

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-OPS-OF
No. 124
Week 05
07.02.05
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 29.01.05 until 04.02.05 (both dates inclusive) and covers the revolutions 281 & 282.

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; NGC6240 (RA 16:52:58.90; DEC +02:24:01.1) and NGC 3281 (RA 10:31:52.06; DEC -34:51:13.3). The activities consisted of GPS and raster dithering observations. In addition, SPI active cooling fine-tuning and the Camera switch-on and performance tests following annealing were performed.

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.

1 slew (CSL) was missed from the Timeline during this period due a problem on the link with REDU station.

The fuel consumption over the period between 28/01/2005 and 03/02/2005 was 0.2181 kg. The remaining propellant is in the order of 163.3535 Kg.

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

3.1.2 Power

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

3.1.3 Thermal

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

3.1.4 OBDH

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

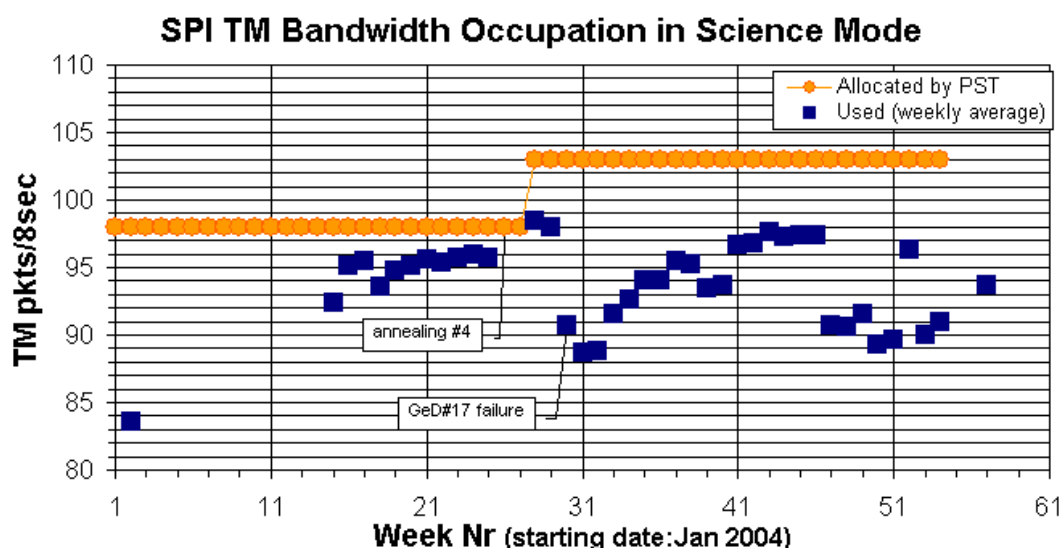
3.2.1 SPI

The overall status of the instrument is nominal.

The 5th annealing of the Germanium detectors ended nominally on 5th February. The compressors were successfully restarted on 30th January and 85K fine-tuning began on 3rd February. During the cooling down period, after switch on of ACS high voltages, fifty runs of the ACS calibration sequence were executed. The SPI camera was re-started on 3rd Feb at 98K. The switch on was nominal. The energy resolution at low energy was nominal. The energy resolution measured at higher energy showed an improvement that will be better quantified when more photons will be processed in the following week. An annealing summary timeline is published in this report, under the future activities section.

After camera switch on, 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 actual occupation of 93.7 pkts/cycle average.

The following plot shows the evolution of the occupied bandwidth, since beginning of 2004.



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

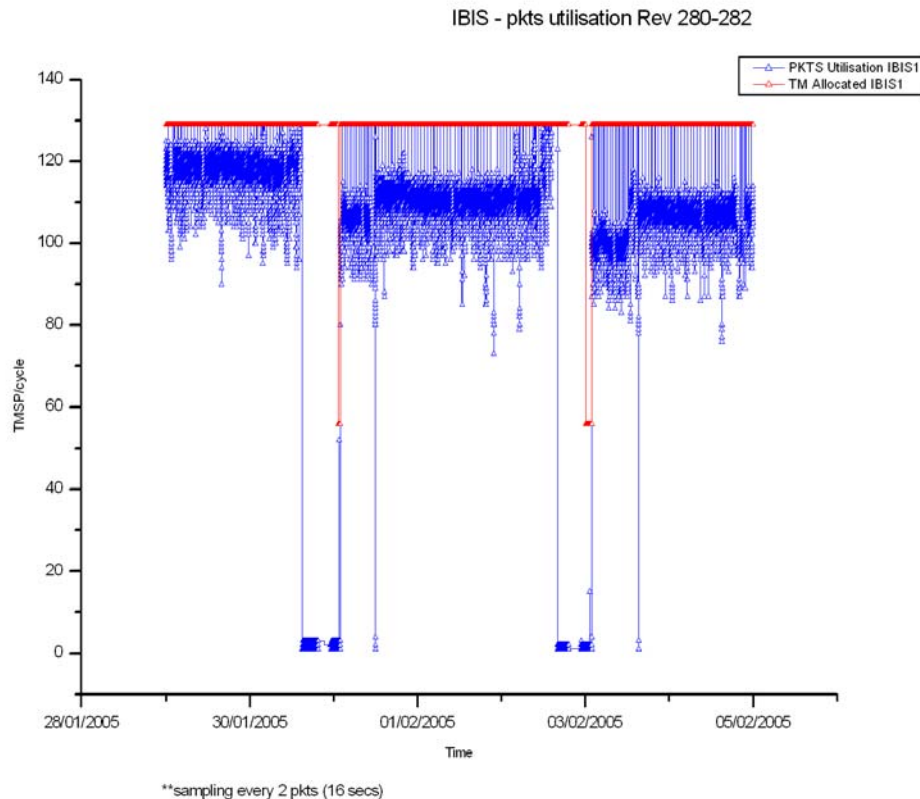
3.2.2 IBIS

The Overall status of the unit is Nominal.

The week was characterised by low solar activity.

During the reporting period the PST allocation to IBIS was most of the time 129 TMPS/cycle. The IBIS mean bandwidth utilisation during the observation period was 111.8 TMPS/cycle, down 10.87 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. JEM-X2 remained dormant (DFEE OFF) with a TM allocation of 1 packet/cycle.

INT_OR_0189 was executed at the start of each revolution to reset the JEM-X1 Broadcast Packet override flags for IREM to DISABLED following the anode calibration ED KEACAL01 in the Timeline.

The TM parameters K5136 BUFFER LOSS, K5119 SOFTWARE TRIGGER and K5317 RAD MONITOR 3 went out of limits briefly on several occasions during this reporting period.

In addition, JEM-X1 made two autonomous transitions to Safe mode, triggered on both occasions by the unit's Software Ratemeter. The first instance was ~20 minutes before it was due to be commanded into Safe mode before radiation belt entry of revolution 280 and in the second case it was ~1hr20mins before it was due to be commanded into Safe mode before radiation belt entry of revolution 281.

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.

During the reporting period OMC operations were performed by the automatic timeline, with the TM allocation to OMC of 5 packets/cycle.

At the start of the week, the OMC was in SAFE mode due to the high radiation. There were 159 OMC pointings executed nominally, 1 was delayed due to ground problems, and 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.

On DoY 030 at 23:12Z at AOS_TM of revolution 281, an automatic reset of IREM S/W (SEU#19) occurred. There was no impact on the other instruments as it happened during the perigee passage. The unit was successfully recovered and currently no degradation of the performance is reported.

Solar Activity

The observation period was characterized by low solar activity, but the Radiation Belts reported still modification induced by the recent high solar activity.

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 very good this week, well above the system performance requirements, one pointing was delayed due to ground problems.

4.1 Mission Operations Centre

The performance of the MOC was excellent this week, there was an error sending data to ISDC, that cleared itself, but apart from that nothing.

4.2 Ground Stations & Network

The performance of the ground stations and Network was very good this week. There were three occurrences of communications problems with Redu, one of which caused a delayed in the start of a pointing. The overall performance was well above the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. ISOC operations

A major milestone for ISOC operations has occurred this week. After a couple of weeks of parallel operations at ESTEC and ESAC the operations has now switched from ESTEC to ESAC in Spain. This change of site occurred as planned. The operation includes completion of all AO 3 data base preparations, copying of the data base and file directories from ESTEC to ESAC, switching the ISOC scheduling web pages to a new location and blocking of the ESTEC system to prevent inadvertent sending of any information to the other ground segment parts. This complicated and delicate operation was successfully performed without an interruption of any science operations from ISOC. The coming weeks will contain some additional temporary procedures to be carried out. In particular re-planning due to ToO or for any other reason is a delicate operation up to the moment the execution of the first AO 3 revolution starts on 17 February.

2. Mission planning

PSF's received up to rev 291. Hence new ones delivered. Mission planning has been done on a low level this week due to the switch over from ESTEC to ESAC. Revolution 286 that was planned last week was sent together with the first revolution, 287, produced solely in ESAC. This latter POS has been successfully imported by MOC. TSF received up to rev 283.

SPI annealing was completed and SPI is now back in operation again. OMC flat field calibration still planned for rev 286.

3. Observation status

ECS for rev 268 received this week. Corresponding OCS's sent. No extra time allocated. Now all revolutions up to 269 have been received and processed.

4. ISOC science data archive

This week there was a meeting held in ESAC with participation from ISDC, ISOC, the Archive group at ESAC and INTEGRAL Mission Manager. The main objective of the meeting was to discuss topics relevant to the planned opening of the ISOC Science Archive (ISDA) to the public with public INTEGRAL data in early April. By exchanging plans and views the aim was to come to a harmonized implementation strategy for this archive.

5. ISOC system

Version 10.7 is still used both in ESTEC and ESAC. No problems reported.

6. AO 3

The AO 3 observation program is now fully implemented in the ISOC data-base including amalgamation. ISDC has received the corresponding observation information. What remains is sending to the OMC PI list of all targets and completion of the ToO strategy.

7. Problems

Now that operations have started from ESAC the absence of the last operations scientist in the ISOC team in ESAC is becoming a increasing problem. Although the intended person is available we have been unable to kick-off the contract due to administrative delays. If this situation prevails much longer it will have an impact on the ability of ISOC to perform its duties properly, in particular the possibility to respond to ToO requests may suffer.

