

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-TOS-OF
No. 013
Week 51
20.12.02
PV Phase

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1 General

The Flight Control Team at MOC has compiled this report considering a couple of inputs provided by the Flight Dynamics Team.

It addresses the activities from 14.12.02 until 20.12.02 (both dates inclusive) and covers the revolutions 20 (only partially), 21 and 22.

2 Summary of Activities

The operations were performed from the automatic Timeline as in the Routine Mission Phase. The Timelines of the various revolutions were based on the planning inputs provided by ISOC. There is still a considerable number of change requests that require an update of procedures and operations. They concern mainly the configuration of SPI.

The target during the reporting period was again Cygnus. Most of the revolution 21 was devoted to an on-axis dither pattern. At the end of the revolution on off-axis observation was introduced. This off-axis observation was also considered for revolution 22.

The automated operations were impacted by a few problems of the ground and space segment that caused the loss of a couple of pointings.

3 Satellite Status

3.1 Platform

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

3.1.1 AOCS

In summary, the AOCS operations were executed from the Automatic Timeline. The reporting period was mainly composed of raster type observations in the area of Cygnus. In the reporting period 29 Open Loop Slews and 187 Offset Slews were performed. The timeline execution was interrupted a few times, requiring the use of the "recover schedule" tool. The main interruption happened on the 14th of December, when due to a control system problem some 10 pointings were lost.

In the reporting period, the OTF as provided by the ACC flickered in 11 occasions, most of them not seen in the Broadcast Packet, 9 times due to STR undetected false events, and 2 due to excessive roll jump at the end of slews. Of these last 2, 1 was caused by a procedural problem when handling the Automatic Stack, and the other needs to be investigated by Flight Dynamics.

Also during this period the guide star was lost in one occasion, due to the SEU Filter been exceeded. This happened within the first minute after the end of a slew, and for this reason the IMU was not powered on. The only impact of the problem was that for this pointing the OTF went briefly to True immediately after the end of the slew, and then went to False for the duration of the pointing.

The fuel consumption over the last 10 days was 0.15 kg. The remaining propellant was in the order of 180.57 Kg on 19 December. Considering that more science operations have been

performed according to the planning this consumption might give a first indication of the average fuel consumption in the Routine mission phase.

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

3.1.2 Power

The power subsystem is working as specified. The available power is in the order of 2380 W as since the beginning of the mission, i.e. no degradation has been identified so far.

3.1.3 Thermal

The thermal control of the satellite is working well. The temperatures are currently all within the specified operational limits. The temperatures of the batteries are lower than during the previous revolutions but they are not critical.

3.1.4 OBDH

The satellite has reached its nominal configuration, i.e. all units are switched on. The OBDH subsystem is working flawlessly. A new RACP command (#42) was loaded and the On-board monitoring table was updated to improve the monitoring of the RCS temperatures and to increase the protection against under-temperature problems in the fuel lines. All changes to the database and the procedure were validated on the simulator before uplink.

3.1.5 RF

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

The functions and performances of the various instruments are still being assessed. The instruments work mostly as expected. A few new anomalies / problematic areas have been identified, see chapter 6.

3.2.1 SPI

The instrument is working nominally in photon by photon mode according to the planned schedule. Change Requests to manually configure the instrument as function of the TM allocation have been implemented (CR PI-OPS-207) for rev.21.

The cryocooler strokes were changed two weeks ago (increase of 1 LSB on the 4 compressors) in order to investigate the constant temperature drift, (positive) observed since cooling operations at 90K have started. After the initial cool down and stabilisation, in this week the drift phenomena started again: analysis from CNES points towards a possible contamination of the coldest parts of the active cooling assembly. Cryocooler performance degradation is excluded. The execution of the outgassing procedure is under evaluation (it would interrupt SPI nominal operations for a few days).

With the current drift rate and the current cryocooler setting, it is expected that the Germanium detector cold plate temperature stays below 91K until about mid January. At the moment no change of the stroke is planned until that time.

3.2.2 IBIS

IBIS was operated in normal science mode according to the planning inputs provided by ISOC. The problem of high count rate, lasting for more than 5 minutes, affecting the ISGRI MDUs occurred few times during the week.

The configuration of the instrument for the belt passages that was requested by the IBIS PI has been implemented for revolution 22.

Note: Some further details concerning the IBIS operations are provided in the Appendix.

3.2.3 JEM-X

Both JEM-X instruments are operated according to the planning inputs. It is foreseen to keep both instruments on during the operational phase that will start at the end of the year. However only JEM-X 2 will be activated to perform the science operations. The purpose is to limit the degradation of JEM-X 1 to ensure that there will always be at least one JEM-X throughout the mission lifetime.

JEM-X has entered three times the Save Mode in this period due to various system problems, see the Appendix for further details.

3.2.4 OMC

The OMC is working nominally. The OMC imaging activities are operated from the automatic Timeline.

OMC has entered two times the Save Mode in this period due to various system problems, see the Appendix for further details.

3.2.5 IREM

The INTEGRAL Radiation Monitor (IREM) has shown a major anomaly on 16 December. An automatic reset was performed, which caused a switch to Safe Mode of all instruments apart from SPI, for which the IREM reaction has not yet been activated. Further details concerning the anomaly are provided in section 6. Apart from this anomaly IREM was working as expected.

