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

INTEGRAL
Mission Report

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

No. 126
Week 07

21.02.05

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 12.02.05 until 18.02.05 (both dates inclusive) and covers the revolutions 285, 286 & 287.

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 Target of Opportunity V0332+53 (RA 03:34:59.89; DEC +53:10:23.6); the galactic disk l<0 (RA 16:18:32.00; DEC -50:22:26.0); the galactic plane; an OMC Flat Field attitude (RA 19:19:12.00; DEC +61:54:00.0); the Galactic Center field (RA 17:45:40.00; DEC -29:00:28.0) and the galactic bulge region (RA 17:45:36.00; DEC -28:55:60.0). The activities consisted of raster and hexagonal dithering observations as well as GPS and staring observations. In addition, OMC Flat Field and Dark Current calibrations 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.

3 slews (all OSLs) were missed from the Timeline during this period 2 due to problems at the ground station, and 1 to problems within the MOC.

The fuel consumption over the period between 10/02/2005 and 17/02/2005 was 0.2438 kg. The remaining propellant is in the order of 163.0214 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 in this week is nominal.

The instrument was in photon-by-photon mode for the whole period, with spectra TM enabled, an assigned TM bandwidth in the science observation windows of 103 pkts/cycle and an actual occupation of 93.2 pkts/cycle average.

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

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

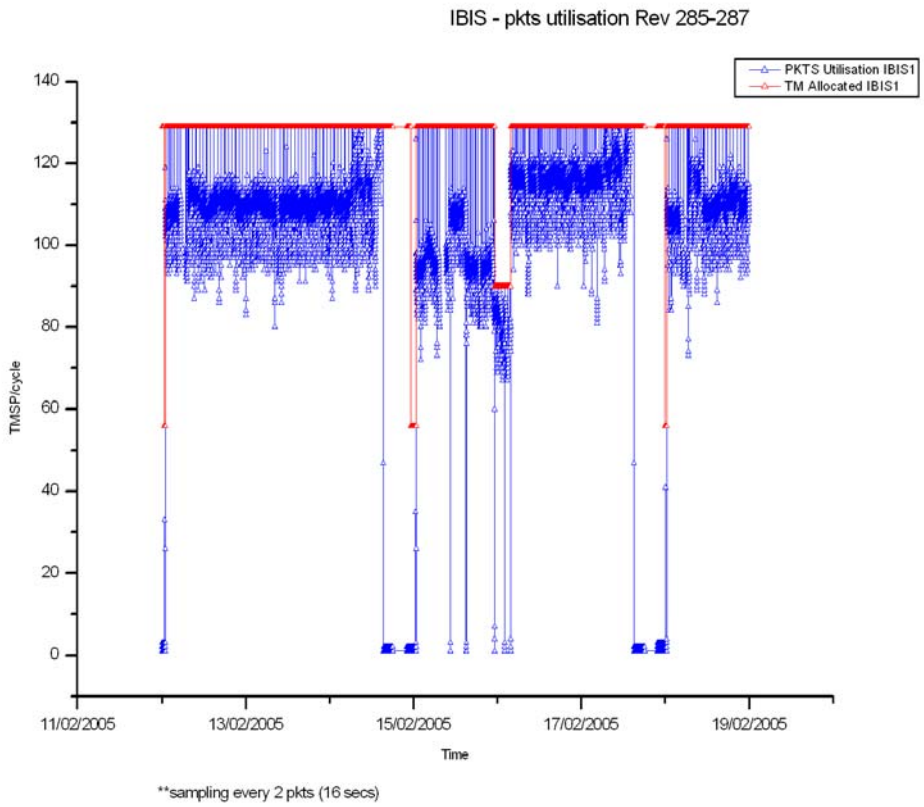
3.2.2 IBIS

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**.** However in revolution 286, from 2005.02.15 23:19Z to 2005.02.16 03:54Z, the PST allocation was set to 90 for IBIS due to an OMC Calibration. The IBIS mean bandwidth utilisation during the observation period was 109.8 TMPS/cycle, down 3.25 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.

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.

There were 177 OMC pointings executed nominally, 3 were lost, 10 minutes of telemetry was lost during another pointing, and part of the flat-field calibration failed.

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.

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

4 Ground Facilities

The performance of the Operational ground facilities was good this week, well above the system performance requirements, 3 pointings were lost, and ten minutes of TM from a 4th, also part of the OMC Flat-field calibration was lost due to ground problems.

4.1 Mission Operations Centre

The performance of the MOC was good this week, although there was one instance, where a nctrs-a problem caused the loss of a pointing, and several events recorded in the log associated with low computer resources, none of which impacted the mission.

4.2 Ground Stations & Network

The performance of the ground stations and Network was good this week. There were several occurrences of station and/or communications problems, one of which caused the loss of 2 pointings and another incident, where there was a power outage at Redu, which left a TM gap in a 3rd. The overall performance was still well over the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning
Execution of the first revolution of the AO 3 program started this week. The transition was very smooth. PSF's received up to rev 294. Mission planning has been resumed on a normal level from ESAC. POS's generated and sent up to rev 291. There has also been replanning of rev's 284 to 287 due to ToO. One revised TSF file received for rev 288. This is caused by replanning on MOC side due to use of VILSPA instead of REDU. Rev 289 was replanned on MOC request since it appeared to be impossible to perform a large slew from a ToO target to the galactic centre region.

2. Observation status
No change from last week. From revolution 270 there is in ISDC a switch to so called "rev 2" data.

3. ISOC science data archive
No new data received from ISDC.

4. ISOC system
Version 10.7 is still used. A version 10.7.3 was introduced containing updates to the ISOC web pages due to the start of AO 3 program.

5. AO 3
The ToO strategy for all types of ToO's was finalized this week. This means that ToO requests can now be processed as intended.

6. Problems
The problem reported last weeks with unavailable science staff in ISOC is not yet formally resolved but the situation has eased a bit.

4.3.2 ISDC

Status of ISDC observation processing on 21/02/2005:

- Latest Standard Analysis completed: observation 02600010001 (Cyg X-1 Cal/11.3, Revolution 257) on 12/02/2005

- Latest products archived: observation 02201460001 (3C273, Revolution 267) on 13/02/2005

- Latest observation products sent to the observer: observation 02297000015 (Abell 2256, Revolution 257) on 20/02/2005

5 Special Events

6 Anomalies

There were a number of problems that impacted the operations:

- On DoY 043, at 07:30, the idda was in a yellow state on the global mmi. Indicated was 4GB free space, and the hfa partition not existing or ambiguous. This was fixed on DoY 046 at 15:53, when the lts disk was installed.
- At 16:40, a power failure at Redu caused complete loss of the links. At 16:50, the links were restored using Vilspa II. The impact was a 10 minute loss in TM from pointing 02850020. Redu came back on-line at 17:07.
- On DoY 044, at 10:59, the nctrs-a mmi was in a yellow state, with the event log consuming 89% of the cpu.
- On DoY 045, at 13:37, the imcb became disconnected due to a SCSI problem.
- At 16:03, the parameter E0392 (TCR COLD-PLATE L2) was indicating out-of-limits on AND E0391C, but not in the OOL display.
- On DoY 046, at 06:55, 13 bad frames were received from Redu, there was no impact.

- At 07:45, TC A2562 (RC Mapping) failed release due to the dynamic PTV and TCE-2, which had 'no bit-lock'. The impact was that pointings 02860014 & 02860015 were lost.
- At 16:47, the message: Event Logger: TMD, idda, Error system, request for pid not found MADDS-B REC idda Error. Connection to TMAR lost. Then, a minute later: EV: PDSserEV imca, Warning, System fd95 disconnected irregularly. The problem was solved at 17:41 when the lost tasks were restarted.
- At 23:18, an extraneous M1500 (OMC to Stand-by) command failed release from the Auto-stack. The impact of this was that all subsequent OMC commands had their PTVs overridden. (This was cured at 09:20 the following day, when the Auto-stack was re-started). At 23:48, the 2nd M1540 (OMC Flat-field calibration) command was rejected owing to a missing M1500. The impact was a partial loss of the calibration. See OMC section for details.
- On DoY 047, at 08:57, there was an Event Log error: MADDS-B, AUX is not extracting ASF files.
- At 20:00, the iddb was in a yellow state, with the disc /dev/md/dsk/d8 down to 90MB of free space.
- At 23:30, the NCTRS-A was indicating yellow in the global mmi, with the event log consuming 98% of the cpu. This continued at least until 01:05 the following day.
- On DoY 048, at 21:55, the iddb was again in a yellow state, with disc d8 down to 83MB.
- On DoY 049, at 00:00, the message TCONmainRT, idda, ERROR, SOFTWARE, HFA CTMrecord store link to archive with stream 4905 not present. Try to create was seen.
- At 08:11, an NCTRS-A problem caused an AOCS command to be missed. The impact was the loss of pointing 02870014.
- At 21:10, the mmi application launcher was restarted for imca and imcb due to low swap space, and high cpu usage.
- At 21:57, the message: 'TMD sun128 ERROR addindexRecord:Error duplicate packet at end of block-packet ignored' appeared in the event logger, there was no impact.

The following new anomaly reports were entered into the ARTS system.

AR id	Date Created	Subject	Segment	Status
INT-2701	14/02/2005	TC & TM links lost at REDU	ESA Stations	Pending
INT-2702	16/02/2005	OMC to Standby command sent at wrong time.	IMCS	Pending

7 Future Milestones

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 285
The activities in revolution 285 consisted of a hexagonal dithering observation of the Target of Opportunity V0332+53 (RA 03:34:59.89; DEC +53:10:23.6) lasting ~4.5 hours, followed by an amalgamated raster dithering observation of the galactic disk l<0 (RA 16:18:32.00; DEC -50:22:26.0), performed for the remaining ~54.5 hours of observation time.

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

Revolution 286
The activities in revolution 286 consisted of the following:

- 14 pointings of a GPS lasting ~10 hours;
- Hexagonal dithering observation of the Target of Opportunity V0332+53 (RA 03:34:59.89; DEC +53:10:23.6) lasting ~4.5 hours;
- 11 pointings of a GPS lasting ~7.5 hours;
- Staring observation at an OMC Flat Field attitude (RA 19:19:12.00; DEC +61:54:00.0) lasting ~3.5 hours, during which OMC Flat Field and Dark Current Calibrations were performed;
- Raster dithering observation of the Galactic Center field (RA 17:45:40.00; DEC -29:00:28.0), performed for the remaining ~34.5 hours of observation time.