4.3.2 ISDC

Status of ISDC observation processing on 07/02/2005:

- Latest Standard Analysis completed: observation 02201460001 (3C273, Revolution 267) on 05/02/2005
- Latest products archived: observation 02200280002 (GRS 1915+105, Revolution 255) on 24/01/2005
- Latest observation products sent to the observer: observation 02200280002 (GRS 1915+105, Revolutions 255) on 27/01/2005

5 Special Events

6 Anomalies

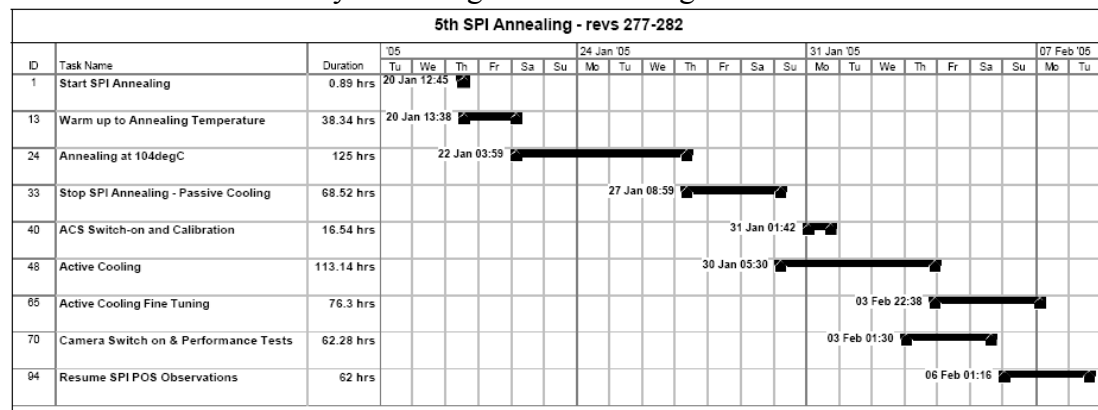
There were a number of problems that impacted the operations:

- On DoY 030, at 02:01, there were 2 short drops in TM from Redu of about 10 seconds each. There was no impact.
- At 10:24, the TM & TC links with Redu dropped, the links returned at 10:30. The impact was a 20 minute delay in the start of pointing 02800066.
- At 23:22, after AOS it was noticed that IREM had crashed during the perigee passage. See IREM report for details.
- On DoY 031, at 06:30, there was an error sending data to the ISDS, which seemed to clear autonomously.
- On DoY 034, at 15:48, there were Reed-Solomon alarms followed by 22 bad TM frames from Redu. There was no impact.

Issue : 1
Rev. : 0
Page : 9

AR id	Date Created	Subject	Segment	Status
INT_SC-111	31/01/2005	IREM CSCI reset # 19 2005-01-30	Payload	Open
INT-2700	02/02/2005	I/O error on IDDA - lts6 disc	IMCS	Closed

The 5th annealing of the SPI Germanium detectors has started on 20th January and will continue until 6th February according to the following schedule:



8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 281

The activities in revolution 281 consisted of 13 pointings of a GPS lasting ~9 hours, followed by an amalgamated raster dithering observation of NGC6240 (RA 16:52:58.90; DEC +02:24:01.1), performed for the remaining ~51.5 hours of observation time.

Throughout these observations IBIS, JEM-X1 and OMC were in their nominal science modes, SPI was in the cooling phase following annealing and the JEM-X2 DFEE remained off. The TM allocation was IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

Revolution 282

The activities in revolution 282 consisted of 18 pointings of a GPS lasting ~12 hours, followed by an amalgamated raster dithering observation of NGC6240 (RA 16:52:58.90; DEC +02:24:01.1) lasting ~28 hours. A raster dithering observation of NGC 3281 (RA 10:31:52.06; DEC -34:51:13.3) was then performed for ~14 hours.

Throughout these observations IBIS, JEM-X1 and OMC were in their nominal science modes, SPI was undergoing active cooling fine-tuning and the Camera switch-on and performance tests following annealing and the JEM-X2 DFEE remained off. 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

2005-01-23T12:46:30.000Z	163.7370	F	Automatic TM processing.
2005-01-23T14:10:46.000Z	163.6710	F	Automatic TM processing.
2005-01-24T16:03:45.000Z	163.6430	F	Automatic TM processing.
2005-01-25T00:25:30.000Z	163.6090	F	Automatic TM processing.
2005-01-25T09:08:19.000Z	163.5890	F	Automatic TM processing.
2005-01-28T00:12:18.000Z	163.5716	F	Automatic TM processing.
2005-01-28T08:59:07.000Z	163.5165	F	Automatic TM processing.
2005-01-30T17:26:49.000Z	163.4986	F	Automatic TM processing.
2005-01-31T00:02:33.000Z	163.4725	F	Automatic TM processing.
2005-01-31T08:43:30.000Z	163.4559	F	Automatic TM processing.
2005-01-31T11:09:06.000Z	163.4406	F	Automatic TM processing.
2005-02-02T17:17:04.000Z	163.4254	F	Automatic TM processing.
2005-02-02T18:35:28.000Z	163.4107	F	Automatic TM processing.
2005-02-02T23:50:41.000Z	163.3792	F	Automatic TM processing.
2005-02-03T08:45:22.000Z	163.3535	F	Automatic TM processing.

This report was generated Fri Feb 4 08:00:19 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 29/01/2005-04/02/2005

AOCS operations were executed from the Automatic Timeline.

During this period, 88 Open Loop Slews, 86 Closed Loop Slews and 8 Momentum Bias were executed. 1 slew was not executed due to a problem with the link to REDU station. This is equivalent to a ~ 0.5 %.

29/01/05 (Day of Year 029, Revolution 280)

Flickering of the Pointing-Bit at the end of open loop slew due to Roll Error: At the end of open loop slew 02800032 the error in roll with respect to the Sun-Steering-Law assumed roll angle was more than the OTF threshold for roll and resulted in the flickering of the Pointing-Bit, which was not seen at BCP level. This error already existed at the start of the slew and was introduced by the attitude reconstruction after the large open loop slew 02800031. The attitude determination was based on the first mapping after this slew, during which the SSL was enabled. The jitter caused by enabling of the SSL after the slew introduced the error in roll, which was propagated to the next slew by the slew update.

30/01/05 (Day of Year 030, Revolution 280-281)

Slew missed from the Timeline: Due to a problem on REDU station (lost of TC & TM links due to node reset), the slew 02800066 (CSL) was not executed. A manual recovery was then performed to the same attitude of PID 02800066 and the pointing was reached with a delay of 14 minutes wrt the planned slew in TL. The next slew (OSL) for PID 02800067 was manually updated and executed from the Timeline.

31/01/05 (Day of Year 031, Revolution 281)

Flickering of the Pointing-Bit at the end of open loop slew due to Roll Error: At the end of open loop slew 02810002 the error in roll with respect to the Sun-Steering-Law assumed roll angle was more than the OTF threshold for roll and resulted in the flickering of the Pointing-Bit, which was not seen at BCP level. This error already existed at the start of the slew and was introduced by the attitude reconstruction after the large open loop slew 02810001. The attitude determination was based on the first mapping after this slew, during which the SSL was enabled. The jitter caused by enabling of the SSL after the slew introduced the error in roll, which was propagated to the next slew by the slew update.

01/02/05 (Day of Year 032, Revolution 281)

Flickering of the pointing-bit due to yaw error: At 15:18:22Z an undetected false event on the star tracker caused a jump (~ 40 arcsec in yaw) in the position of the CCD image of the guide star. The error in yaw was more than the OTF threshold for this axis and resulted in the flickering of the pointing-bit. This was not seen at BCP

level. The magnitude 8.45-guide star was picked by the ACC after an open loop slew at CCD location [15884, -12563].

02/02/05 (Day of Year 033, Revolution 281-282)

Nothing to report.

03/02/05 (Day of Year 034, Revolution 282)

Nothing to report.

04/02/05 (Day of Year 035, Revolution 282)

Nothing to report.

8.3.2 SPI Operations

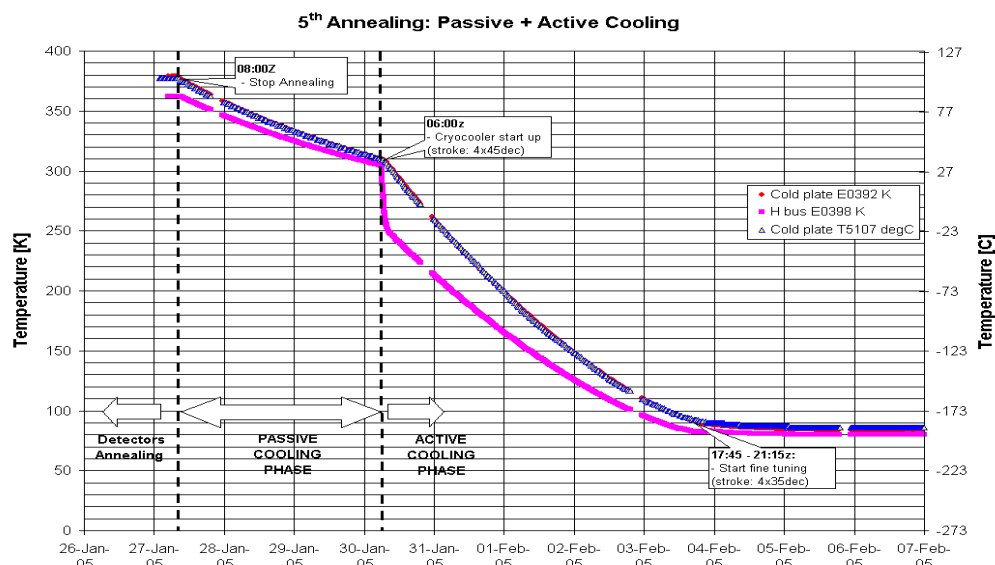
Stirling Compressors and Cryostat:

The performance of the subassembly is nominal.