4 Ground Facilities

The overall performance of the ground segment was good. Despite of the problems that are to be expected in the early phase of the mission, the overall performance is mostly above the required 95 %. The main problems that impacted the operations are addressed in section 6.

4.1 Mission Operations Centre

The overall performance of the MOC was good and the configuration was stable.

The processing of the received data and the distribution to the ISDC is working in general well. There are still problems concerning the consolidation of the TM archive. An operational workaround has been set up to facilitate the identification of data gaps. This shall support the consolidation of the TM archive until a proper configuration is established in the station and in the IMCS.

The main problem that impacts the operations concerns the occasional failure of the Pre Transmission Verification and Command Execution Verification of commands. This can lead to an unnecessary interruption of the Timeline.

4.2 Ground Stations & Network

The performance of the operational network was in general good. However, there were still a few interruptions of the TM and TC services. In addition a few data gaps have been identified in the archive but it is not clear where the data are lost in the system.

4.3 Science Ground Segment

4.3.1 ISOC

The planning inputs for the revolutions have been provided and could be processed by the MOC. There were a couple of problems to generate the POSs for the revolutions 22 to 26. The generation of the POSs took longer because unnecessary slews were removed by ISOC and some special instrument configurations, e.g. for JEM-X, had to be considered. In addition there were problems concerning the generation of a valid slew profile for the revolutions (in particular revolution 26) and concerning the proper planning of slews (Closed Loop vs Open Loop Slews). A modification of the Flight Dynamics Tools at ISOC (update of Star Catalogue and Configuration File) was required.

4.3.2 ISDC

No ISDC Input has been provided

5 Special Events

None

6 Anomalies

A list of the pending anomalies is presented in the Appendix. The main anomalies that had an influence on the operations are summarised in following.

The TM archive has been verified for one revolution (20) and only a few data gaps have been identified. They covered sometimes only a few TM frames. It is not yet fully understood which mechanisms can cause these data gaps. Only some of them are due to identified system

problems. The operational workarounds that are put in place improve the situation. However, without the planned improvements concerning the IMCS and the stations it is not possible to identify all data gaps and to perform a 100 % consolidation of the TM archive.

The main anomaly related to the IMCS that impacted the operations occurred on 14 December at 1621 Z. The pre transmission verification of one AOCS command failed though the conditions were OK. The attempted recovery of the schedule also failed due to the same reason. Since the source of the problem was not immediately identified several pointings were lost until the schedule could be fully recovered. Further details are available in the anomaly reports that were generated.

This failure cannot be excluded in the future without an update of the IMCS. The relevant recovery procedure has been updated to limit the implications.

The performance of the involved ground stations (Redu and Goldstone) was good during the reporting period. There were only a few short term interruptions of the TM and TC mainly due to H/W problems, e.g. TMP problem at the Redu station.

The platform did not show any anomaly.

The other main problem that impacted the operations concerned the failure of IREM on 16 December. IREM performed an on-board reset at 0738. This was probably caused by a heavy Ion that upset the RAM. The implication was a reset of the OBS and IREM entered autonomously the Standard Mode, which impacted the TM data including the counter readings that are provided to the instruments via the Broadcast Packet. All instruments apart from SPI, for which the I/F to IREM has not yet been enabled, entered the Safe Mode. The IREM flag in the Broadcast Packet was set to Disregard, the instruments were re-activated and the Timeline was resumed. After the analysis of the IREM anomaly IREM was put back into INTEGRAL mode and the performance was checked. When the IREM performance was considered nominal the flag in the Broadcast Packet was set to Regard. At this time JEM-X went again into Safe Mode though the TM readings of IREM were OK. JEM-X was then reactivated by manual commands. A workaround procedure has been put in place for JEM-X but an update of the JEM-X IASW is recommended in the long term.

7 Future Milestones

The Eclipse Season will start on 30 December. The MOC is currently upgrading the planning system to take into account the agreed satellite configuration.

The other upcoming event is the first Galactic Plane Survey that is planned for 28 December.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

An overview of the revolutions, i.e. the planned observations, is provided under the following WEB address: ftp://astro.estec.esa.nl/pub/rmuch/summary.v8_ops.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2002-12-09T07:20:21.000Z	180.7170	F	Automatic TM processing.
2002-12-10T17:42:32.000Z	180.7052	F	Automatic TM processing.
2002-12-12T07:08:53.000Z	180.6882	F	Automatic TM processing.
2002-12-13T17:14:00.000Z	180.6650	F	Automatic TM processing.
2002-12-14T17:36:26.000Z	180.6481	F	Automatic TM processing.
2002-12-14T20:28:27.000Z	180.6330	F	After 0020_0051_M.RWB
2002-12-14T22:08:11.000Z	180.6170	F	After 0020_0054_M.RWB
2002-12-15T06:59:32.000Z	180.6046	F	Automatic TM processing.
2002-12-16T17:26:39.000Z	180.5865	F	Automatic TM processing.
2002-12-18T06:50:43.000Z	180.5699	F	Automatic TM processing.

This report was generated at Thu Dec 19 12:11:38 GMT 2002

Note: The 4.24kg pressurant has now been removed from the fuel-book - the above list shows ONLY the remaining propellant

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 13/12/2002-19/12/2002

Due to personal reasons the detailed information will be provided later.