Throughout these observations, SPI, IBIS and JEM-X1 were in their nominal science modes and the JEM-X2 DFEE remained off. During the OMC Flat Field observation, OMC was in FFCalibration followed by DCCalibration modes and the TM allocation was IBIS 90; SPI 84; JEM-X1 8; JEM-X2 1; OMC 63. For the other observations, OMC was in Science Normal mode and the TM allocation was IBIS 129; SPI 103; JEM-X1 8; JEM-X2 1; OMC 5.

Revolution 287
The activities in revolution 287 consisted of a hexagonal dithering observation of the Target of Opportunity V0332+53 (RA 03:34:59.89; DEC +53:10:23.6) lasting ~4.5 hours, followed by a hexagonal dithering observation of the galactic bulge region (RA 17:45:36.00; DEC -28:55:60.0) lasting ~3.5 hours. An amalgamated raster dithering observation of the galactic disk l<0 (RA 16:18:32.00; DEC -50:22:26.0) was then performed for the remaining ~51 hours of observation time.

Throughout these observations all instruments were in their nominal science modes, except for JEM-X2 for which the DFEE remained 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

```
2005-02-02T23:50:41.000Z     163.3792    F   Automatic TM processing.
2005-02-03T08:45:22.000Z     163.3535    F   Automatic TM processing.
2005-02-05T07:01:42.000Z     163.3430    F   Automatic TM processing.
2005-02-05T08:07:34.000Z     163.3278    F   Automatic TM processing.
2005-02-05T23:24:24.000Z     163.3191    F   Automatic TM processing.
2005-02-06T08:14:17.000Z     163.3032    F   Automatic TM processing.
2005-02-08T23:10:08.000Z     163.2791    F   Automatic TM processing.
2005-02-10T20:47:56.000Z     163.2652    F   Automatic TM processing.
2005-02-11T15:40:38.000Z     163.2048    F   Automatic TM processing.
2005-02-11T22:58:31.000Z     163.1928    F   Automatic TM processing.
2005-02-12T05:38:32.000Z     163.1488    F   Automatic TM processing.
2005-02-14T17:35:18.000Z     163.1315    F   Automatic TM processing.
2005-02-14T22:48:23.000Z     163.1208    F   Automatic TM processing.
2005-02-15T07:40:57.000Z     163.0638    F   Automatic TM processing.
2005-02-17T22:34:07.000Z     163.0214    F   Automatic TM processing.

This report was generated  Fri Feb 18 08:00:21 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 12/02/2005-18/02/2005

AOCS operations were executed from the Automatic Timeline.

