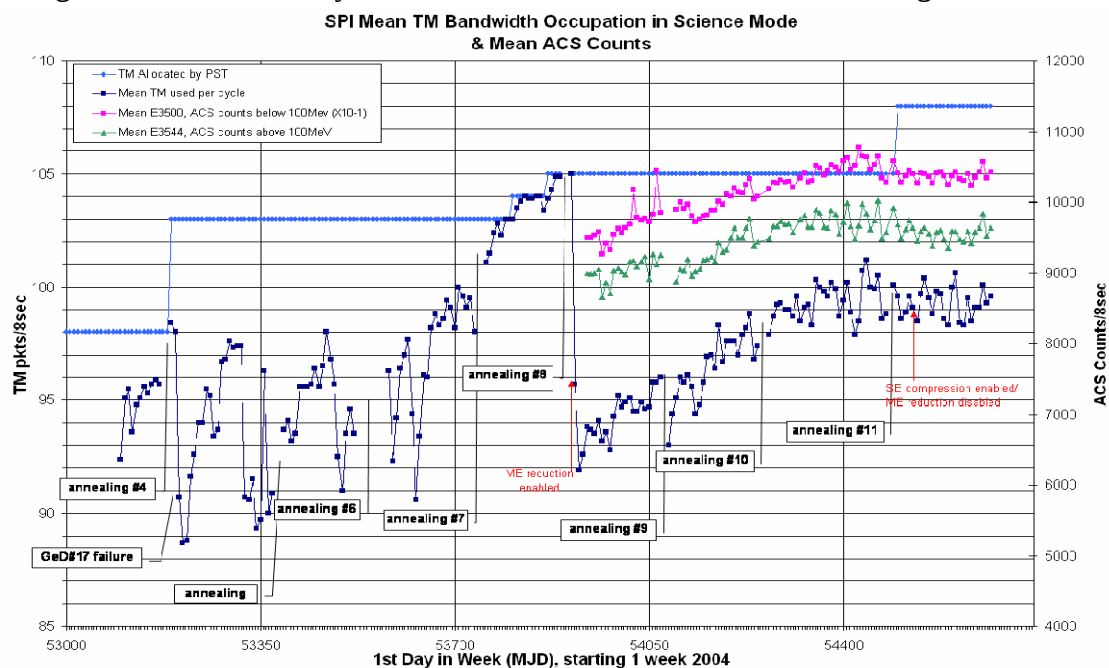
3.2.1 SPI

Following the 11th annealing, which ended on 30th January, the overall status of the gamma-ray spectrometer is nominal, except for the Ge detector #12 which, although its energy resolution improved since the previous annealing, is still showing a slightly degraded energy resolution compared to the other detectors and is therefore operating at a lower HV setting of 3.5kV (instead of 4kV). Detector #2 is failed since 06/12/2003 and detector #17 since 17/07/2004.

The Stirling compressors are working nominally, maintaining the Germanium detectors at 80 +/-1K.

During science operations, the instrument was kept in photon-by-photon mode with spectra TM enabled. The assigned TM bandwidth in the science observation windows was 108 packets/cycle and the average telemetry occupation was 99.6 packets/cycle.

The following plot shows the evolution of the assigned and the average occupation of the SPI TM bandwidth along with the mean ACS count rate evolution (since July 2006). As can be seen, there is a strong correlation between the evolution of the background as measured by the ACS and the overall TM bandwidth usage.



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

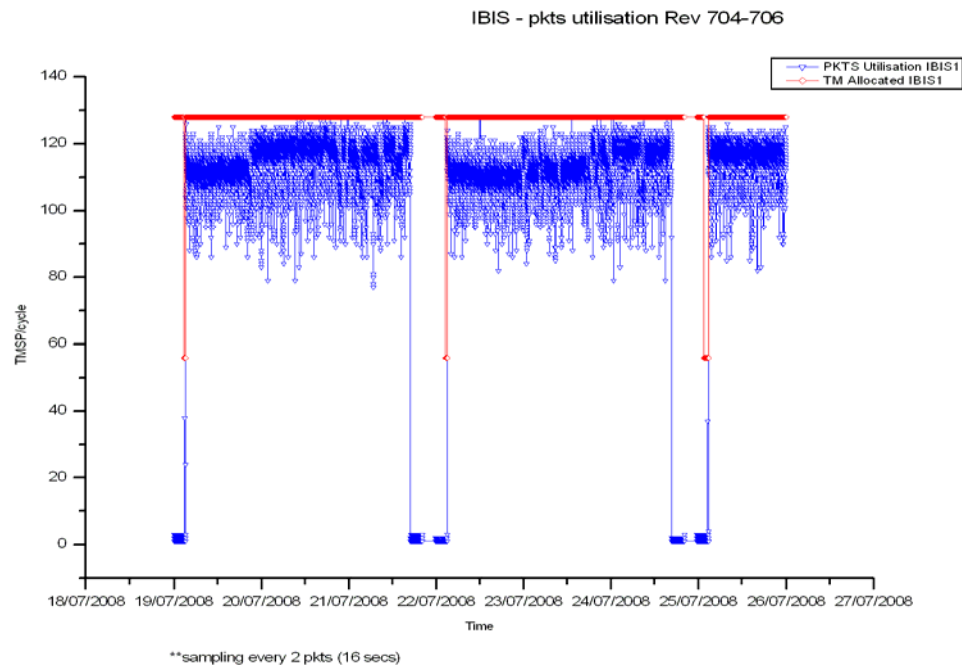
3.2.2 IBIS

The overall status of the unit is nominal.

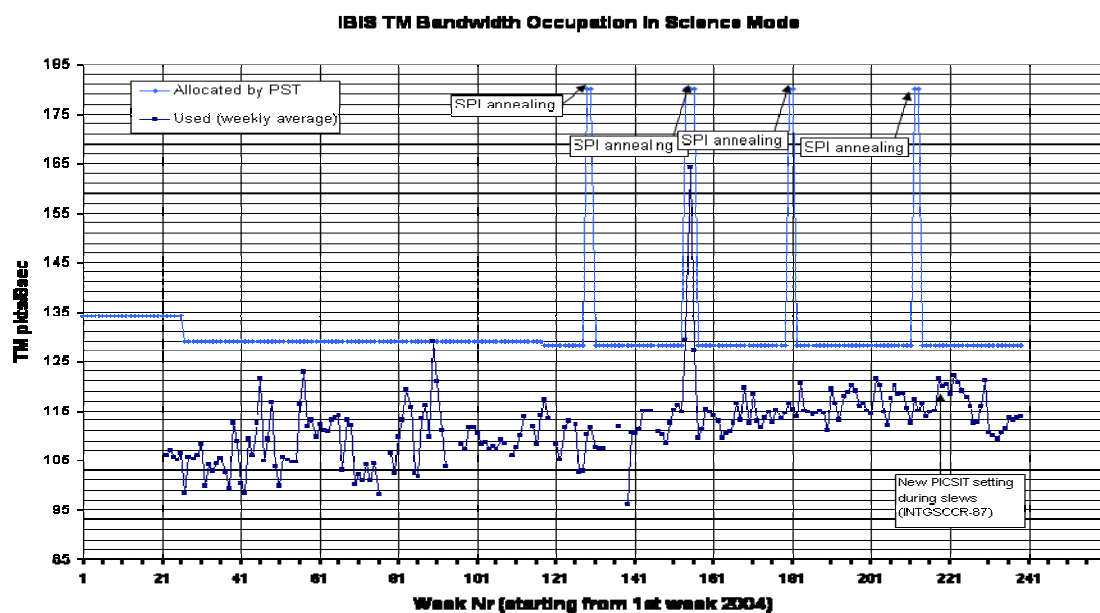
During the reporting period, the TM bandwidth statistics were as follows:

- PST allocation to IBIS above radiation belts: 128 packets/cycle.
- IBIS mean bandwidth utilisation in science mode: 113.76 packets/cycle (up 0.31 on last week)
- Percentage of TM cycles in which full bandwidth was used: 0.25%

The plot below shows the IBIS TM utilisation during the observation period.



A plot of the IBIS weekly bandwidth utilisation since 2004 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. JEM-X2 was dormant (DPE OFF) with no TM slots allocated.

Note: Some more information concerning the JEM-X operations is provided in the Appendix.

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, 169 of the 174 planned science pointings were executed nominally, 4 pointings were lost, and 1 shortened.

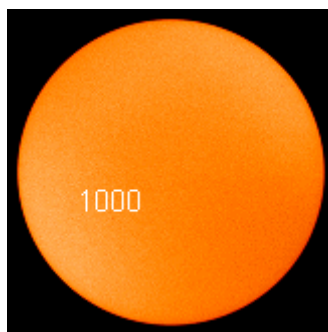
Note: Some more information concerning the OMC operations is provided in the Appendix.

3.2.5 IREM

The overall status of the unit is nominal.

Solar Activity

The observation period was characterised by low solar activity. Sun-spot #1000 was visible on the 19th and 20th July, for the rest of the week, the sun was blank. The risk of solar flares was very low.



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 good this week. The overall performance was over the 95% requirement.

4.1 Mission Operations Centre

The performance of the MOC was good this week. There were several problems with executing star mappings, mostly caused by the Star Mapper 1750 fault. 6 pointings were lost and one delayed by this problem.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were three drops of TM from Redu, all without impact.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning

Now new PSFs have been received.

Observations have been planned for revolutions 712 and 713, the last revolutions in AO-5.

New TSFs have been received for revolutions 707 to 710.

2. Observation status

New ECS files were received for revolutions 689, 694 and 695.

3. ISOC Science Data Archive

All available Science Window data has been ingested, data at observation level is being ingested.

4. ISOC system

Work is ongoing on ISOC system V19.4 foreseen for end August.

5. Problems

None.

4.3.2 ISDC

Status of ISDC observation processing on 28/07/2008:

- Latest Standard Analysis completed: observation 05200080003 (Loop I-Loop IV Super, Revolutions 690) on 22/07/2008.
- Latest products archived: observation 05200080005 on 24/07/2008.
- Latest observation products sent to the observer: observation 05200510009 (Mrk 421, Revolutions 679) on 16/06/2008.

5 Special Events

6 Anomalies

The following problem was reported this week that impacted operations.

- On DoY 202, at 17:38:58, TC A3089 (Start Sun Steer) failed CEV “F”. This was the start of a series of problems caused by difficulties performing star mappings and a 1750 fault (see AOCS section for details). The Timeline was eventually recovered at 19:16:00. The impact was the loss of pointing 07040056 to 07040059.
- On DoY 203, at 00:46:00, a power outage caused the lighting in the control rooms to fail. Operations were conducted using torches, there was no further impact!!
- On DoY 204, at 10:58 the FDS failed to update the slew ID 07050010. FDS issued an error during the update process as insufficient stars were found to perform the attitude reconstruction update the next slew. A recovery was executed and the Timeline rejoined at 12:20. The impact was the loss of pointings 07050010 & 07050011.
- On DoY 205, at 19:00:15 another Star tracker 1750 fault forced the suspension of the Timeline. A recovery was performed, and completed at 20:20. The impact was an 11 minute delay in the start of pointing 07050043.

