SDAST Meeting #32, Copenhagen 2005-06-06

Participants: Stéphane Paltani (ISDC), Silvia Martínez Núñez (GACE), Stefan Larsson (University of Stockholm), Peter Kretschmar (ESAC), Carl Budtz-Jørgensen, Ib Lundgaard Rasmussen, Niels J. Westergaard, Niels Lund, Carol Anne Oxborrow, Jérôme Chenevez, Søren Brandt (all DNSC)

NL: Welcome.

SP: News from ISDC. Busy with OSA5. All software is now delivered. Release is imminent. In beginning of July there will be an INTEGRAL user meeting at ISDC. Priorities for continued developments of the ISSW are to be discussed.

INTEGRAL is now in an extended phase and a user group has been (or will be) set up.

OSA5 should be a much leaner distribution based on binary executables and this should also be compatible with developers' needs. Macintosh computers will also be supported.

Little changes for OMC and SPI. For PICsIT there were some improvements. ISDGRI has changed a lot of functions e.g. better rejection of high-activity pixels leading to improved Crab light-curve. Absorption maps have been produced for the NOMEX material. Both raytracing results and Crab observation analysis has been used to produce a model for the absorption.

Response matrix of ISGRI: Saclay people are working on this.

NL: Instrument status: There has been a discussion whether we want to work with the two JEM-X instruments in parallel, but there is a definite degradation in the use of the instruments and we don't know how long time the INTEGRAL satellite will be in operation. Therefore the decision has been taken to continue operation with a single JEM-X. This attitude is supported by ISWT.

A shift of the hexagonal dither pattern from cycle to cycle has been proposed by us. That would be an advantage for JEM-X. A decision will probably be taken at the next ISWT meeting but the implementation may be delayed due to reduced staff at ISOC.

JC: Anode behaviour: Loss of anode 212 on JEM-X1 2004-12-17. No degradation since then.

SB: JEM-X status: DFEE software is working fine. DPE software is working fine.
During revolution 315 the background increased by a factor of 2 (measured by rate of hardware triggers). The detector gain went correspondingly down by ~20% while the energy resolution was almost unchanged.

The position of the Xe line is slowly drifting with respect to the Cd line of the FRSS calibration sources and a correction procedure is being developed.

Recovery of gain after long time switch off takes about 15 hours.

Start up procedure with HV three steps under nominal position is now obsolete, but after short HV fall-outs the overshoot will happen so in that situation the old procedure is adequate.

The JEM-X reaction on IREM has been disabled.

Conclusion: Performance is nominal except for the ageing of the microstrip plates.

Discussion of the start-up procedure in the light of the gain correction software (j_cor_gain). Will there appear a problem? Right now the first half hour of data cannot be used since the gain is much too low.

CBJ: JEM-X status: Some comments on the broken anodes coinciding with the read-out amplifier positions. Period folding with the read-out amplifier leads to valleys around zero and one indicating a correlation.

The varying position resolution with energy means that rejecting events seemingly coming from a broken anode can lead to an undue loss of data at low energy where the position resolution is about 3 mm.

Discussion of how to handle the broken anodes in the analysis.

PK: ISOC news: Frans Jakobs leaving and replaced by Paul Balm. Planning is generally running smoothly. Tools for smarter planning are being developed.

Next SPI annealing will happen in revolutions 327-331. It will be private observations (Crux arm, Revnivtsev) and JEM-X will get more telemetry (several packets more, perhaps 20).

'Smarter' dither patterns will be scheduled after rev. 324 but only for 5x5 dither. The direction will be instrument axes +11.3 deg. The moving center of pattern will continue. There is no corresponding change planned for hex dither pattern.

Copy of the INTEGRAL archive is being set up at ESAC using common archive software. Currently the process of local beta testing is under way.

Person power. NL: We should identify the most important issues that need further development because we must foresee a decrease of the available work force. SMN: Not completely clarify, some more interactions with Victor is necessary. Paul Connell is now concentrated on SPI (problems with spiros). SL: Has a lot of other obligations but will be around in 2005 at least. The Stockholm Archive can continue for a number of years (at least two). NL: will continue to work on JEM-X for a time (into 2006). CAO: The PLANCK work has been neglected for too long, so the JEM-X work must be downgraded very soon. CBJ: The day-to-day analysis of IPF data can continue along with the work on ASIM. NJW: will continue about 100%. SB: Will continue with a large fraction but there are negotiations about involvement in ASIM.

The background modelling gets a lower priority.

The modelling of sources in j_ima_iros and j_src_spectra/lc is similar and since SL has only effectively 14 days of work the response modelling should be merged into a single pot.

JC: Application for PRODEX for 2006-2008 with emphasis on JEM-X work (50% software development and 50% science analysis). PK: Hopes to be able to spend about 20% of time on JEM-X software development after August 2005.