8.3.2 OBDH Operations

Execution of CR PS-OPS-19 load a new RACP TC (#42), and update the OBM table accordingly.

This new RACP is equivalent to TC T4331 (Propellant Heater B on via SPDU-B). This is the Redundant command of RACP #41.

The 14 OBM entries, which monitor the RCS temperatures, were updated to issue RACP #42 as well as #41 in the event of under-temperature detection.

The sequence of events was;

1. Load the new RACP, uplink the last 3 TCs of TC sequence DS0110, see FCP_DHS_1245 issue 2.3.
2. Clear the On-board Monitoring table, TC: D3492, see FCP_DHS_1223 issue 1.1, step 8.
3. Load and enable the new Monitoring table using FCP_DHS_1231, issue 1.3.

All database changes and procedure updates were validated on the simulator, before export to the operational system.

8.3.3 IBIS Operations

The problem of high count rate, lasting for more than 5 minutes, affecting the ISGRI MDUs occurred few times during the week;

The Configuration of the unit is completely automatic, driven by EDs. Limited manual commanding is requested occasionally.

The anomalies noticed in the past for VETO VDM # 4 and 12 did not occur again: new settings for the VDM HVs have been implemented following the CR from IBIS PIs. New VETO division factor for the strobe pulse distributed to PICsIT has been implemented following the CR from IBIS PI.

Reported OEM ID 184 Class 2 <<IBIS1 VETO 28 V VDM/CDM VOLTAGE IS OUT OF RANGE>> during Rev #22 at 352.07.28: the analysis performed a posteriori does not evidence a particular problem for the VETO unit. The recovery action foreseen was not evidencing any problem and the reading was correct and in limit. The only command action in coincidence (in 2 minutes) was the TC to SAVE the VETO CTX from the peripherals to the DPE.

Reported OEM ID 183 Class 2 <<IBIS1 VETO 5V VOLTAGE IS OUT OF RANGE>>, but as for the previous one no problem was found.

Implemented modification of the automatic configuration at Belt Entry: the ED GEBENT02 has been moved after the Belts in the JEM-X HV window.

On DOY 353.00.00 has been observed an increasing of the count rates of the order of 200 counts for ISGRI, 50 counts for PICsIT and 2000 counts for VETO. The reason of that seemed to be related to solar activity on-going. Anyway the intensity was not so high to trigger an autonomous reaction by the instruments.

From the scientific side, a new GRB was triggered on DOY 352.07.50 by Burst alert system resident in ISDC.

8.3.4 JEM-X Operations

OVERVIEW

During the reporting period, JEM-X units were set to SAFE mode three times. The first time was by ground TC due to an expected ground station outage. The second time was because of an unexpected IREM mode change, which distributed high count rates and set all instruments to SAFE. The third time was an unexpected behavior of the JEM-X IASW after re-setting the BCP DRMC flag to REGARD.

Both JEMX units are being switched to SAFE mode at 90 minutes before the BCP radiation belt entry time.

DETAILS

13-Dec-2002, DOY 347, Revolution 20

- 18.48.31 and 18.49.38, JEM-X1 and JEM-X2 were commanded into SAFE mode. The reason was the cancellation of Goldstone pass from 347.20.18.00 to 348.01.16.00. MOC was requested to put all instruments in SAFE mode during this period.

14-Dec-2002, DOY 348, Revolution 20

- 02.19.31, JEM-X1 and JEM-X2 high voltage reactivation was started and at about 03.00.00 both JEM-X units were fully activated.
- 22:17:00, JEMX1 to SAFE by time-tag TC
- 22:17:10, JEMX2 to SAFE by time-tag TC

16-Dec-2002, DOY 350, Revolution 21

- 07:09:00, Time-tag commands were uplinked to put JEMX1 and JEMX2 in SAFE mode at 90 minutes before Rev 21 BCP radiation belt entry time.
- 07.38.00, Due to a failure on IREM (probably an SEU), IREM mode changed from INTEGRAL to STANDARD. This caused the distribution of radiation count rates of FFFF [Hex] via the broadcast packet to the instruments and transition of both JEM-X units to SAFE mode. After some investigation it was decided to set the BCP DRMC Flag to DISREGARD (disregard IREM) and reactivate the instruments.
- 08.58.00, Re-activation of JEM-X1 started and at 09.39.00 JEM-X1 was rejoined with the automatic timeline.
- 09.32.00, Re-activation of JEM-X1 started and at 10.02.00 JEM-X1 was rejoined with the automatic timeline.

After performing the required investigations, IREM was configured back to INTEGRAL mode and its behavior was monitored for about three hours, before setting the BCP DRMC Flag back to REGARD.

- 18.50.14, after setting the BCP DRMC Flag back to REGARD, both JEM-X units switched to SAFE mode unexpectedly with the SHUT-DOWN-LEVEL= RAD.BELTS. At this time all the IREM count rates were zero and JEM-X trigger counters were also nominal. This was reported to the JEM-X PI.

The reason for this behavior is that when the DRMC flag is set to DISREGARD, the JEM-X IASW disregards all the inputs from IREM, including the count rates, and does not update its information. When the flag is set back to REGARD, the first thing that the IASW remembers is the registered high count rates from IREM and immediately switches JEM-X to SAFE, although the count rates can be low at the moment. The proposed workaround is to use the JEM-X internal BCP Override Flags in conjunction with the BCP DRMC Flag. This causes some complications in executing the BCP Group1 Setting procedure of the Data Handling System. This workaround can be applied in short term, but MOC has asked the JEM-X team to look into the possibility of developing a corrective S/W patch.