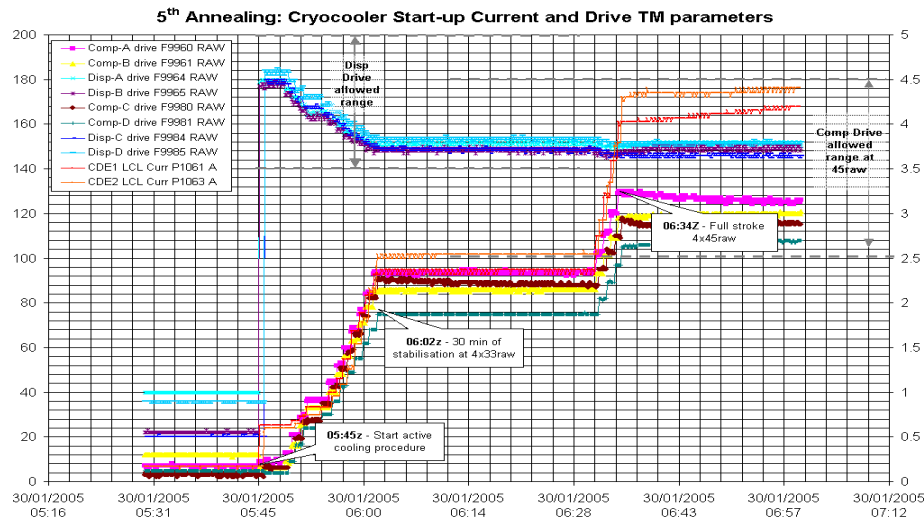
After the annealing period, the passive cooling phase was started on 27th January at 08:00z. When the thermal braids temperature was below 35degC, the compressors were turned on, on 30th January at 05:45z. Fine-tuning, to reach 85K target, started on 3rd February at 17:40z. The following strokes have been commanded:

time	compressor A	compressor B	compressor C	compressor D
30 Jan 06:39z	45	45	45	45
3 Feb 11:52z	43	43	43	43
3 Feb 17:42z	41	41	41	41
3 Feb 19:20z	39	39	39	39
3 Feb 20:46z	36	36	36	36
3 Feb 21:16	35	35	35	35
4 Feb 12:38	34	34	35	35

The following plot shows the cold plate and thermal braids temperatures during the whole cooling period.



The following plot shows the typical signature of the compressor telemetry at start-up.



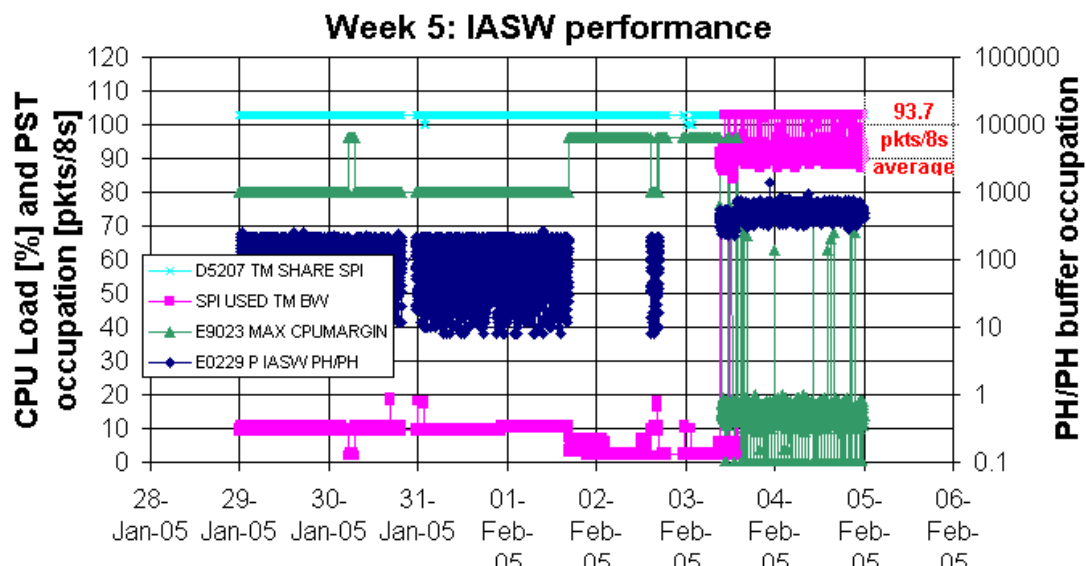
DPE and IASW:

The performance of the IASW/DPE is nominal.

No SPI specific science observations were running during the period due to the on-going annealing, however after camera re-activation the following TM bandwidth resources was allocated and used:

- TM pkts allocated by PST: 103 pkts/cycle
- TM pkts used by SPI: 93.7 pkts/cycle average in science mode

The following diagram 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 subassembly is nominal.

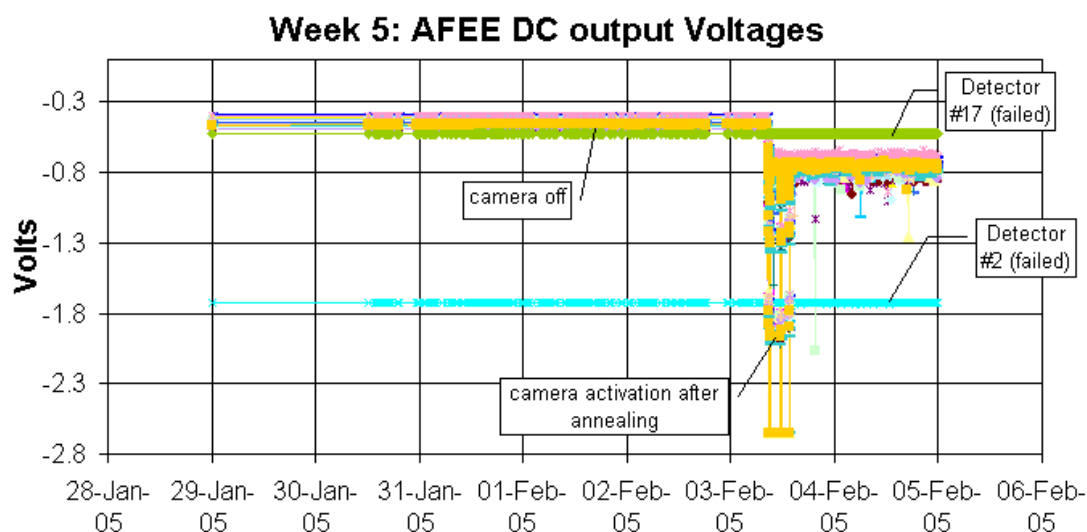
The ACS HV power supplies were switched on after the annealing period and fifty runs of the ACS calibration sequence were performed on 1st February 16:32z. A set of ACS calibrations was also performed on 2nd February at 12:00z, however it was shortly after interrupted due to the approaching radiation belts.

AFEE and Ge Detectors:

The performance of the subassembly is nominal.

The detectors HV power supplies were switched on when the cold plate temperature was at 98K, on the 3rd February at ~09:00z. All the voltages were set temporarily at 4kV, though detector #2 and #17 were still not working (next week they will be re-set to nominal value, i.e. 0,5kV for the failed detectors and 4kV for the good detectors). After camera switch on, the initial photon data showed that the energy resolution at low energy was nominal. The energy resolution measured at higher energy showed an improvement that will be better quantified when more photons will be processed next week.

The following plot shows the AFEE dc output signals during the reporting period.



DFEE:

The performance of the unit is nominal.

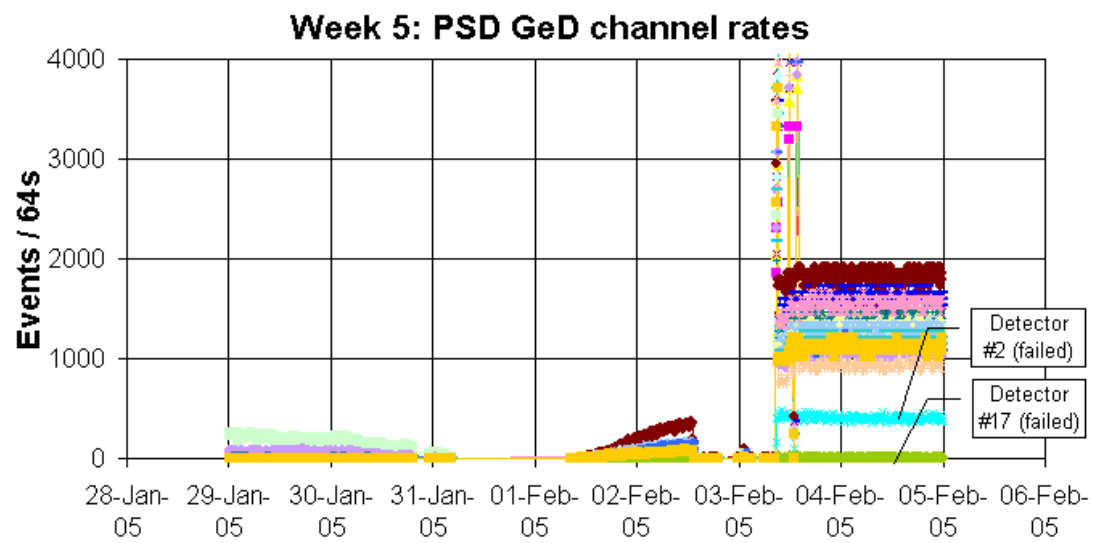
During the annealing, the DFEE was configured in such a way to have all detectors masked except for GeD#2 channels; Single Event acquisition was enabled while Multiple Events, PSD Events and Spectra acquisition were disabled. With this configuration the instrument was left in photon-by-photon mode to catch any signal from the failed channels triggered by thermal noise. Unfortunately not a single noise count was detected during the overall period.

PSD:

The performance of the unit is nominal.

During annealing the event trigger thresholds were increased to reduce the number of counts cause by thermal noise that might lead to a PSD crash. The thresholds were again set to nominal values when the cold plate temperature was below 128K.