During this period, 92 Open Loop Slews, 108 Closed Loop Slews and 5 Momentum Bias were executed. 3 slews were not executed due to ground problems. This is equivalent to a ~ 1.5 % loss.

12/02/05 (Day of Year 043, Revolution 285)

Nothing to report.

13/02/05 (Day of Year 044, Revolution 285)

Nothing to report.

14/02/05 (Day of Year 045, Revolution 285-286)

Nothing to report.

15/02/05 (Day of Year 046, Revolution 286)

Loss of pointings due to Bit-lock problem: At 07:45, the AOCS TC A2562 failed release to the dynamic PTV, which failed as the TCE-2 in Redu had lost bit-lock. During the recovery, a further command failed release again due to the dynamic PTV, coupled with intermittent bit-lock. The bit-lock seemed to settle down autonomously, and a recovery was performed to the attitude of pointing 02860015. The timeline was resumed at 09:10. The impact was the loss of pointings 02860014 & 02860015 (both Open Loop Slews).

16/02/05 (Day of Year 047, Revolution 286)

Nothing to report.

17/02/05 (Day of Year 048, Revolution 286-287)

Nothing to report.

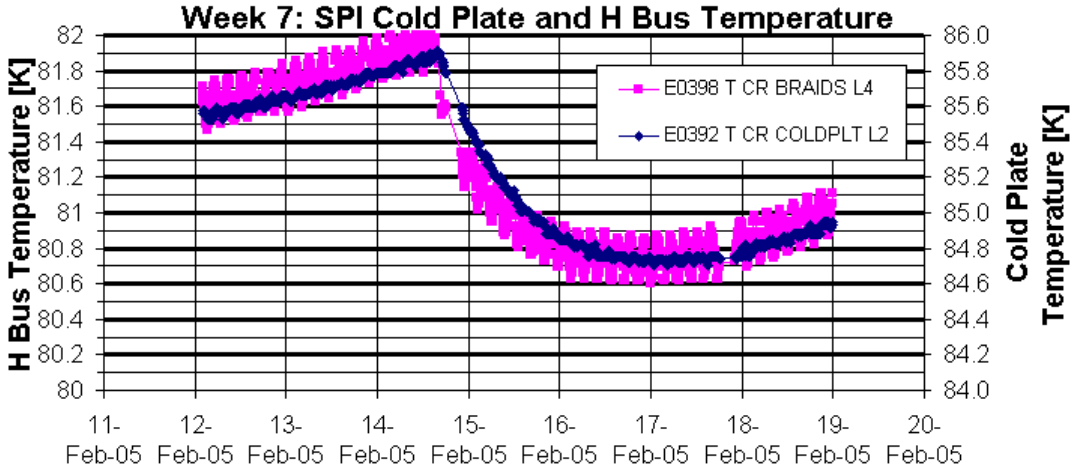
18/02/05 (Day of Year 049, Revolution 287)

Pointing lost due to NCTRS problem: At 08:11, due to problems with the nctrs-a, the TC A8119 timed out on the Auto-stack. A manual recovery was performed at 08:36 to the attitude for pointing 02870015. At 09:06, the AOCS commanding was re-enabled. The impact was the loss of pointing 02870014, an Open Loop Slew.

8.3.2 SPI Operations

Stirling compressors and Cryostat:
The performance of the compressors is nominal.
The cold plate temperature was maintained at 85K+/-1K over the reporting period, showing the pronounced positive drift expected after an annealing cycle. The stroke of the 4 compressors was increased by one lsb each on 14th Feb at 16:20z to 4x36dec raw.

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

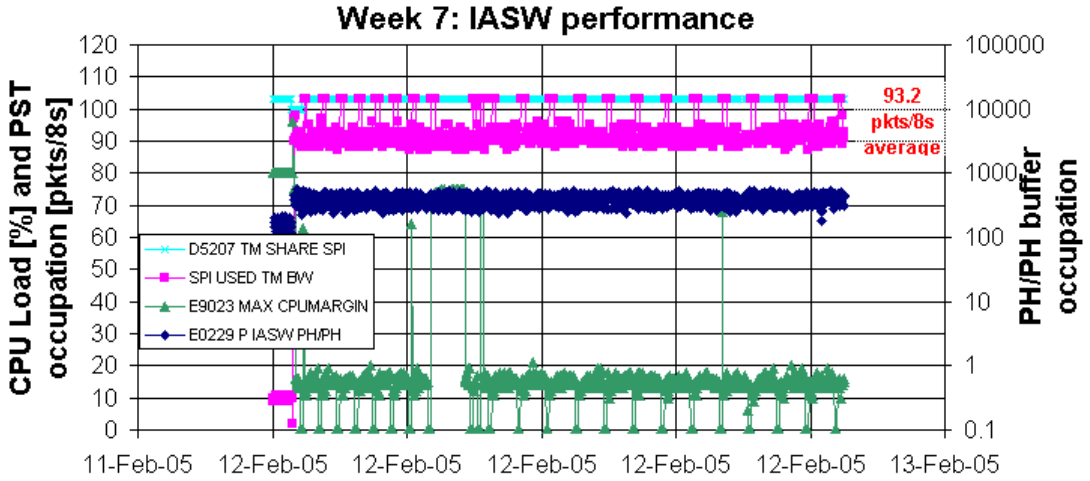


DPE & IASW:

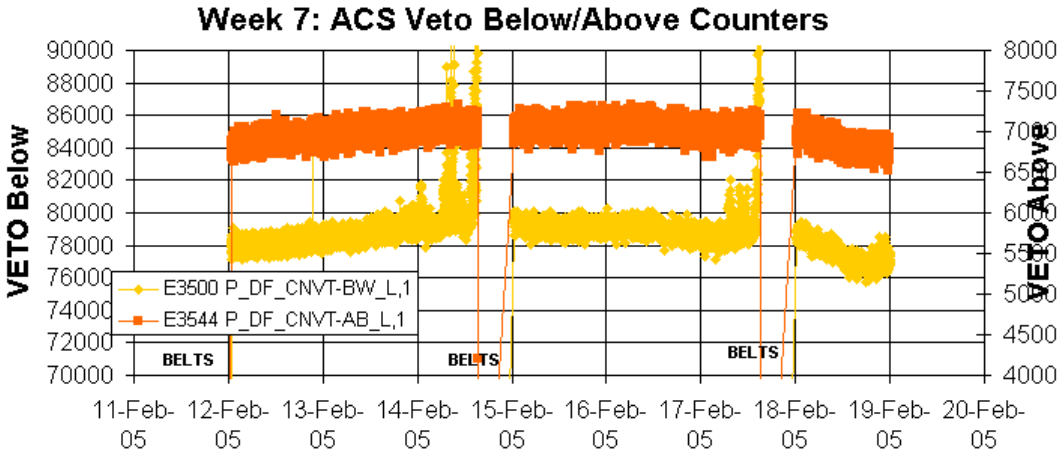
The IASW performance is nominal. The PST TM bandwidth allocation was 103 pkts/cycle in the science windows; the actual TM bandwidth usage is :
103 pkts/cycle peak;
93.2 pkts/cycle average in science mode.

The SPI team is currently analysing the IASW code, investigating on the TM leakage anomaly INT_SC-107. The re-arrangement of the SPI TM slots in the PST, uplinked manually by the SPACON at every revolution, is still used as workaround to this malfunction.