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

AR id	Date Created	Subject	Segment	Status
INT-3010	2008-07-20	FDS: failed slew update	FDS	Pending
INT-3012	2008-07-23	FDS: failed slew update, not enough stars found	FDS	Pending
INT_SC-232	2008-07-30	AOCS: STR 1750 Fault	Spacecraft	Pending
INT_SC-233	2008-07-30	AOCS: STR 1750 Fault	Spacecraft	Pending

7 Future Milestones

- The 11th on-board clock wrap around due at 01:24:34 on 22/08/2008.
- The 12th SPI annealing is due to take place between 17th August and 5th September 2008, during revolutions 714 to 719.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 704

The observations in revolution 704 began with a raster dither of Loop I-Loop IV Super (RA 13:57:10.00, DEC +07:34:37.0), lasting ~17.4 hours. They continued with a sequence of Galactic disk latitude scans (RA 14:19:16.80, DEC -58:57:36.0), lasting ~8.8 hours, then (RA 14:10:07.20, DEC -63:33:00.0), lasting ~17.1 hours, then back to (RA 14:19:16.80, DEC -58:57:36.0), lasting ~8.3 hours. Finally a raster dither was performed of the Galactic Plane Region 3 (RA 13:09:32.98, DEC -62:47:56.4), lasting ~2.9 hours, until the end of the revolution.

Revolution 705

The observations in revolution 705 began with a raster dither of Loop I-Loop IV Super (RA 13:57:10.00, DEC +07:34:37.0), lasting ~20.3 hours. They continued with a raster dither of the Galactic Plane Region 3 (RA 13:09:32.98, DEC -62:47:56.4), lasting ~14.5 hours. Finally a Galactic disk latitude scan (RA 14:27:43.20, DEC -58:33:36.0), lasting ~17.1 hours, was performed, until the end of the revolution.

Revolution 706

The observations in revolution 706 consisted entirely of a raster dither of the Perseus OB2 Cloud (RA 03:32:48.00, DEC +31:26:00.0), lasting ~57.9 hours.

Throughout these observations, all instruments were in their nominal science modes, except JEM-X2, which is switched off. The TM allocation was IBIS 128; SPI 108; JEM-X1 8; JEM-X2 0; OMC 5.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2008-07-04T01:39:26.000Z	139.8576	F	Automatic TM processing.
2008-07-05T11:01:53.000Z	139.8229	F	Automatic TM processing.
2008-07-07T01:27:57.000Z	139.8135	F	Automatic TM processing.
2008-07-08T10:47:05.000Z	139.7851	F	Automatic TM processing.
2008-07-10T01:16:53.000Z	139.7750	F	Automatic TM processing.
2008-07-11T10:51:12.000Z	139.7218	F	Automatic TM processing.
2008-07-13T01:06:44.000Z	139.7195	F	Automatic TM processing.
2008-07-14T11:21:12.000Z	139.6937	F	Automatic TM processing.
2008-07-16T00:57:24.000Z	139.6844	F	Automatic TM processing.
2008-07-17T10:20:16.000Z	139.6300	F	Automatic TM processing.
2008-07-19T00:43:08.000Z	139.5768	F	Automatic TM processing.
2008-07-20T10:03:36.000Z	139.5488	F	Automatic TM processing.
2008-07-22T00:30:13.000Z	139.5421	F	Automatic TM processing.
2008-07-23T00:12:47.000Z	139.5067	F	Automatic TM processing.
2008-07-25T00:19:08.000Z	139.4894	F	Automatic TM processing.

This report was generated Fri Jul 25 08:00:12 GMT 2008

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, 19/07/2008 – 25/07/2008

The AOCS operations were executed from the Automatic Timeline.

During this period, 90 Open Loop Slews, 102 Closed Loop Slews and 5 Momentum Biases were executed (as reported by ACC).

7 slews (4 OSL, 3 CSL) were missed from TL, during the observation period due to STR 1750 Fault (processor reset) and failed update by FDS (not enough stars for attitude determination and slew update)

The OTF was not reached during PID 07040055 and 07050042.

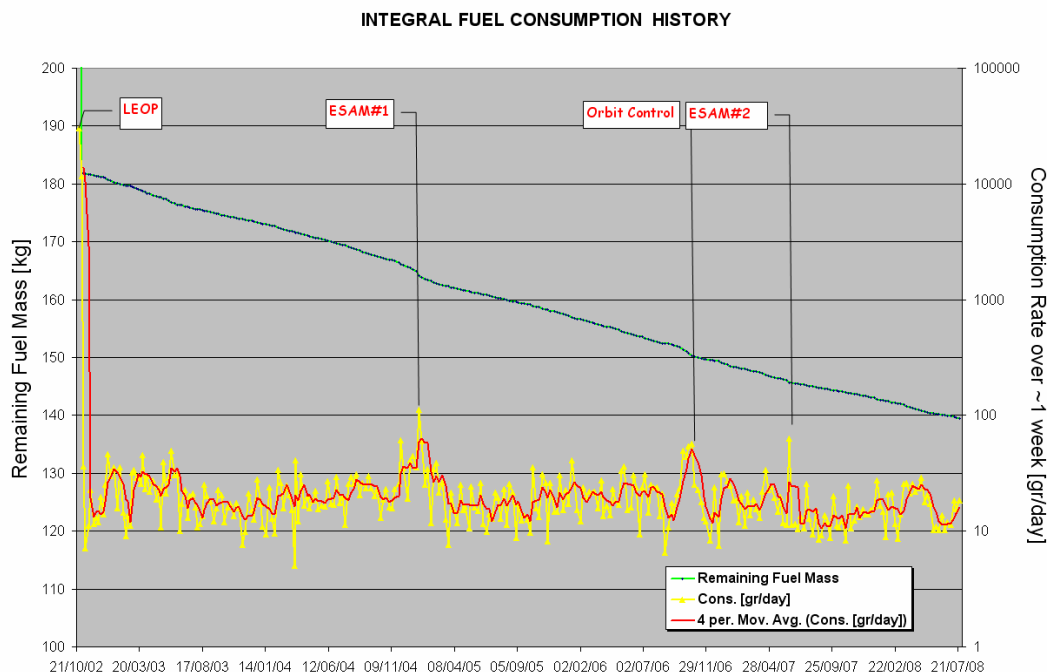
This is equivalent to ~ 3.6 % of the total number of slews planned (196).

Orbit Control

No update

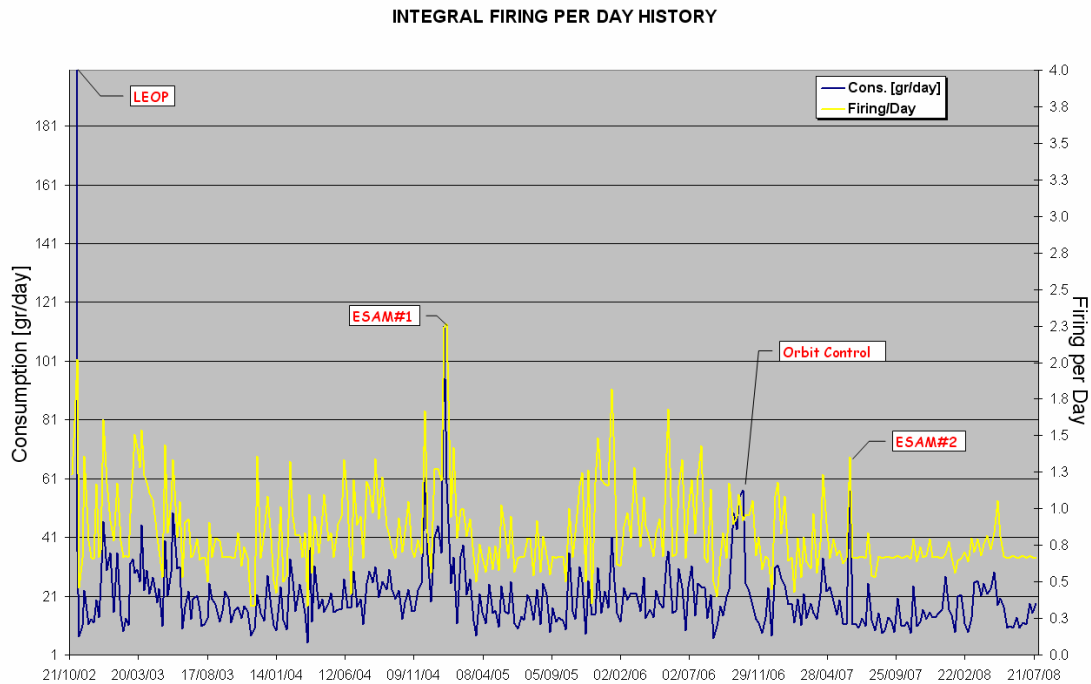
Fuel consumption

The fuel consumption (total, grams per day) over the period between 01/11/2002 and 25/07/2008 is reported in the plot below.



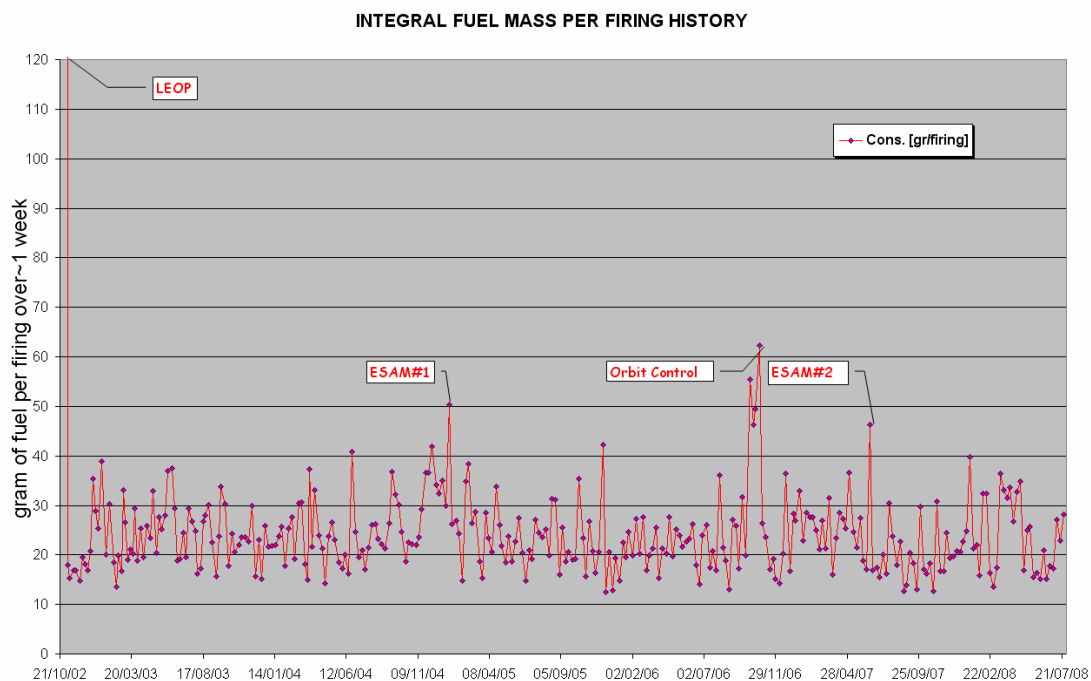
The above plot considers the ESAM fuel consumption spread over period of ~1 week.

The firing per day over the period between 01/11/2002 and 25/07/2008 is reported in the plot below.



The above plot considers the ESAM fuel consumption spread over period of ~1 week.

