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

INTEGRAL
Mission Report

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

No. 098
Week 32

09.08.04

Routine Phase

Prepared by: M. Walker (OPS-OFO)

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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 31.07.04 until 06.08.04 (both dates inclusive) and covers the revolutions 220 & 221.

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 Algol (RA 03:08:10.13; DEC +40:57:20.3), SN 2004dj (RA 07:37:17.00; DEC +65:35:57.8) and PSR B1509-58 (RA 15:13:55.62; DEC -59:08:09.0). The activities consisted of hexagonal and raster dithering observations.

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

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

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

Three close loop slews were missed in two different instances due to the selection of the eclipsing binary Algol (beta Persei) as the slew star. Algol, which is a periodic variable system, was near its lowest magnitude at the time of the slew and the search process failed to pick it because the commanded magnitude was higher than the actual magnitude of the star. The star was excluded in the FDS.

Five more slews were missed in revolution 220 because of the cancellation of a Goldstone pass.

The guide star was released during two perigee passes, caused by false events on the STR, which triggered the STR SEU filter.

The fuel consumption over the period between 30/07/2004 and 06/08/2004 was 0.182 kg. The remaining propellant is in the order of 168.987 Kg on the 6th of August.

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

After the failure of Germanium Detector#17, on 17th July, the overall status of the instrument in this week is nominal, except for the PSD (Pulse Shape Discriminator), which reproduced twice the anomaly of 18th July (zero counts on all the PSD channel rates for a few minutes).
The instrument was maintained in photon-by-photon mode with spectra TM enabled, an assigned TM bandwidth in the science windows of 103 pkts/cycle and an actual average occupation of 88.8 pkts/cycle.
The cryo-cooler is working well, maintaining the 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.

During the reporting period the PST Allocation to IBIS was 129 TMSP / Cycle. The mean IBIS Bandwidth usage was 99.9 TMSP / Cycle, down 8.4 TMSP on last week.

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 was dormant with a TM allocation of 1 packet/cycle.

Further information on the JEM-X operations can be found in the Appendix Section 8.3.4.

3.2.4 OMC

The status of OMC is nominal.

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

There were 185 OMC pointings executed nominally, 9 were lost.

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

3.2.5 IREM

The overall status of the unit is Nominal.

Solar Activity
The observation period was characterised by the influence of the recent solar activity on the structure of the Radiation Belts. The last CMEs caused a strong modification of the Belt characteristics that affected revolution 219 and 220.

The proton counter showed high peak values during each passage, which were a few orders of magnitude over the typical values.

Data retrieved from SEC-GOES presented moderate proton level across 1st and 2nd of August.

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, 4 pointings were lost through unplanned events.

4.1 Mission Operations Centre

The performance of the MOC was in general good in the reporting period, there some problems with the FDS, which led to the loss of 2 pointings, and a PTV failure, which also led to the loss of 2 pointings, but apart from that, a quiet week.

4.2 Ground Stations & Network

The performance of the ground stations and Network was in general good this week. There were some minor problems with DSS-16 and a failure in the AD service with Redu, but neither problem led to the loss of scientific data. A pass with DSS-16 was cancelled owing to the delay in the launch of the US Messenger probe. The overall performance though was well above the 95% requirement.

4.3 Science Ground Segment

4.3.1 ISOC

1. Mission planning
PSFs: nothing new.
POS and POD: no new revolutions planned this week, but see below for ToO.
TSFs: complete up to revolution 222.

In response to the announcement of supernova SN 2004dj, two separate ToO alerts were received by ISOC. One was turned down, the other was accepted, and a corresponding replanning (POS, POD) for revolutions 221, 222 and 224 was performed, and TSFs for 221 and 222 were received back from MOC.

2. Observation status
No change in ECS status since last week. All pending OCSs have now been generated. In revolutions 202, 207 and 209 there are some periods when the good time is significantly less than the exposure time; these cases will be discussed in an ISOC-ISDC tele-con on August 9th.

3. ISOC science data archive
Nothing to report.

4. ISOC system
The ISOC system version 10.4 patch 5 is still in use.

5. Problems
No new problems.

4.3.2 ISDC

Status of ISDC observation processing on 09/08/2004:

- Latest Standard Analysis completed: amalgamated observations 02200210001, 02201030001, 02297000004 (Carina, Revolution 197-200) on 29/07/2004

- Latest products archived: amalgamated observations 02200210001, 02201030001, 02297000004 (Carina, Revolution 197-200) on 30/07/2004

- Latest observation products sent to the observer: amalgamated observations 02200210001, 02201030001, 02297000004 (Carina, Revolution 197-200) on 07/08/2004

5 Special Events

6 Anomalies

There were a number of problems related to the ground segment that impacted the operations:

- On DoY 213, at 12:50, sun121 was in a yellow state, with 42%of the available cpu being used. The number of displays was reduced, and the state returned to green.
- On DoY 214, at 05:30, there was a drop in the bad frame link with DSS-16. At 05:44, the TCP was swapped to cure the problem, the corresponding DR# is G104673. At 07:24, there was a drop in the TM & TC links with DSS-16, for no apparent reason, the links returned at 07:26 without any impact.
- Later, at 12:43, there was a Flight Dynamics alarm, that the update slew had failed to determine a good attitude. Also, the wheel profile plot on sun126 was not updating. Flight Dynamics were called in to fix the problems, there was no impact.
- At 13:45 an AOCS command: A3085 (RC Sun Steer Ini) was unverified, and at 13:46, there was an error getting latest sample of load task parameter: TC A3086 due to the interlock from the previous command.
- On DoY 215 at 09:47, an AOCS command failed release due to PTV failure, the impact was pointings 02200040 & 02200041 were missed.
- On DoY 216 from 05:13 to 08:16, the Timeline was interrupted, due to the launch of the US probe Messenger, causing the cancellation of a DSS-16 pass. The impact was the loss of pointings 02200075 through to 02200079.
- Later, at 21:34, a FD alarm on sun125 was observed: Update slew failed to generate IPF (level 2), No IPF is generated for slew-id 02200105. the cause was the mapping had failed to find a suitable star. The impact was pointings 0220105 & 0220106 were lost.
- On DoY 218, at 22:48, the TC link with Redu was lost, at 22:58, the TM link dropped as well, without any apparent cause. At 23:01, Network reported they couldn’t re-establish the AD service, and it was decided to continue with TC2 and BD mode. There was no impact.

The following new anomaly report was entered into the ARTS system.

AR id	Date Occurrence	Subject	Segment	Status
INT-2627	02/08/2004	INTEGRAL LCTF system in Redu out of order	FDS	Pending

7 Future Milestones

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 220
In revolution 220 a raster dithering observation of Algol (RA 03:08:10.13; DEC +40:57:20.3) was performed throughout the available observation time (~62 hours).

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

Revolution 221
The observations in revolution 221 consisted of a hexagonal dithering observation of the Target of Opportunity SN 2004dj (RA 07:37:17.00; DEC +65:35:57.8) lasting ~4 hours, followed by an amalgamated raster dithering observation of PSR B1509-58 (RA 15:13:55.62; DEC -59:08:09.0), performed for the remaining ~55 hours of observation time.

Throughout these observations all instruments were in their nominal science modes, except for JEM-X2, which was in Safe mode, 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

```
2004-07-23T22:20:59.000Z     169.3178    F   Automatic TM processing.
2004-07-25T00:00:38.000Z     169.3016    F   Automatic TM processing.
2004-07-26T07:57:38.000Z     169.2291    F   Automatic TM processing.
2004-07-26T13:02:18.000Z     169.2216    F   Automatic TM processing.
2004-07-26T22:02:27.000Z     169.2060    F   Automatic TM processing.
2004-07-27T23:41:26.000Z     169.2020    F   Automatic TM processing.
2004-07-29T14:12:27.000Z     169.1809    F   Automatic TM processing.
2004-07-29T14:58:27.000Z     169.1691    F   Automatic TM processing.
2004-07-30T22:51:26.000Z     169.1619    F   Automatic TM processing.
2004-08-01T07:26:02.000Z     169.1397    F   Automatic TM processing.
2004-08-01T12:35:22.000Z     169.0780    F   Automatic TM processing.
2004-08-02T22:45:18.000Z     169.0560    F   Automatic TM processing.
2004-08-04T07:15:05.000Z     169.0420    F   Automatic TM processing.
2004-08-04T12:22:17.000Z     169.0200    F   Automatic TM processing.
2004-08-04T18:37:14.000Z     168.9870    F   Automatic TM processing.

This report was generated  Fri Aug 6 08:00:17 GMT 2004
```

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 31/07/2004-06/08/2004

AOCS operations were executed from the Automatic Timeline.

During this period, 44 Open Loop Slews, 153 Closed Loop Slews and 6 Momentum Bias were executed. 8 slews were missed or executed manually. This is equivalent to a 4.1%.

31/07/04 (Day of Year 213, Revolution 219)

Nothing to report.

01/08/04 (Day of Year 214, Revolution 219-220)

Guide star released by the STR SEU Filter of the ACC: At 11:08:29, during the perigee passage, the guide star was release when the number of detected false events on the STR exceeded the SEU filter threshold. At LOS the magnitude 6.85 star was located at CCD coordinates [-12006, 824]. At AOS, the new guide star was at [3877, -5285] with magnitude 4.45.

02/08/04 (Day of Year 215, Revolution 220)

Close loop slew failed execution: At 09:47, close loop slew 02200040 failed execution because the actual magnitude of the slew star was lower than the commanded magnitude and the STR did not pick the star in the search process. The commanded star was the eclipsing binary system Algol (Cat. # 2851 2168). Every 68.75 hours the magnitude of Algol drops rapidly by about an order-of-magnitude before returning as rapidly to its normal brightness. The blinking takes about 8 hours. The catalogue magnitude of Algol is 2.49 and the commanded magnitude was 2.75. The magnitude reported in TM as seen by the STR was 3.30 – 3.55 at this time. Slews 02200040 and 02200041 were missed from the Timeline.

Algol was later excluded in the Flight Dynamics System to prevent further problems.

03/08/04 (Day of Year 216, Revolution 220)

Slews missed from the Timeline due to cancellation of the Goldstone pass: Because of the launch of the MESSENGER spacecraft, the Goldstone pass planned from 04:41 to 08:02 was cancelled and slews 02200075 to and including 02200079 were missed from the Timeline. During this time INTEGRAL was staring in the attitude of PID 02200074.

FDS failed to generate update for close loop slew 02200105: The only suitable star to perform close loop slew 02200105 at this attitude was Algol, which was previously excluded from the FDS. The system therefore failed to generate the slew update TPF. PID 02202105 was lost and the Timeline was rejoined by performing an open-loop slew to the attitude of PID 02202106.

When a star is excluded in the FDS, all the already-planned future close loop slews are checked to verify if they could still be executed as close loop slews. If not, the

slew(s) are changed to open-loop slew(s) in the Timeline. This was also done when Algol was excluded. However, FD apparently missed analysing slew 02202105 and converting it to an open loop slew.

