

Attendants

Søren Brandt	DTU Space	SB
Carlo Ferrigno	ISDC	CF
Jutta Hübner	DLR	JH
Elizabeth Jourdain	CESR Toulouse	EJ
Peter Kretschmar	ESA, ESAC	PK
Lorenzo Natalucci	IASF Roma	LN
Jean-Pierre Roques	CESR Toulouse	JPR
Richard Southworth	ESA, ESOC	RS
Erik Kuulkers	ESA, ESAC	EK

1 Welcome, Agenda, Actions — PK

The Agenda was accepted unchanged.

Actions from past meetings have been closed, except for the implementation of the new OMC FF calibration scheme, ongoing at ISOC.

2 Mission Status & Ground Segment Status

2.1 Platform status — RS

Performance remains stable. No significant platform anomalies. Only proton belt effects: startracker, solar array and solar cell, batteries still fine.

Changing wheel constraint leads to less wheel biases has reduced fuel usage from 0.57 kg to 0.46 kg per month.

2.2 Platform and instrument status — JH

JH summarised anomalies (see viewgraphs). Generally everything working smoothly.

2.3 IBIS status — LN

IBIS team has produced ARFs for two latest Crab observations, with no worrying differences. Losing low energy (<25 keV) counts, as expected. CF inquired if there was a difference between results for revolution 1327 and 1328.

The question was raised what was to be done about the idea to disable the IBIS calibration source. LN stated that this would need to be handled by G. La Rosa (GLR). JH noted that she was in contact with GLR, but hardly received replies, except for anomaly resolution.

Action IOCG/06–01 on PK

Clarify working interface Operations/IBIS

Due: end December

2.4 SPI status — JPR

SPI annealing 21 worked very well. But raises concern of having had telemetry gaps during switch-on and final cooling.

JH stated that next annealing will be done with full TM coverage for this critical period. The next annealing will probably be required second half of February 2014. The final decision will be taken in early December.

During a Fermi-observed gamma-ray flare SPI Crab spectra find normal parameters. Normalisation of last Crab observation (Rev 1327+1328) seems slightly higher.

EK inquired how much integration time would be required to calibrate the SPI spectral response well up to ~ 1 MeV. JPR replied that they'd have to estimate the time again. The calibration cannot be gained just from adding all data, as the detectors are not expected to be completely stable at higher energies.

Action IOCG/06–02 on EJ	Due: end March
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Estimate required calibration times for HE calibration.

2.5 JEM-X — SB

JEM-X operations are stable and the anode loss is $<1\%$ /year, but the gain dependency on temperature has increased to almost 5% per degree. HV changes are now also driven by the need to avoid gain peaks, the next HV change is expected in 2014. The final gain calibration is done offline at DTU Space, although in most situations the automatic NRT solution still works.

The HW trigger rate is down by 40% since Oct 2010. This does not directly affect the background, as particles are efficiently filtered on-board, but the deadtime has gone down from 18% to 12%. The grey filter mechanism still occasionally kicks in.

A strong gain depression has been observed during solar a CME event. This is explained by protons above 5 MeV passing the Be window and leaving large charge if just a bit above 5 MeV.

Two X-class flares led to very different reaction in JEM-X. One illuminated the mask, leading to scattered X-ray photons observed by the detector, the other had no impact.

An update of calibration files is expected soon.

The ISDC has developed a small tool to filter out early data from revolutions where the gain is varying strongly. It should be discussed further if this becomes part of OSA.

2.6 OMC — PK for AD

On behalf of AD, PK presented the OMC status. In summary, the CCD is surviving well, the flatfield has stabilized, the sensitivity and photometric accuracy are stable. There is a slow, steady increase in dark current, but still well within acceptable limits. No evident effects of the low perigee passages have been observed. The number of hot pixels, for example, can be well described by a linear trend since the beginning of the mission.

2.7 INTEGRAL orbit evolution — RS

Long-term evolution driven by forces beyond our control. Can control semi-major axis by appropriate wheel biases. Occasionally it has been necessary to constrain the perigee attitude.

2.8 Ground stations – RS

From 1 Dec 2013, Redu will be no longer available for INTEGRAL. Prime station will be Kiruna 1, where now *Integral* will be generally the exclusive user.

Back-up stations are available, but may be limited in visibility with long gaps developing in the coming years.

Sources of RFI have been identified. Filters will be installed for SMOS & JASON-1, but nothing directly can be done about the GLONASS and COMPASS navigation satellites.