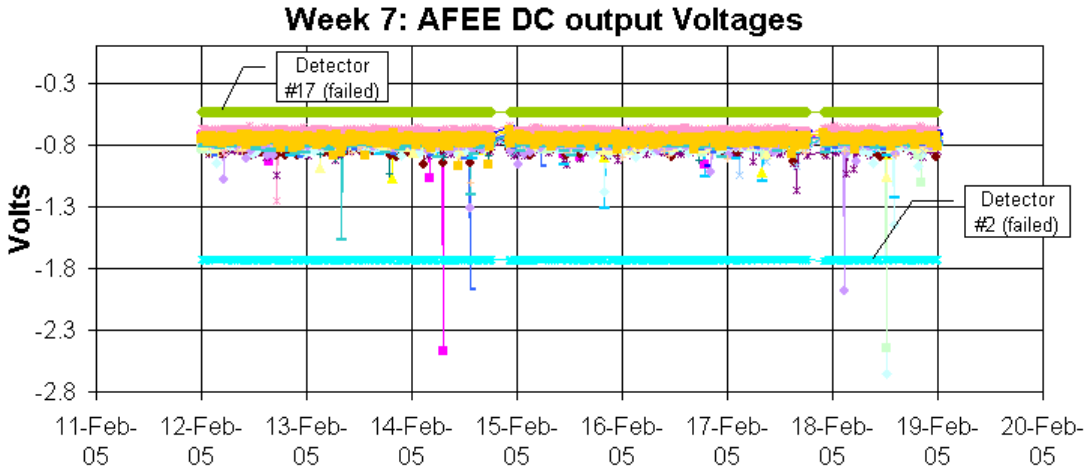
The following diagram shows the IASW performance in terms of TM bandwidth, event buffer occupation and DPE CPU load during the reporting period.



ACS:
The performance of the ACS is nominal. The following plot shows the ACS overall count rate evolution during the reporting period.



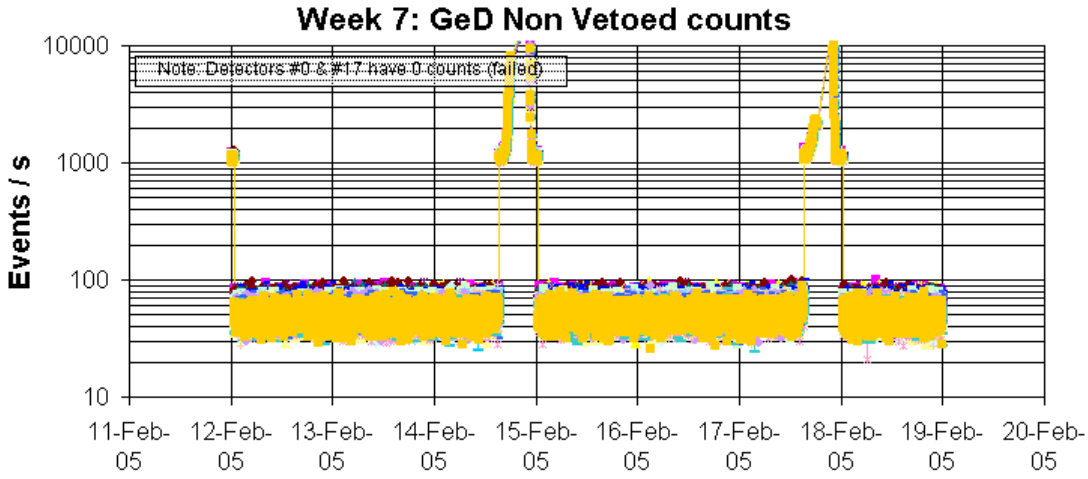
AFEE and Germanium Detectors:
The performance of the detectors is nominal except for the detector #2, failed since 06.12.2003, and detector #17, failed since 17.07.2004.
The following plot shows the AFEE dc output signals during the reporting period.

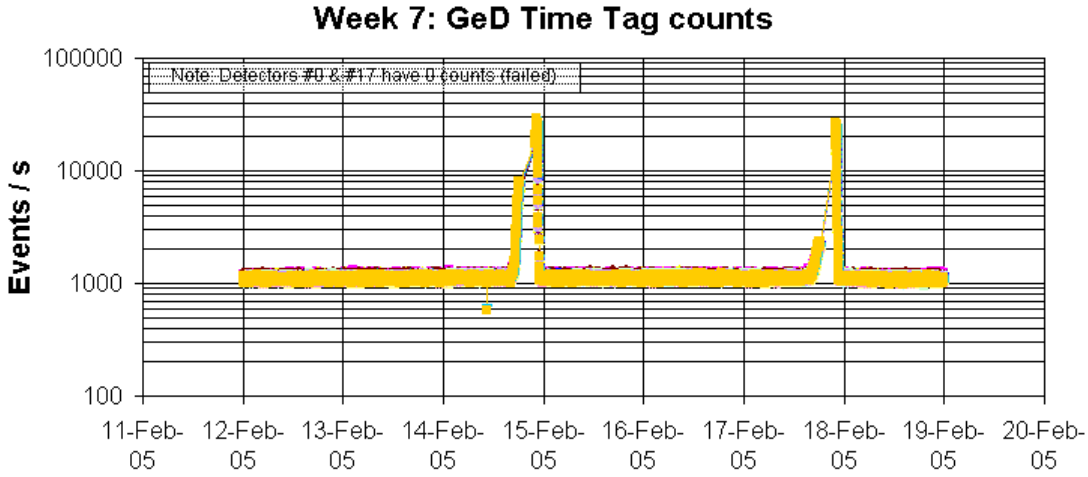


DFEE:

The performance of the unit is nominal.

The following plot shows the Non Vetoed event rates, processed by the DFEE during the reporting period. The count rate of each detector is within the expected range, except for the failed detector #2 and #17.

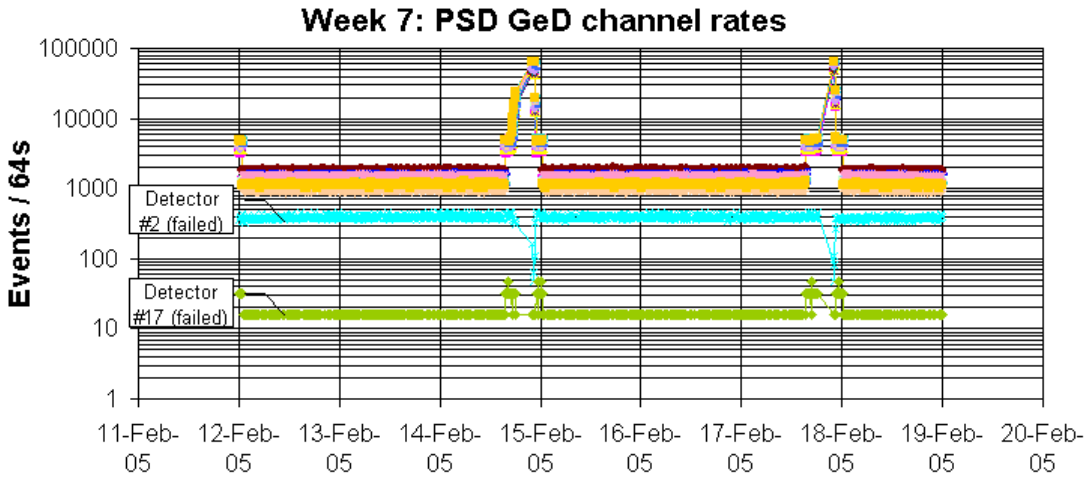




PSD:

The performance of the unit is nominal.

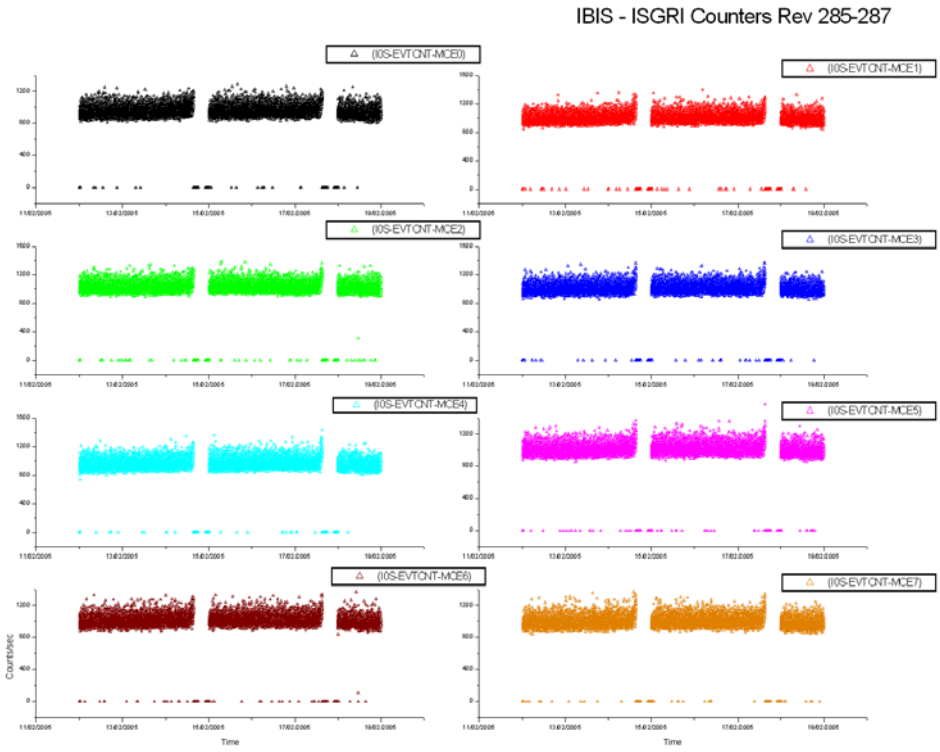
The malfunction of the channel rates blanking occurred again this week (see AR INT_SC-90 for a detailed description of the anomaly).
NOTE: Last week it was reported that the malfunction had not re-appeared since the last annealing. This was an incorrect statement due to wrong interpretation of the data. The malfunction actually reproduced itself again just after the annealing.
The following plot shows the PSD channel rates during the reporting period.



8.3.3 IBIS Operations

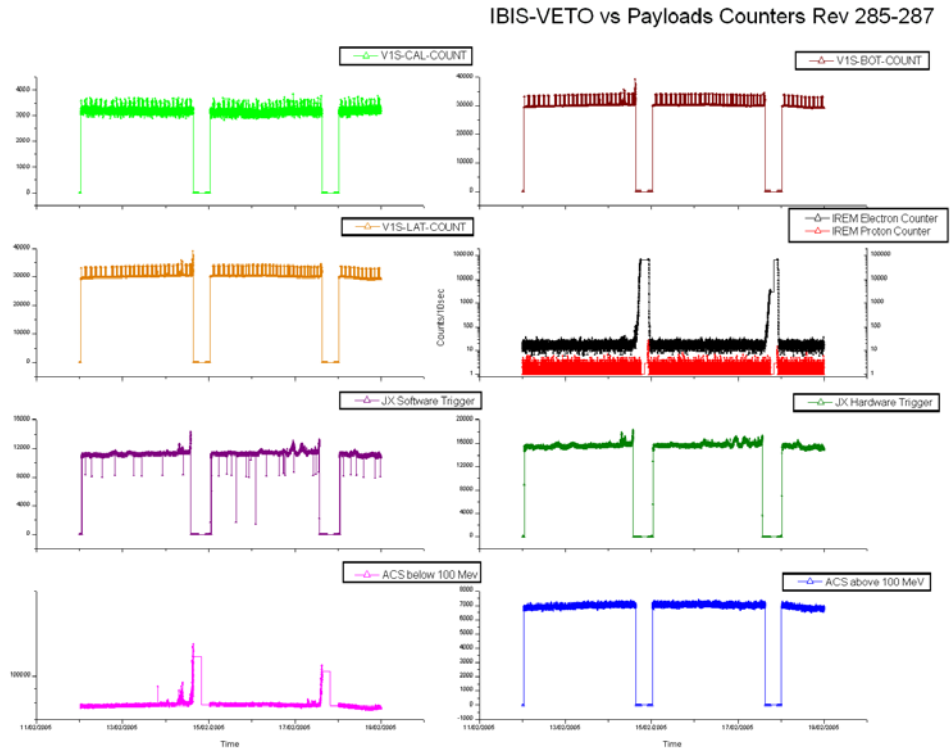
IBIS Event Counters Plots.

ISGRI Counters:



**sampling every 4 pkts (32 secs)

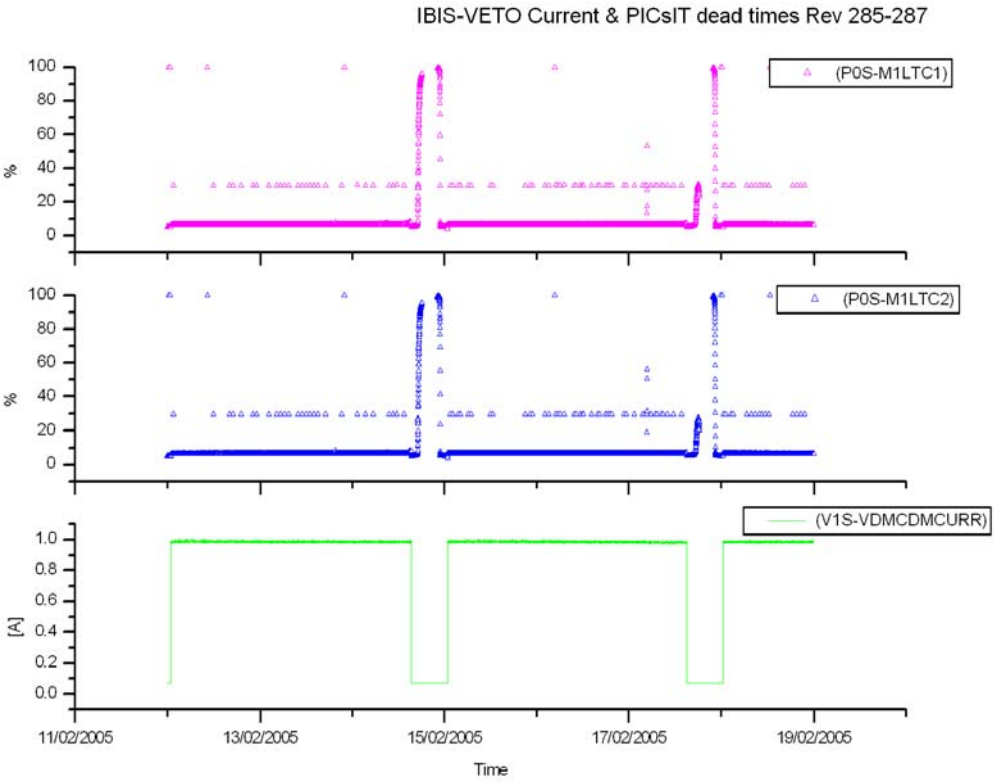
VETO vs Payloads Counters



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

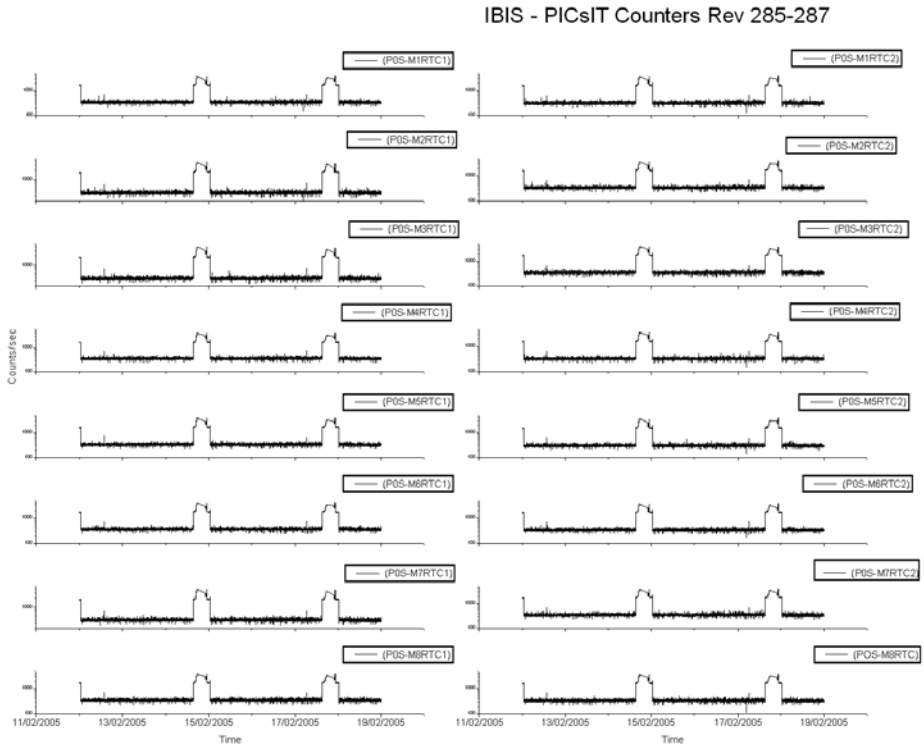
The week was characterised by low solar activity.

Veto Current:



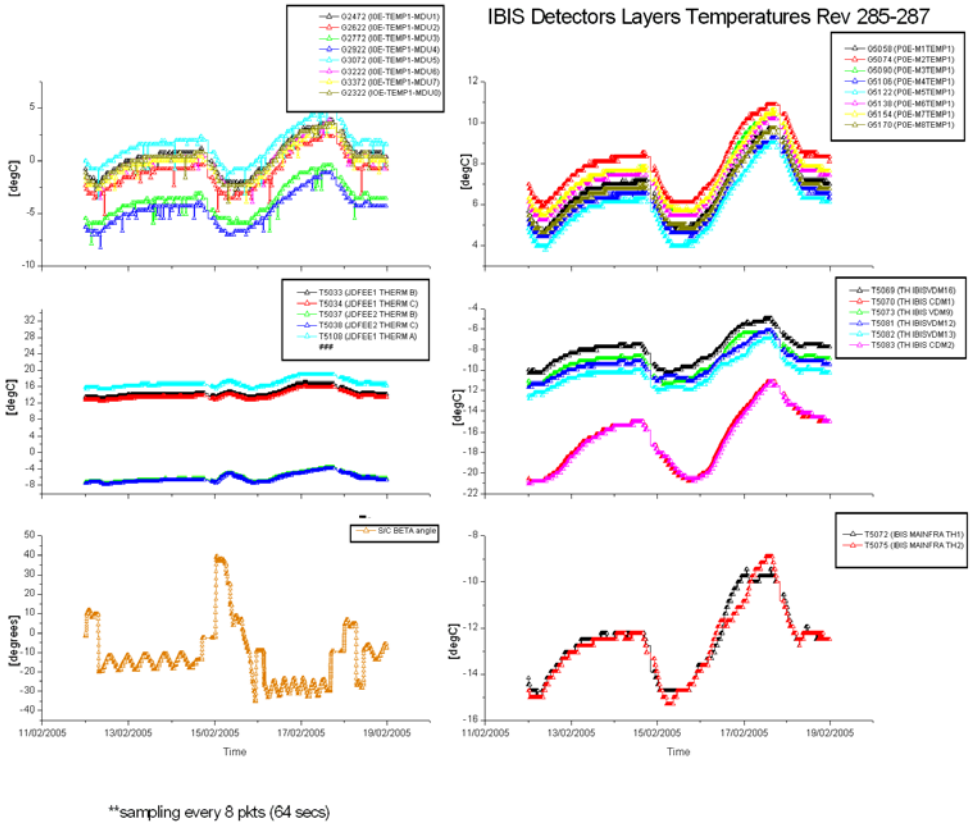
**sampling every 4 pkts (32 secs)

Picsit Counters:



**sampling every 4 pkts (32 secs)

IBIS Detectors Layers Temperatures



IBIS daily report

DoY 2005.044 (13/02/2005)

At 11:34Z TM parameter G2056 (IOE-OVFWPXADD-M5) was reported OOL "SCC fail", and back within limit one minute later.

DoY 2005.045 (14/02/2005)

At 15:23Z, TM G8015 (S1E-A2_PMT_V) was reported OOL 'High'. As this happened in radiation belts, no action was taken.

DoY 2005.048 (17/02/2005)