- 19.16.53, Both JEM-X units automatically switched from SAFE to SETUP. This was about 1600 seconds after the SAFE transition (above). This is the time set on-board to automatically reconfigure JEM-X from SAFE to SETUP after the IREM count rates go back to normal values. The reactivation of the high voltages could not be performed right away because of ground outage.

17-Dec-2002, DOY 351, Revolution 21

- 01.50.00, after AOS, JEM-X HV activation started and was completed by 02:30:00. The CCF was enabled to start JEM-X data taking at the next CCF occurrence.
- 05.04.37, JEM-X set to data taking by CCF.
- 22:07:00, JEMX1 to SAFE by time-tag TC
- 22:07:10, JEMX2 to SAFE by time-tag TC

18-Dec-2002, DOY 352, Revolution 22

- 16:16:30, Time-tag commands were uplinked to put JEMX1 and JEMX2 in SAFE mode at 90 minutes before Rev 22 BCP radiation belt entry time.

8.3.5 OMC Operations

OVERVIEW

During the reporting period, OMC was set two times to SAFE mode. Once by ground commanding due to an expected station unavailability and the second time by BCP high radiation count rates caused by an unexpected IREM mode change.

OMC timeline driven operations were also interrupted two times.

DETAILS

13-Dec-2002, DOY 347, Revolution 20

- 18.46.55, OMC was commanded into SAFE mode. The reason was the cancellation of Goldstone pass from 347.20.18.00 to 348.01.16.00. MOC was requested to put all instruments in SAFE mode during this period.

14-Dec-2002, DOY 348, Revolution 20

- 03.08.57, OMC SAFE OFF command was uplinked to switch Off the safe mode. OMC started nominal activities as per timeline.
- 16:21:00 to 21:31:00, OMC operations were interrupted due to problems with PTV failure of AOCs commands and the recovery actions. Pointings 89 to 99 were missed. At 21:31:00 the schedule was fully recovered and OMC restarted normal operations.

16-Dec-2002, DOY 350, Revolution 21

- 07.38.00, Due to a failure on IREM (probably an SEU), IREM mode changed from INTEGRAL to STANDARD. This caused the distribution of radiation count rates of FFFF [Hex] via the broadcast packet to the instruments and transition of OMC to SAFE mode. After some investigation it was decided to set the BCP DRMC Flag to DISREGARD (disregard IREM) and reactivate the instruments.

- 08.45.42, OMC SAFE mode was switched Off and OMC resumed normal operation as per timeline.

17-Dec-2002, DOY 351, Revolution 21

- 00.25.00, Due to delay in establishment of TM/TC link from Goldstone (station problem), slew 54 and pointing 54 were missed. OMC commanding was disabled and the schedule was recovered to join the timeline at slew 55. From pointing 55, normal OMC activities restarted.

8.3.6 IREM Operations

On DOY 349 failed CEV for TC U4921 due probably to a late TM verification from the unit.

Anomaly noticed on DOY 350.07.38.20z, the unit went autonomously in apparent "Standard Mode". As first analysis the unit had a mismatch in the checksum (due to unknown event), the unit in such situation reacted with a local reset (i.e. went back to standard mode and copy the PROM to RAM). During the anomaly, the status of the unit was the following:

- 1) temperatures nominal
- 2) LCL current nominal
- 3) last HK before the anomaly shown HV, 5V and 6V OK
- 4) the anomaly occurred at 2002.350.07.38.21 and the received IREM TM looked like a Standard Mode TM (i.e. no block counter increasing, all the words FFFF)
- 5) the first dump of the status word after the anomaly by TC U4904 (parameter =0) shown the value 48320 Dec = '1011110011000000', i.e. the unit was reporting a status as it was in Integral mode with counting ON accumulation ON and the checksum failure flag was ON. This value of the status word we assumed as an old one written by the sw (at moment of anomaly).
- 6) dumping all the registers bank by TC U4904 (parameter = 1) has been noticed different values of the status word 48256 Dec = '1011110010000000', i.e. still the unit was reporting the status as in Integral mode but the checksum failure flag was OFF and the checksum failure counter in the register number 3 was incremented.
- 7) a second single dump of the status word shown the value 48256 Dec in coincidence with the value when dumping all the registers bank (i.e. no checksum failure flag was anymore present)
- 8) IREM is accepting Standard Mode TC ---> we are really in Standard Mode

The IREM PI looking at the data concluded that the unit was affected by a SEU. This external event could have triggered a change in the checksum failure control, triggering again a local reset of the unit. During the reconfiguration to Integral mode, the status of the unit was the following:

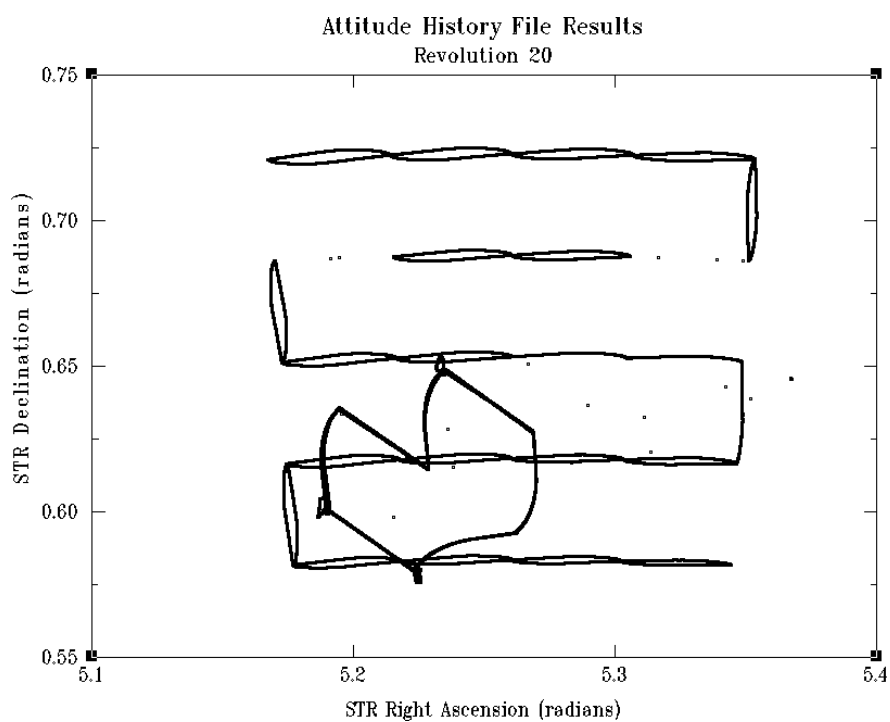
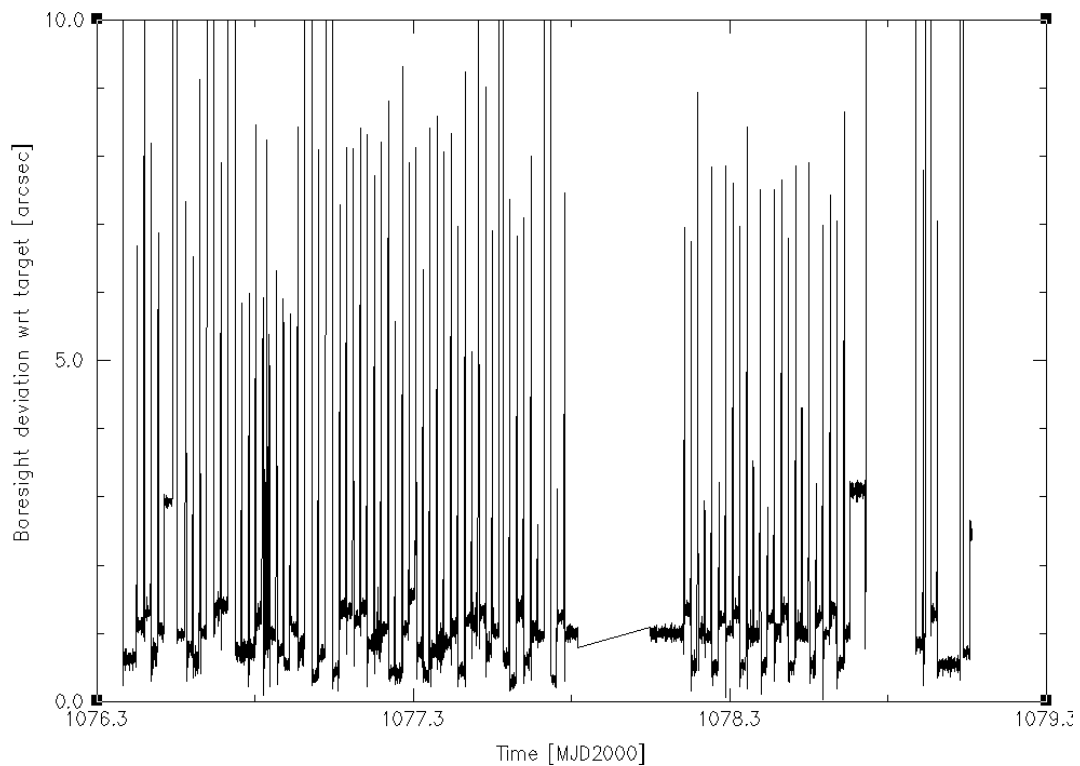
- 1) the unit reacted to the TC U4916 performing the transition to Integral mode
- 2) the status word was not the expected one: the TM_para U9903 (int ground link) and U9906 (integral count) were set to 1 (in agreement with what read in the status word in Standard) against the expected values of 0; the TM_para U9902 (block state) was set to GND Link OFF and this was not matching with the status of U9903. Forcing OFF/ON the U9903 and U9906 we received the imposed value in the status word. At ground Link ON IREM started to work correctly downloading the files accordingly with the set configuration (HK_interv_size=4XACC, ACC_interv_size=60 sec, Electron_count=TC3, Proton_count=TC1)
- 3) temperatures inside limits
- 4) LCL current OK, 0.088 A
- 5) the first HKs downloaded shown the expected value for 5V, 6V and HV