04/08/04 (Day of Year 217, Revolution 220-221)

Guide star released by the STR SEU Filter of the ACC: At 11:19:57, during the perigee passage, the guide star was release when the number of detected false events on the STR exceeded the SEU filter threshold. At LOS the magnitude 6.10 star was located at CCD coordinates [6617, -2647]. At AOS, the new guide star was at [-2052, -10] with magnitude 2.45.

Flickering of the Pointing-Bit due to Roll Error at the end of corrective open loop slew: At the end of corrective open loop slew 02210002 the error in roll with respect to the sun-steering law assumed roll angle was 196.5 arc-seconds. This is more than the OTF threshold for roll and caused the flickering of the pointing-bit, which was not seen at BCP level. This error was already there at the beginning of the slew. The attitude reconstruction for updating the slew parameters were based on the first mapping after open loop slew 02210001 with 47° amplitude. Enabling of the SSL during this mapping introduced and error in the attitude determination, which was propagated into the next slew.

Flickering of the Pointing-Bit due to Pitch Error: At 21:13:00 and undetected false event on the star tracker caused a jump in the position of the CCD image of the guide star. The error in pitch 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 8.2 guide star was picked by the ACC after an open loop slew.

05/08/04 (Day of Year 218, Revolution 221)

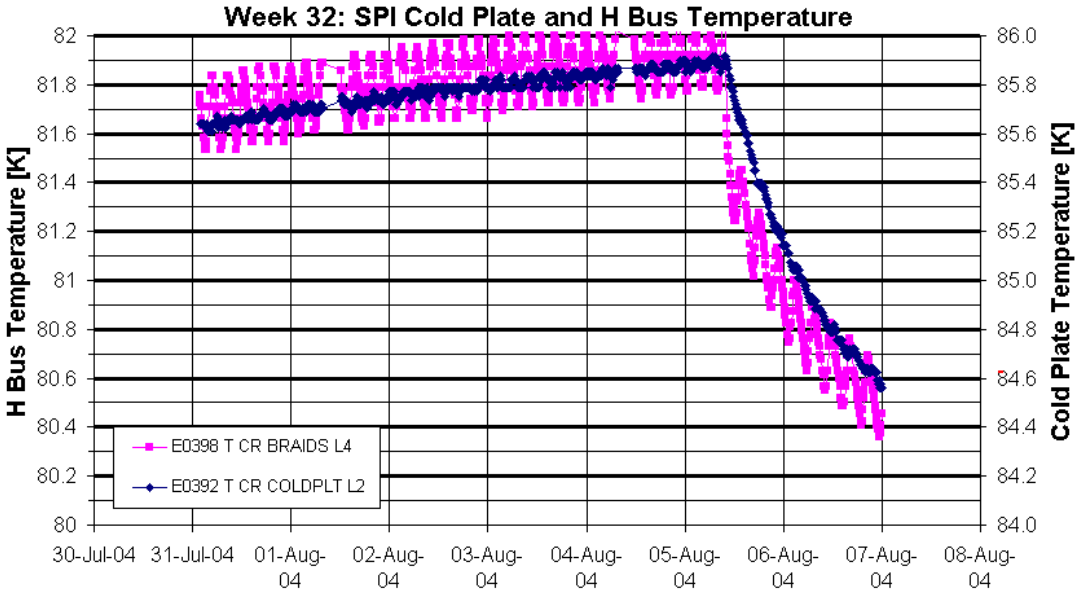
Nothing to report.

06/08/04 (Day of Year 219, Revolution 221)

Nothing to report.

8.3.2 SPI Operations

Cryo-cooler / Detector Cold-Plate:
The performance of the cryo-cooler is nominal.
The cold plate temperature was maintained at 85K+/-1K though still showed a notable positive drift, present since the last annealing cycle, completed on 30th June. The SPI PI has been contacted to provide an assessment and confirmed that the increased drift is still to be considered nominal
The following plot shows the evolution of the cold-plate and H bus temperatures during the reporting period.

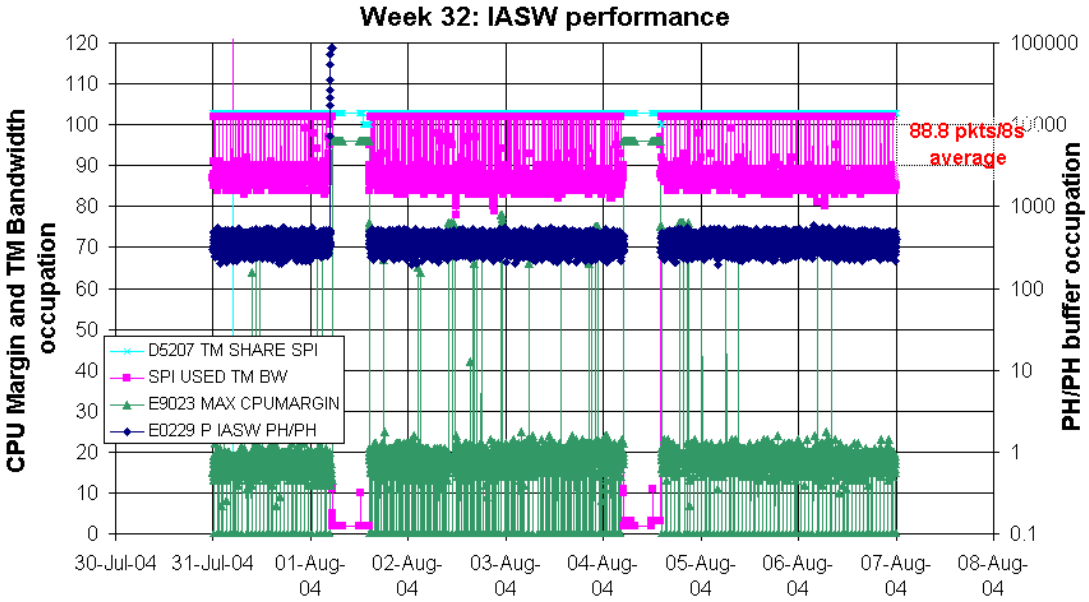


IASW/DPE:

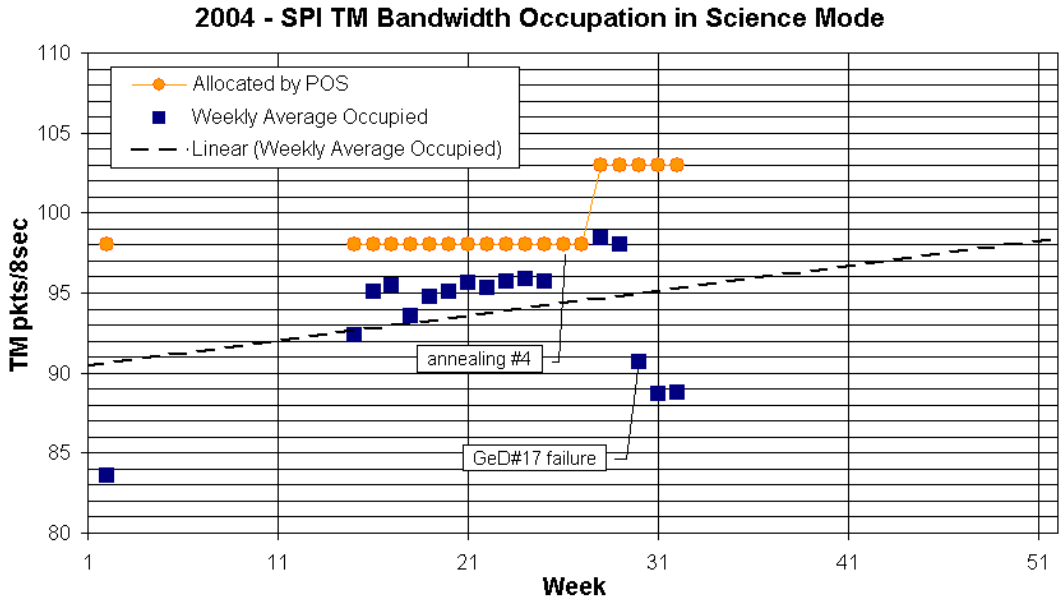
The performance of the IASW/DPE is nominal.

The average TM bandwidth occupation was 88.8 pkts/cycle in the science windows.

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



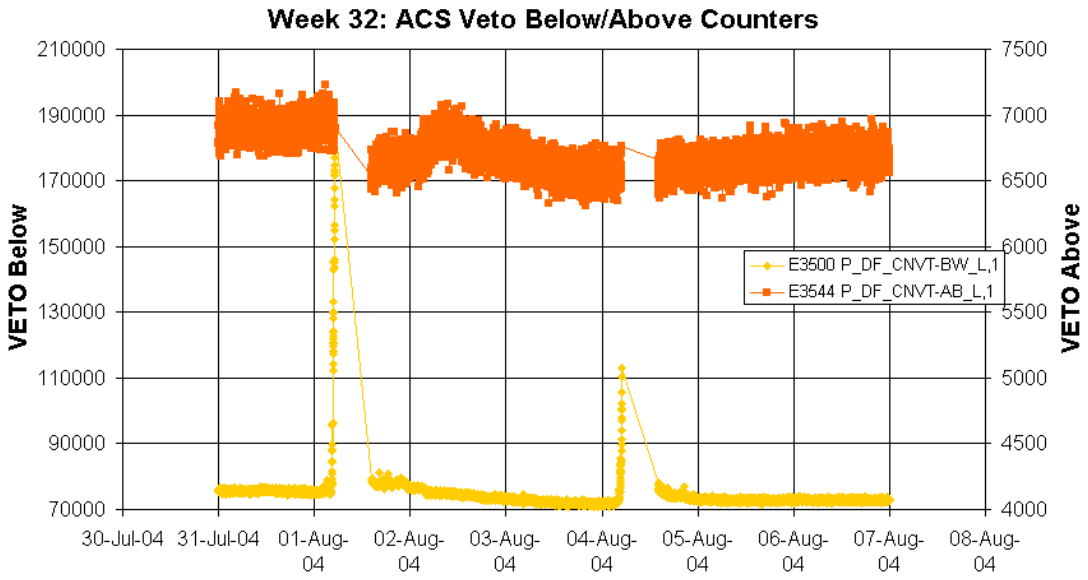
The following plot shows the trend of the occupied bandwidth, since beginning of 2004.



ACS:

The performance of the ACS is nominal.