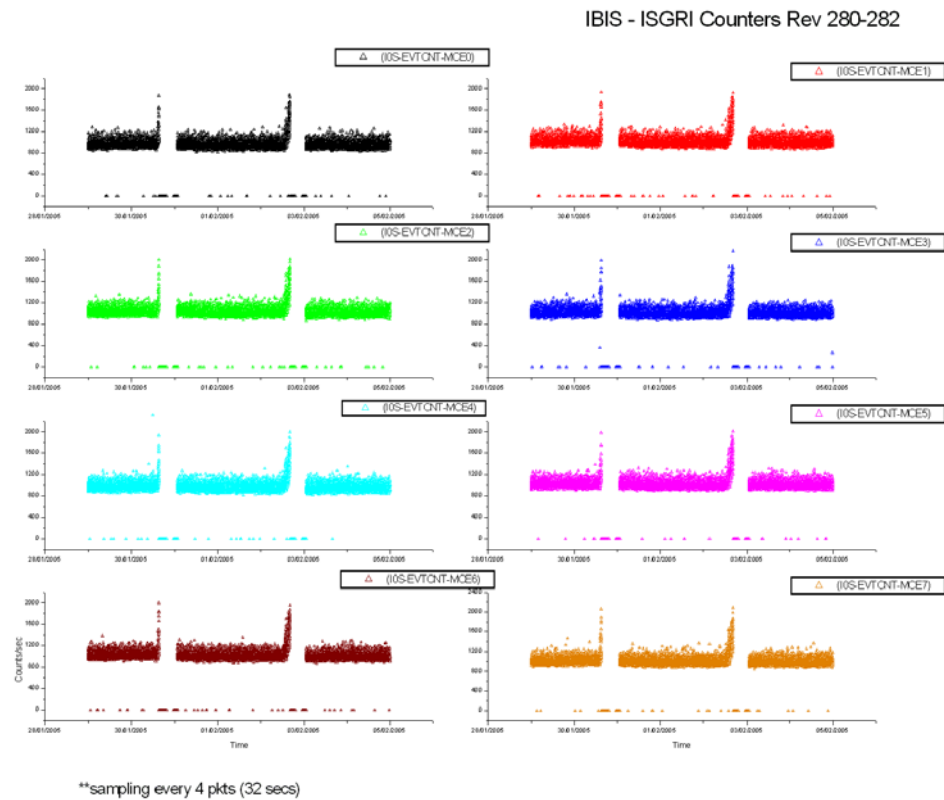
The following plot shows the PSD channel rates during the reporting period.



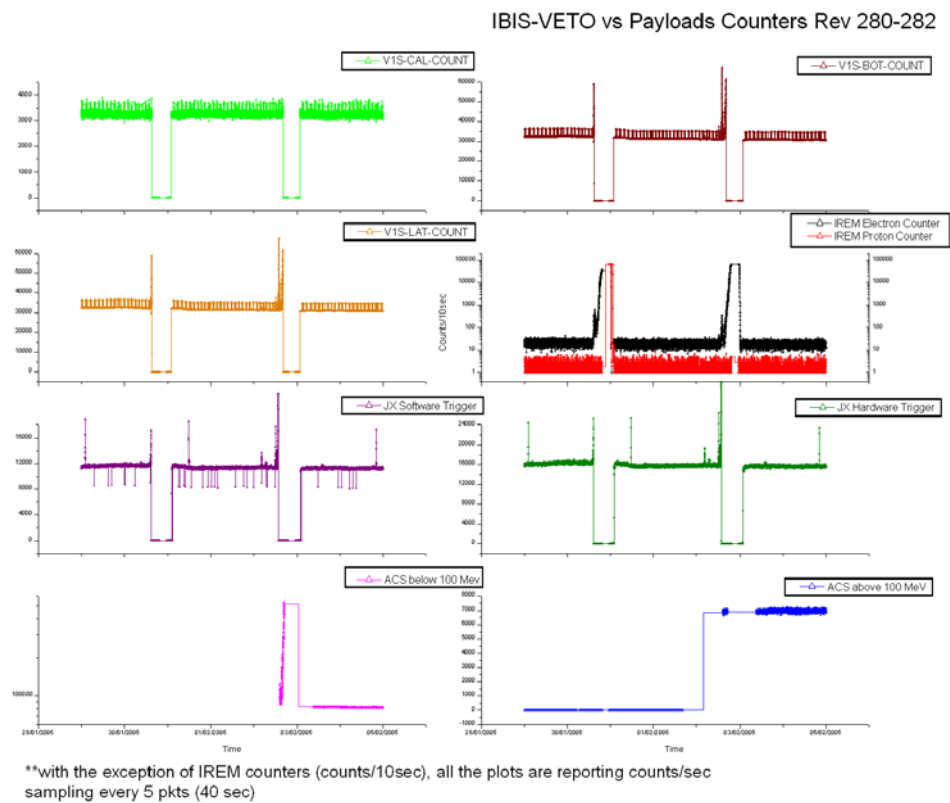
8.3.3 *IBIS Operations*

IBIS Event Counters Plots.

ISGRI Counters:

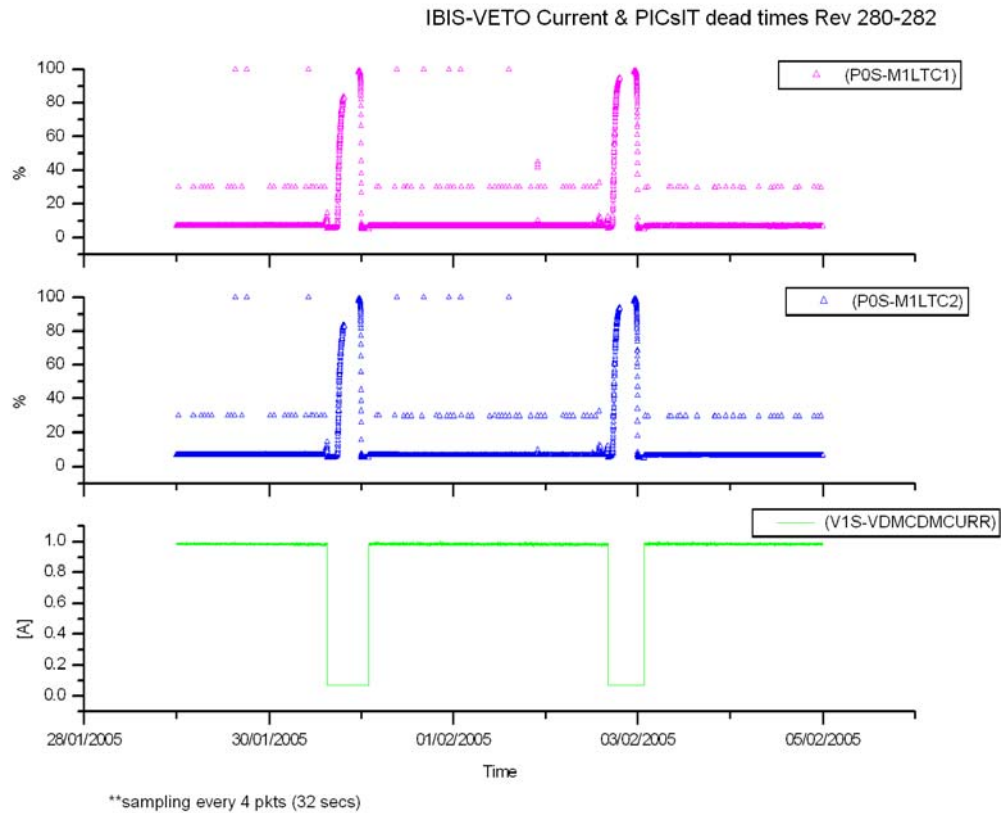


VETO vs Payloads Counters

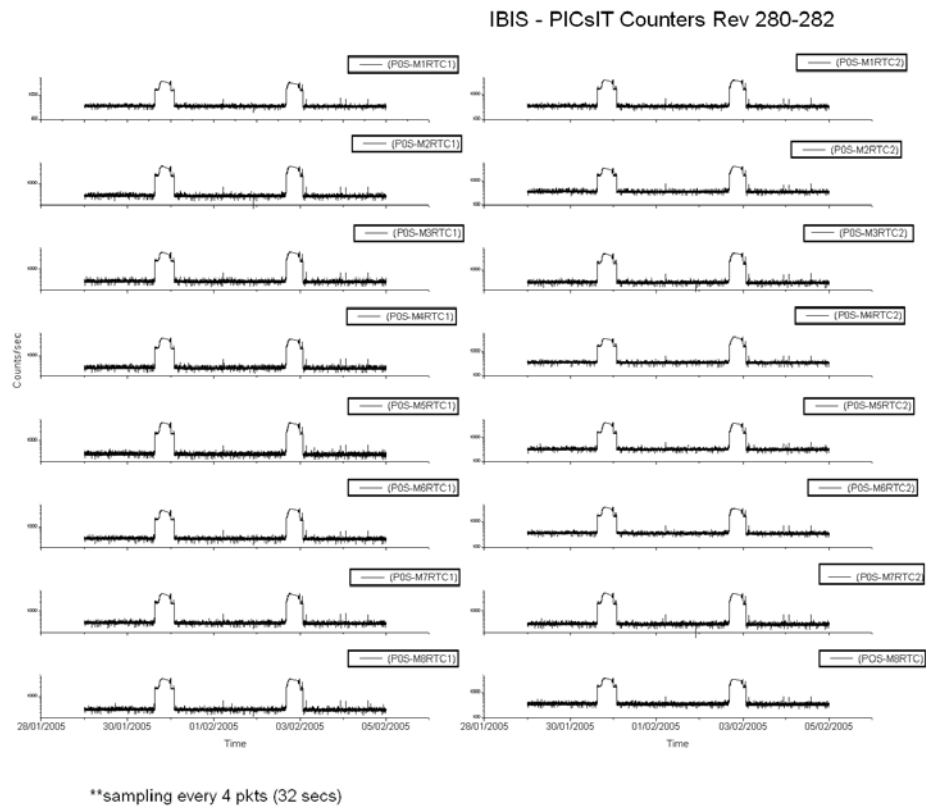


The week was characterised by low solar activity.