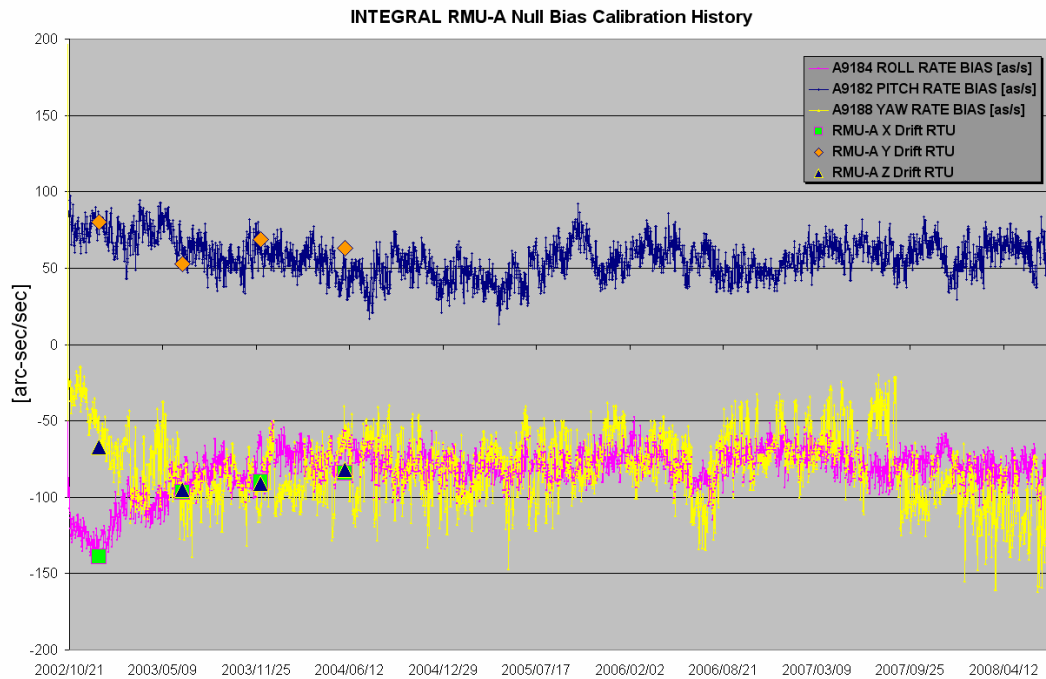
The fuel per firing over the period between 01/11/2002 and 25/07/2008 is shown in the plot below.



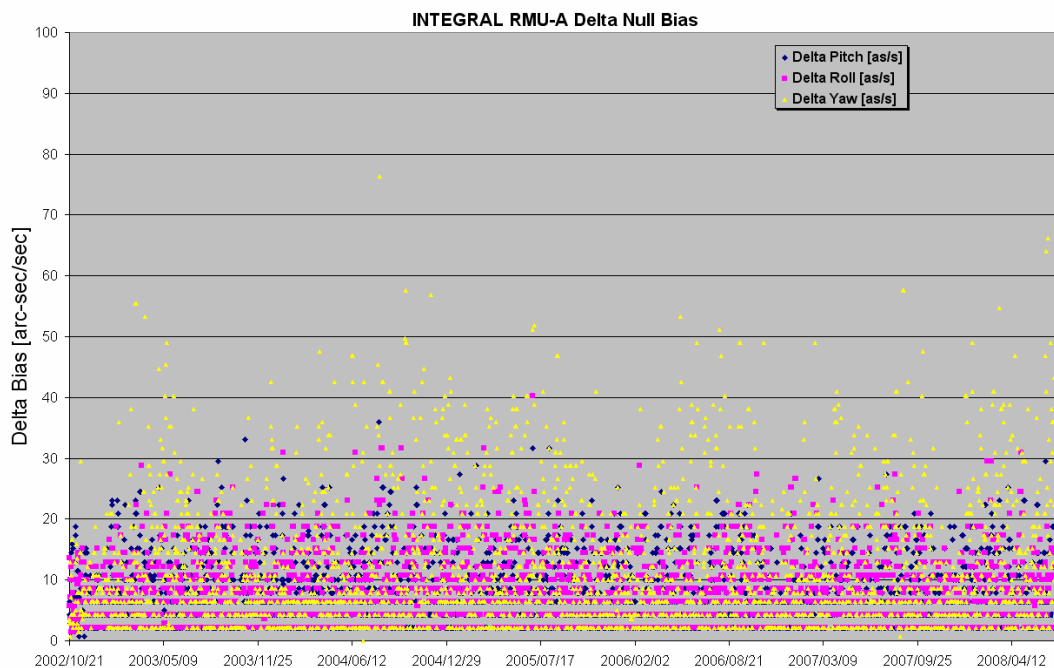
The RMU-A null bias calibration

The RMU-A null bias calibration history, on pitch, roll and yaw channel over the period between 01/11/2002 and 25/07/2008 is reported in the plot below.

Problems have been reported during the last period on FDS when generating the drift update for the RMU-A Yaw channel: the limits set on FDS have been violated few times. The evolution of the drift on yaw channel is under constant monitoring but the values are still well within the specs. At moment the current constraints (for drift update generation) on the FDS have been relaxed to cope with the current situation.



The RMU-A delta null bias calibration history, on pitch, roll and yaw channel over period between 01/11/2002 and 25/07/2008 is reported in the plot below.



19/07/2008 (Day of Year 201, Revolution 704)

Nothing to report.

20/07/2008 (Day of Year 202, Revolution 704)

FDS failed slew update: at 04:22z the FDS failed the update of slew ID 07040033. FDS reported an error during the update process: the automatic job update seemed not to be scheduled.

A manual recovery was performed at 04:32z and the slew ID 07040033 was manually updated in TL.

No impact on TL.

STR 1750 Fault: at 17:38:40z a STR 1750 Fault occurred. This happened at the end of the execution of the planned open loop slew ID 07040055. The automatic mapping executed after slew END lasted less than 3 sec, in details:

OEM MAPPING START at 17:38:40z

OEM MAPPING END at 17:38:43z

The IMU was switched ON not immediately as the event occurred within the first minute after the slew end which is nominal. At 17:41:35z the IMU was finally switched ON. During the STR 1750 Fault event the ACC automatically commanded new mappings but not successful. At 17:44:04z finally the mapping reported successful execution and a manual recovery (OSL) performed with agreement of SOE and FD on-call from PID 07040055 to the attitude of PID 07040059. The slew ID 07040060 was manually updated in TL at 19:06z.

A preliminary investigation reported a dense cluster of galaxies (extended object of $M_i > 15$) at the expected planned attitude. Moreover, considering that the attitude was reached by an OSL of $\sim 30^\circ$, it is also possible that the error associated with the slew execution could have pointed the S/C to an attitude slightly different from the planned one, including in the STR FOV several bright objects (among those the star Iota Centaurus, $M_i \sim 2$).

The following slews were missed in TL: ID 07040056(CSL)-57(OSL)-58(CSL)-59(OSL)

21/07/2008 (Day of Year 203, Revolution 704-705)

Nothing to report.

22/07/2008 (Day of Year 204, Revolution 705)

FDS failed slew update: at 10:58z the FDS failed the update of slew ID 07050010. FDS reported an error during the update process: not enough stars found to perform attitude reconstruction and next slew update.

A manual recovery was performed at 11:55z from the PID 07050009 to the PID 07050011. The slew ID 07050012 was manually updated in TL.

The following slews were missed in TL: ID 07050010(OSL)-11(OSL)

23/07/2008 (Day of Year 205, Revolution 705)

STR 1750 Fault: at 19:00:15z a STR 1750 fault occurred. At 19:00:32 the following STR parameters were reported in OOLs only for 1 TM cycle.

A5089 Health Check 1 flag	INVALID
A5091 1750 Fault	FAULT
A5097 Health Check 2 flag	INVALID
A5098 P/S +5V	OUT OF RANGE
A5099 P/S +12V	OUT OF RANGE
A5100 P/S -12V	OUT OF RANGE
A5101 COOLER V	OUT OF RANGE
A5103 OPTICS TEMP FLAG	OUT OF RANGE
A5104 CCD TEMP FLAG	OUT OF RANGE

This happened after the execution of open loop slew ID 07050042. The automatic mapping executed after slew END lasted less than 6 sec, in details:

OEM MAPPING START at 19:00:15z

OEM MAPPING END at 19:00:21z

The star in position 1 at the time of the event was Mi 6.40 at CCD position [196, - 6973]. The ACC automatically commanded new mappings

This OOLs condition lasted for 1 TM cycle and went back in limits at 19:00:40z. The unit reported, before/after the event, nominal values. The Fault was reported in the HK telemetry of the 1750 Fault itself and also in the form of failure of S/W checks (OOLs) in the cycle when the fault was detected.

The IMU was not switched ON because the event occurred within the first minute after the slew end and this is nominal. At 19:01:31z the automatic mapping commanded by ACC was successful.

A preliminary investigation reported a very bright object (the star Alpha Crux, Mi ~1) in the STR FOV; likely this could have determined the STR processor reset.

A manual recovery was performed from PID 07050042 to the attitude of PID 07050043. The slew ID 07050044 was manually updated in TL at 20:20z.

The following slew was missed in TL: ID 07050043(CSL)

The OTF was not reached during PID 07050042.

24/07/2008 (Day of Year 206, Revolution 705-706)

Nothing to report.

25/07/2008 (Day of Year 207, Revolution 706)

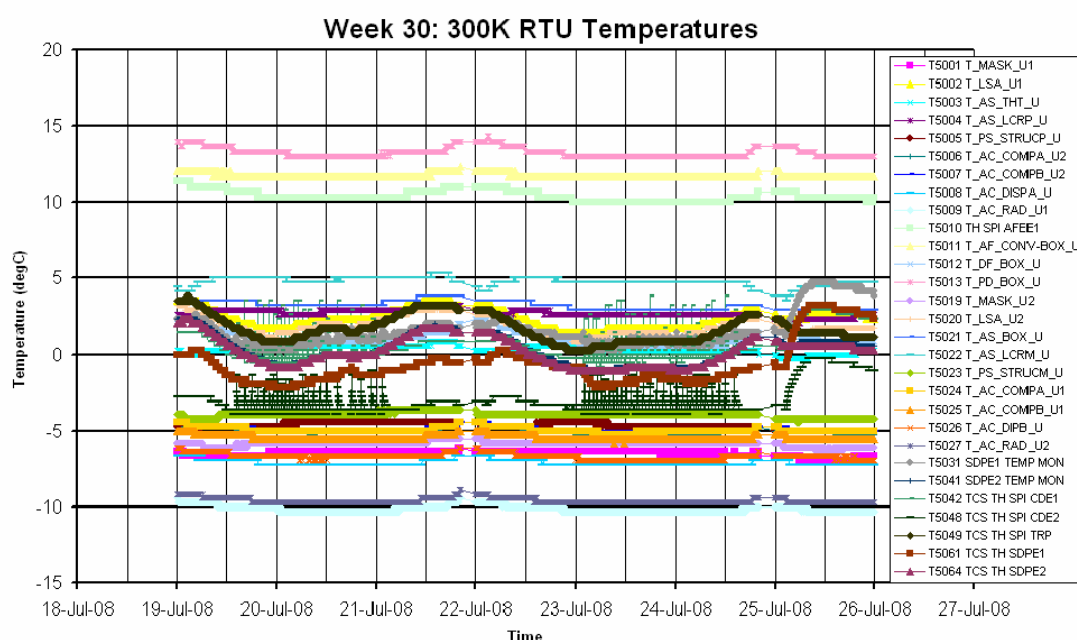
FDS failed slew update: at 06:06z the FDS failed the update of slew ID 07060008. FDS reported an error during the update process: not enough stars found to perform attitude reconstruction and next slew update.

A manual recovery was performed and the slew ID 07060008 was manually updated in TL.

No impact on TL.