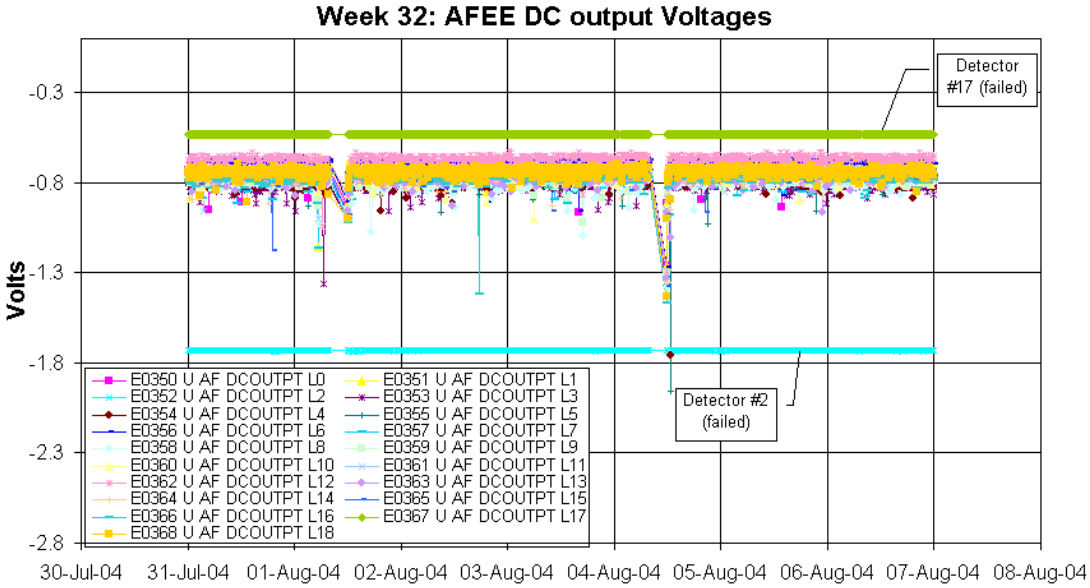
The following plot shows the ACS overall count rate evolution during the reporting period.



AFEE:

The performance of the 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.

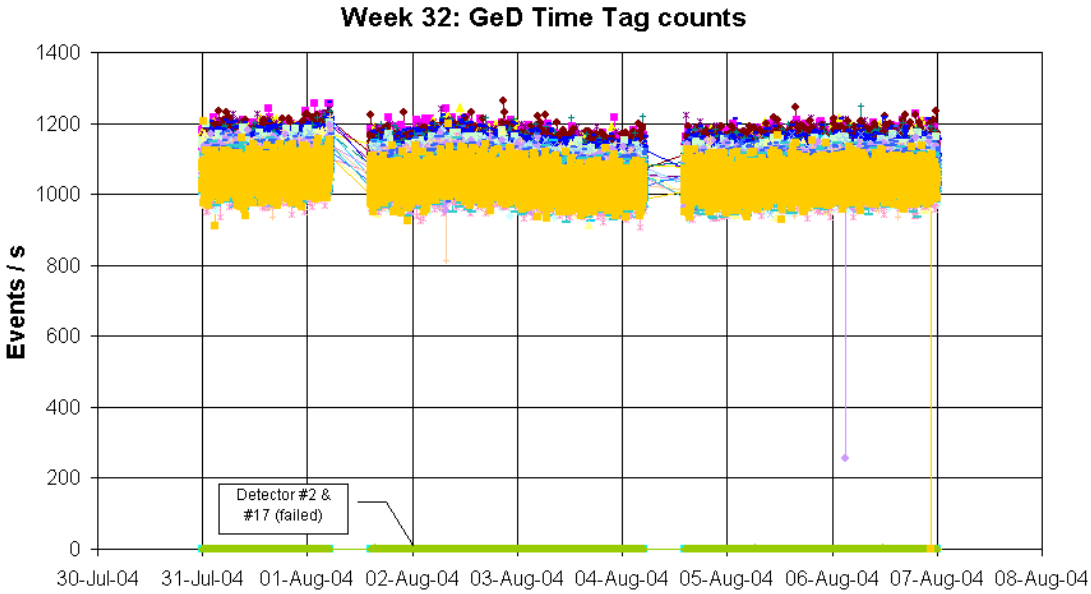


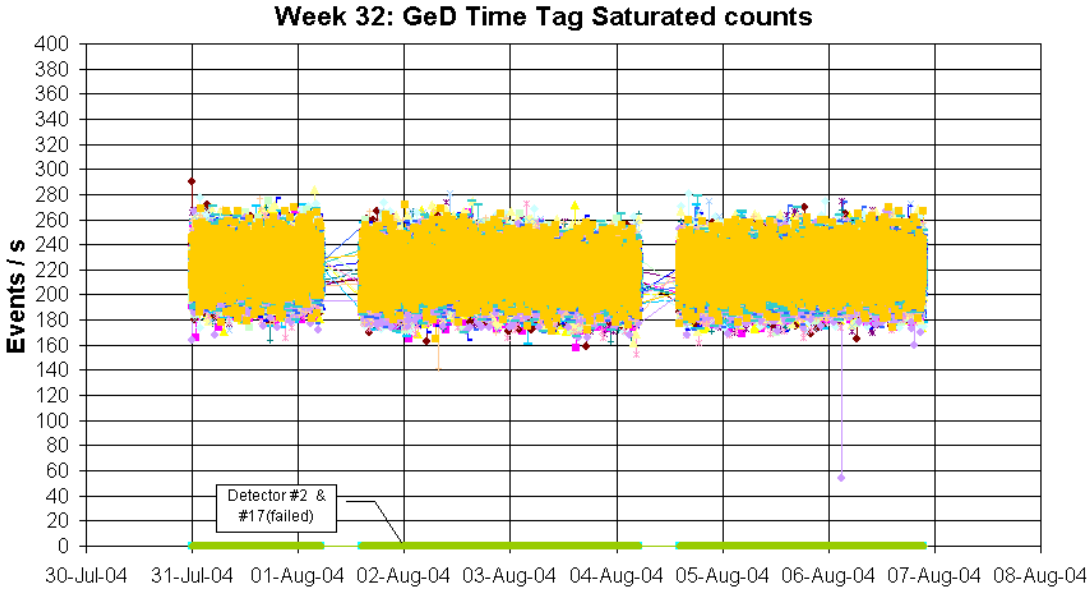
DFEE:

The performance of the unit is nominal.

The following plot shows the GeD Time Tagged, Time Tagged Saturating and 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.





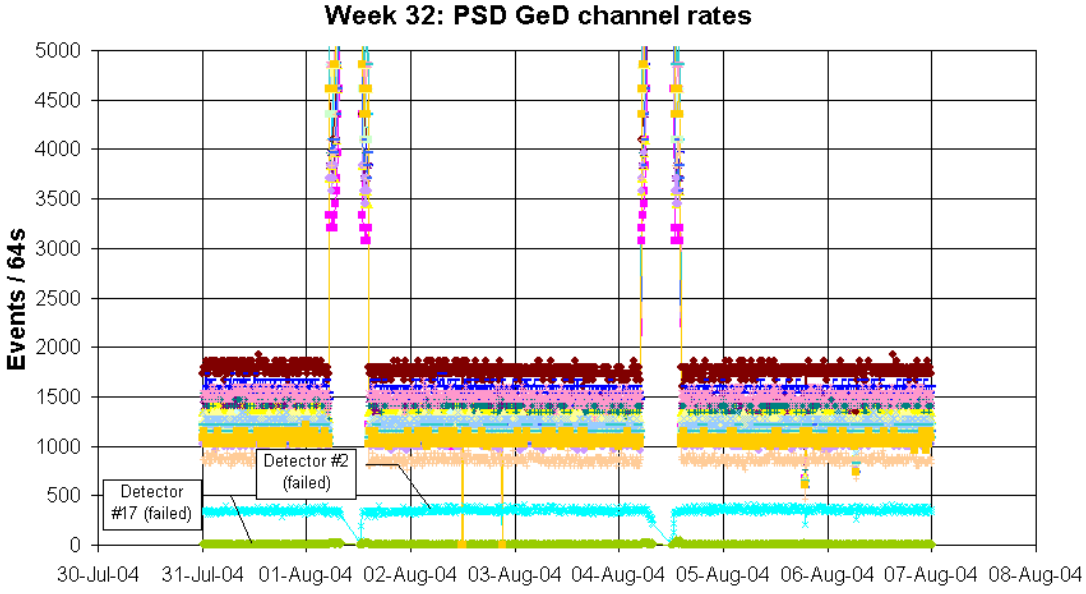
PSD:

The performance of the unit is nominal, though the malfunction logged as AR INT_SC-90 occurred again twice on 2nd August (all the PSD channel rates drops to zero counts for a few minutes).

The anomaly affected only the PSD locally as the GeD count rates measured by the DFEE (see above) were still nominal; also the dc output voltage showed a nominal pattern during the malfunction.

This anomalous "hang-up" was already observed once, the day after the GeD#17 failure and current explanations correlate it to this failure. A possible recovery procedure is under discussion with the PI.

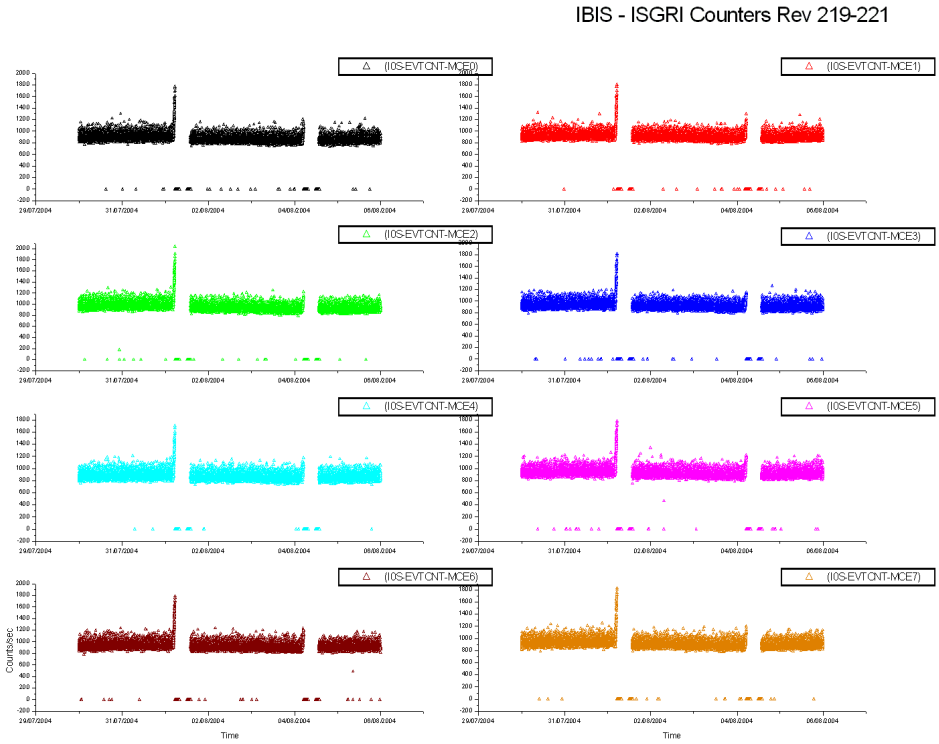
The following plot shows the PSD channel rates during the reporting period.