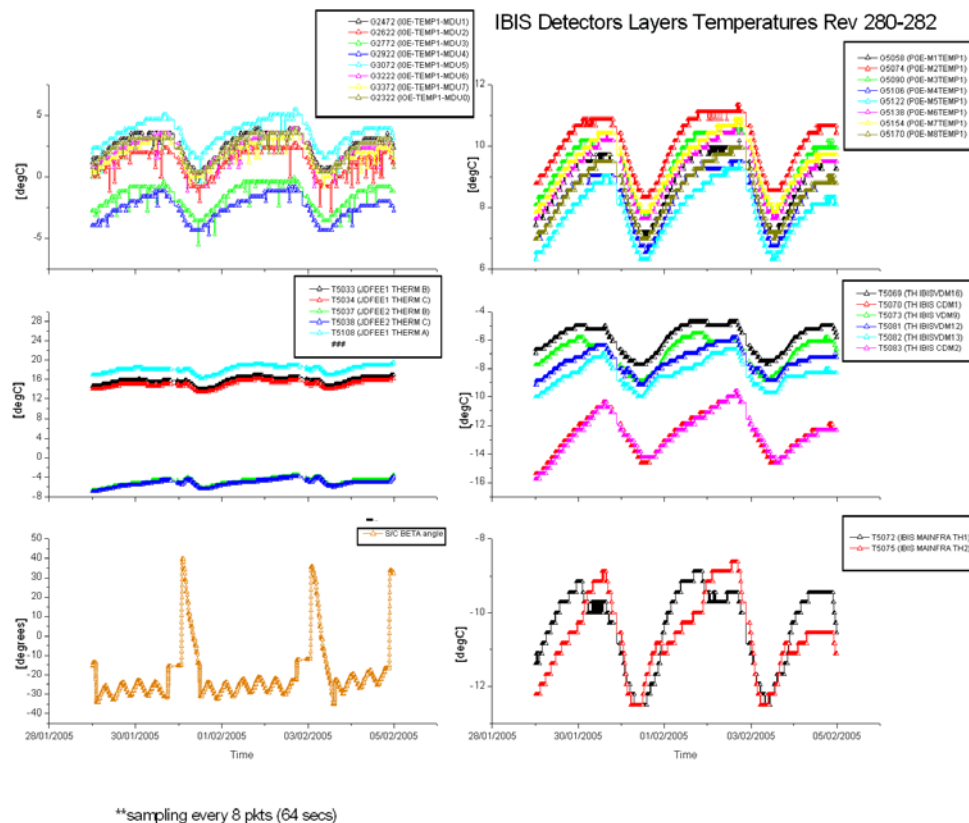
Veto Current:



Picsit Counters:



IBIS Detectors Layers Temperatures



IBIS daily report

DoY 2005.029 (29/01/2005)

Nothing to report.

DoY 2005.030 (30/01/2005)

At 15:09Z IBIS entered Stand-by mode due to an earlier, than expected, radiation belts entry (BCPKT time:16:28Z).

DoY 2005.031 (31/01/2005)

Nothing to report.

DoY 2005.032 (01/02/2005)

At 21:56Z 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 2005.033 (02/02/2005)

At 13:54Z G8080 (Valid event rate on HBRA) went Out of Limit low. According to H-OVF2, no action was taken.

At 13:54Z G6062 and G6063 (VETO Bottom and Lateral counters) went Out Of Limit "high" and back. According to V-BOT and V-LAT, no action was taken.

At 14:49Z G8080 was reported OOL again.

At 15:51Z both G6062 and G6063 were toggling at soft high threshold.

At 16:13Z G8015 (S1E A2 PMT V) was reported OOL "high", as this occurred inside the radiation belts, according to V-VLT1, no action was taken.

At 18:11Z, TM G5027 (POS M6RTC1: PDM6 counter semi-module1) went OOL "high". According to P-CNT-1, as this occurred inside radiation belts, no action was taken.

DoY 2005.034 (03/02/2005)

Nothing to report.

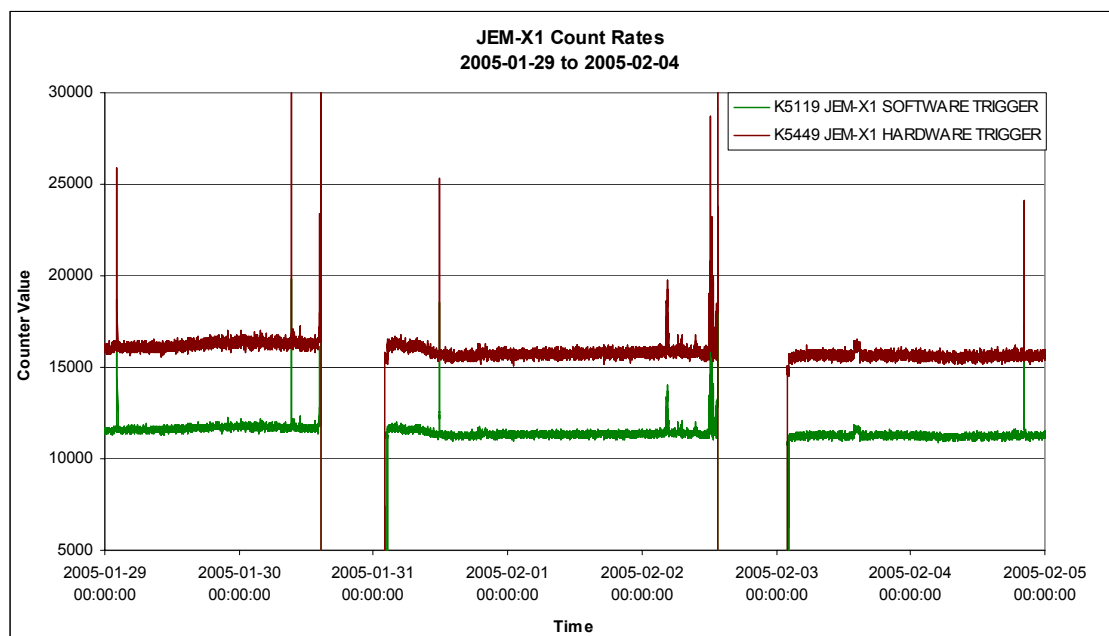
DoY 2005.035 (04/02/2005)

Nothing to report.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

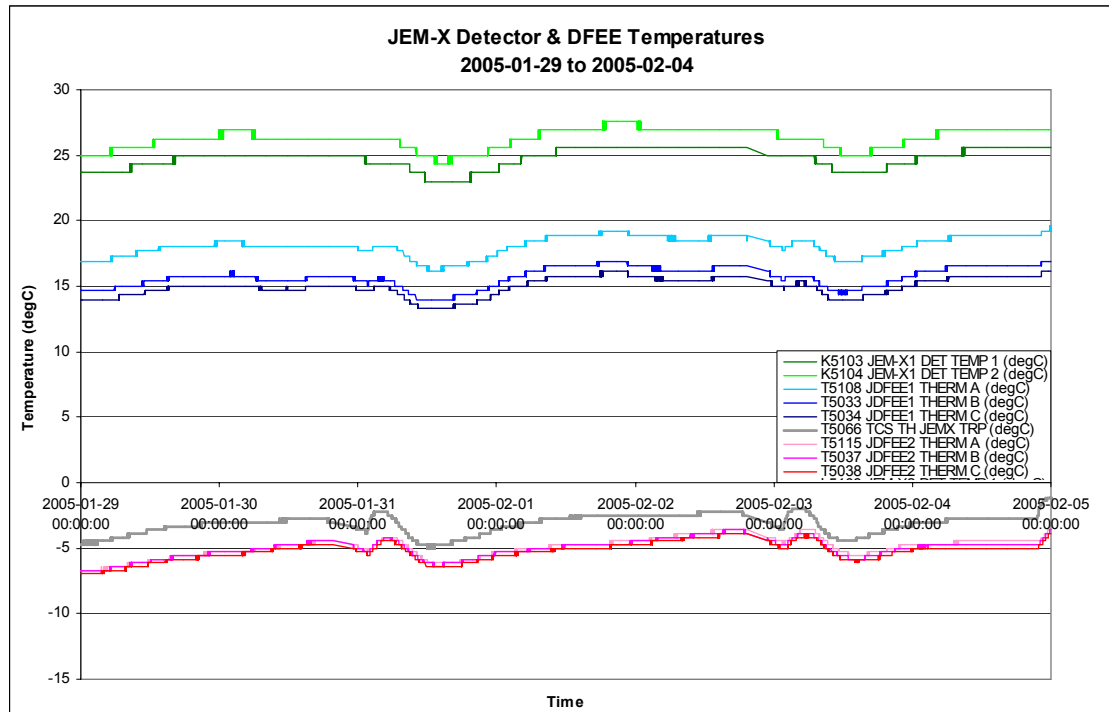
JEM-X1 count rates over the reporting period are displayed in the following graph¹.



8.3.4.2 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.



8.3.4.3 JEM-X Daily Report

2005-01-29 (DOY 029, Rev 280)

At 02:12:34Z the parameter K5136 BUFFER LOSS went out of limits High (value = 373), reaching a maximum of 992 at 02:13:06Z and returning within limits at 02:13:22Z.

2005-01-30 (DOY 030, Rev 280-281)

At 09:16:10Z the parameter K5136 BUFFER LOSS went out of limits High (value = 247), but then returned within limits at the next TM cycle.

At 14:43:54Z the parameter K5119 SOFTWARE TRIGGER went out of limits Warning High (value = 22607) for 1 TM cycle and then at 14:44:18Z it went out of limits Alarm High (value = 24054). At this time, there was also an out of limits on the IREM Electron Counter parameter K5317 RAD MONITOR 3 (value = 88), which then went back in limits at 14:44:49Z.

At 14:44:58Z K5119 SOFTWARE TRIGGER exceeded the Safe threshold for JEM-X1, causing JEM-X1 to transition autonomously to Safe mode. As the parameter K5462 DFEE STATE IASW transitioned to Setup (value = 5) at this time, there was an occurrence of the OEM189 JEM-X1 PROB DFEE 9. At 15:04:52Z the ED

² Data sampled (1 frame in 8)

KESAFE01, scheduled in order to put JEM-X1 in Safe mode before radiation belt entry of revolution 280, was executed from the Timeline. This caused K5462 DFEE STATE IASW to also be set to Safe at this time and the OEM 254 ERROR OFF was received.

2005-01-31 (DOY 031, Rev 281)

At the start of revolution 281, at 01.42.59Z, FCP_JEM1_0120 was executed to disable the JEM-X1 reactions to the IREM count rates in the Broadcast Packet as per INT_OR_0189.

At 11:43:46Z the parameter K5136 BUFFER LOSS went out of limits High (value = 254), reaching a maximum of 1309 at 11:44:26Z and returning within limits at 11:44:42Z.

2005-02-01 (DOY 032, Rev 281)

Nothing to report

2005-02-02 (DOY 033, Rev 281-282)

At 12:11:06Z the parameter K5136 BUFFER LOSS went out of limits High (value = 198), but then returned within limits at the next TM cycle. At 12:11:22Z the IREM Electron Counter parameter K5317 RAD MONITOR 3 went out of limits High (value = 74), returning within limits at 12:11:46Z. At 12:22:34Z the parameter K5119 SOFTWARE TRIGGER also went out of limits Warning High (value = 20224) for 1 TM cycle.

At 13:28:34Z K5119 SOFTWARE TRIGGER went out of limits Warning High again (value = 20962) and then began fluctuating in and out of its soft limit. At 13:29:30Z K5317 RAD MONITOR 3 also began fluctuating in and out of limits.