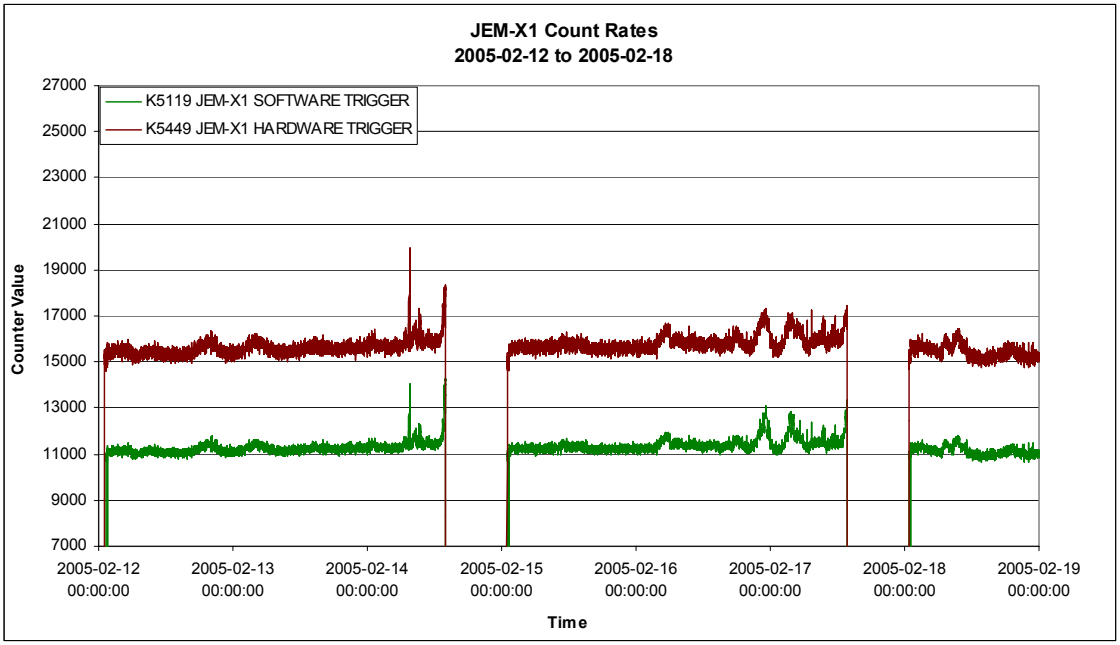
At 04:43Z TM family G5068 (PDMi semi-module #1 FIFO Error Flag) and TM family G5072 (PDMi semi-module #2 FIFO Error Flag) were reported OOL "SCC fail". According to P-FIF-1, no action was taken.

At 21:55Z, TM G8015 (S1E-A2_PMT_V) was reported OOL 'High', and back within limits on DoY 2005.049 (18/02/2005) at 00:32Z. As this happened during radiation belts passage, no action was taken.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

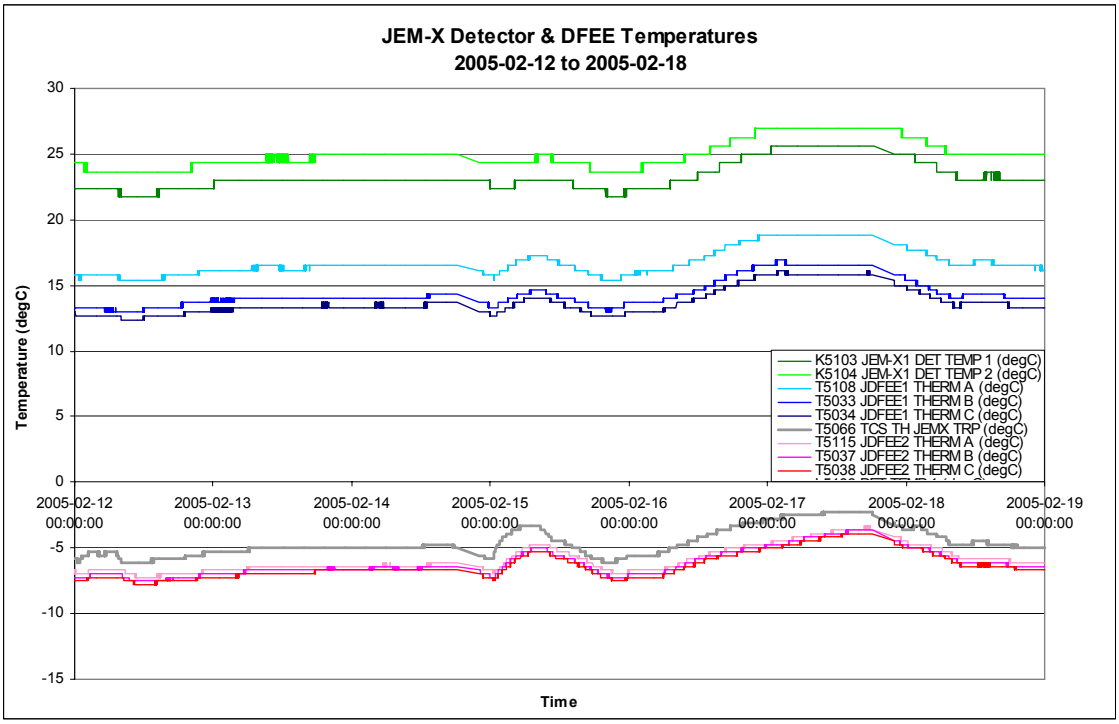
JEM-X1 count rates over the reporting period are displayed in the following graph[1].



8.3.4.2 JEM-X Temperatures

JEM-X Detector and DFEE temperatures, along with the temperature on the detector bench between the two units, over the reporting period are displayed in the following graph[2].

[1] Data sampled (1 frame in 4) and smoothed to remove spikes in S/W Trigger due to flushing of buffer after slews.
[2] Data sampled (1 frame in 8)



8.3.4.3 JEM-X Daily Report

2005-02-12 (DOY 043, Rev 285)

At the start of revolution 285, at 00.44.00Z, 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.

2005-02-13 (DOY 044, Rev 285) to 2005-02-14 (DOY 045, Rev 285-286)

Nothing to report

2005-02-15 (DOY 046, Rev 286)

At the start of revolution 286, at 00.28.27Z, 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.

2005-02-16 (DOY 047, Rev 286) to 2005-02-17 (DOY 048, Rev 286-287)

Nothing to report

2005-02-18 (DOY 049, Rev 287)

At the start of revolution 287, at 00.14.06Z, 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.

8.3.5 OMC Operations

On DoY 043, at 00:46, the OMC command M1511 (Safe Off) was sent, to recover the instrument to stand-by mode after it was manually 'safed' due to an IREM SEU, and subsequent high radiation observed by IBIS.

At 16:40, a power failure at Redu caused a 10 minute loss in TM from pointing 02850020, the link was restored from Vilspa II.

On DoY 046, at 07:45, due to the TCE not having bit-lock, an AOCS command failed. Further problems during the recovery meant that pointings 02860014 & 02860015 were lost.

On DoY 046, at 23:18, an OMC M1500 (OMC to Stand-by) command failed release as the unit was already in stand-by. At 23:19:21, the Flat-field calibration started when the command M1540 was sent, but the second M1540 command at 23:48 was rejected, as the unit had not been returned to Stand-by.