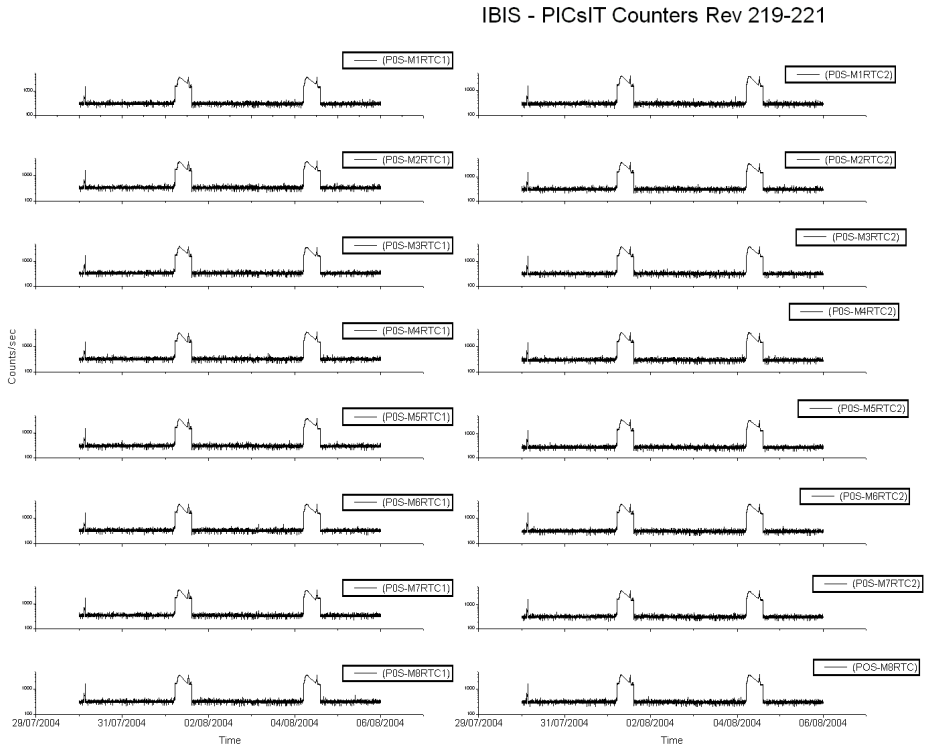
8.3.3 IBIS Operations

IBIS Event Counters Plots.

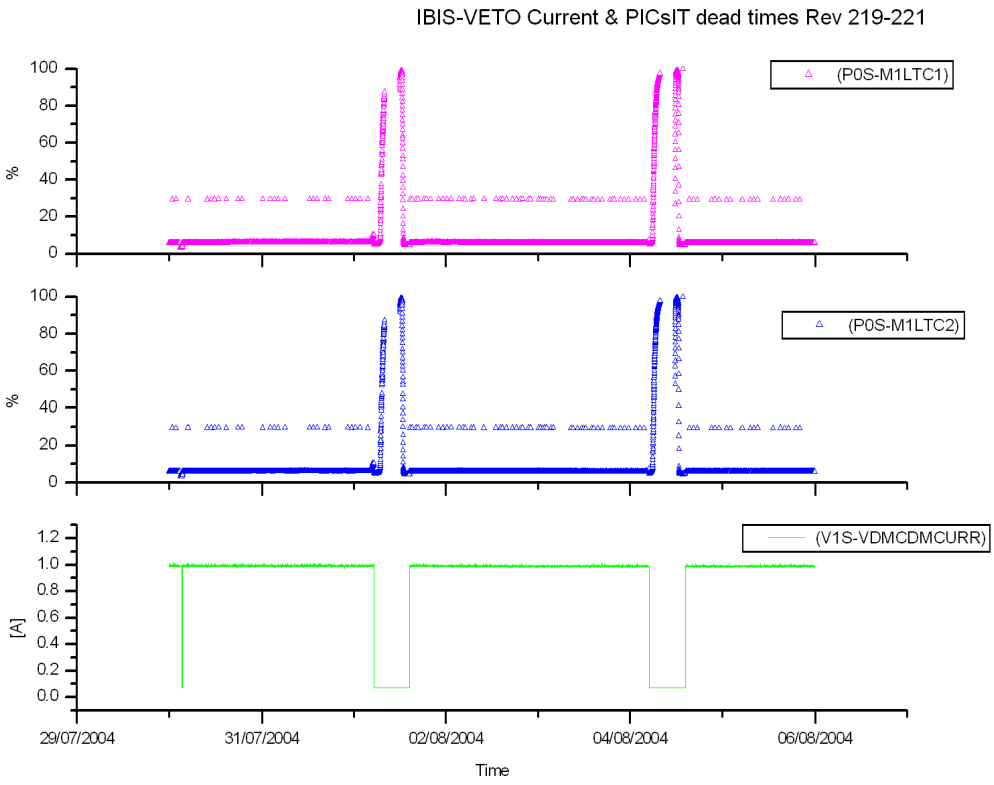
ISGRI Counters:



Picsit Counters:

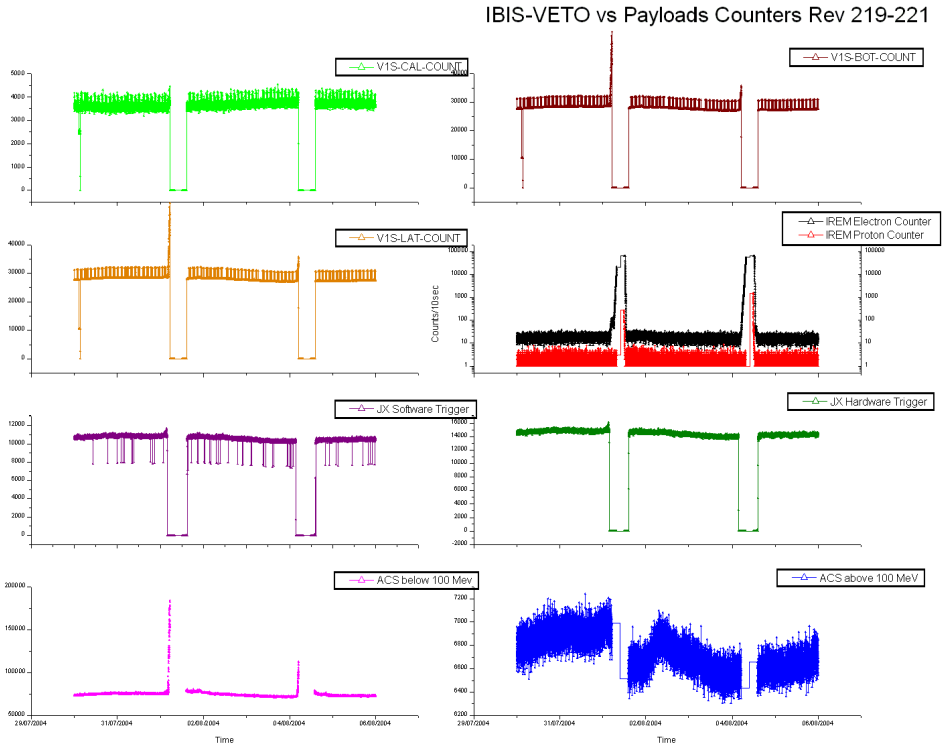


Veto Current:



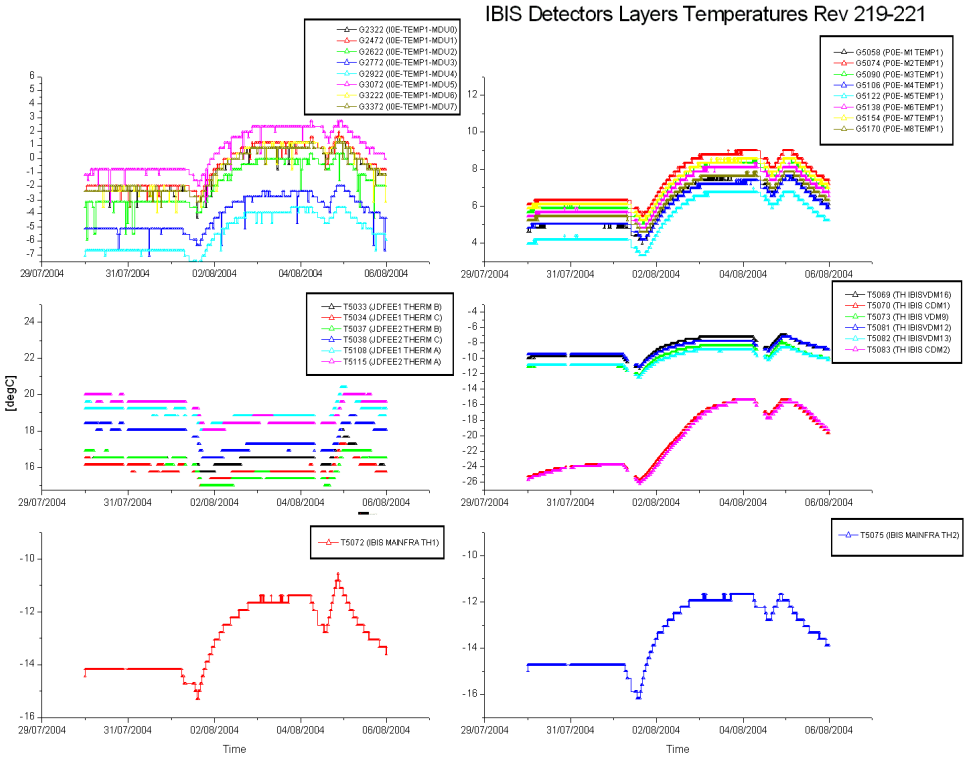
VETO vs Payloads Counters

The comparison between the count-rates reported by VETO, the SPI-ACS, the IREM counters and JEM-X hardware/software triggers, gives an indication of the fluctuation of the radiation background driven by the solar activity in the previous week. As previously observed, this is only a temporary effect which should progressively disappear in the following revolutions.



**with the exception of IREM counters (counts/10sec), all the plots are reporting counts/sec

IBIS Detectors Layers Temperatures



IBIS daily report

DoY 2004.212 (30/07/04)

At 2:50Z the parameter G6061 (counter for VETO calibration unit) in alarm low was reported. After consultation with the IBIS SOE it was decided to switch OFF the VETO high voltages (by cycling the VETO mode Nominal/Stand-By) for 5 minutes. After the transition back to Standard Mode the parameter G6061 reported value inside limits. No further action was taken.

DoY 2004.213 (31/07/04)

Nothing to report.

DoY 2004.214 (01/08/04)

At 13:55Z the OEM APID 1280 CLASS 0 ID 169 <<HK OUT OF SYNCH>> flagging a lost of synch in the HK telemetry was reported. The problem was solved autonomously by the unit and no further action was taken.

At 14:04Z the parameter G2000 (Overflow of the noisy pixel address buffer in MCE0) failing the SCC (OOL) was reported. The parameter indicated an overflow of the number of the noisy pixels for the ISGRI detector module # 0. The parameter returned within limits after one TM cycle. No further action was taken.

DoY 2004.215 (02/08/04)

Nothing to report.

DoY 2004.216 (03/08/04)

At 05:13Z due to the cancelation of the DSS16 pass for the Messenger launch , the unit was left in Scientific Standard Mode at the attitude of PID 74 until 08:16Z. The PIDs 02200075-79 were missed.