The source extraction should be attacked by NL and SB (take over from SL) in order to solve the ever lasting problem of 'varying' Crab fluxes.

Documentation: The update of the ADD has secondary priority compared to the "JEM-X Science Validation Report". The various chapters were handed out to the primary authors.

Next day

CAO: Misalignment determination. We have a misalignment relative to the startracker of 9 arcmin. The old misalignment gave a spread of about 1.2 arcmin whereas the new one gives a spread of 0.7 arcmin for Cyg X-1.

PK: The misalignment matrix is used in the spectral/lc extraction and we should bring some information on the difference in results using the two matrices. SL can run the diagnostic mode with a small grid to see if the new misalignment matrix gives equal or better results than the old one. The misalignment matrix should be derived for the program that is going to use it. In principle it is possible to repeat the misalignment matrix generation by only using the spectral/lc extraction. The misalignment matrix is also used for planning purposes.

NL: In the long run the detector modelling code should be identical in j_ima_iros and j_src_spectra/lc.

CAO: Gain ageing factor: For JMX2: Steady increase of Xe line position from 29 – 31.6 keV from mission start to revolution 170. 10 IMOD periods will be sufficient to describe this development with sufficient precision. The extra correction factors are brought in JMXi-SPAG-MOD. In the longer terms it is possible to generate a new IC file that can take this into account in an appropriate way. Using other background spectral lines is difficult because the statistics are too scarce. On the other hand we can combine data from the first half of the mission and from the second half in order to verify that the correction for Xe also applies for another energy.

NJW: Imaging:

Discussion: There should be a significance map together with the mosaic image (SP: the code should already exist in j_ima_mosaic) or at least an option to produce it. Currently there is no tool to make a search for source in the mosaic. One idea is to rework j_ima_src_find to do the source search and produce (or update) a recipient data structure.
The functionality to extract source flux by j_ima_iros for a given coordinate even if it is not found is missing and should be included.

PK: Should I update q_identify_srcs to include one or more catalog sources to enforce spectral extraction for sources not found in j_ima_iros? The functionality to include catalog sources should be implemented.

JC: Changes in j_ima_mosaic from version 5.0.1 to 5.0.2 mainly consists of finding the variance as the inverse of the sum of inversion variants. (Then a extended discussion on exposure and if an exposure map should have been produced in j_ima_iros).

NL: Imaging (cont.): The edge of j_ima_iros images is ragged because it has been imposed that at least 300 detector pixels should be visible from the sky pixel position.

NL: Crab calibration in revolution 300: 19 pointings in a tight hexagonal pattern. An analysis of the collimator shadow was presented. There is also a dependence on the amplifier positions.

NJW: Crab calibration: New ARFs have been produced for a new set of RMF IC files and they have been delivered to ISDC for inclusion in OSA5.

SMN: Scripts: j_script-4.5.2 has been delivered to include j_ima_iros and j_ima_mosaic with parameter updates. The GUI shows the parameters and the units should appear when the mouse points to a particular parameter. There were also parameter changes for j_src_spectra.
There is a question about what the "save" button does in the GUI.

SL: Source extraction: New features in version 5.0.0 1) Introduce a collimator tilt 2) produce a PIF file. A high PIF value indicates a high number of counts in the detector pixel. Deviations from this general rule can stem from bad modelling or strange detector behaviour.
The eventlist is suited for timing analysis. The PIF value can be better to use than the light curve extraction, especially for short duration bins, because the background is only estimated for the individual time bin in the lc extraction.

The JMXi-COLL-MOD must be updated with SL's best collimator tilt data.

PK: Science results: Vela X-1 analysis is underway with improved results. A3xxxx is very strong now but also very close to the Sun.

NL: SN1006 results plus a new source in IBIS image. A new observation (amalgamated) has been done. The Galactic Center observations (A. Goldwurm) by JEM-X only show a very slight trace of SgrA*. Revnivtsev et al. have proposed that SgrA* has been a factor 10000 stronger 300 years ago.

SMN: Science Results: Be/X Survey, Scutum Survey, Cyg X-3 spectral evolution.
Some spectral variability of EXO 2030+375. BQCam has been observed in the beginning of 2005. A comparison of source finding by OSA4.2 and OSA5 of the Scutum arm observations does not show better source finding for j_ima_iros. More sources are found by SPI than with ISGRI.

JC: Uncommon Burst from GX3+1: Intermediate decay time – much longer than type I bursts and shorter than the superbursts. Spectral modelling implies a two-component fit.

SB: A finer timeresolution reveals a very strong initial burst (type I) followed by the long duration (700s decay time) tail. SGR1806-20 showed a giant flare interpreted as a magnetic rearrangement.

CBJ: GRBs from May in the JEM-X field of view.

Next meeting: First week of September 2005 in Copenhagen