```
2005.046.23.48.42.793 2005.046.23.48.28.029   1792  Real Time Rejection 131
REJECTED TC1
        FIX2=0 M5010=5,FFCALIB M9079=3 M9080=131 M5001=5,******** M9068=1 FIX2=0
M9069=713
```

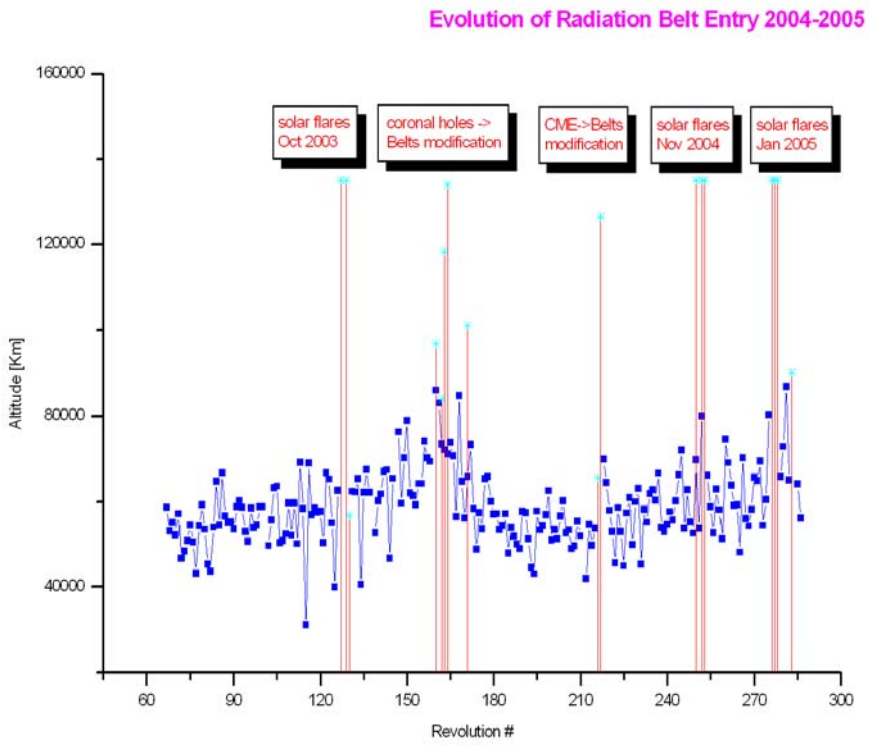
Up till now, a redundant MESTBY01 ED that was always inserted before the flat-field calibration in the POS had been manually removed. This time, the wrong Stand-by command ED was removed from the timeline, leading to the problems observed.

On DoY 049, at 08:11, an NCTRS problem caused the failure of an OACS command. The impact was the loss of pointing 02870014. At 08:45, the TC M1500 was manually sent to return the unit to Stand-by.

On DoY 045 at 15:22:43 and DoY 048 at 15:08:36, 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

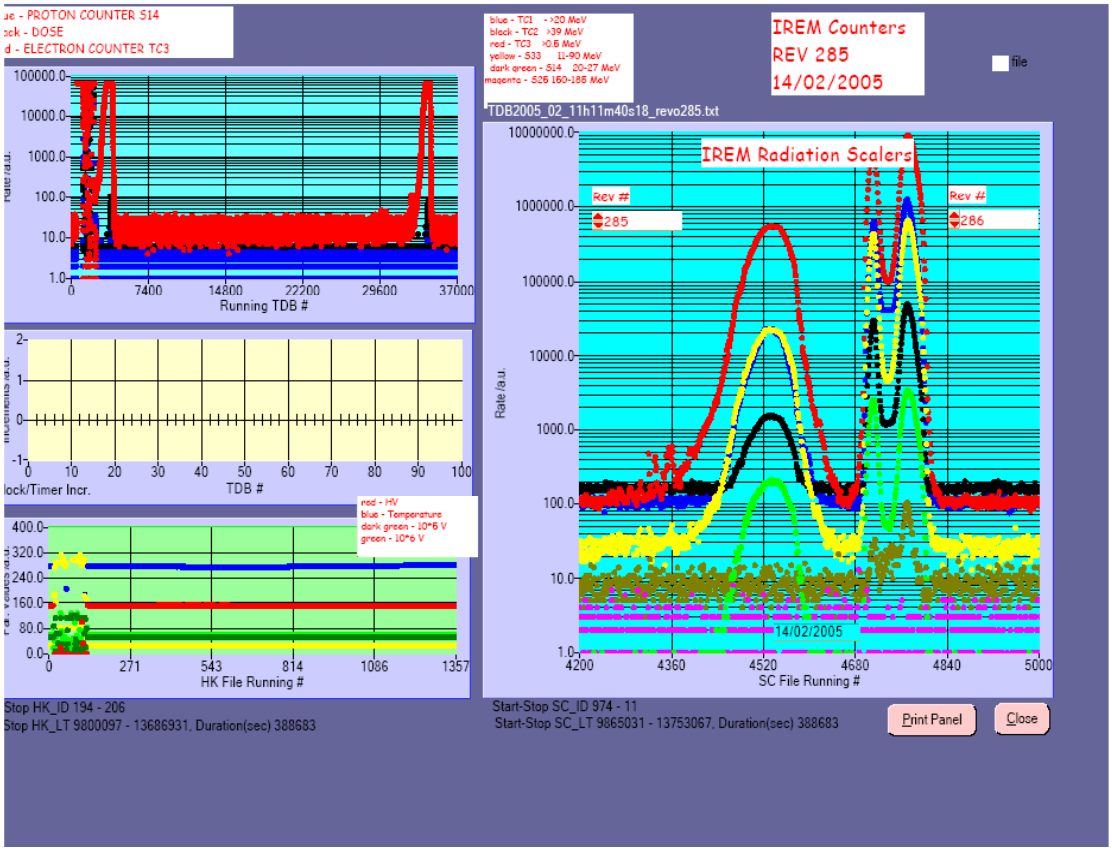
REV	S/C BCPKT (electron)	Electron CUT-OFF Observed Entry/Exit	Observed Entry/Exit Altitude [Km]	Electron CUT-OFF Predicted Entry/Exit	Predicted Entry/Exit Altitude [Km]