DoY 2004.217 (04/08/04)

Nothing to report.

DoY 2004.218 (05/08/04)

Nothing to report.

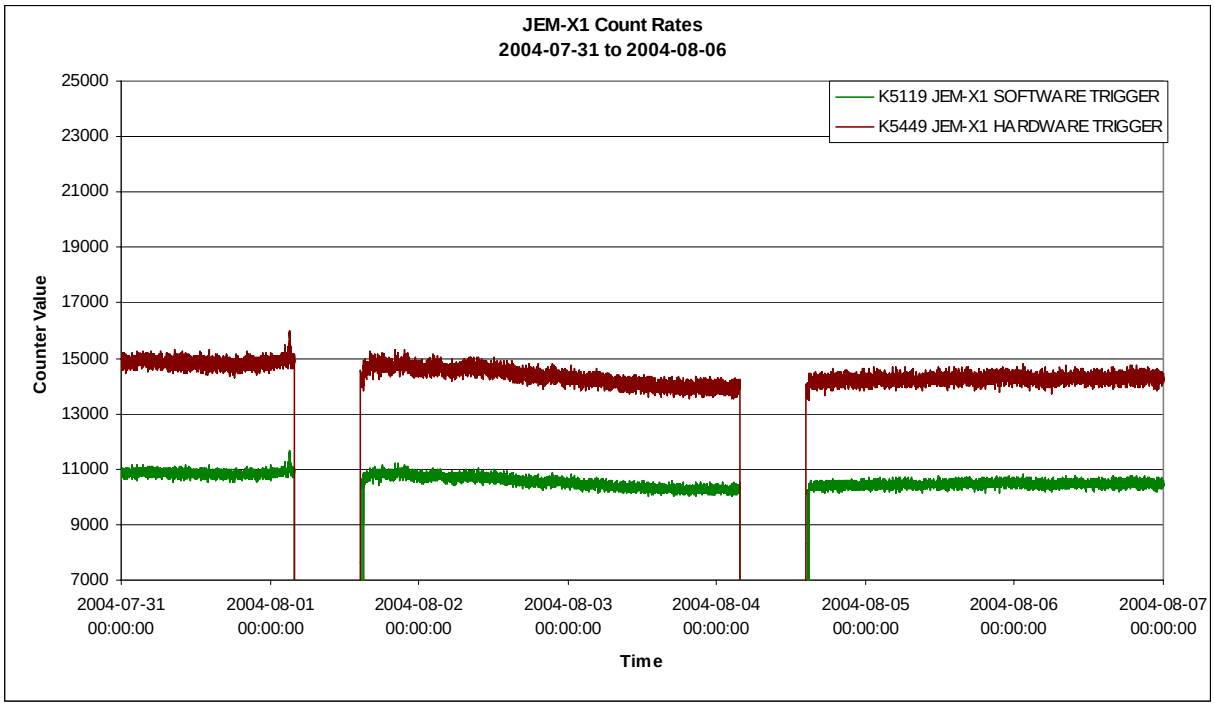
DoY 2004.219 (06/08/04)

Nothing to report.

8.3.4 JEM-X Operations

8.3.4.1 JEM-X Count Rates

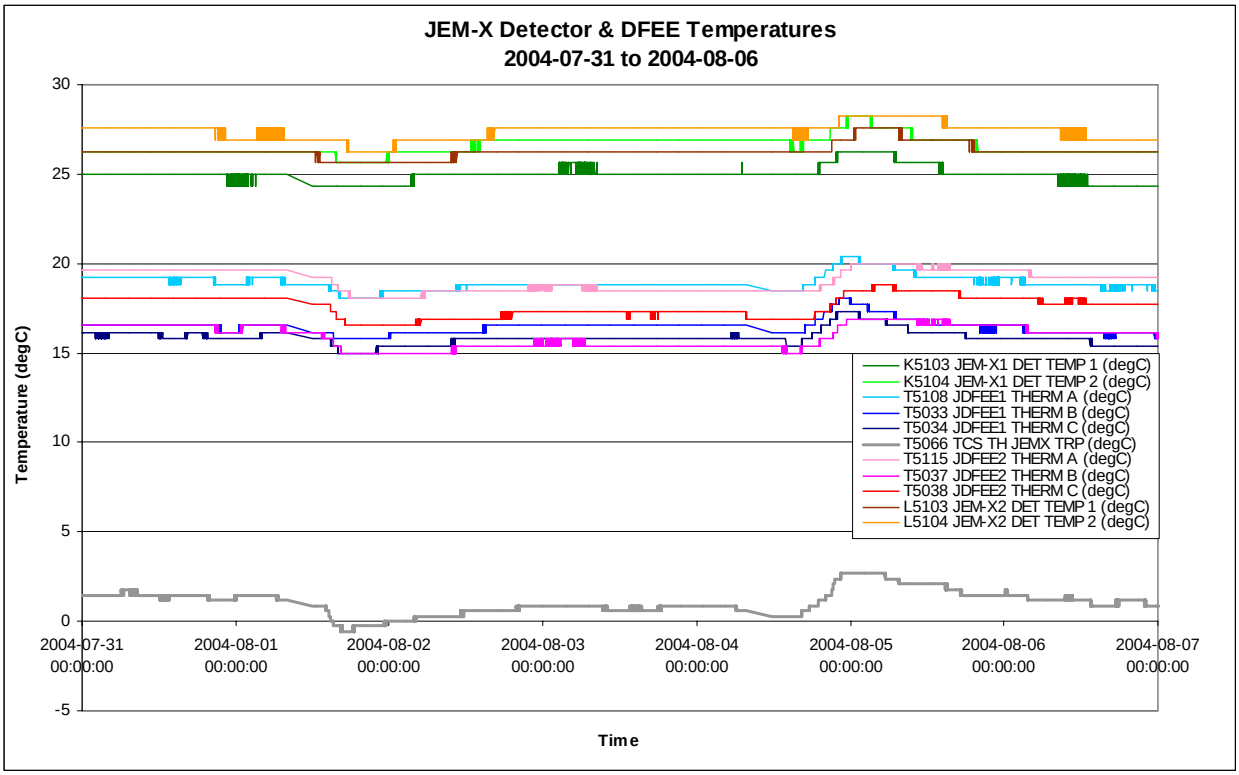
JEM-X count rates over the reporting period are displayed in the following graph[1].



8.3.4.2 JEM-X Temperatures

The JEM-X1 and JEM-X2 detector temperatures over the reporting period are displayed in the following graph, along with the temperatures at a selection of DFEE locations and on the detector bench between the two units[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

2004-07-31 (DOY 213, Rev 219) to 2004-08-06 (DOY 219, Rev 221)

Nothing to report.

8.3.5 OMC Operations

On DoY 215, at 09:47, an AOCS problem caused the loss of pointings 02200040 & 02200041, it was at this time that the following pairs of commands were rejected:

```
2004.215.09.50.38.764 2004.215.09.50.31.260   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=444
2004.215.09.50.30.038 2004.215.09.50.25.010   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=443

2004.215.10.22.46.545 2004.215.10.22.36.511   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=446
2004.215.10.22.39.073 2004.215.10.22.30.011   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=445
```

These correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) commands for those pointings.

On DoY 216, from 05:13 to 08:16, due to the delayed launch of the US Messenger probe, a DSS-16 pass was lost, the impact was the loss of pointings 02200075 through to 02200079.

On DoY 216, at 21:34, due to the Flight Dynamics system failing to find a suitable star, the Timeline was interrupted, the impact was the loss of pointings 02200105 & 02200106, it was at this time that the following pairs of commands were rejected:

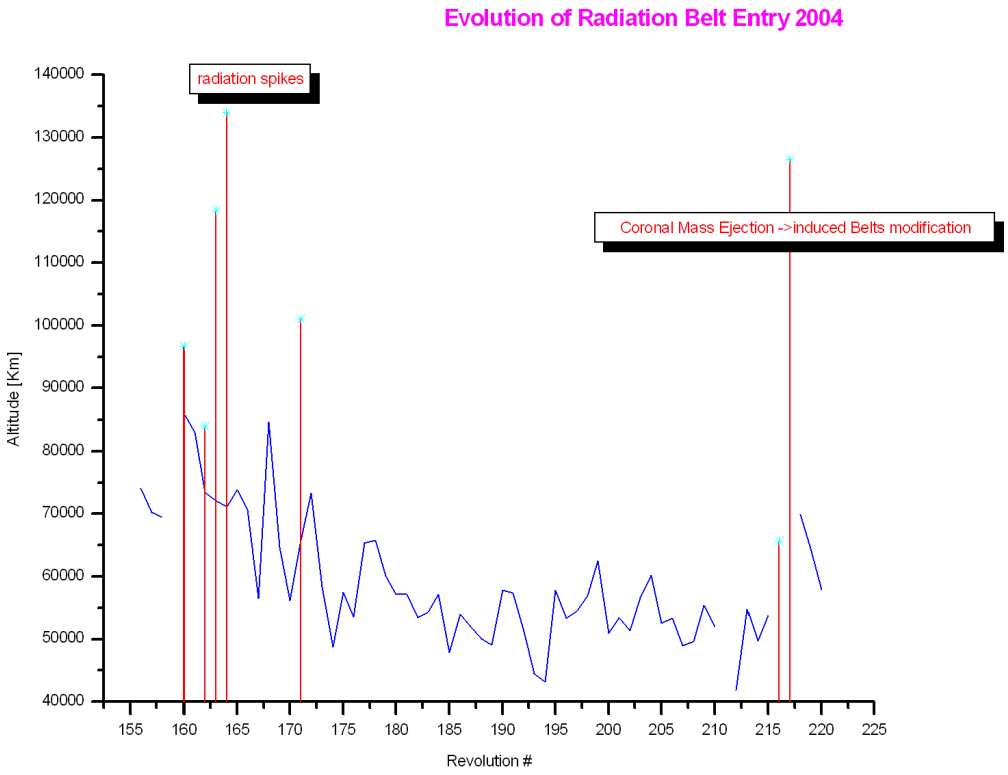
```
2004.216.21.59.49.758 2004.216.21.59.44.578   1792  Real Time Rejection 131
REJECTED TC1
        FIX2=0 M5010=6,NORMAL M9079=3 M9080=131 M5001=60,IM A M9068=1 FIX2=0 M9069=736
2004.216.21.59.49.669 2004.216.21.59.38.328   1792  Real Time Rejection 131
REJECTED TC1
        FIX2=0 M5010=6,NORMAL M9079=3 M9080=131 M5001=130,RESET IM M9068=1 FIX2=0
M9069=735

2004.216.22.31.57.169 2004.216.22.31.49.204   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=738
2004.216.22.31.48.663 2004.216.22.31.43.079   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=737
```

These correspond to the M1130 (RESET IM) and MU1310 (IMAGING-A) commands for those pointings.

On DoY 214 at 05:13:45 and on DoY 217 at 05:02:34, OMC was switched by the Timeline to SAFE mode, at the nominal time.