At 13:31:30Z K5119 SOFTWARE TRIGGER went out of limits Alarm High and at the next TM cycle, it had exceeded the Safe threshold for JEM-X1 and JEM-X1 transitioned to Safe mode. The TM parameter K5462 DFEE STATE IASW reported Safe on one occurrence and then began to report state Setup and thus there were two occurrences of the OEM 189 JEM-X1 PROB DFEE 9. At 13.37.28Z FCP_JEM1_0040 was executed to command JEM-X1 to Safe mode, thereby resetting K5462 DFEE STATE IASW to Safe as well. At this time, OEM 254 ERROR OFF was received.

2005-02-03 (DOY 034, Rev 282)

At the start of revolution 282, at 01.24.49Z, FCP_JEM1_0120 was executed to disable the JEM-X1 reactions to the IREM count rates in the Broadcast Packet as per INT_OR_0189.

2005-02-04 (DOY 035, Rev 282)

At 20:16:02Z the parameter K5136 BUFFER LOSS went out of limits High (value = 395). It reached a maximum of 1034 at 20:16:26Z and returned within limits at 20:16:42Z.

8.3.5 OMC Operations

On DoY 030, at 10:24, the TM & TC links with Redu dropped, the links returned at 10:30. The impact was a 20 minute delay in the start of pointing 02800066. It was at this time the following TCs were rejected:

```
2005.030.10.30.08.008 2005.030.10.29.56.218 1792 Real Time Rejection 131
REJECTED TC1
FIX2=0 M5010=6,NORMAL M9079=3 M9080=131 M5001=130,RESET IM M9068=1 FIX2=0
M9069=570
2005.030.10.30.15.749 2005.030.10.30.03.218 1792 Real Time Rejection 131
REJECTED TC1
FIX2=0 M5010=6,NORMAL M9079=3 M9080=131 M5001=60,IM A M9068=1 FIX2=0 M9069=571
```

These correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) commands for that pointing. The commands were eventually sent at 10:52.

On DoY 030 at 16:27:59 and DoY 033 at 16:13:47, OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

IREM daily report

DoY 2005.030 (30/01/05)

At 23:12Z at AOS_TM of revolution 281, a local reset of the IREM CSCI S/W (SEU #19) was reported: as previously (see anomalies on 16/12/02, 01/01/03, 03/06/03, 11/07/03, 19/07/03, 05/08/03, 24/08/03, 26/12/03, 13/05/04, 16/05/04, 09/06/04, 12/06/04, 10/09/04, 14/09/04, 28/10/04, 06/11/04, 11/12/04) the status of the unit, before the occurrence of the anomaly and before LOS_TM, was nominal, here is a summary:

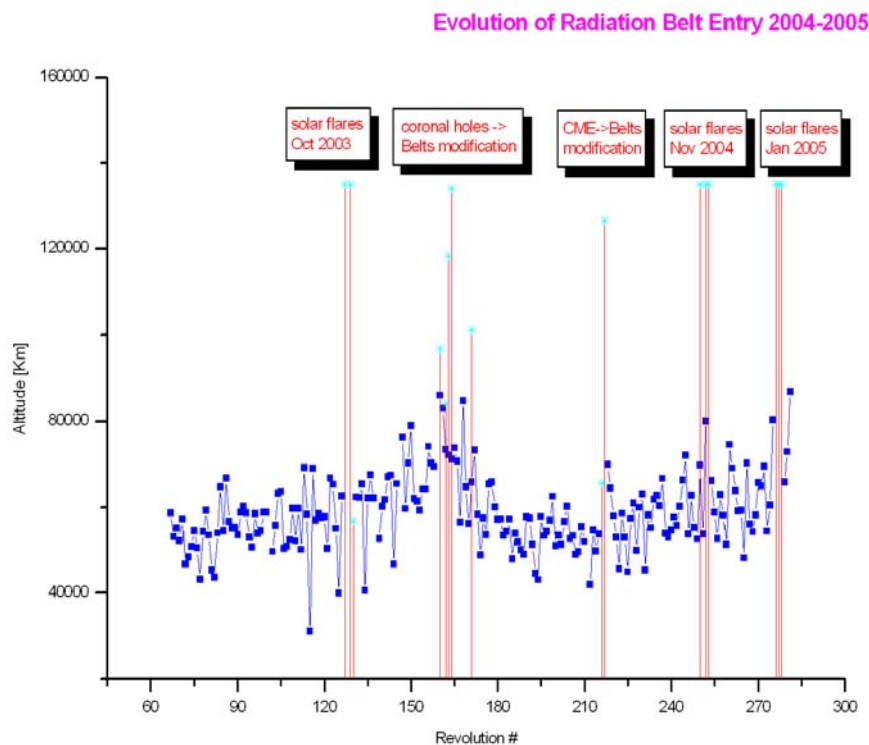
1. Temperatures nominal;
2. LCL current nominal;
3. Last HK before the anomaly HV, 5V and 6V voltages inside limits;
4. The anomaly occurred during perigee passage (at AOS, 2005.030.23.12Z, the S/C altitude was 17004.9 km) and the unit performed an automatic transition to Standard Mode (ie. no block counter increasing, all the TM words= FFFF hex); just before the anomaly, radiation counters reported nominal values considering the position of the S/C along the orbit;

5. The recovery of the unit started at 23:54Z, using procedure CRP_SYS_2570. The first dump of the status word after the anomaly showed a value of 38C0 HEX = 14528 DEC = 0011100011000000 (checksum failure flag ON and Ground Link OFF). This value is different from the one usually reported in such a case. Therefore the command was resent and the status word showed the value: 3C80 HEX = 15488 DEC = 0011110010000000 (checksum failure flag reset). According to this unexpected behaviour, it was decided to power OFF and ON the unit and to perform one more dump of the first status word that gave this time 480 HEX = 1152 DEC = 0000010010000000 (checksum failure flag OFF). Later off-line investigation explained the observed status word '38C0'hex, after the anomaly, as expected with the Ground Link status set to OFF: this because the anomaly happened during the perigee passage and no Ground Link ON TC was executed;
6. Subsequently, a dump of all registers bank reported a nominal configuration of the unit in Standard Mode;
7. The patch was performed successfully with the correct re-starting of the S/W. The operation was completed at 02:13z;

The IREM automatic transition to Standard Mode did not affect the instruments since it occurred during Perigee Passage.

The cause of this S/W reset is still under investigation, but as it was in past occurrences, it is probably due to the unit's memory device, which is sensitive to ionising radiation.

Radiation Belts Entry



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]
280	RAD_ENTR R 2005-01-30T16:27:46Z	2005-01-30 14:40:43	72906.7	2005-01-30 17:12:43	53929.31
281	RAD_EXIT R 2005-01-31T01:38:25Z	-	-	2005-01-31 00:22:43	28098.25
281	RAD_ENTR R 2005-02-02T16:13:26Z	2005-02-02 12:11:23	86732.5	2005-02-02 17:07:06	52850.52
282	RAD_EXIT R 2005-02-03T01:24:20Z	2005-02-03 00:04:11	>26527.1	2005-02-03 00:17:06	29347.98

Reference

Very small error vs reference (less than 10 minutes)

Small error vs reference (between 10 and 30 minutes)

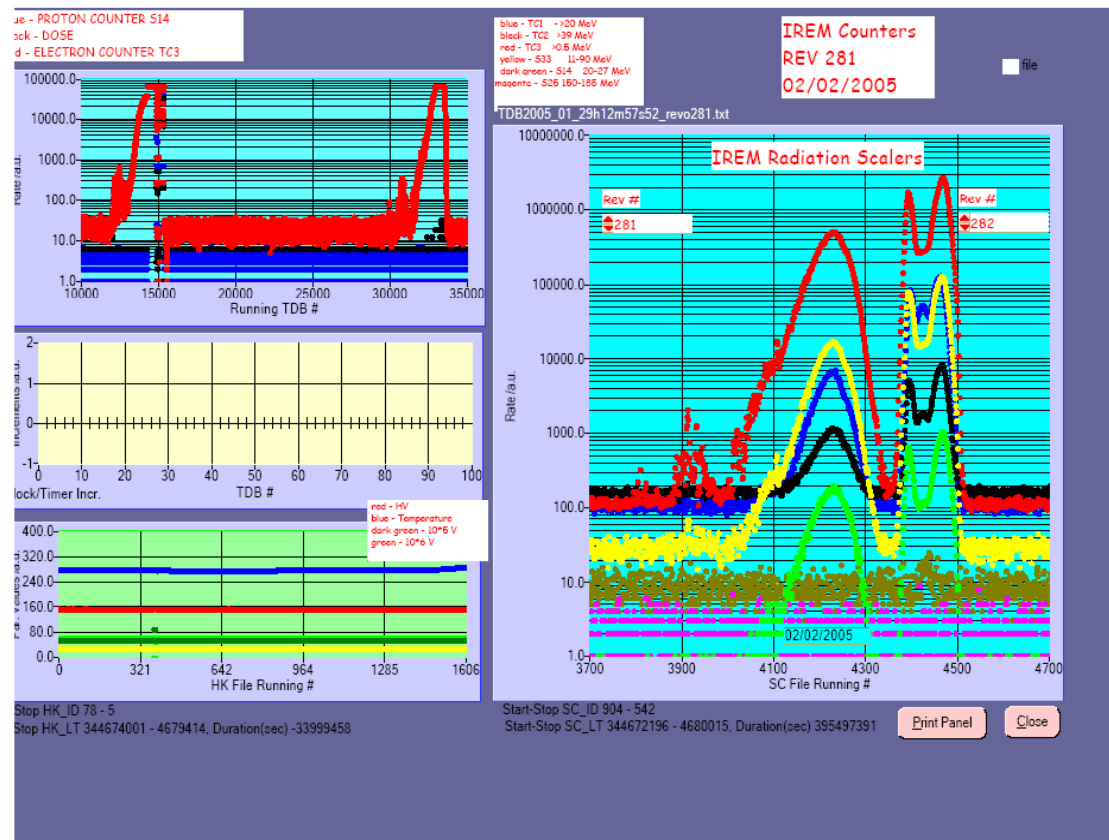
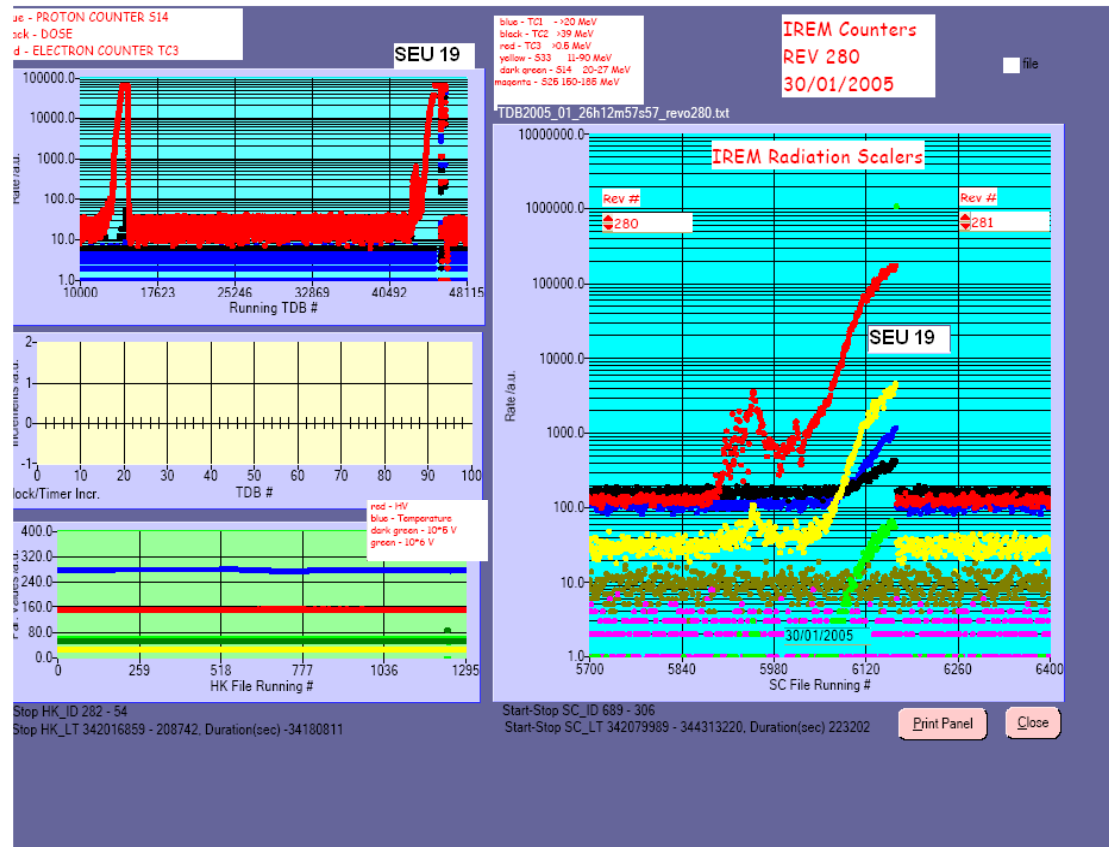
Large error vs reference (more than 30 minutes)