8.3.2 SPI Operations

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

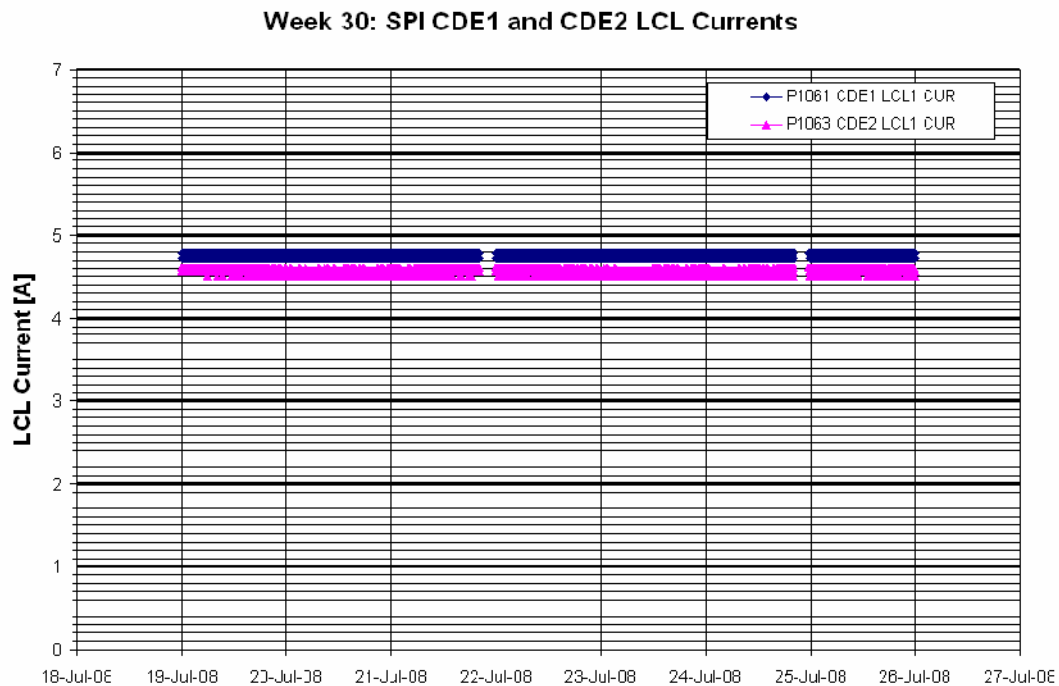


Stirling Compressors and Cryostat: The performance of the compressors is nominal. The cold plate temperature was maintained in the range 80K +/-1K.

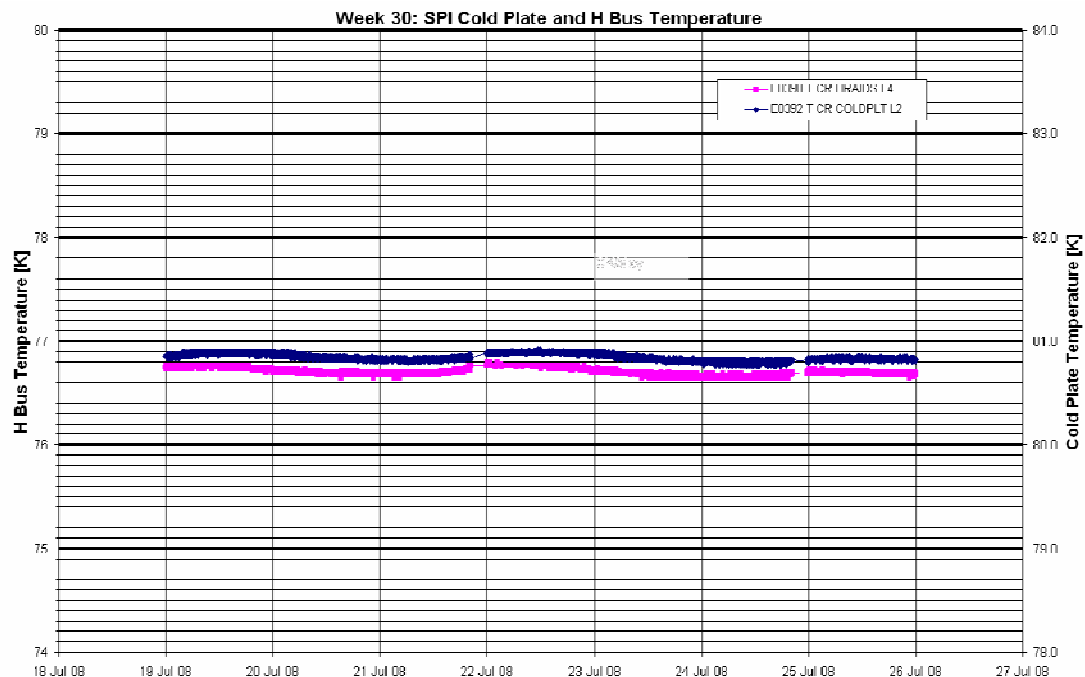
The stroke of all four compressors was set to 40 throughout the week. The average CDE LCL currents were as follows:

- CDE1 LCL Current = 4.75A
- CDE2 LCL Current = 4.56A

The following plot shows the evolution of the CDE LCL currents during the reporting period.



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

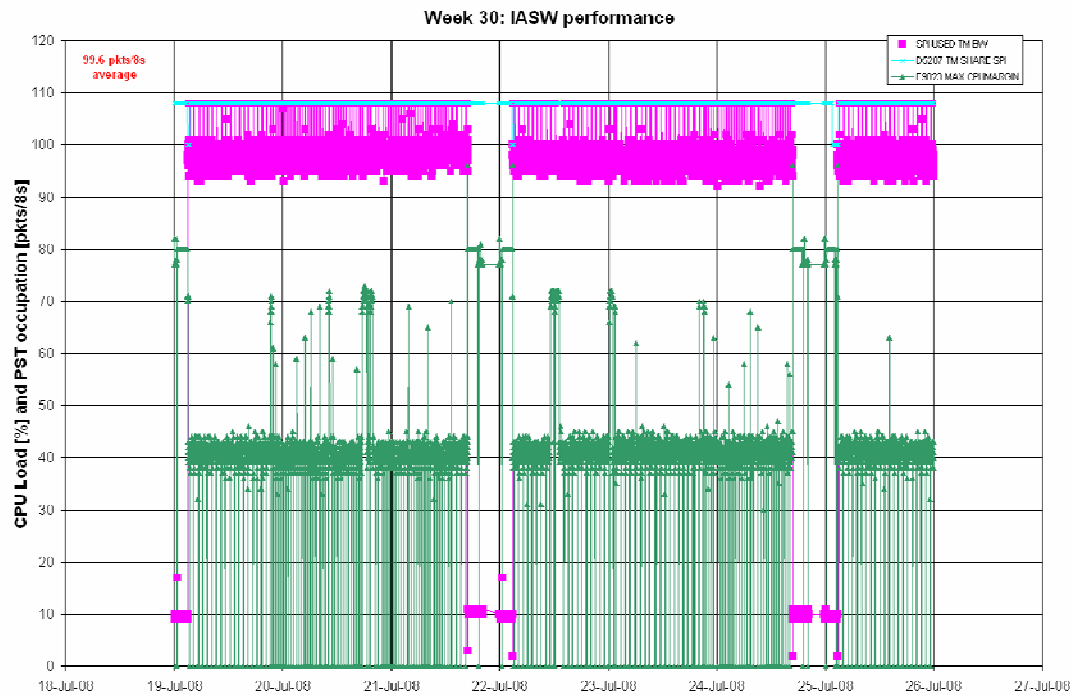


DPE & IASW: The DPE health and IASW performance is nominal.

The IASW version installed is v4.3.4 with SE compression only enabled and the spectra scaling factor set to 8/19 SE.

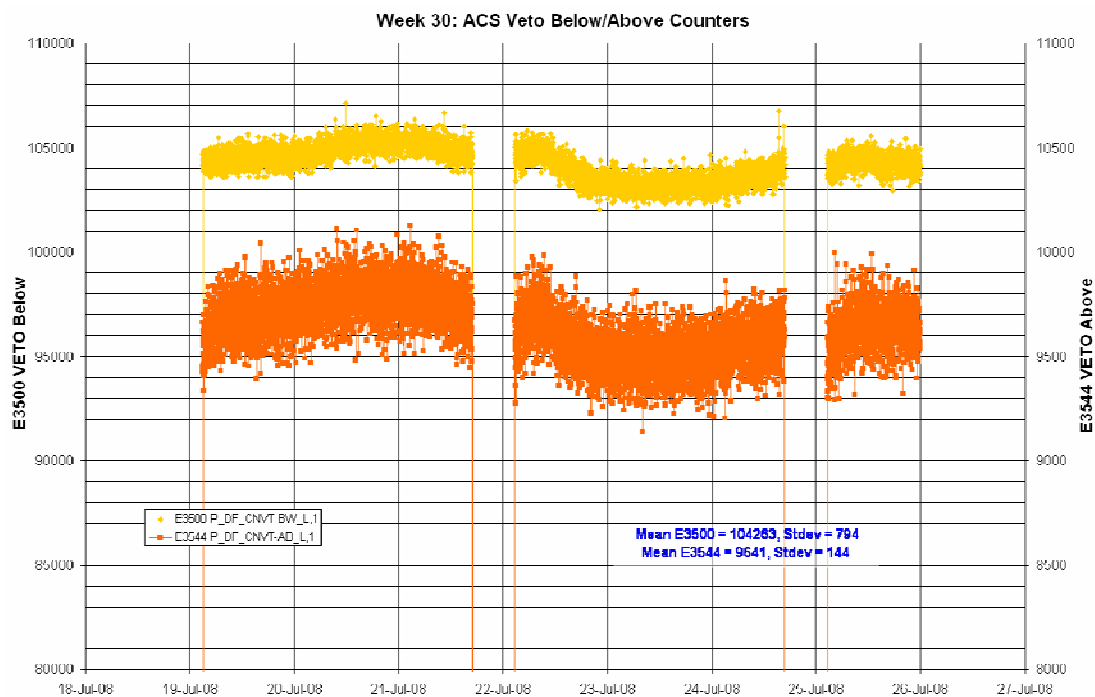
The average TM bandwidth occupation of SPI was 99.6 packets/cycle over the science window when the TM allocation was 108 packets/cycle.