8.3.6 IREM Operations

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]
219	RAD_ENTR R 2004-08-01T05:13:30Z	2004-08-01 04:35:38	64467.7	01-Aug-2004 06:01	53731
220	RAD_EXIT R 2004-08-01T14:19:58Z	2004-08-01 13:04:10	27697.2	01-Aug-2004 13:01	27132
220	RAD_ENTR R 2004-08-04T05:02:16Z	2004-08-04 05:14:42	57965.5	04-Aug-2004 05:52	53204
221	RAD_EXIT R 2004-08-04T14:08:16Z	2004-08-04 12:55:30	>24845.7	04-Aug-2004 12:52	27815

Reference
Small error vs reference
Large error vs reference
Radiation Spike

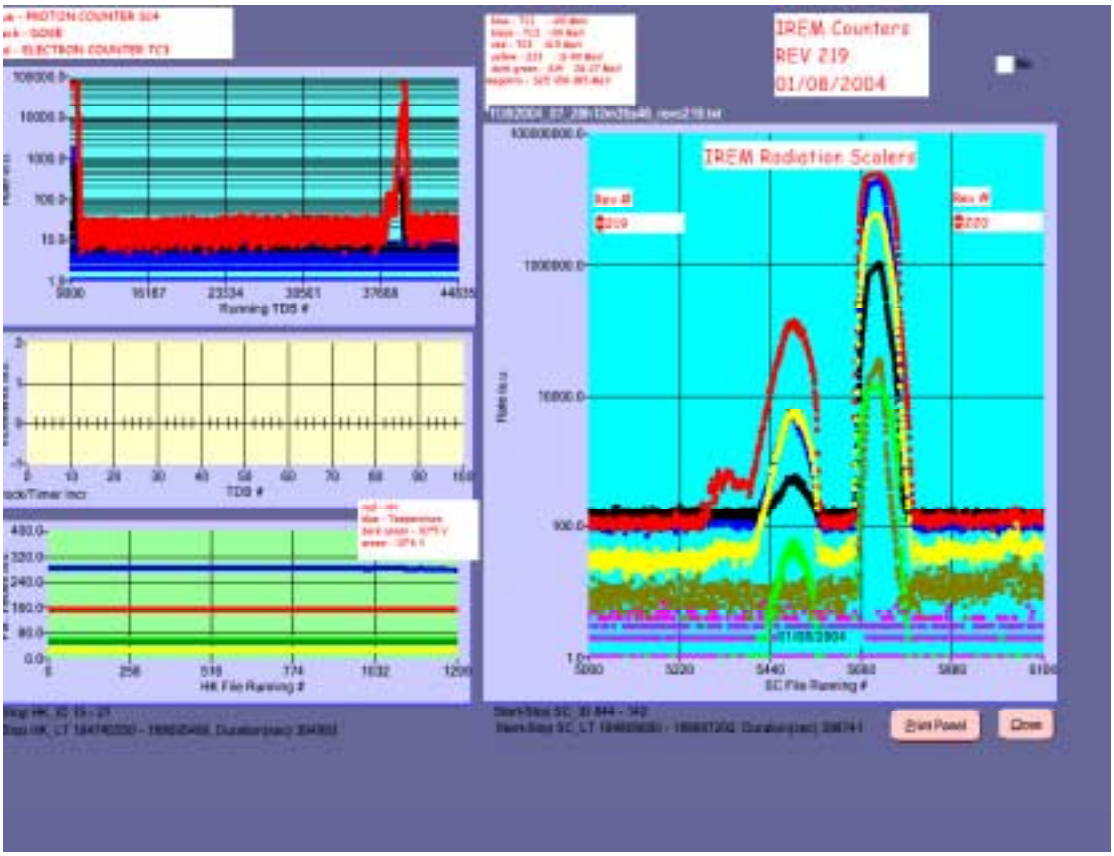
Proton Belts

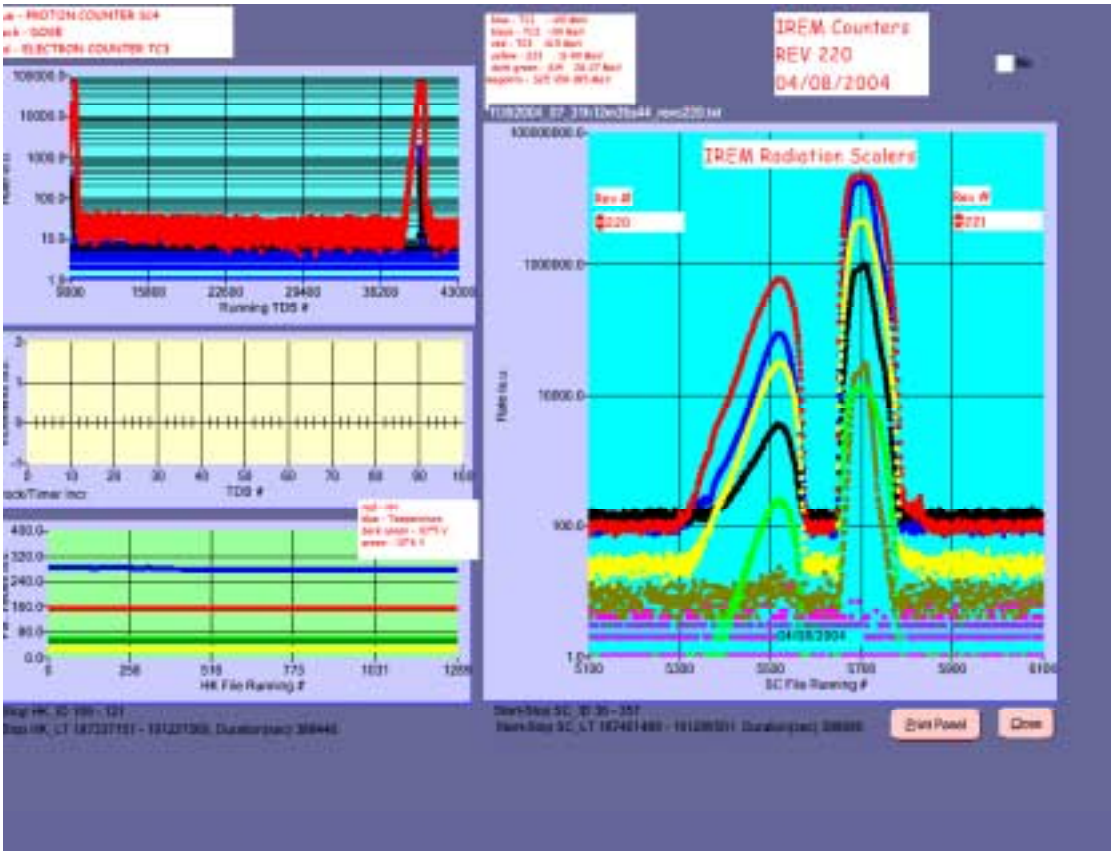
REV		Proton CUT-OFF Predicted Entry/Exit	ALT[Km] predicted
219	PROTON_RAD_ENTR	01-Aug-2004 11:31	13281
220	PROTON_RAD_EXIT	01-Aug-2004 11:41	14437
220	PROTON_RAD_ENTR	04-Aug-2004 11:12	12654
221	PROTON_RAD_EXIT	04-Aug-2004 11:32	14924

IREM daily report

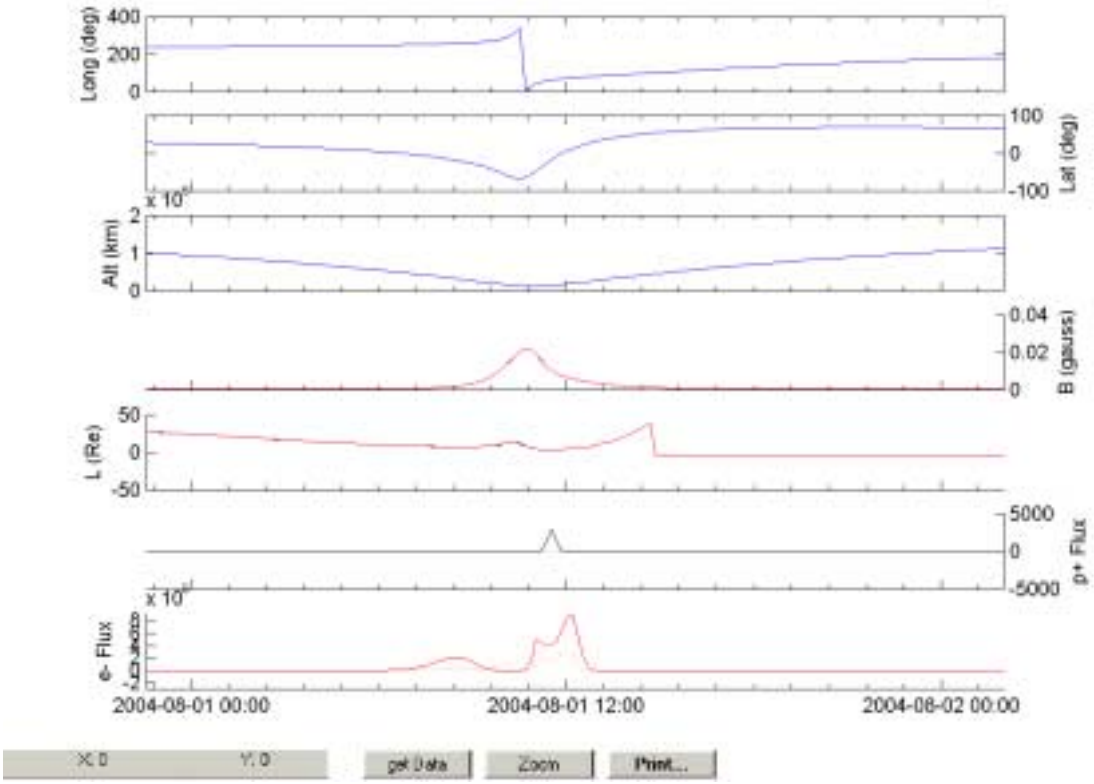
Nothing to report.