Radiation Spike

Proton Belts

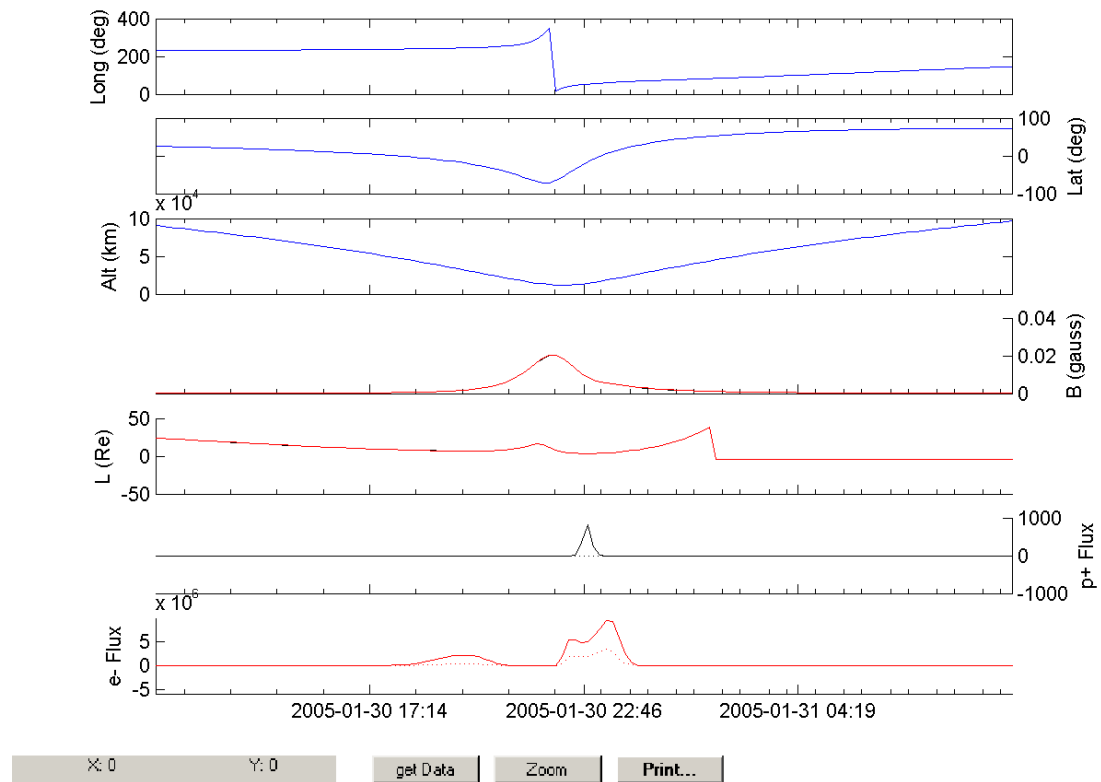
The flux of protons >8MEV computed by RadMon, did not exceed the threshold. Therefore, no predicted proton cut-off is provided for this week.

IREM radiation counters

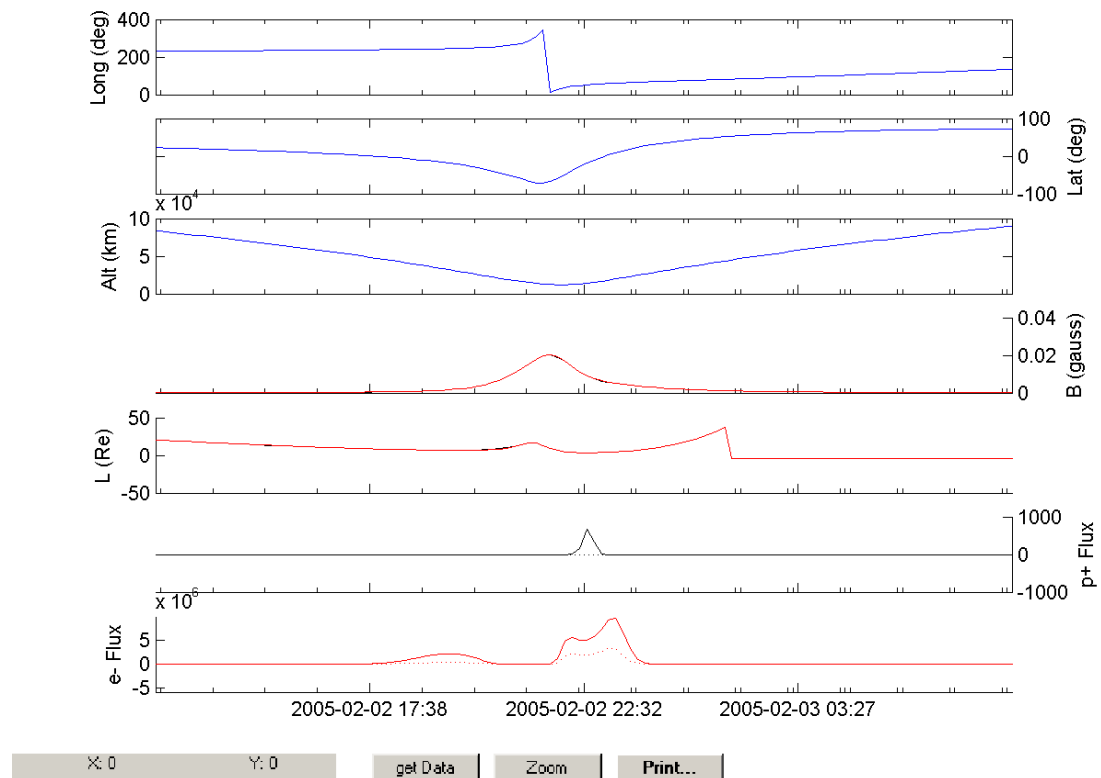


IREM Predicted Radiation Belt Passages.