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

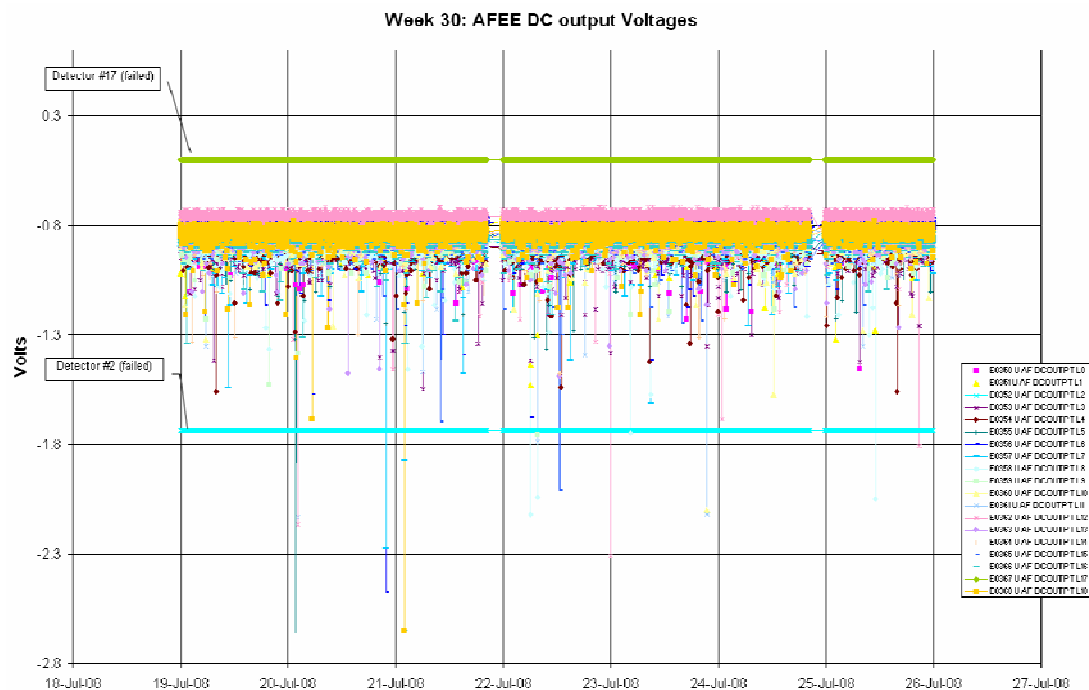


ACS: The performance of the ACS is nominal, except for FEE #81 which remains nominally switched off since the anomaly on 29/10/2006 (INT_SC-162) and FEE #57 which is nominally OFF due to the anomaly on 5/8/2003 (INT_SC-61).

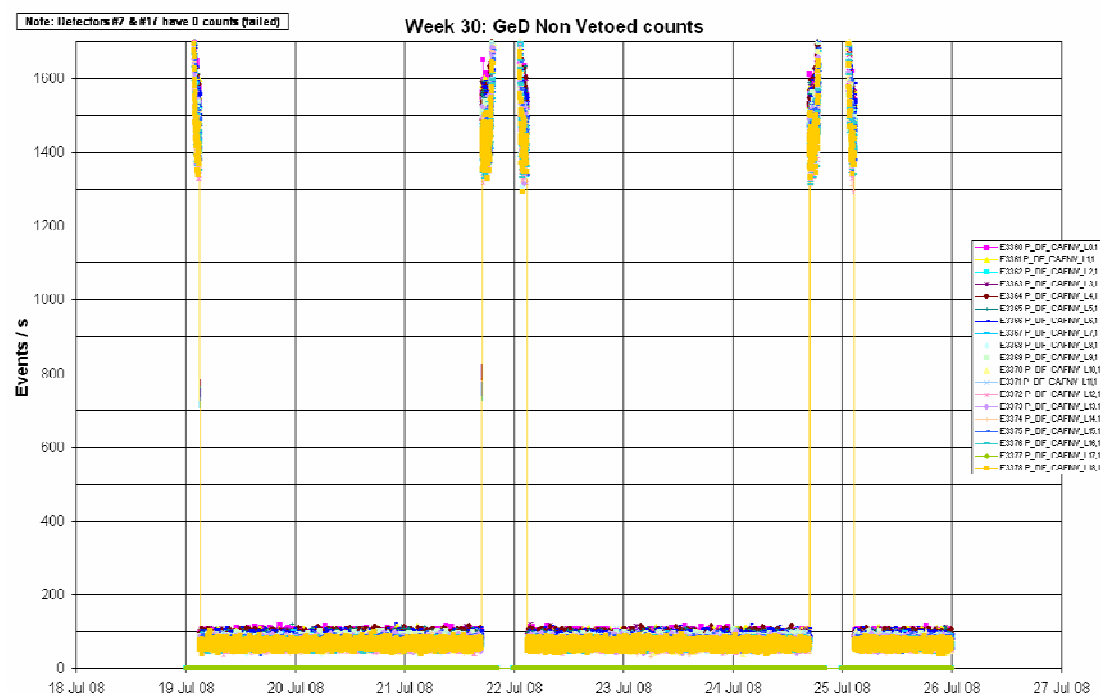
The following plot shows the ACS overall count rate evolution during the reporting period:

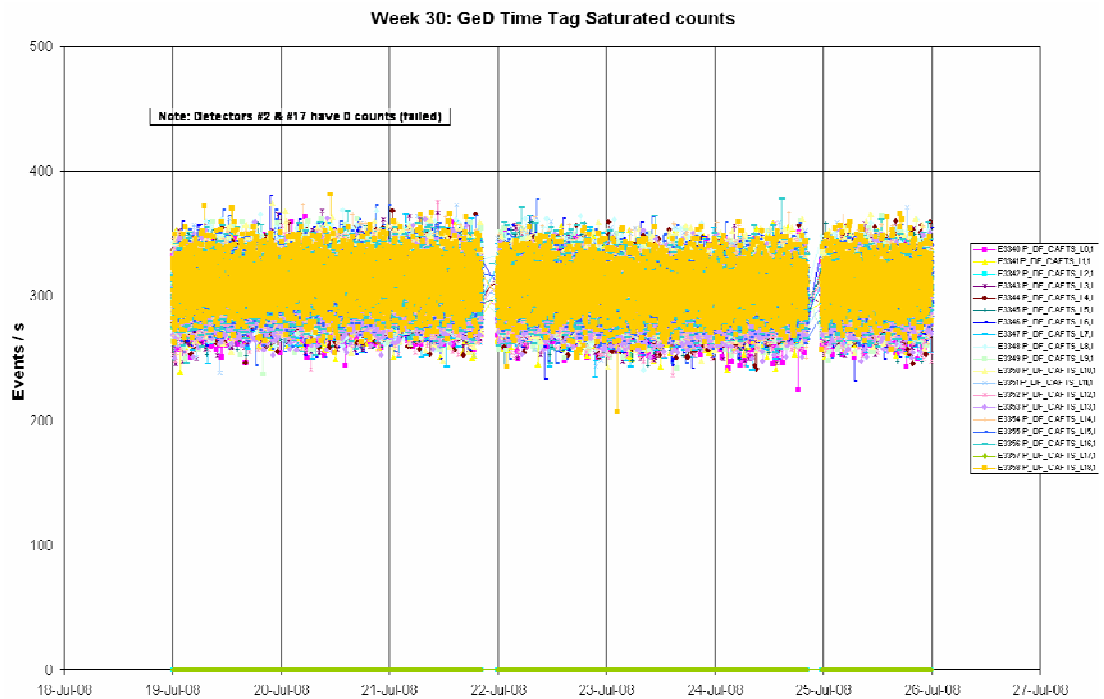
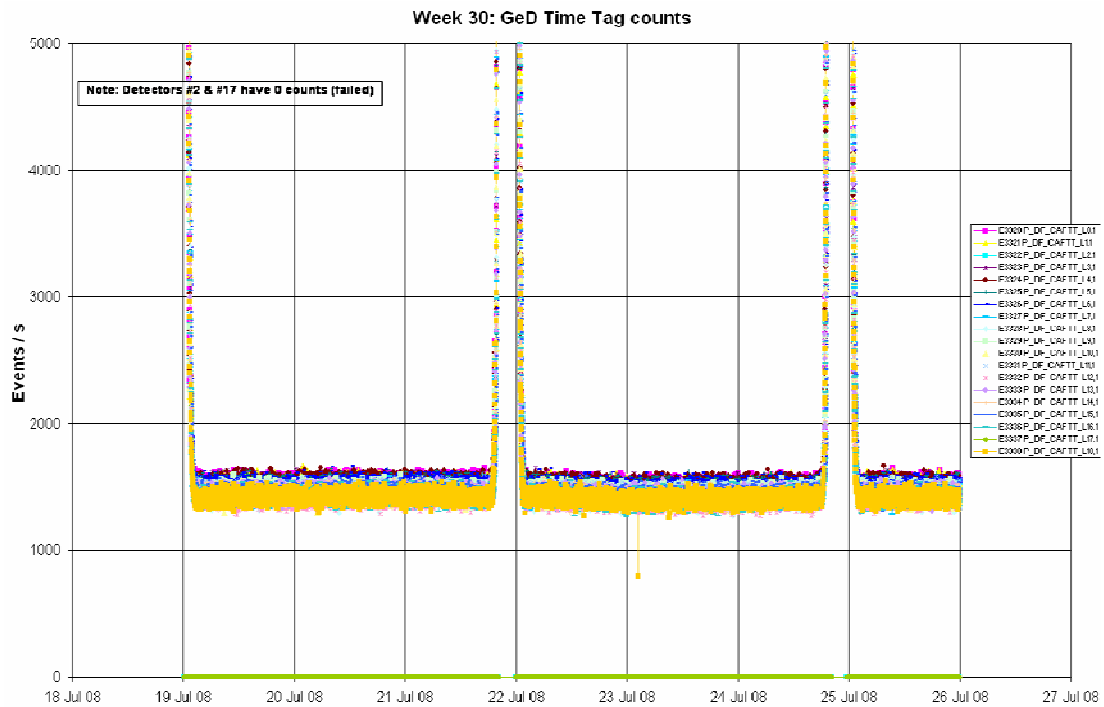


AFEE: The health of the AFEE is nominal. The following plot shows the dc voltage offset of the detector channels during the reporting period. The values are nominal. Detector #2 is failed since 06/12/2003 and detector #17 is failed since 17/07/2004.

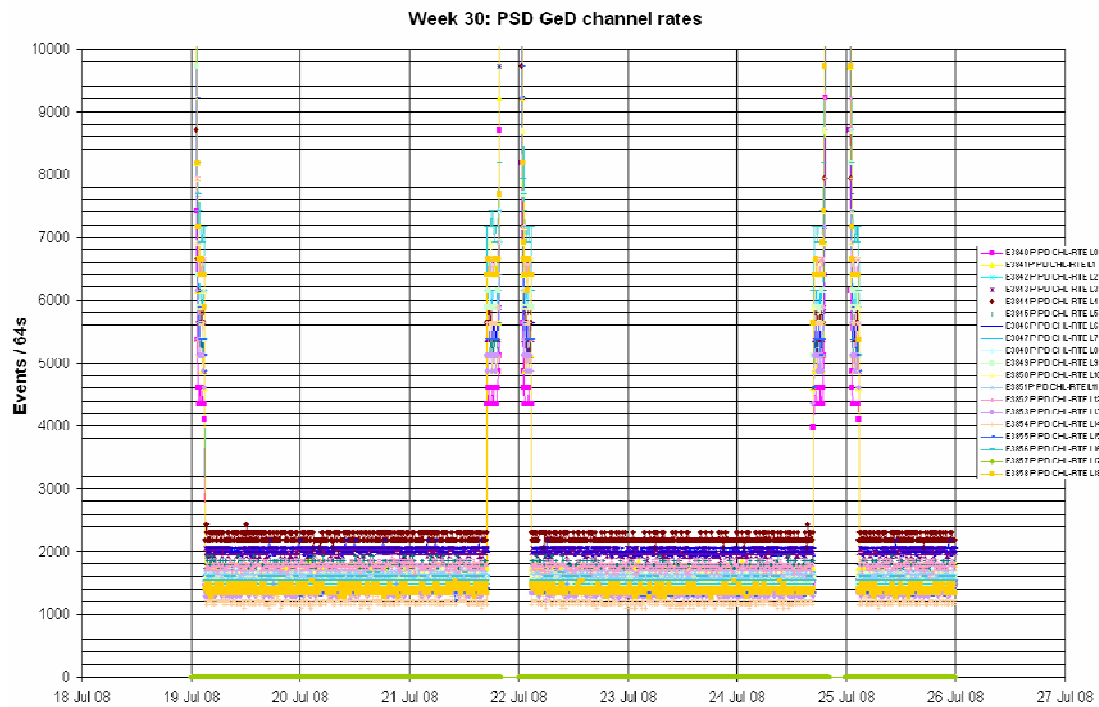


DFEE: The performance of the unit is nominal. The following plots show the Non Vetoed, Time Tag and Time Tag Saturated Event count rates during the reporting period.