2.9 MOC status — RS

RS presented the team status with many team members shared with other projects (mainly XMM).

The current Mission Control System is based on old HW and OS. It is being replaced by virtual machines, with a cross-backup with XMM. Virtual machines might be available for PI usage. XMM will migrate early 2014, the INTEGRAL MCS migration is planned for the second quarter.

There is an ongoing effort to automate repetitive tasks including some anomaly recoveries. This might save up to 50% of the time currently invested by SPACONs in such tasks and allow a possible sharing with Gaia.

The change of the connection to ISDC from a leased line to public internet was discussed in some detail. For technical and manpower reasons at the ISDC the move will not be possible before mid January. Therefore, the current lease of the line will need to be extended.

2.10 ISDC status — CF

Operations are running smoothly, but analysis of specific sources (e.g., A 0535+26, a bright transient close to the Crab) demonstrates issues with the spectral calibration.

CF expressed his worry about arriving at a well-consolidated legacy archive and the need for tighter collaboration between the ISDC and instrument teams. Especially for SPI he saw a need for more interaction.

An extended discussion about the SPI OSA software ensued in which JPR commented on the choices taken by ISDC in the past with respect to this software. There is also a Web front-end for SPI data analysis at Toulouse which has been advertised in the IUG, but does not see outside users yet. JPR stated that this was not very different from `spiros` in OSA, just that `spiros` was difficult to use correctly by a non-specialist.

PK proposed to arrange a meeting in Toulouse in 2014 to discuss the commonalities and differences and possibly agree on a way forward.

Action IOCG/06–03 on ISOC	Due: end January
<i>Try independent comparison of SPI software as available in OSA with results obtained via the front-end in Toulouse.</i>	

2.11 ISOC status — PK

PK discussed the implications of the savings measures introduced in the latest mission extension. For ISOC this means a very significant reduction already, with further reduced support from 2015 on.

2.12 MOC Monthly Report — RS

RS explained that mainly due to reduced overall manpower the MOC monthly report was by now significantly delayed (last issued report was January 2013). In its current form the report is a large effort, an automation effort is ongoing, but the question remains, which frequency is actually required (monthly, quarterly, ???) and which contents are the most relevant ones.

Action IOCG/06–04 on PIs + MM	Due: mid December
<i>Comment on contents Monthly Report</i>	

3 Special operations

3.1 SPI annealing

JH summarised the experience of first SPI annealing with strongly reduced GS contact. The annealing went well, but the execution included considerable extra effort for Flight Dynamics, SPACON and on-call Engineer (JH), since critical annealing activities fell during the night or the weekend. The former cannot be avoided (driven by technical requirements), the latter could. There were also various problems in the Ground Segment caused by systems expecting a more or less continuous flow of data.

While a significant number of hours of GS usage has been saved, JH raised the issue that the total savings for ESA are doubtful. PK noted that this measure had been proposed by ESOC and subsequently has been approved up to the SPC, so cannot easily be reverted.

JH also included inputs by CF, who noted that the IREM data from times of contact could not be processed at ISDC – despite considerable effort, exchanges with the IREM team, etc. The problem is that the on-board clock cycle is comparable with the time between GS contacts and thus the TM processing software is unable to correctly order incoming TM packets. The data from these revolutions has thus not been ingested.

PK remarked that it would be acceptable not to have any processed data in the archive from the times the instruments were off.

JH also noted that various calibration activities might be done during SPI annealings, using the GS contact windows, which would save some hours of science time.

3.2 Earth/CXB observations

JH summarised the operations of the first pre-perigee Earth/CXB Observation (EO 3.1) which actually led to slightly less complex operations and better scientific outcome

(discussed at IUG meeting, next day).

The workload on MOC and SOC for each of these is still high and MOC could at best support three such special observations per year. EK and PK remarked, that with the strongly reduced SOC, a maximum of two per year should be envisaged.

4 Preparing the Mission Extension beyond 2016

For the Mission Extension process in 2014, no timeline has been set yet, but PK was told to expect a similar sequence as for the original 2012 extension. This probably means a MEOR in June with strong emphasis on national support besides the technical stability and a discussion of long-term disposal options. The actual case for confirmation 2015+2016 and extension 2017+2018 would then be written by EK and PK in summer for assessment by the committees in fall.

JPR remarked that with reduced ESA support, further reductions would also be probable from CNES. PK responded that one should not assume automatically that everyone was interested in extending the mission and that it would be important to demonstrate that necessary support was still possible.