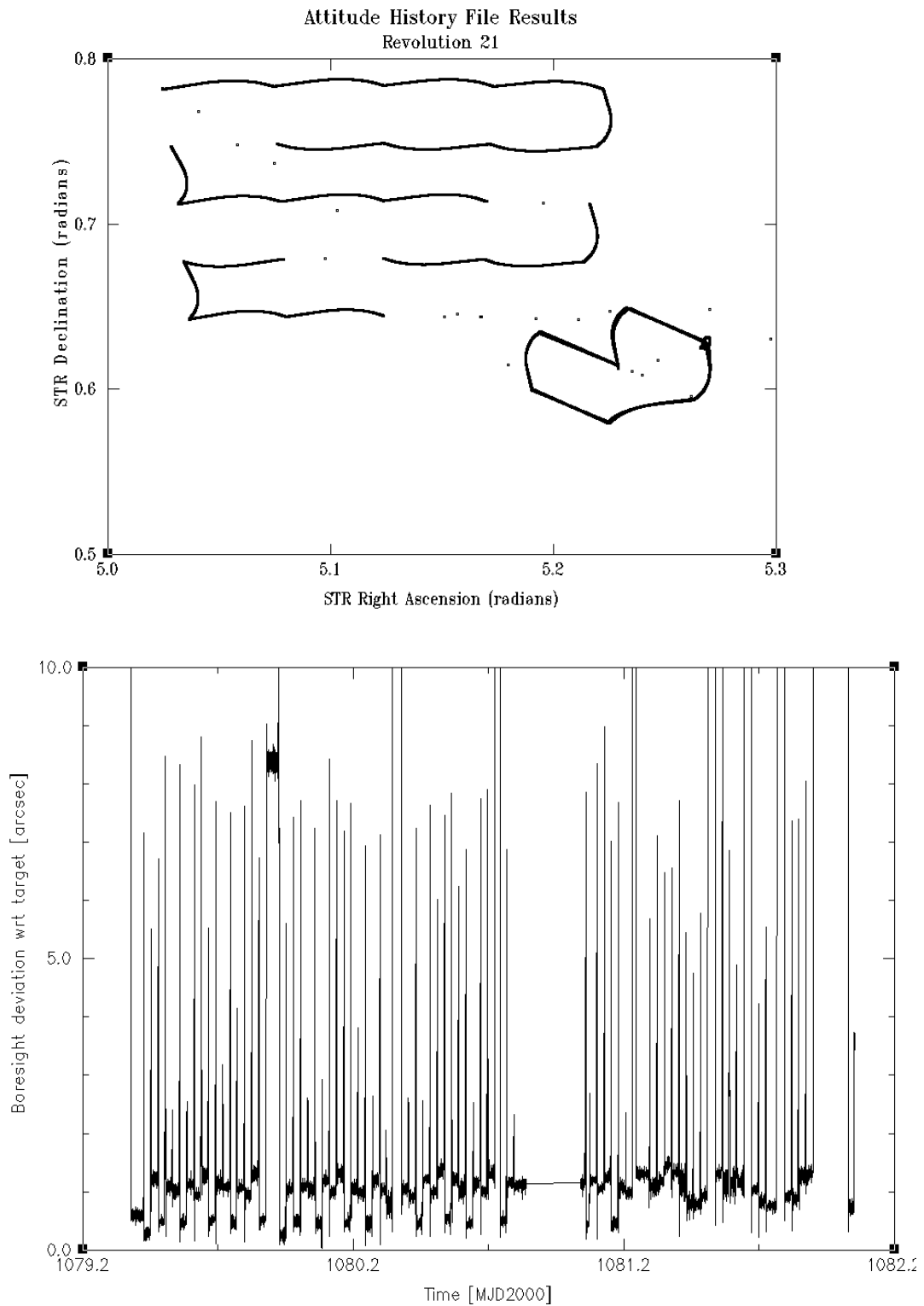
At the end of IREM reconfiguration, during the re-enabling of the DRMC flag in the BCPKT, has been noticed an anomaly on the JEM-X 1 & 2 unit, due probably to a SW problem. The two unit went to SAFE mode after DRMC was set to REGARD. No IREM High count rate was noticed at that time. This problem is under investigation by JEM-X PI

8.3.7 Pointing Accuracy

Flight Dynamics have analysed revolutions 20 and 21 of attitude history file data and conclude that the pointing accuracy for Integral during dithering and rastering is quite good (less than 2 arcsec deviation of STR boresight w.r.t. the planned target).

Here are some plots to visualise these results. Actual path of STR boresight (R.A vrs Dec) and the boresight errors w.r.t. target





8.3.8 S/C Calibration Data

The RMU drift calibration data that have been recorded over the past 2 months have been analysed.