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



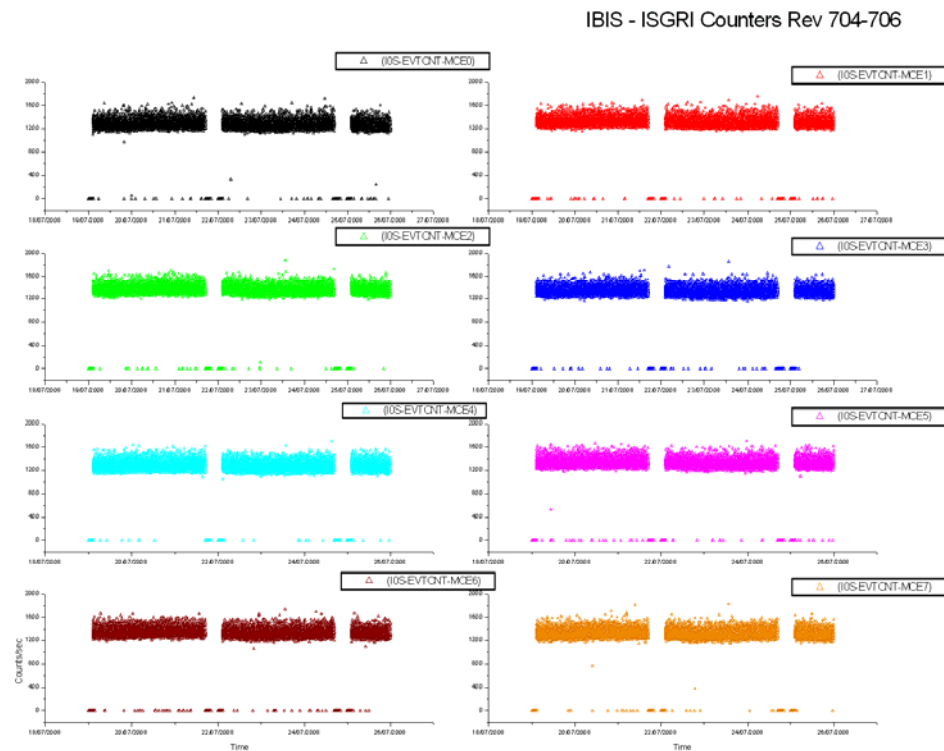
Event Log:

No non-nominal events occurred on SPI over the reporting period.

8.3.3 IBIS Operations

IBIS Event Counters Plots

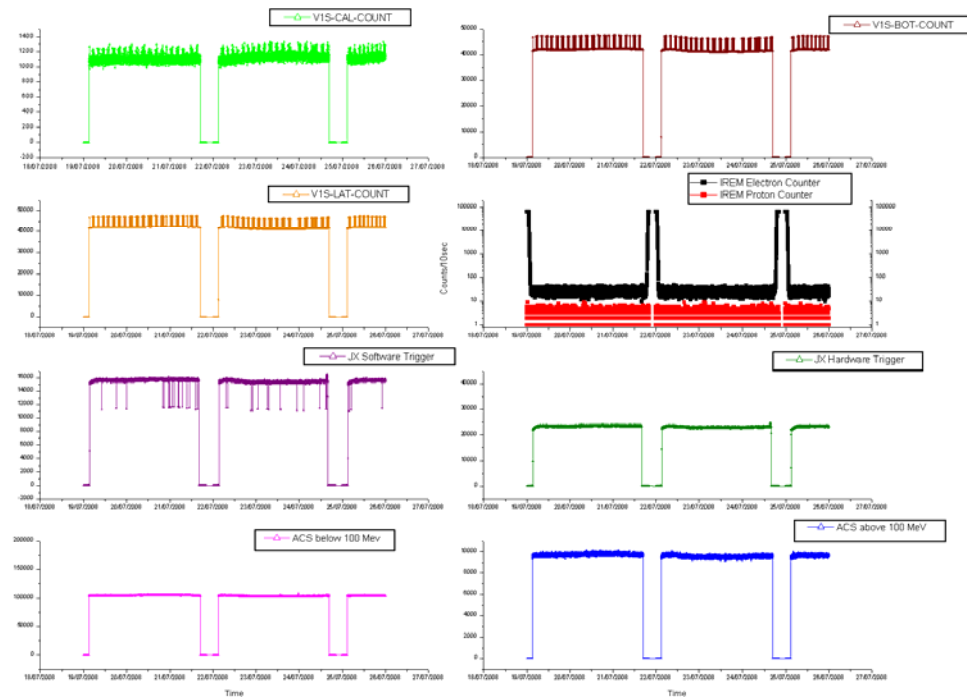
ISGRI Counters:



**sampling every 4 pkts (32 secs)

VETO vs Payload Counters:

IBIS-VETO vs Payloads Counters Rev 704-706

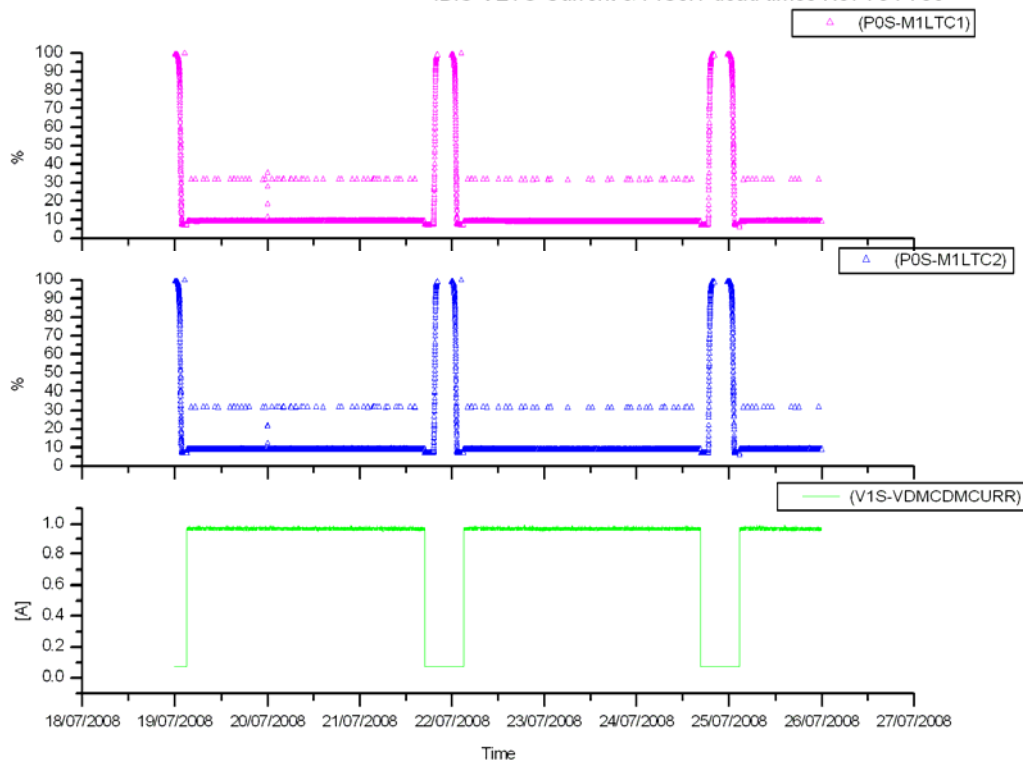


**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec sampling every 5 pkts (40 sec)

The week was characterised by low radiation as reported by the payload.

VETO Current:

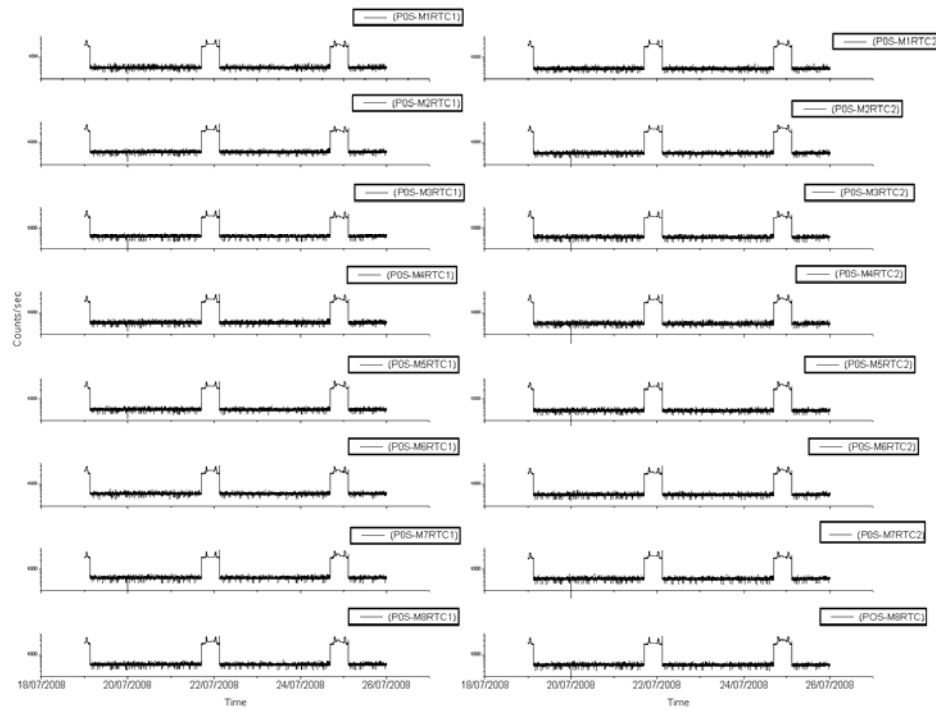
IBIS-VETO Current & PICsIT dead times Rev 704-706



**sampling every 4 pkts (32 secs)

PICsIT Counters:

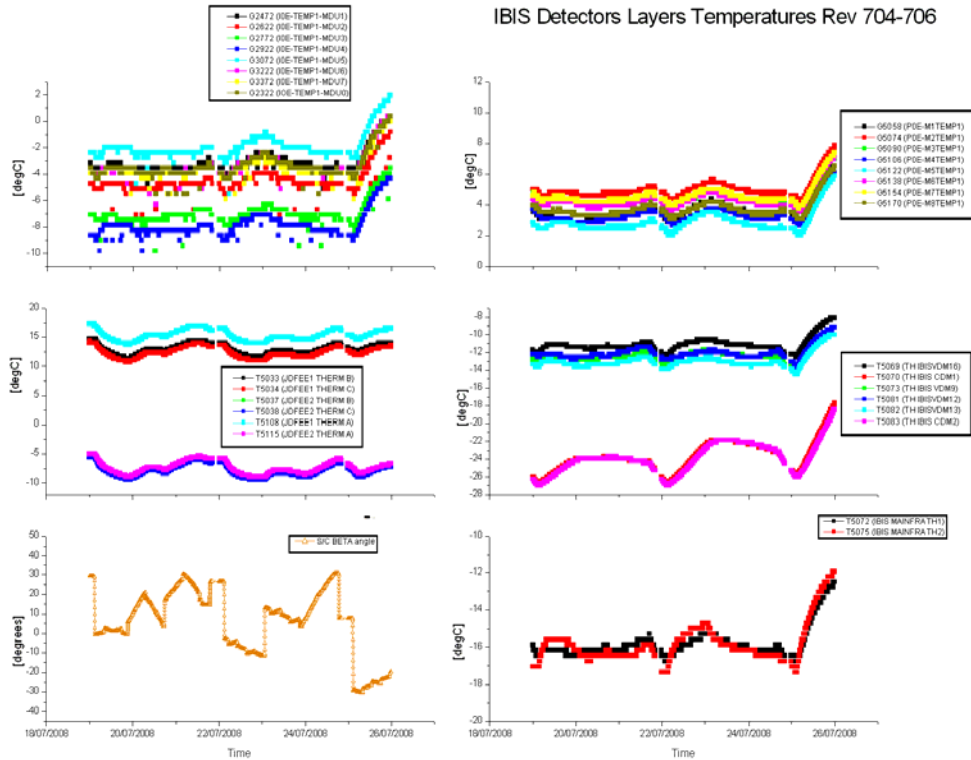
IBIS - PICsIT Counters Rev 704-706



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures:

IBIS Detectors Layers Temperatures Rev 704-706



**sampling every 8 pkts (64 secs)

IBIS daily report:

The usual Out Of Limits on TM parameter G8015 (S1E-A2_PMT_V), G5002 (POS-Mi_RTC1) and G5003 (POS-Mi_RTC2) families and G2000 family (IOE-OVFWPXADD-Mi) were received during the radiation belt passages.