IREM radiation counters

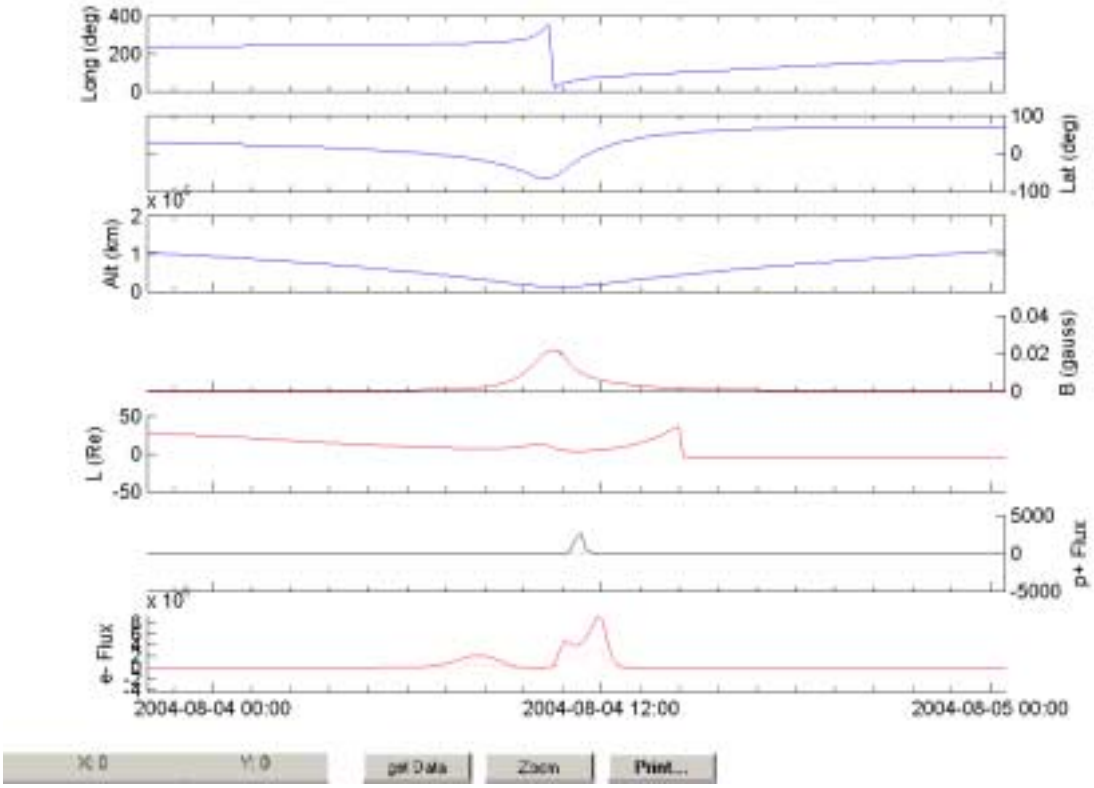



IREM Counters
REV 220
04/08/2004
IREM Radiation Scalers
Rev #
220
Rev #
221
Running TDS #
TDS #
HK File Running #
SC File Running #
Print Panel
Close

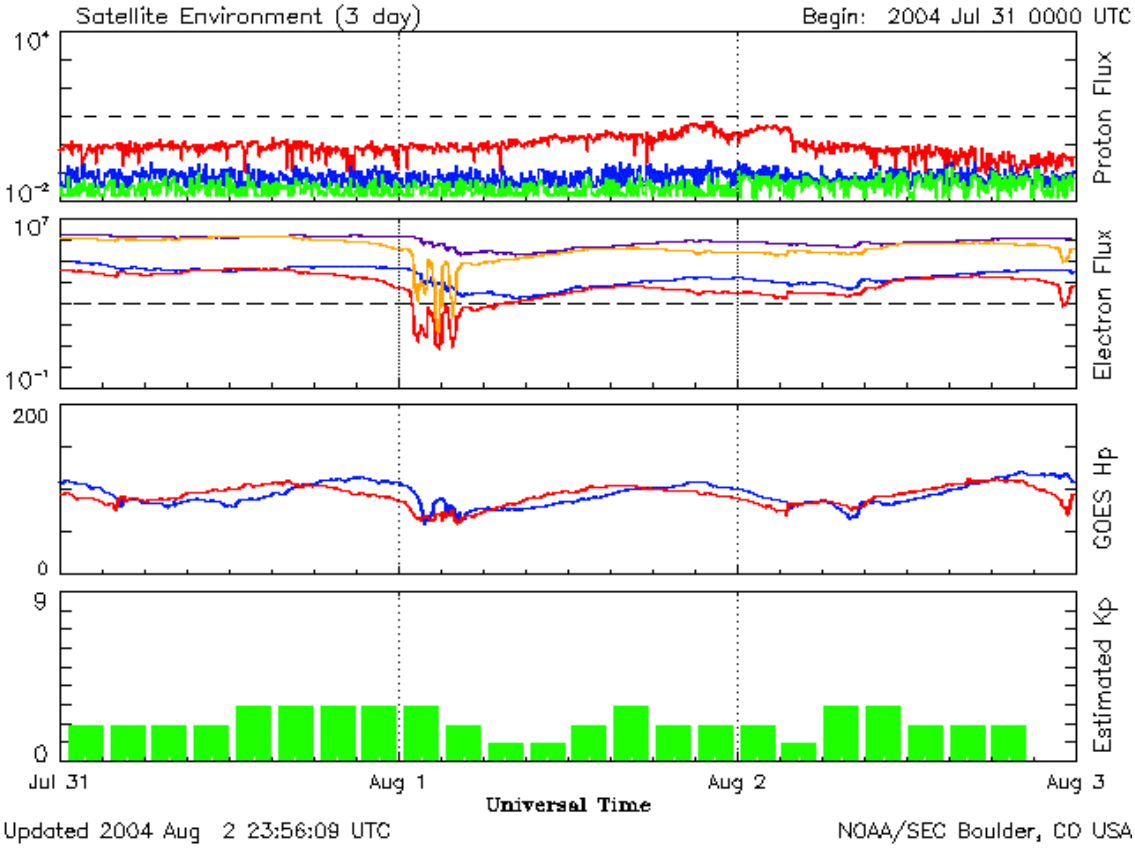
IREM Predicted Radiation Belt Passages. Rev 219