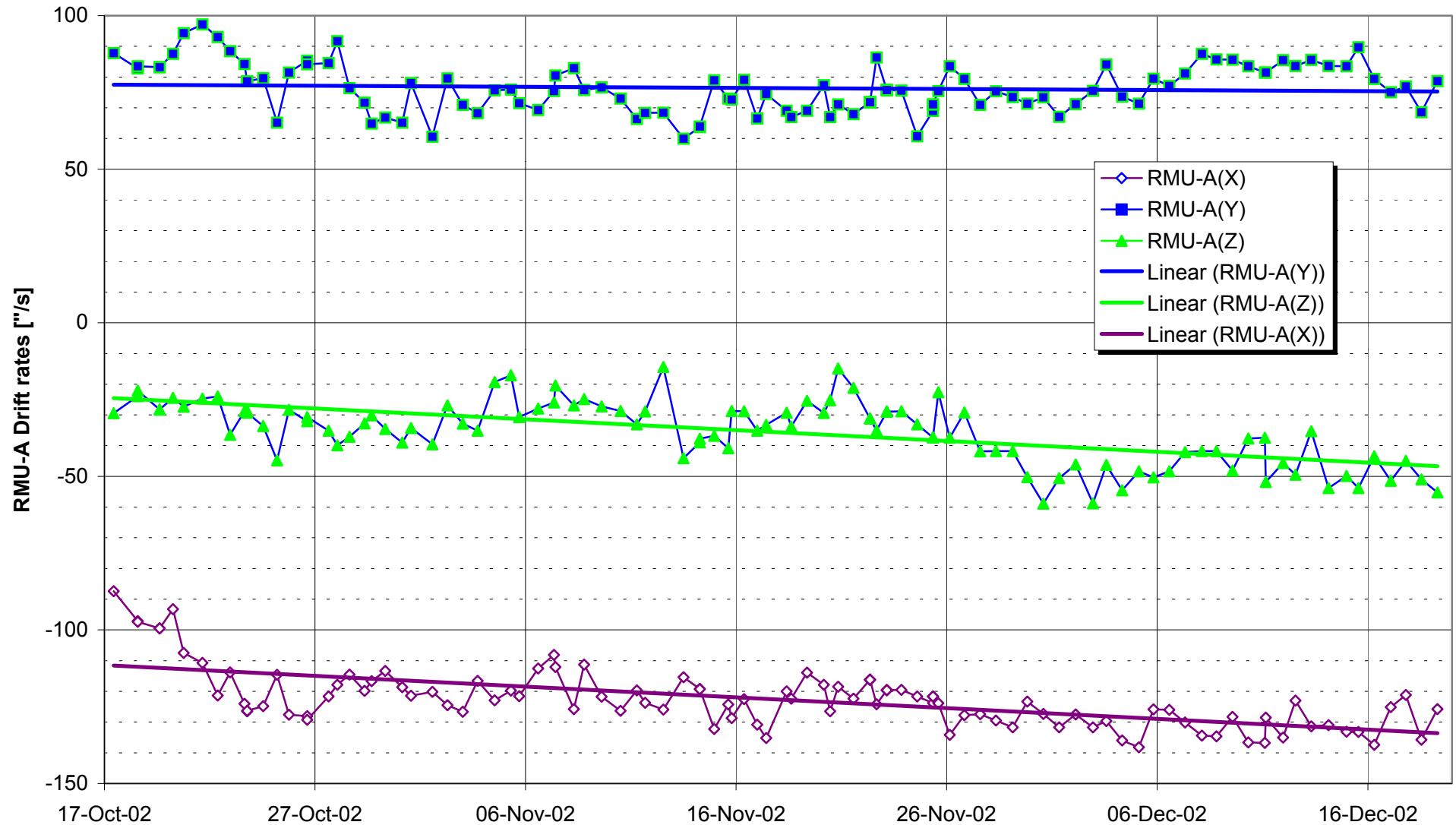
This leads to the following conclusion.

Axis	Average at 19-12-2002	Trend	Spread	Lower Soft Limit	Upper Soft Limit	Lower Hard Limit	Upper Hard Limit
RMU-A X	-135 "/s	-10 "/s/month	+/- 20 "/s	-175 "/s	-115 "/s	-205 "/s	-85 "/s
RMU-A Y	+75 "/s	0 "/s/month	+/- 20 "/s	+55 "/s	+95 "/s	+25 "/s	+125 "/s
RMU-A Z	-50 "/s	-10 "/s/month	+/- 30 "/s	-100 "/s	-20 "/s	-130 "/s	+10 "/s

The soft limits are redesigned such that we do not expect a violation during the next 2 months. The situation shall be re-assessed in February 2003.

The hard limits are wider by +/- 30 "/s w.r.t. the soft limits. If the hard limits are violated, the TPF is not generated.

INTEGRAL RMU Drift Calibration History



8.4 List of Anomalies since Launch

The following table presents the list of all identified anomalies that have been registered since Launch and that are still pending (Status: 04.12.02). Though these Anomaly Reports still have a pending status most of the problems have been analysed and solutions or at least workarounds are already in place. The ARs have just not yet been formally closed.

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002003	19/10/2002	Command failure from TCE2 at Redu1.	Ground	ESA Sta.	Pending
INT - 002007	22/10/2002	Command sequence TENPE_00 is incorrect.	Space	Procedures	Pending
INT - 002010	22/10/2002	Time correlation not applied correctly to time parameters in TM type 8 reports.	Ground	IMCS	Pending
INT - 002018	22/10/2002	Loss of TM and TC with Goldstone.	Ground	NASA Sta.	Pending
INT - 002024	28/10/2002	OEM: SPI1 Fixed print overflow	Space	SPI	Pending
INT - 002058	06/11/2002	Telemetry Play Back Failed	Ground	NASA Sta.	Pending
INT - 002049	07/11/2002	Beginning of a gradual erosion of the anodes on the microstrip plates	Space	JEM-X	Pending
INT - 002048	08/11/2002	TM Data Retrieval Jobs not executed	Ground	IMCS	Pending
INT - 002055	09/11/2002	IBIS VETO anomalous count rates.	Space	IBIS	Pending
INT - 002061	12/11/2002	TM Desktop performance collapses when de-selecting supercommutated processing.	Ground	IMCS	Pending
INT - 002062	13/11/2002	Static PTV wrongly handled by IMCS when commands are copied	Ground	IMCS	Pending
INT - 002066	13/11/2002	Data routing to ISDS	Ground	I/F to SGS	Pending