2008-07-19 (DOY 201, Rev 704)

IBIS operations executed nominally.

2008-07-20 (DOY 202, Rev 704)

At 00:03:04Z several parameters in the TM parameters families G5068 and G5072 failed status consistency check (value = TRUE). These are the PDM semi-module FIFO error flags. As they had all returned within limits of their own accord by 00:04:40Z, no action was taken.

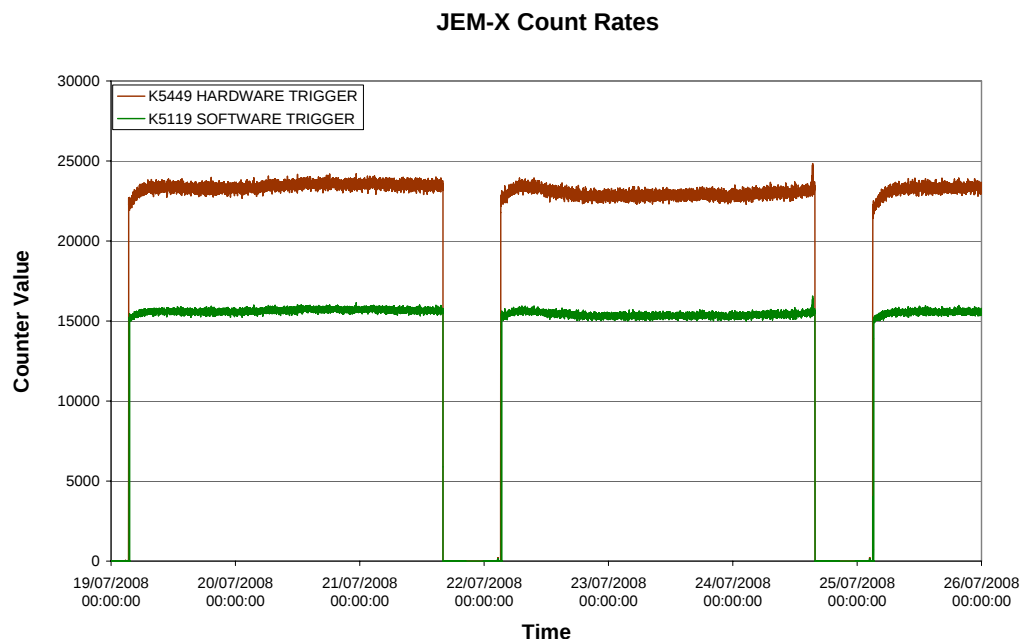
2008-07-21 (DOY 203, Rev 704-705) to 2008-07-25 (DOY 207, Rev 706)

IBIS operations executed nominally.

8.3.4 JEM-X Operations

JEM-X Count Rates

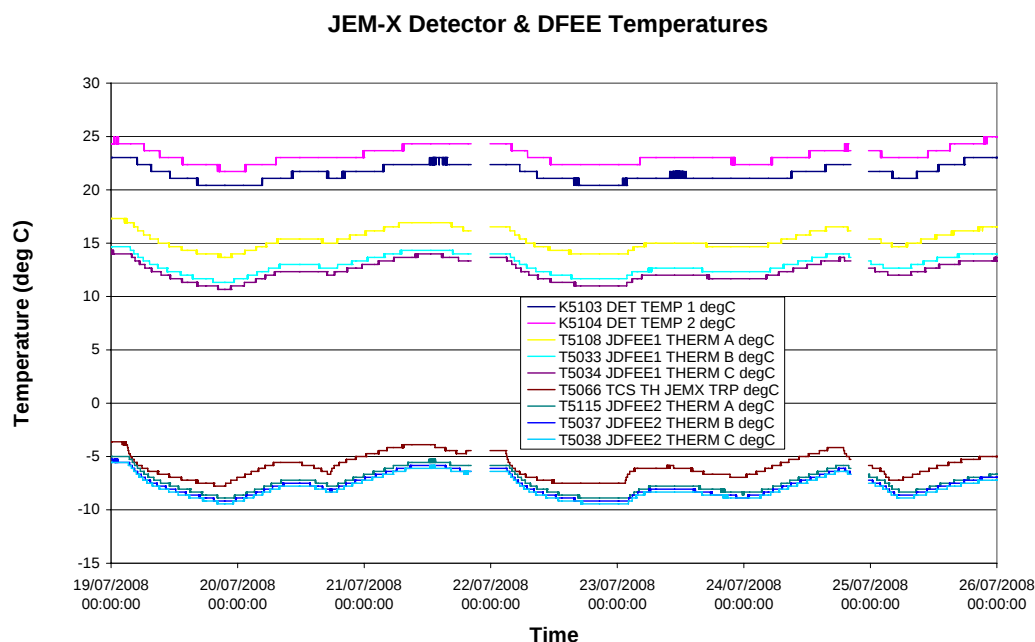
JEM-X count rates over the reporting period are displayed in the following graph¹.



JEM-X Temperatures

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

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.



JEM-X Daily Report

2008-07-19 (DoY 201, Rev 704) to 2008-07-24 (DoY 206, Rev 705)

JEM-X1 operations executed nominally.

2008-07-25 (DoY 207, Rev 706)

On this day, the following anomalous OEMs were received, at the indicated times:

2008.207.03.07.38.766	2008.207.03.07.42.521	1536	RealTime	5	EXCEPTION
JEM-X1 EXC IACS INTERF EXID			0	0	65535 PR N
E					
FIX6		0			
K9079	MESS CLASS	1			
K9080	MESS ID	5			
K9065	CSSW OPERAT ID	START			
K9066	TASK ID 8	IASW			
K9067	LOGICAL ADDRESS	4989			
2008.207.03.07.38.766	2008.207.03.07.42.601	1536	RealTime	6	EXCEPTION
JEM-X1 EXC IACS INTERF CULP			0	0	65535 PR N
E					
FIX6		0			
K9079	MESS CLASS	1			
K9080	MESS ID	6			
K9065	CSSW OPERAT ID	START			
K9066	TASK ID 8	IASW			
K9067	LOGICAL ADDRESS	19726			

No action was taken and the messages did not reappear. There was no impact.

8.3.5 OMC Operations

2008-07-19 (DoY 201, Rev 704)

² Data sampled (1 frame in 8)

Nothing to report.

2008-07-20 (DoY 202, Rev 704)

At 17:38:40, an AOCS problem (see section 8.3.1 for details) forced the interruption of the Timeline. A recovery was subsequently performed, and the Timeline rejoined at 19:06. The impact was the loss of pointings 07040056 & 07040058.

2008-07-21 (DoY 203, Rev 704)

Nothing to report.

2008-07-22 (DoY 204, Rev 705)

At 10:58, an FD problem forced an interruption to the Timeline. A recovery was performed, and a manual slew executed at 11:55 to the attitude of pointing 07050011. The impact was the loss of pointings 07050010 & 07050011.

2008-07-23 (DoY 205, Rev 705)

At 19:00:15, an AOCS problem (see section 8.3.1 for details) forced the interruption of the Timeline. A recovery was performed, and a manual slew executed to the attitude of pointing 07050043. The OMC commands were subsequently manually sent at 20:09:00. The impact was a shortening of pointing 07050043 from a planned 3471 to 2824 seconds.

2008-07-24 (DoY 206, Rev 705) to 2008-07-25 (DoY 207, Rev 706)

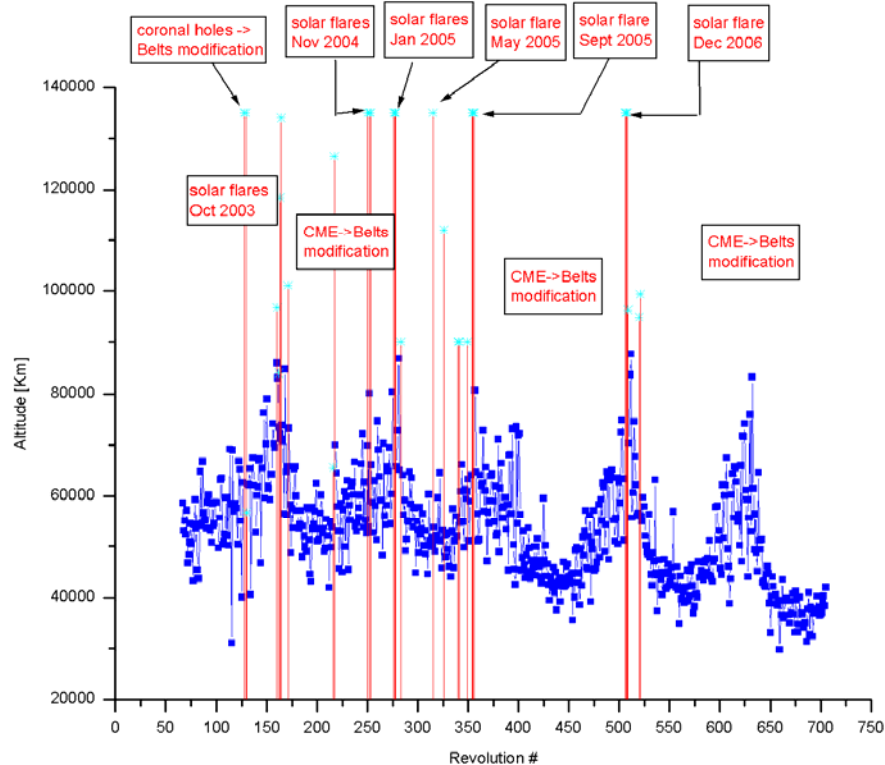
Nothing to report.

On DoY 203 at 16:57:10 and DoY 206 at 16:44:22 OMC went to SAFE mode nominally, at the radiation belt entry time as set in the Broadcast Packet.