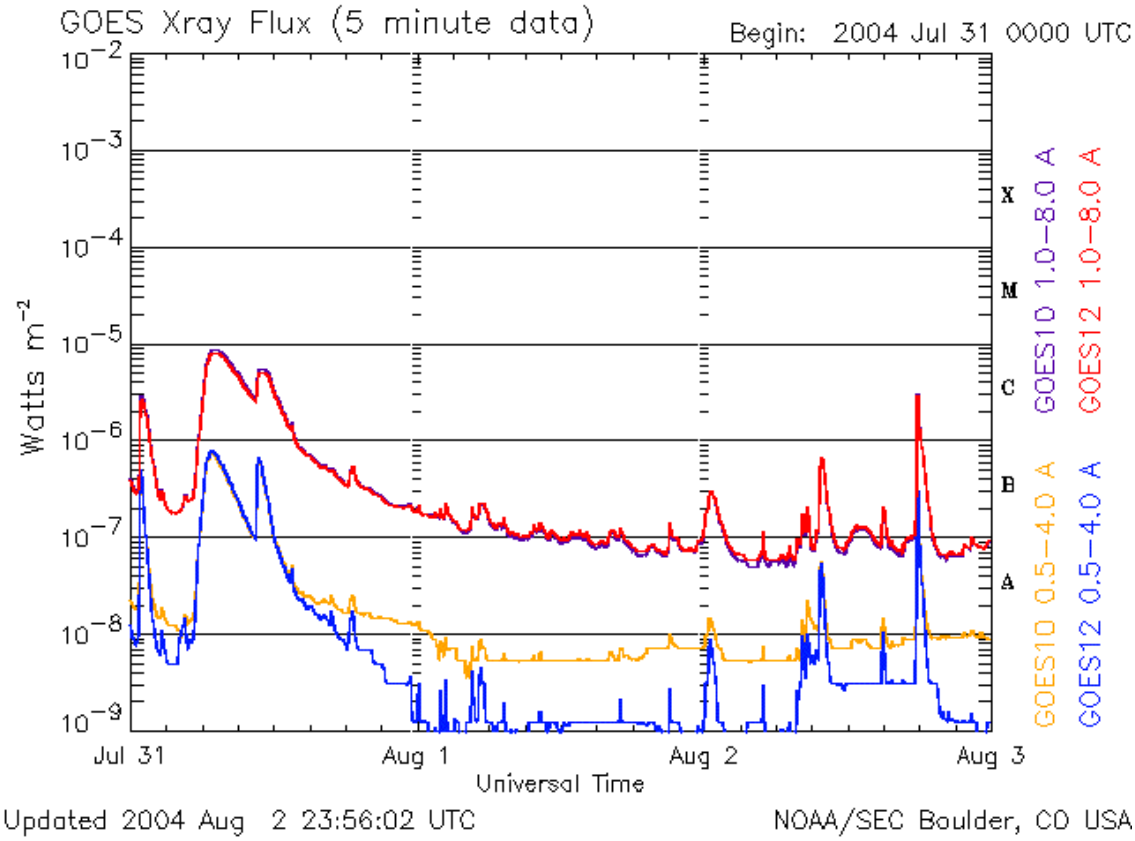


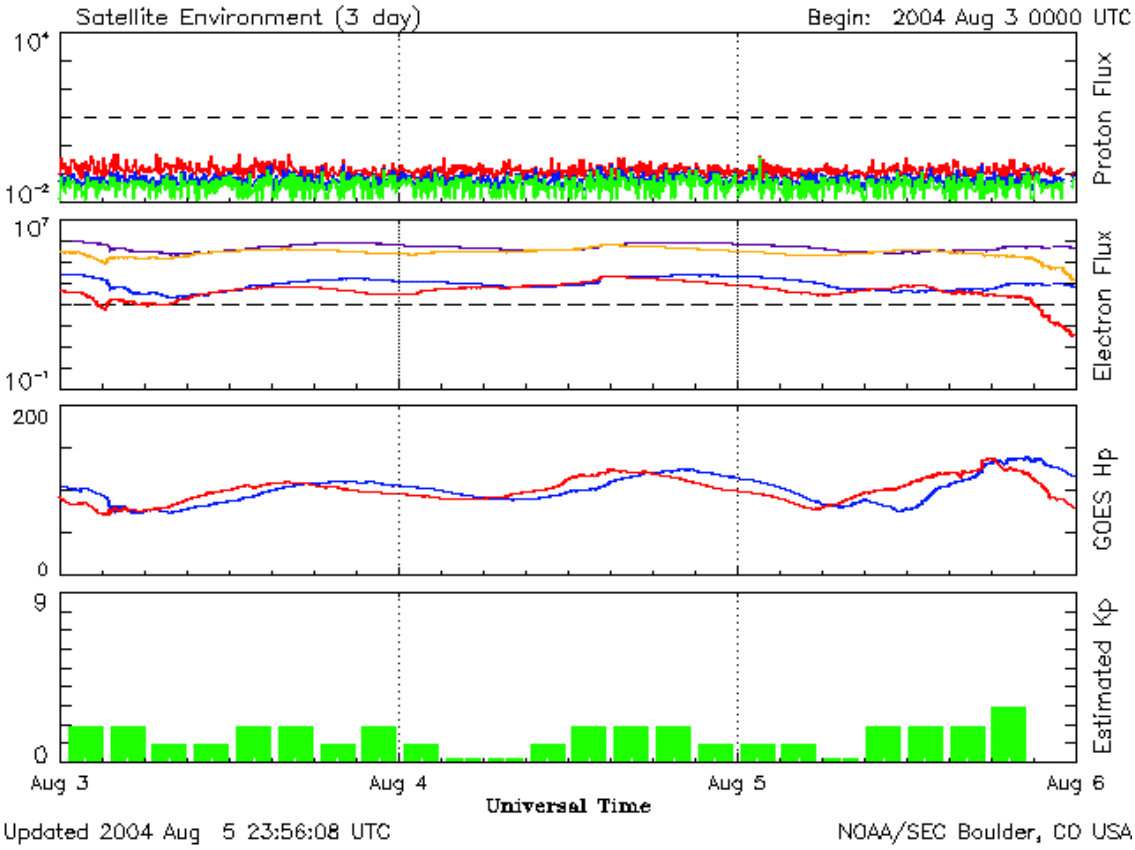
Rev 220

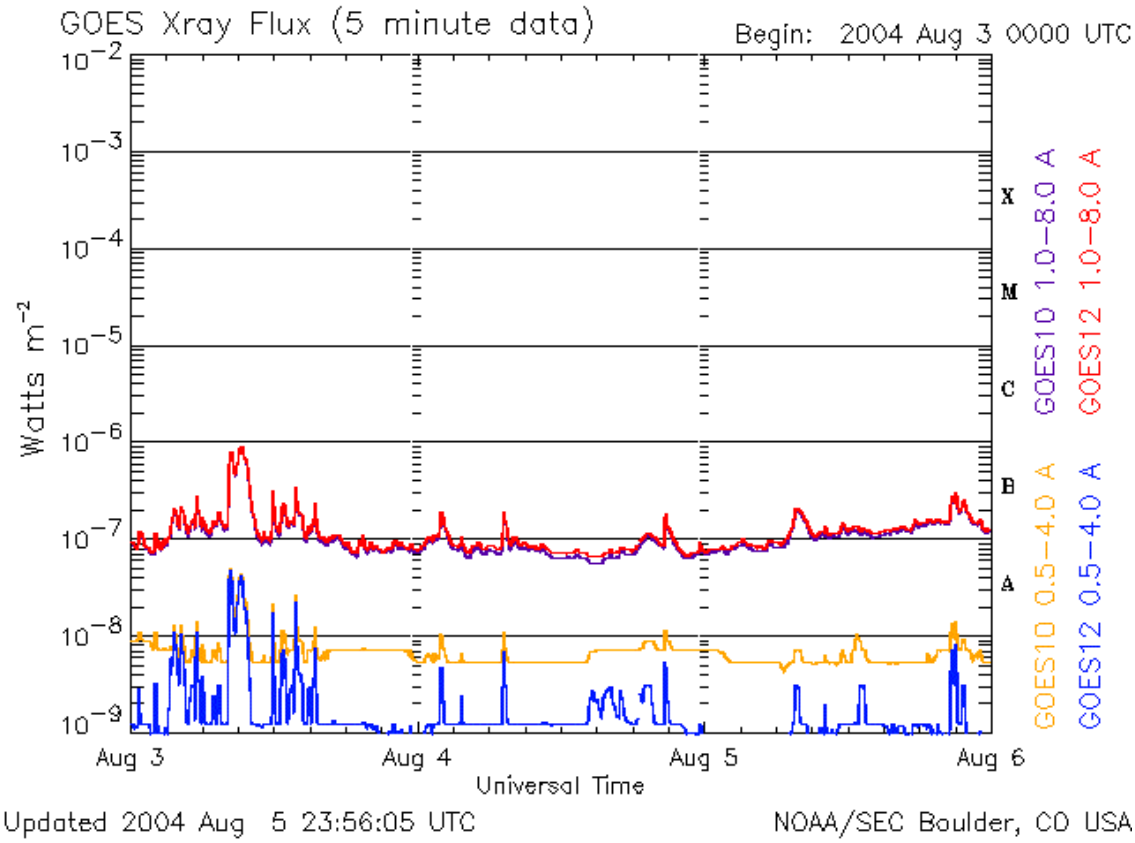


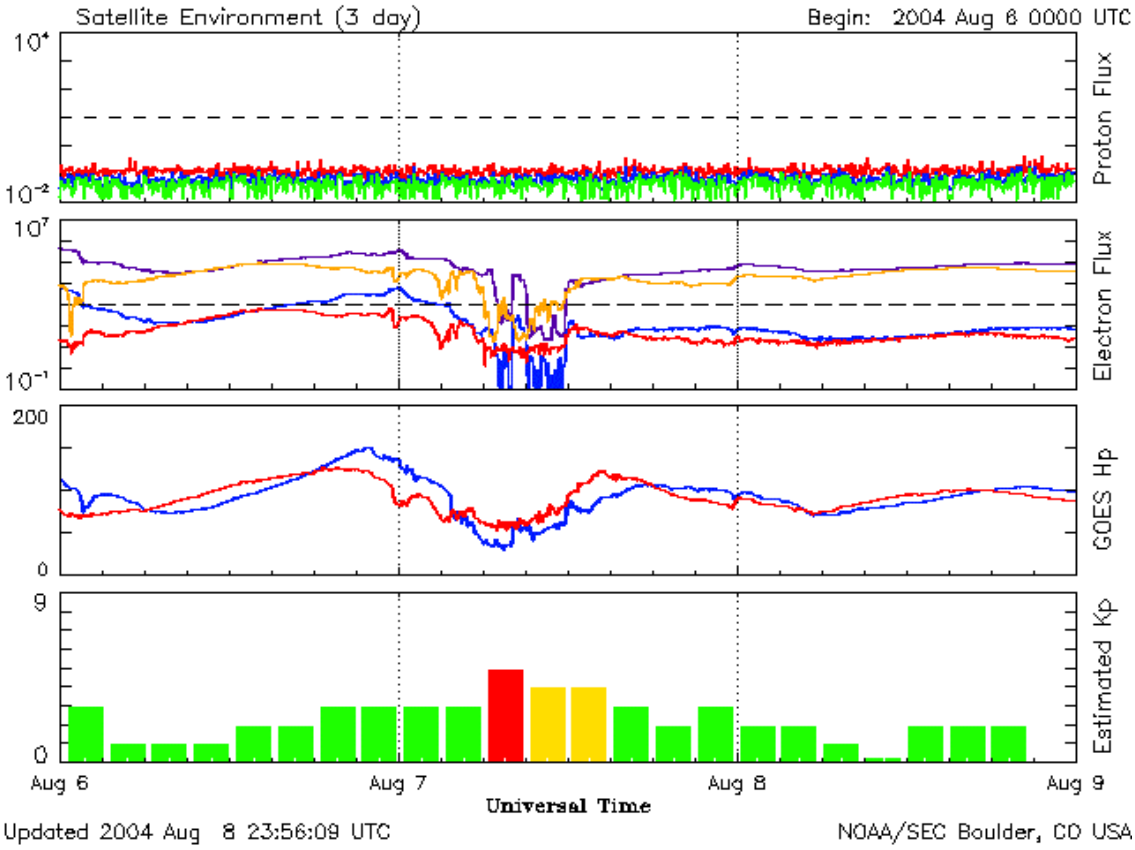
SEC-GOES Observed Particles Fluxes.

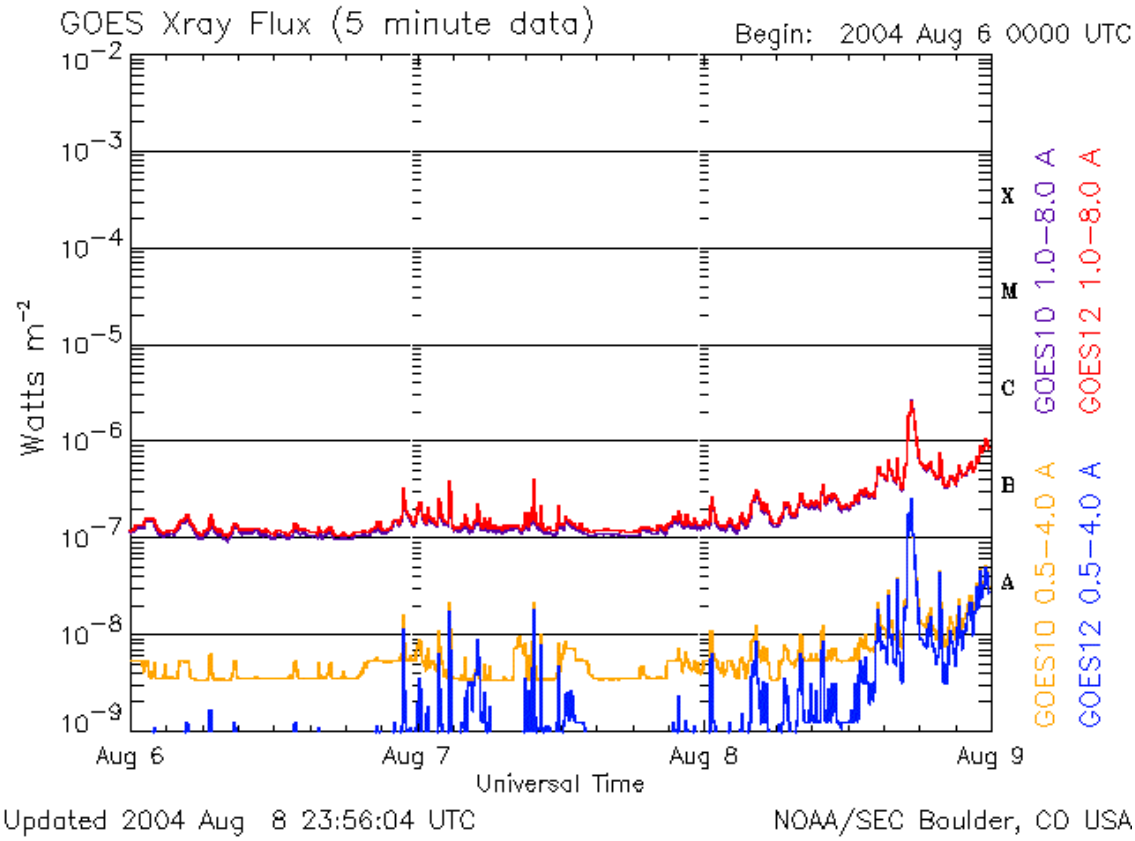





Satellite Environment (3 day)
Begin: 2004 Aug 3 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Aug 3
Aug 4
Aug 5
Aug 6
Universal Time
Updated 2004 Aug 5 23:56:08 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2004 Aug 3 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
Aug 3
Aug 4
Aug 5
Aug 6
Universal Time
Updated 2004 Aug 5 23:56:05 UTC
NOAA/SEC Boulder, CO USA


Satellite Environment (3 day)
Begin: 2004 Aug 6 0000 UTC
Proton Flux
Electron Flux
GOES Hp
Estimated Kp
Aug 6
Aug 7
Aug 8
Aug 9
Universal Time
Updated 2004 Aug 8 23:56:09 UTC
NOAA/SEC Boulder, CO USA


GOES Xray Flux (5 minute data)
Begin: 2004 Aug 6 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
Aug 6
Aug 7
Aug 8
Aug 9
Universal Time
Updated 2004 Aug 8 23:56:04 UTC
NOAA/SEC Boulder, CO USA