INT - 002082	13/11/2002	TM packet production lower than allocation.	Space	SPI	Pending
INT - 002070	14/11/2002	TDRS: data Rerievals cancelled	Ground	IMCS	Pending
INT - 002078	14/11/2002	Antenna Tracking Problems	Ground	ESA Sta.	Pending
INT - 002079	14/11/2002	Timing Problem with Telecommands	Ground	ESA Sta.	Pending
INT - 002083	16/11/2002	SPI DPE Crash	Space	SPI	Pending
INT - 002091	18/11/2002	A-Chain Frozen	Ground	IMCS	Pending
INT - 002092	19/11/2002	Load-Dump comparison uses also non-released load commands	Ground	IMCS	Pending
INT - 002093	19/11/2002	Incorrect MOUT in POS/EPOS/TSF	Ground	ISOC	Pending
INT - 002094	19/11/2002	TDRS does not work with supercommutated parameters	Ground	IMCS	Pending
INT - 002095	19/11/2002	TDRS incomplete retrievals.	Ground	IMCS	Pending
INT - 002096	19/11/2002	Retrieval from the stations	Ground	IMCS	Pending
INT - 002097	19/11/2002	Unexpected dithering process when SPI spectra accumulation = 0	Space	SPI	Pending
INT - 002098	19/11/2002	FEE 3 has 2 occurences of 3 status parameters OOL	Space	SPI	Pending
INT - 002099	20/11/2002	SPI1 periodic task overrun	Space	SPI	Pending
INT - 002107	21/11/2002	TDRS produces gaps in the retrieval, that don't correspond to gaps in the archive	Ground	IMCS	Pending
INT - 002118	25/11/2002	Autostack crashed	Ground	IMCS	Pending
INT - 002121	26/11/2002	ISGRI countrates increase up to 8000 counts/sec in one module	Space	IBIS	Pending
INT - 002116	27/11/2002	SPI Spectra process / cycle stopped	Ground	ISOC	Pending
INT - 002117	27/11/2002	Command releaser failed	Ground	IMCS	Pending
INT - 002124	29/11/2002	Telemetry Drops from GoldStone	Ground	NASA Stat	Pending
INT - 002125	29/11/2002	Data loss between IMCS and ISDC	Ground	I/F to SGS	Pending

INT - 002128	01/12/2002	Wheel Speed monitor crashed	Ground	FDS	Pending
INT - 002122	02/12/2002	IBIS VDM4 HV broke down	Space	IBIS	Pending
INT - 002127	02/12/2002	Telemetry loss from REDU	Ground	ESA Stat	Pending
INT - 002129	03/12/2002	VC-7 data loss	Ground	ESA Stat	Pending
INT - 002130	04/12/2002	Reaction Wheel Task Stopped	Ground	FDS	Pending
INT - 002131	04/12/2002	Lost TC capability via GoldStone(Dss-16)	Ground	NASA Stat	Pending
INT - 002132	05/12/2002	TM/TC loss via REDU	Ground	ESA Stat	Pending
INT - 002133	05/12/2002	Loss of Frames	Ground	IMCS	Pending
INT - 002135	06/12/2002	Inconsistency in Pointing ID vs Slew ID found in POS for revolutions 17 and 18	Ground	ISOC	Pending
INT - 002136	06/12/2002	Invalid PST of SPI in Oper Mode	Ground	ISOC	Pending
INT - 002137	08/12/2002	Handover to DSS-16 delayed due to hardware problems	Ground	NASA Stat	Pending
INT - 002138	09/12/2002	Command failure	Ground	IMCS	Pending
INT - 002139	09/12/2002	Attitude determination Failed	Ground	FDS	Pending
INT - 002141	10/12/2002	TPF failed to load	Ground	IMCS	Pending
INT - 002142	11/12/2002	TDRS Time Interval Setting	Ground	IMCS	Pending
INT - 002144	15/12/2002	Command verifier failed	Ground	IMCS	Pending
INT - 002145	15/12/2002	Commands failing PTV for no reason	Ground	IMCS	Pending
INT - 002143	16/12/2002	Lost commanding via REDU	Ground	ESA Stat	Pending
INT - 002147	16/12/2002	Lost Telecommanding via REDU	Ground	ESA Stat	Pending
INT - 002146	17/12/2002	Late telemetry from REDU	Ground	ESA Stat	Pending
INT - 002149	17/12/2002	OBQD giving wrong results	Ground	IMCS	Pending

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INT - 002150	17/12/2002	TM drop via REDU	Ground	ESA Stat	Pending
INT - 002151	17/12/2002	ISDS-ISDC Disconnected	Ground	I/F to SGS	Pending
INT - 002152	18/12/2002	NCTRS-A required resetting	Ground	NCTRS	Pending