8.3.6 IREM Operations

Radiation Belts Entry

Evolution of Radiation Belt Entry 2003-2008



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]
704	RAD_EXIT R 2008-07-19T03:00:31Z	19/07/2008 02:09:48	>>33580.7	19-Jul-2008 02:16:50	46182.44
704	RAD_ENTR R 2008-07-21T16:57:05Z	21/07/2008 18:56:21	38315.9	21-Jul-2008 18:56:50	38502.93
705	RAD_EXIT R 2008-07-22T02:50:11Z	22/07/2008 01:28:29	>>33558.0	22-Jul-2008 02:06:50	46290.71
705	RAD_ENTR R 2008-07-24T16:44:16Z	24/07/2008 18:25:33	42020.1	24-Jul-2008 18:44:15	38990.48
706	RAD_EXIT R 2008-07-25T02:37:53Z	25/07/2008 01:35:25	43641.2	25-Jul-2008 01:54:15	45817.04

Reference

High radiation

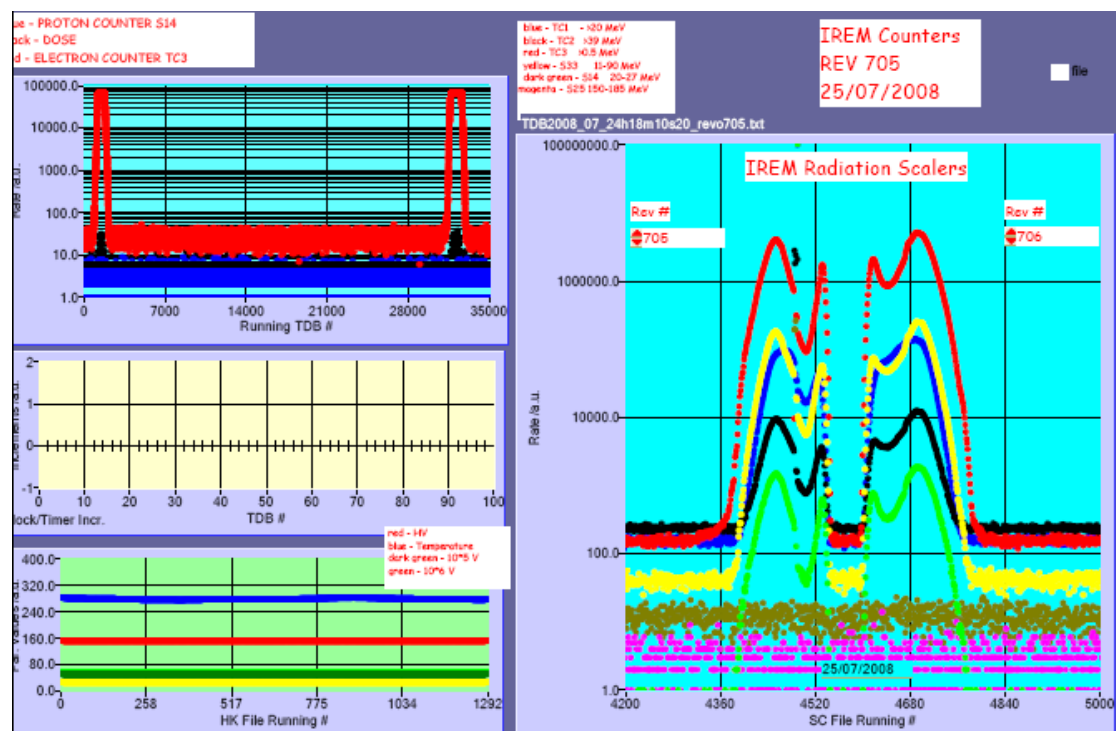
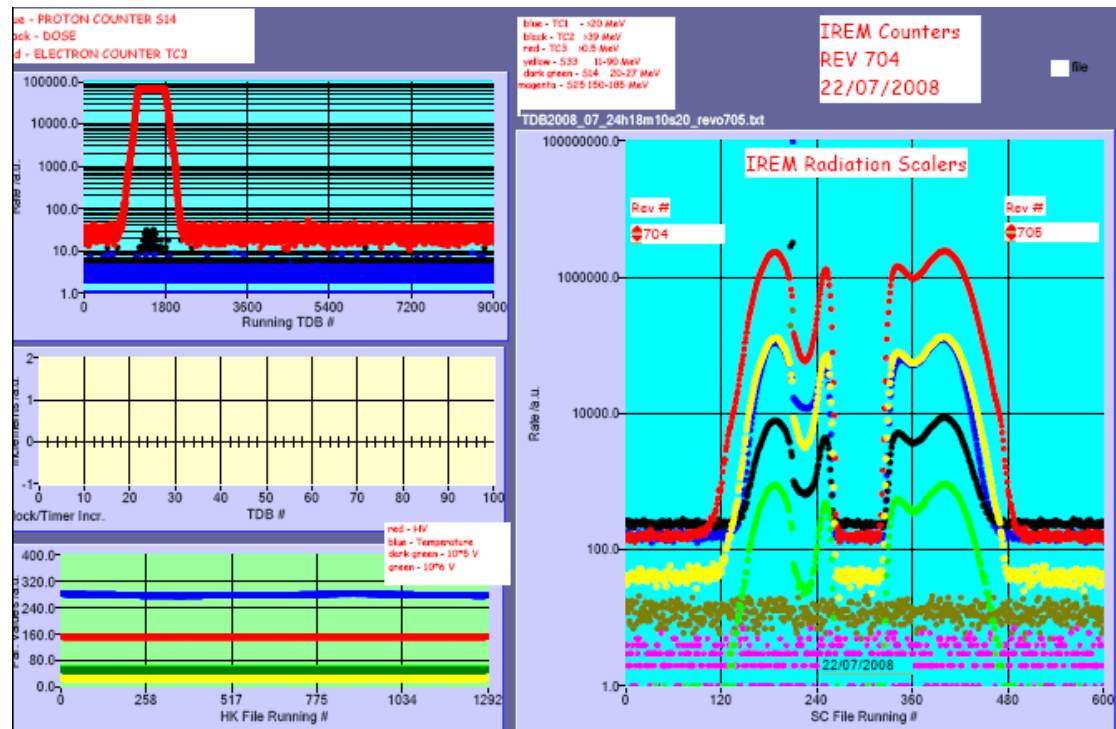
Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

Large error vs reference (more than 30 minutes)

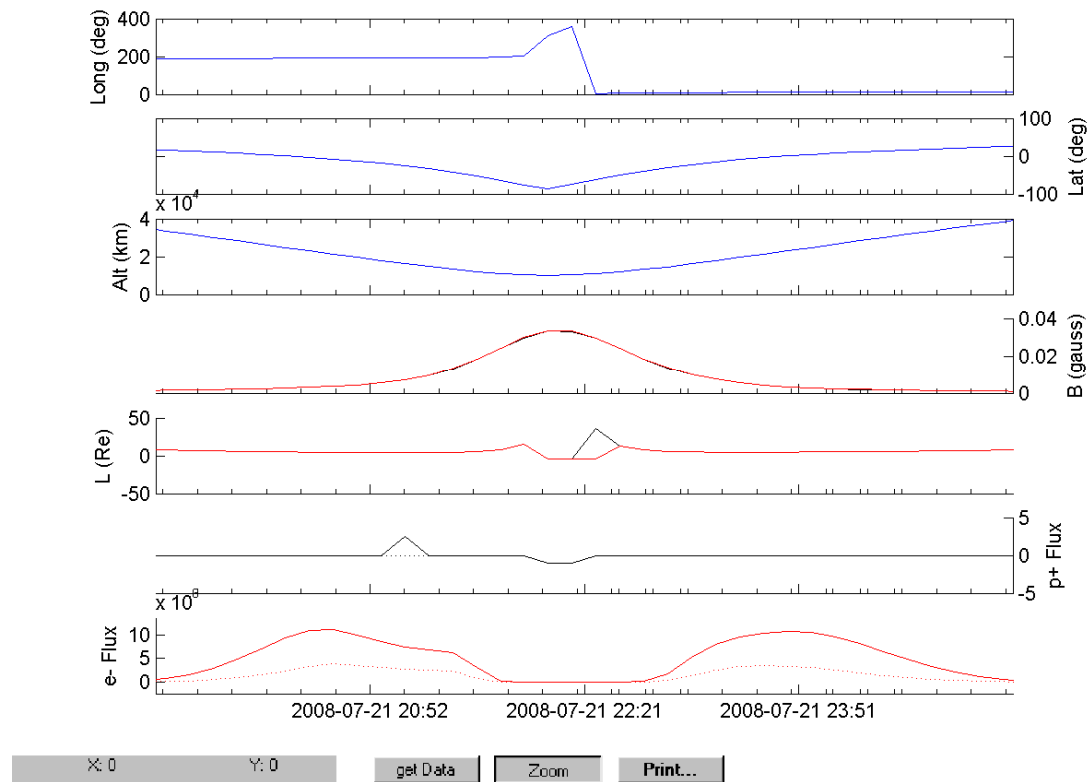
* Rad belt entry time ignoring previous threshold crossings where a gap of more than 30 minutes is present.

IREM radiation counters:

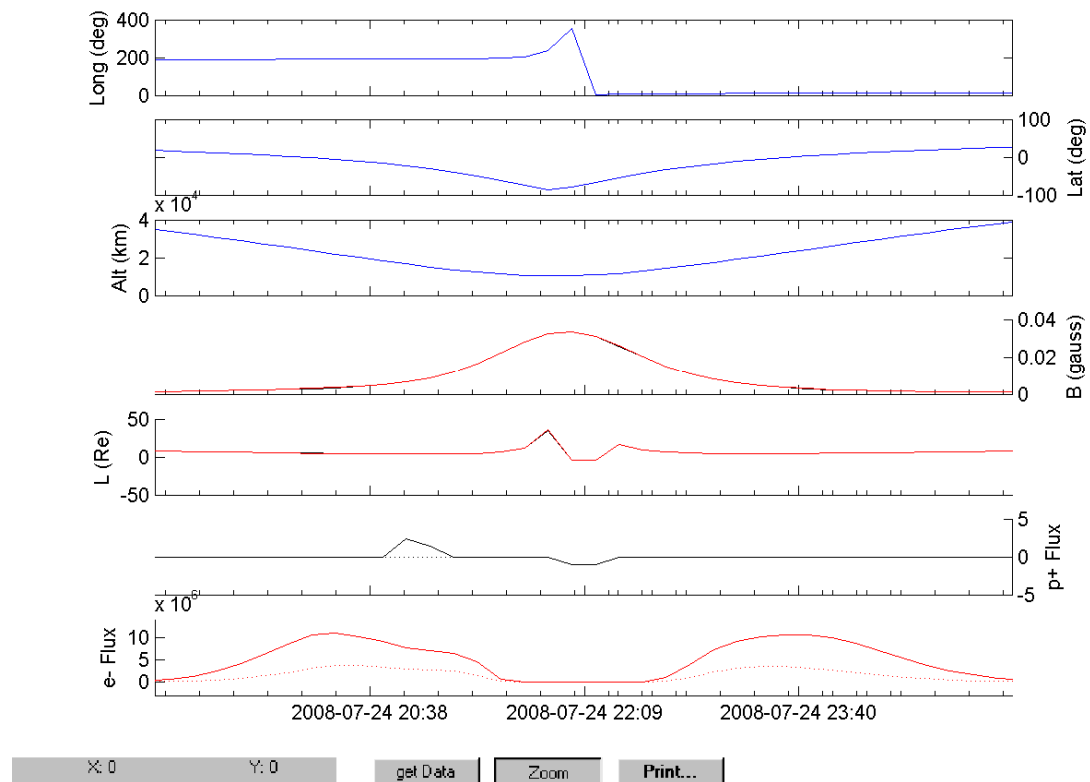


IREM Predicted Radiation Belt Passages

Rev 704



Rev 705



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

Due to a problem on the SEISOP server, no data are available this week. However, the week was very quiet and no radiation was reported.