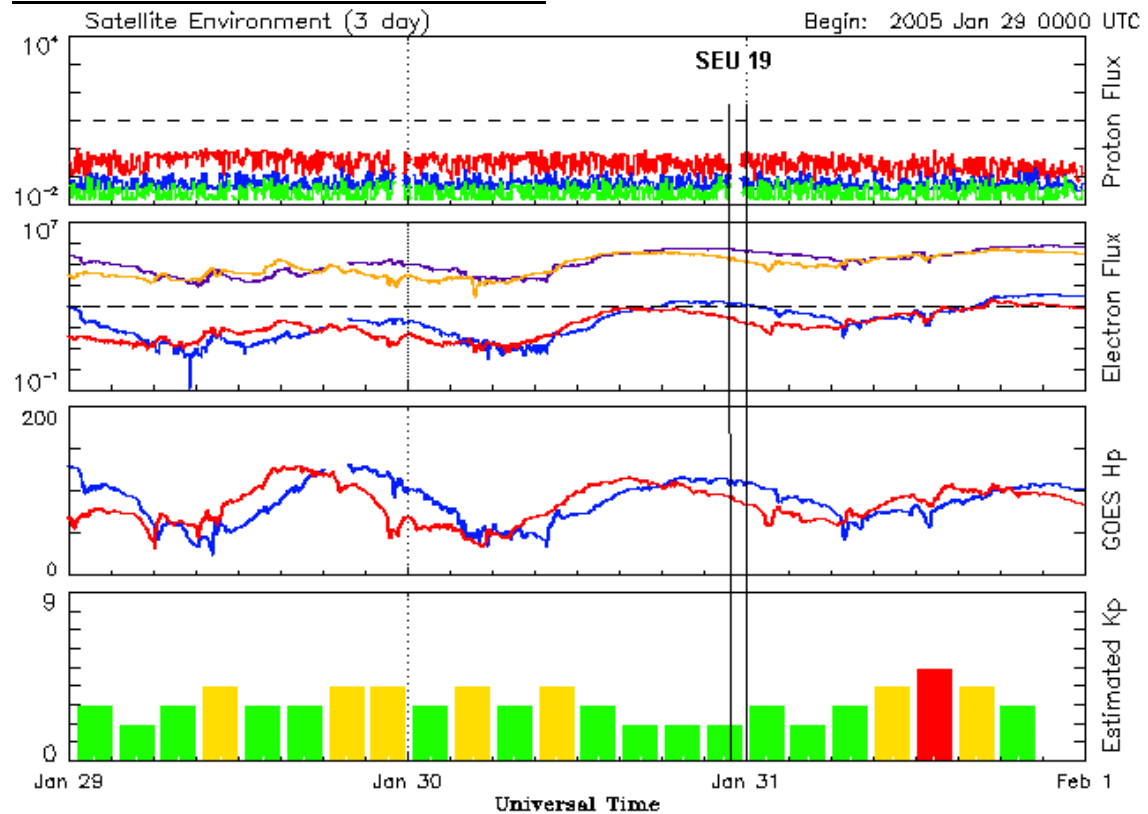
Rev 280



Rev 281

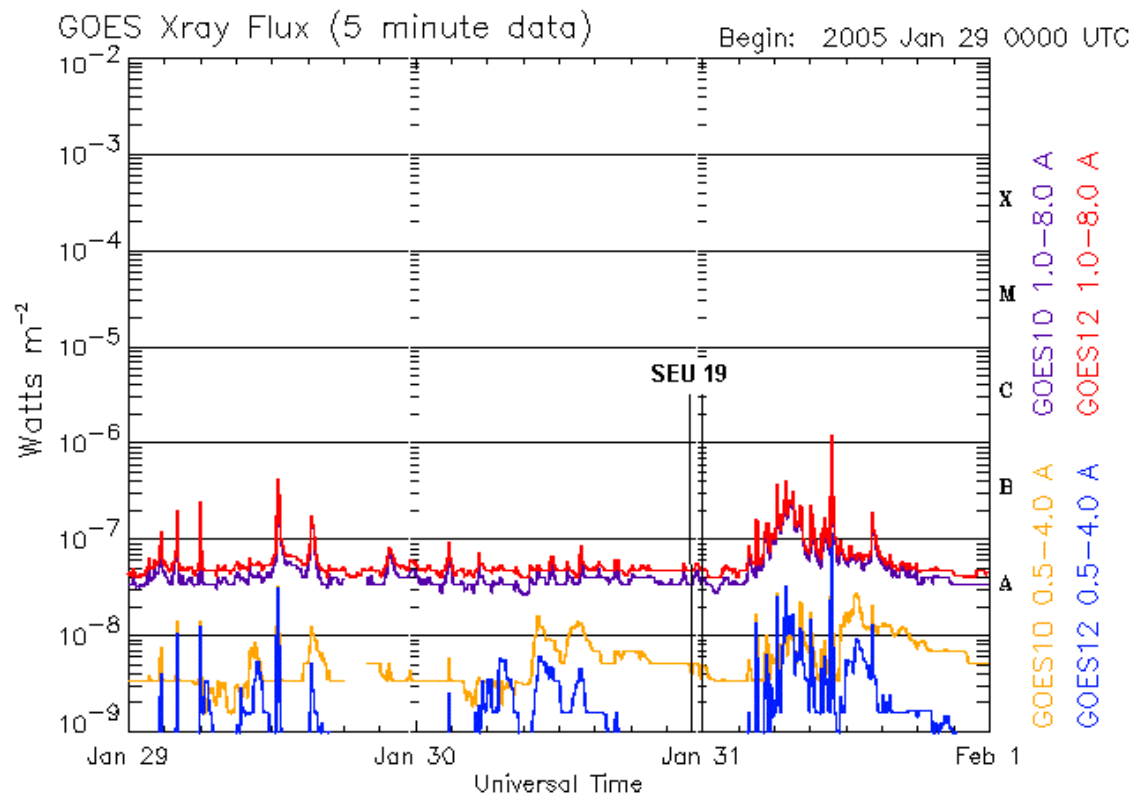


SEC-GOES Observed Particles Fluxes.



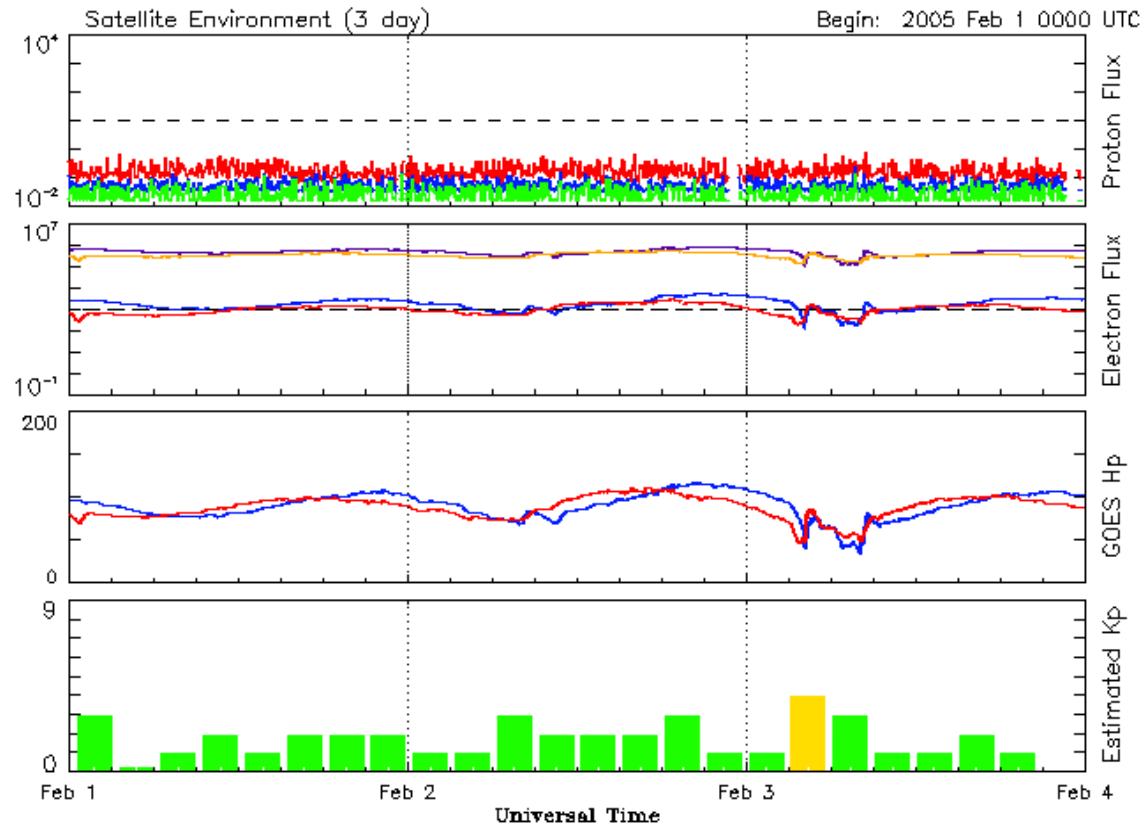
Updated 2005 Jan 31 23:56:11 UTC

NOAA/SEC Boulder, CO USA



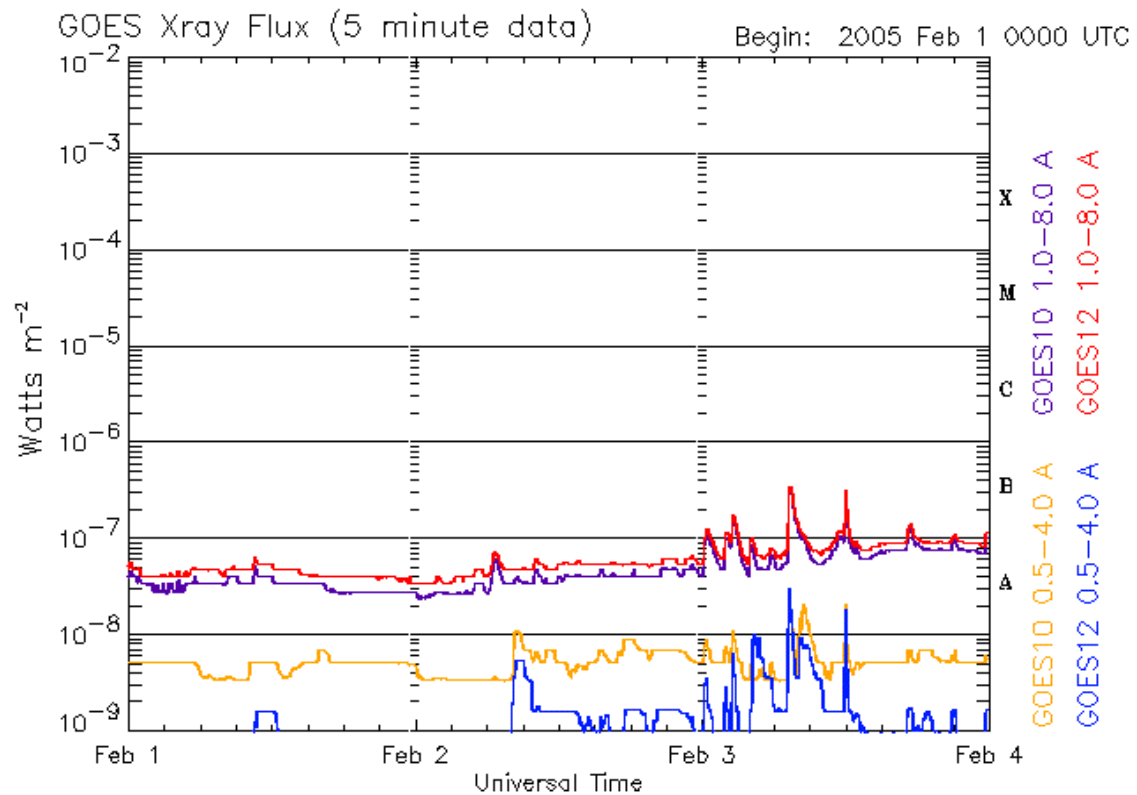
Updated 2005 Jan 31 23:56:05 UTC

NOAA/SEC Boulder, CO USA



Updated 2005 Feb 3 23:56:11 UTC

NOAA/SEC Boulder, CO USA



Updated 2005 Feb 3 23:56:05 UTC

NOAA/SEC Boulder, CO USA