285	RAD_ENTR R 2005-02-14T15:22:25Z	2005-02-14 14:45:23	>64079.2	2005-02-14 16:14:40	52986.03
286	RAD_EXIT R 2005-02-15T00:32:10Z	2005-02-14 23:02:03	>24866.1	2005-02-14 23:24:40	29289.82
286	RAD_ENTR R 2005-02-17T15:08:20Z	2005-02-17 15:40:28	<56213.2	2005-02-17 14:07:38	51382.06
287	RAD_EXIT R 2005-02-18T00:18:27Z	2005-02-17 22:44:36	24868.1	2005-02-17 21:17:38	30564.53

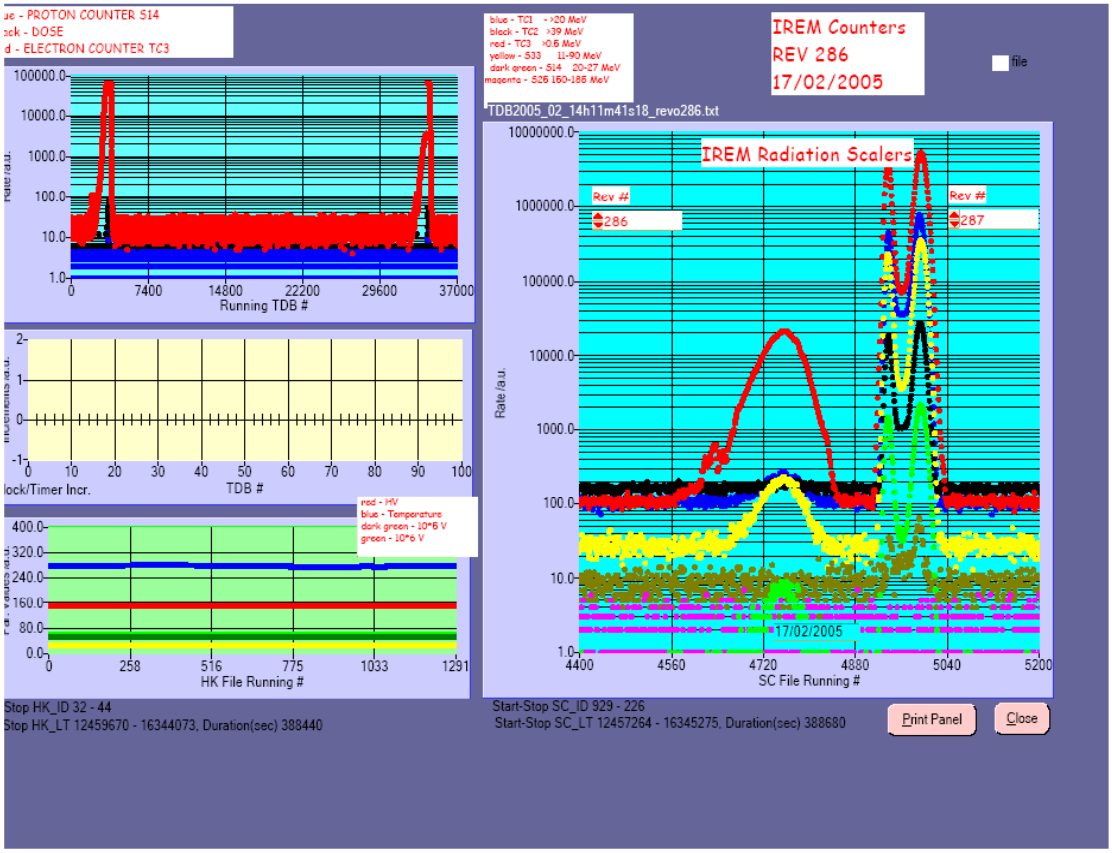
Reference
Very small error vs reference (less than 10 minutes)
Small error vs reference (between 10 and 30 minutes)
Large error vs reference (more than 30 minutes)
Radiation Spike

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.

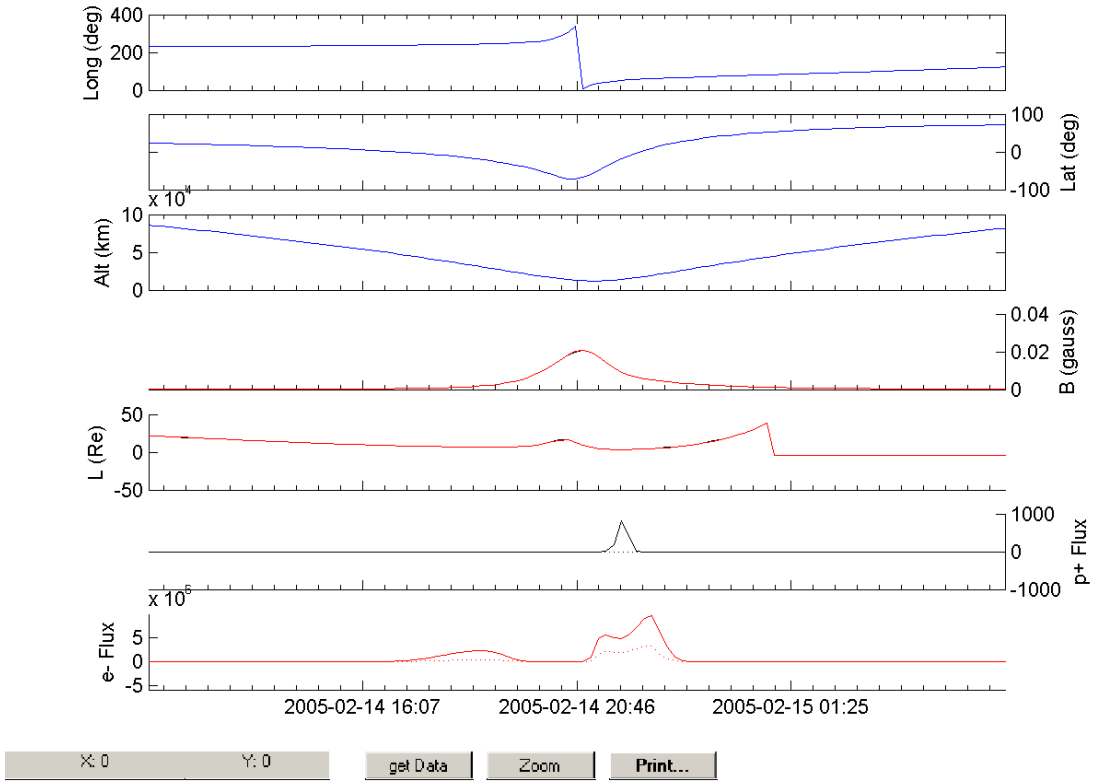
IREM radiation counters



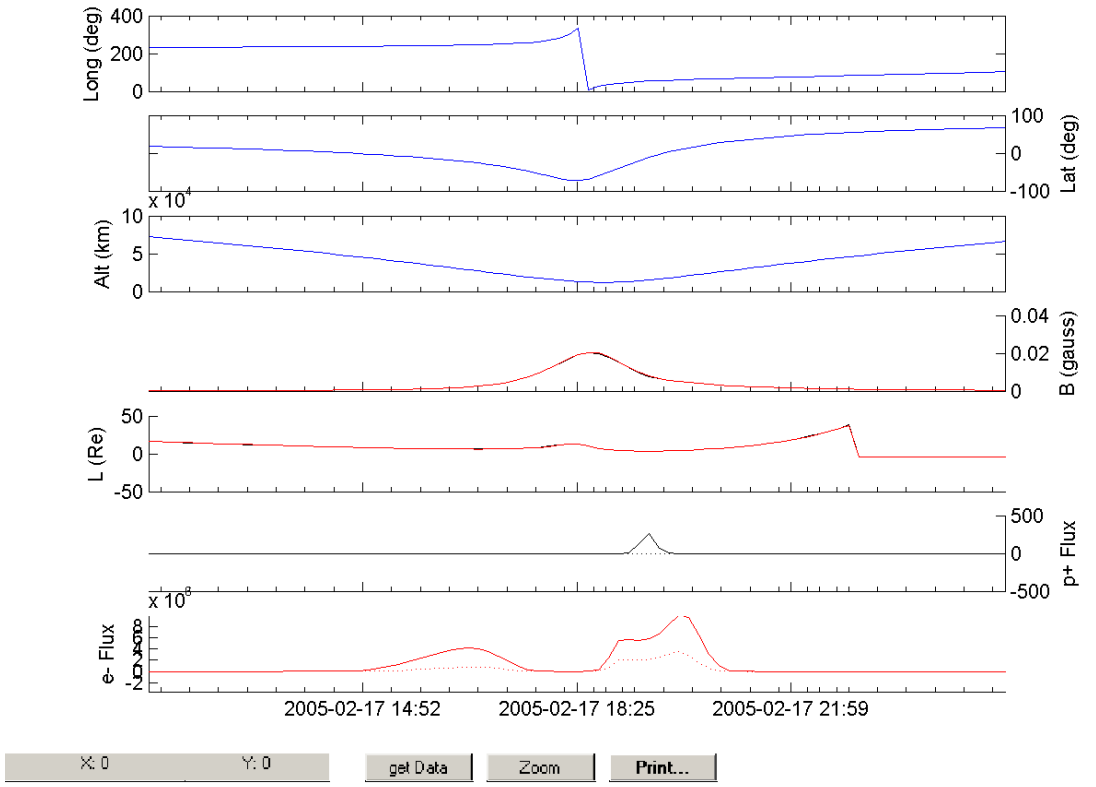


IREM Predicted Radiation Belt Passages.

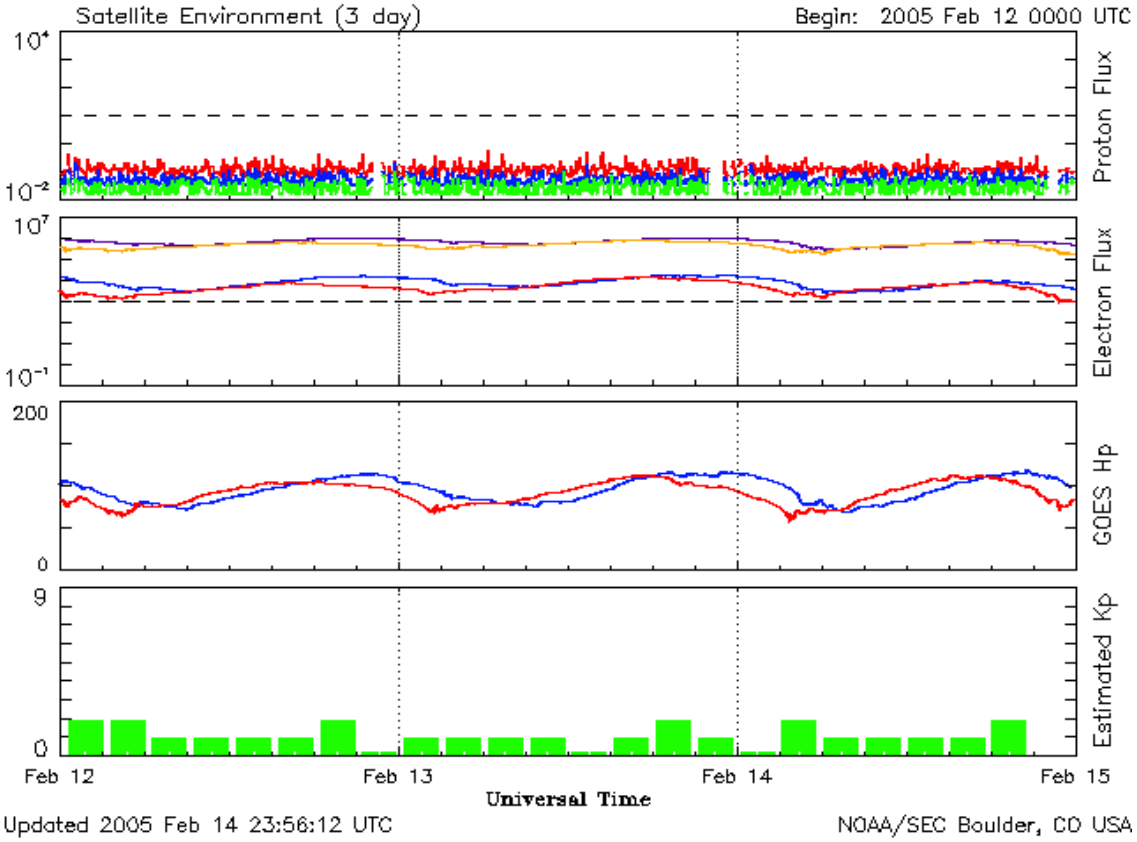
Rev 285

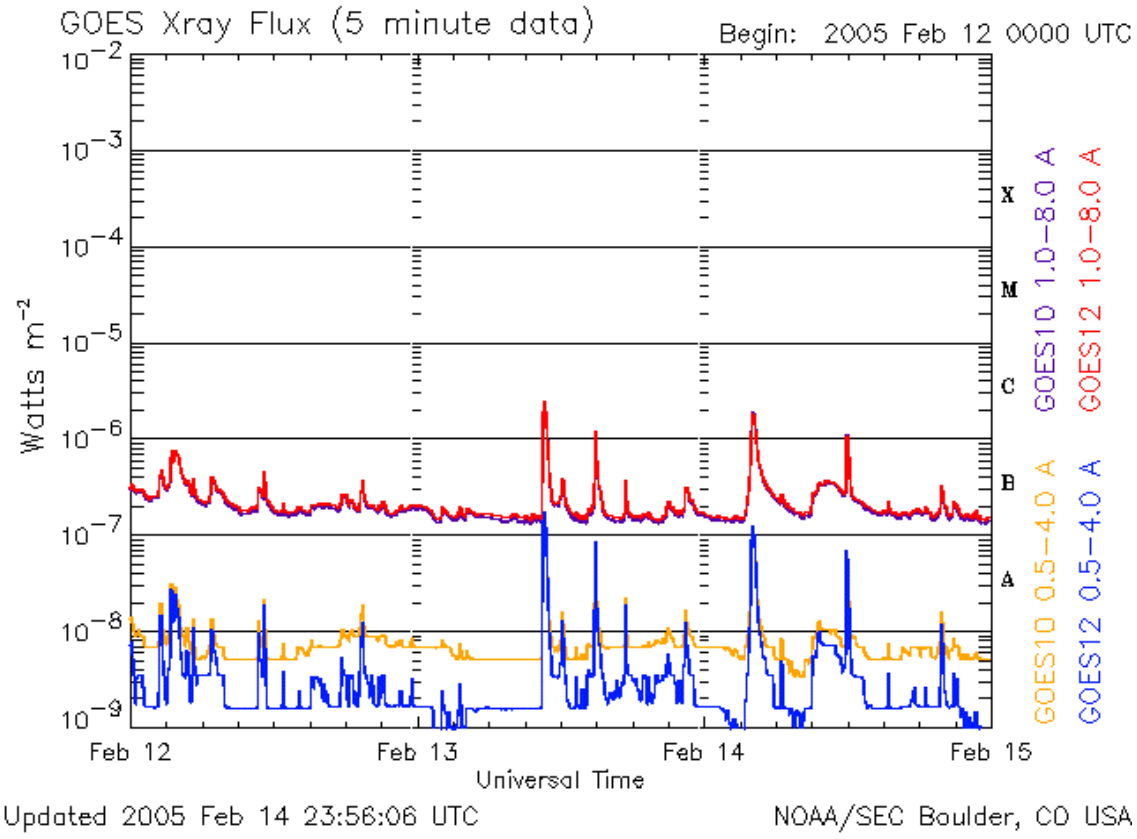


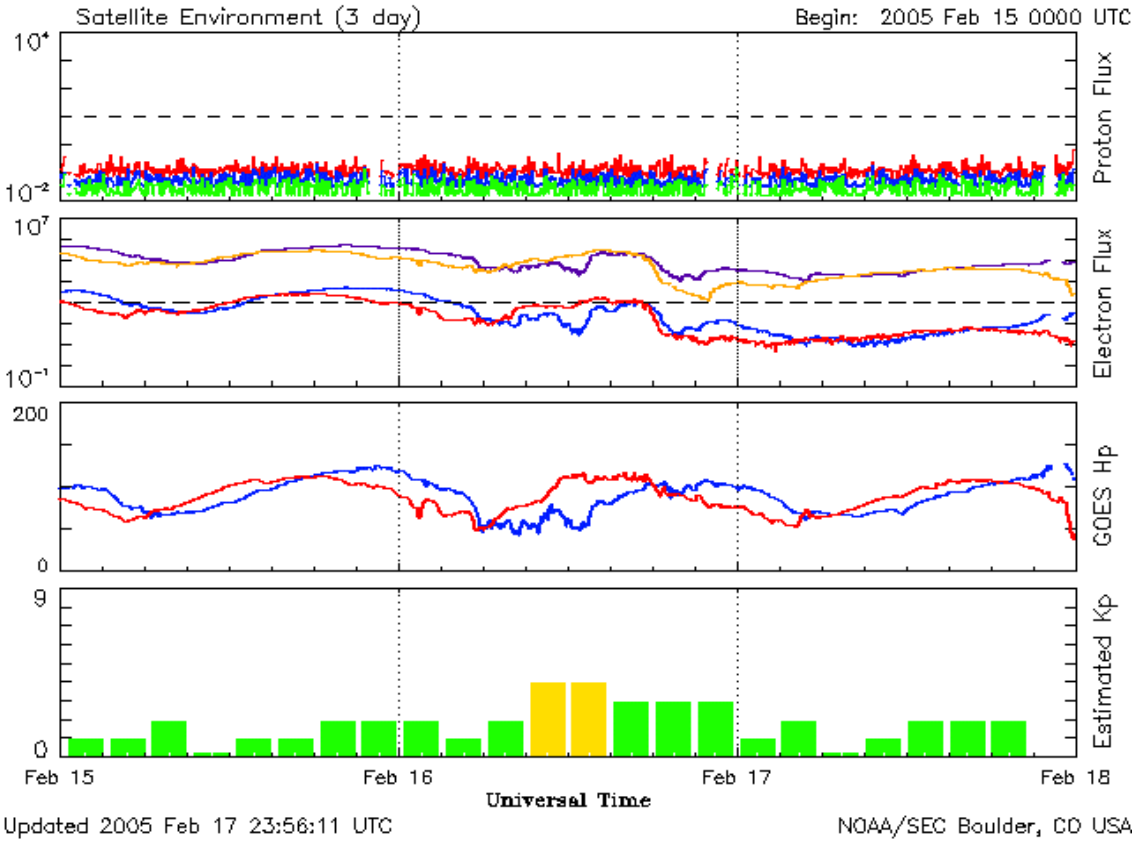
Rev 286

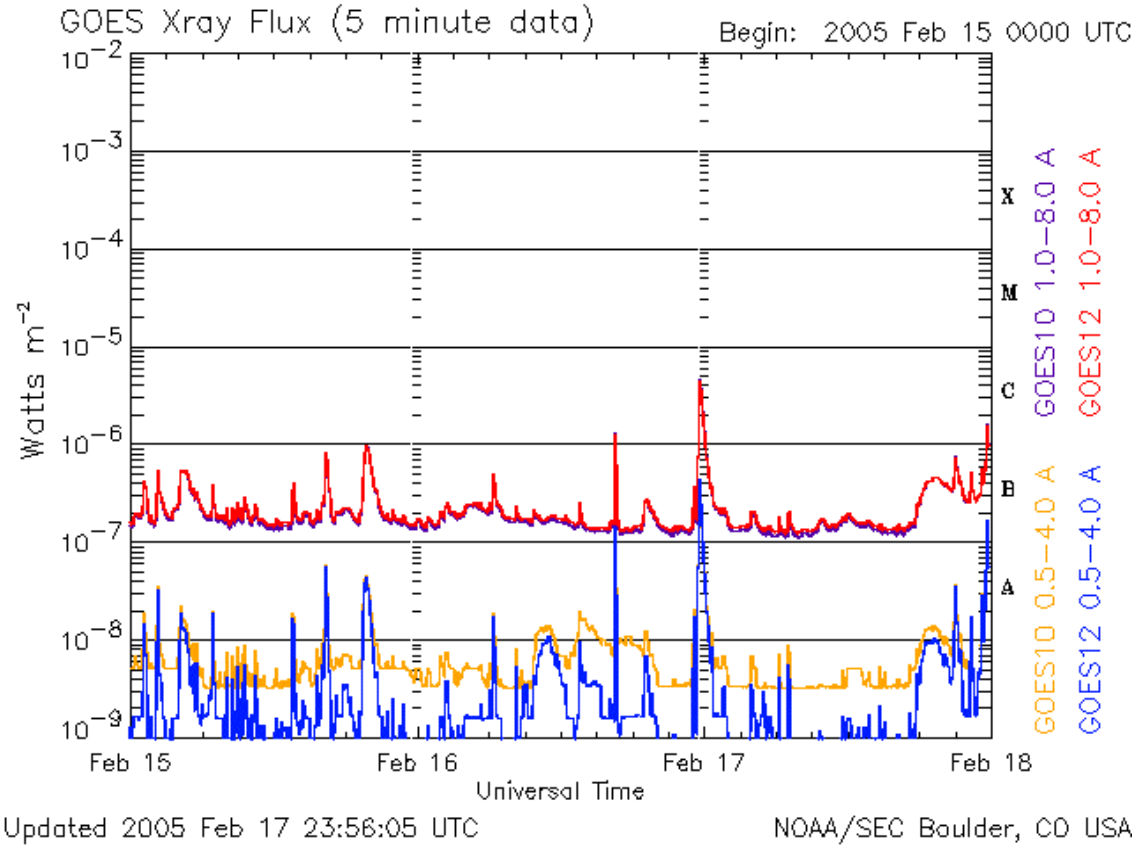


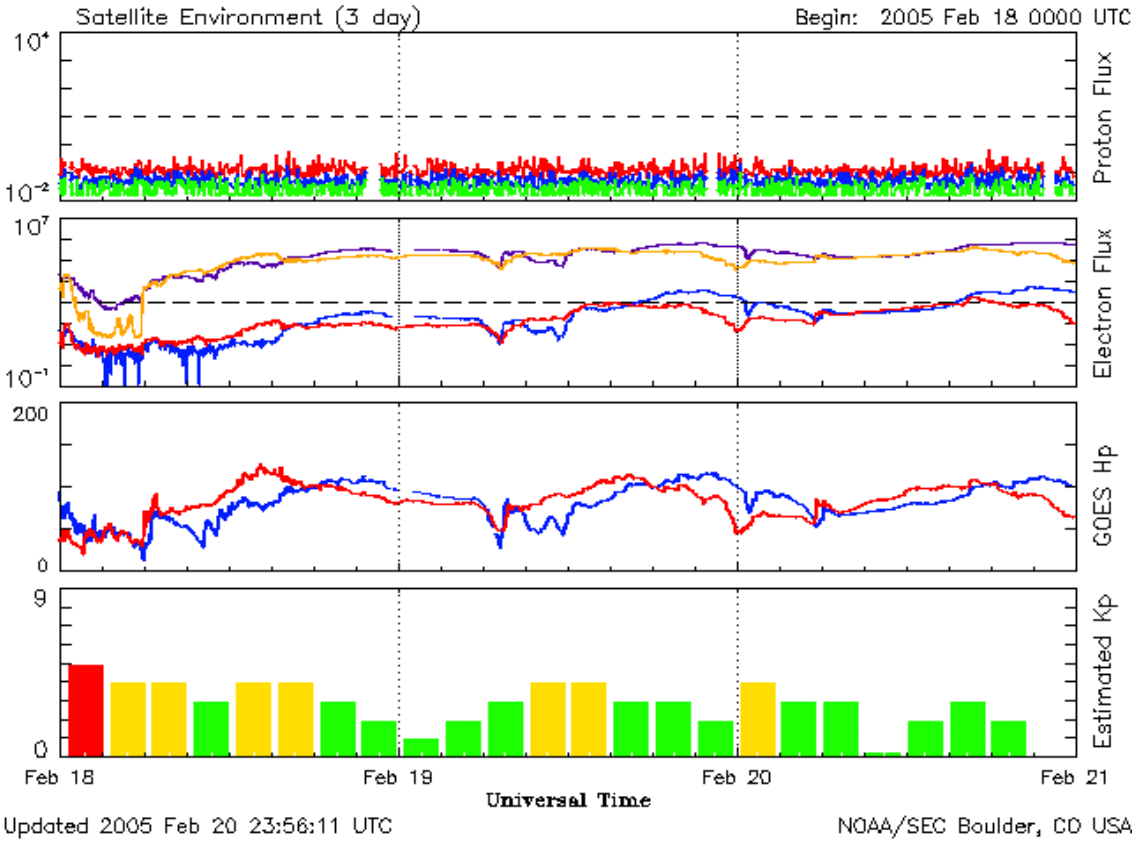
SEC-GOES Observed Particles Fluxes.

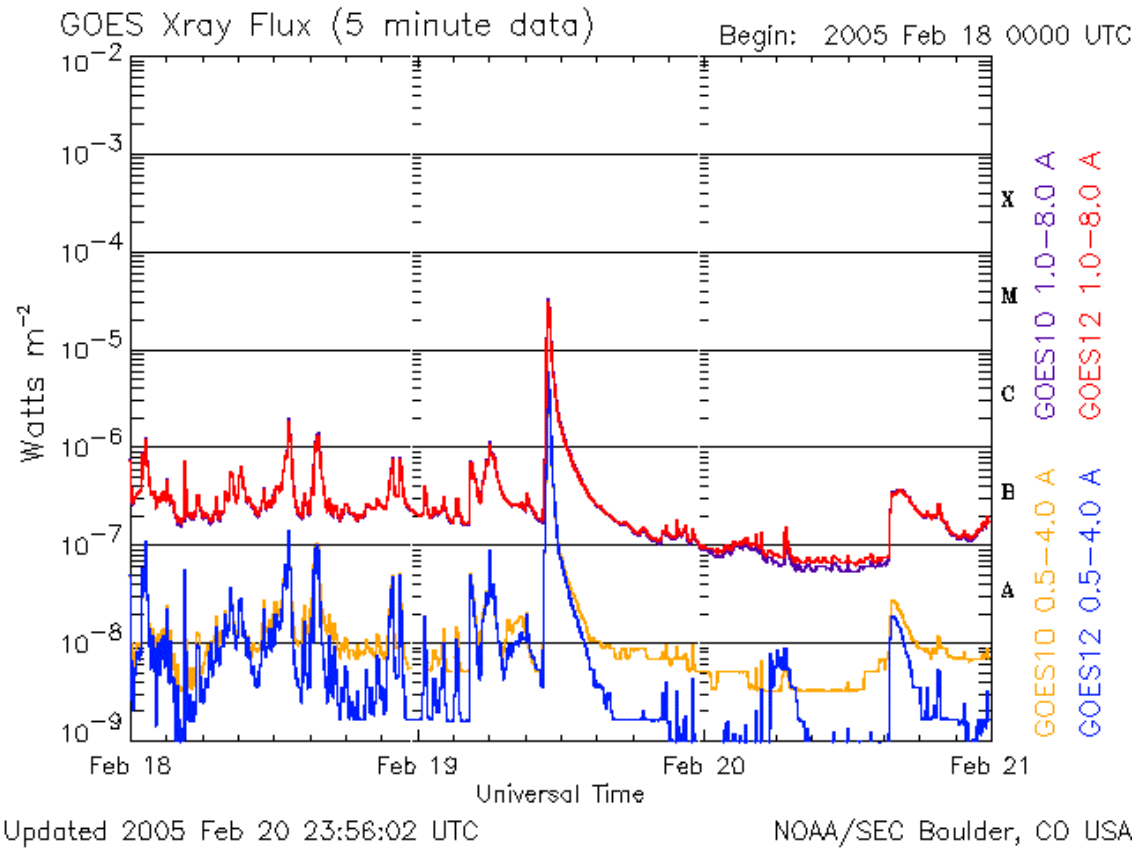





Satellite Environment (3 day)
Begin: 2005 Feb 15 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Feb 15
Feb 16
Feb 17
Feb 18
Universal Time
Updated 2005 Feb 17 23:56:11 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2005 Feb 15 0000 UTC
Watts m-2
X
M
C
B
A
GOES10 1.0-8.0 A
GOES12 1.0-8.0 A
GOES10 0.5-4.0 A
GOES12 0.5-4.0 A
Feb 15
Feb 16
Feb 17
Feb 18
Universal Time
Updated 2005 Feb 17 23:56:05 UTC
NOAA/SEC Boulder, CO USA


Satellite Environment (3 day)
Begin: 2005 Feb 18 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Feb 18
Feb 19
Feb 20
Feb 21
Universal Time
Updated 2005 Feb 20 23:56:11 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2005 Feb 18 0000 UTC
Watts m-2
X
M
C
B
A
GOES10 1.0-8.0 A
GOES12 1.0-8.0 A
GOES10 0.5-4.0 A
GOES12 0.5-4.0 A
Feb 18
Feb 19
Feb 20
Feb 21
Universal Time
Updated 2005 Feb 20 23:56:02 UTC
NOAA/SEC Boulder, CO USA