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MEETING

Meeting Date 16-17 May 2013

Ref MoMUG#14

Meeting Place ESAC/XMM-Newton SOC B5/A24

Chairperson Xavier Barcons

Minute's Date 20 May 2013

Participants

Members: Xavier Barcons (Chair), Hans Böhringer, Anne Decourchelle, Christine Done, Manuel Güdel, Mariano Mendez, Richard Mushotzky (via telecon), Craig Sarazin (via telecon), Beate Stelzer; Marco Salvati (OTAC Chair) Norbert Schartel (Project Scientist), Fred Jansen (Mission Manager), Maria Santos-Lleó (Science Support Manager), Matthias Ehle (UG secretary);

Invitees: Steve Sembay (EPIC PI), Jelle Kaastra (RGS PI), Mat Page (OM acting PI), Simon Rosen (SSC Leicester), Mike Watson (Survey Scientist);
 Presenters and interested staff from the XMM-Newton Science Operations Centre.

Subject

Minutes of XMM-Newton Users Group Meeting 14

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Description	Action	Due Date
Edited by Matthias Ehle. Approved by UG members on 10-06-2013		



WELCOME:

X. Barcons (Chair) and N. Schartel (Project Scientist) opened the meeting on May 16th at 10:00. New members of the XMM-Newton Users Group (UG), Hans Böhringer, Beate Stelzer and Marco Salvati were welcomed and all panel members introduced themselves. Fred Jansen was also welcome back to XMM-Newton project. The UG Chair explained the format of the meeting, with an open meeting on the 1st day, and an open discussion session in the morning of the 2nd day followed by a UG member-only executive session in the afternoon.

ADOPTION OF THE AGENDA:

The agenda of the meeting was presented and approved by the participants.

PRESENTATIONS:

The following presentations were given on May 16th:

Instrument Operations & Data Generation	(R. Muñoz; 10:05-10:30)
Overall Mission Status	(F. Jansen; 10:30-10:55)
Report of the Project Scientist	(N. Schartel; 11:10-11:40)
User Support and Mission Planning	(M. Ehle; 12:05-12:20)
Calibration	(M. Guainazzi; 12:30-13:25)
SAS Developments and Future Plans	(C. Gabriel; 14:35-14:55)
SSC Status	(M. Watson; 15:15-15:35)
Slew Survey	(R. Saxton; 15:40-15:55)
HST Frontier Fields / Calibration & Post-operations Requirements	(N. Schartel; 15:55-16:05)

The view-graphs of the presentations are available on the XMM-Newton public web site, under “General User Support” → “Users Group”.

DISCUSSIONS:

During the presentations, several questions were raised and discussions took place:

After the presentation on Instrument Operations & Data Generation, X. Barcons asked how much time was lost because of the EPIC-pn anomaly described. Only 3-5 hours of science were lost in the first occasion, no science time lost in the second because it was during perigee. UG asked about the total time needed for PPS data products becoming available in the archive: usually this is completed in less than 3 weeks: the ODF data generation needing 4-5 days and the screening of products, together with the fast pipeline processing, done in ~2 weeks time. X. Barcons congratulated the project for smooth and effective operation, even after XMM-Newton being many years in orbit.

After the presentation on the Overall Mission Status and the information received about needed cost reductions, the UG noted the options that had been examined by ESA management and what had been decided. X. Barcons explained that UG would prepare a resolution, to be discussed on the 2nd day of the meeting, in order to express their views and propose priorities of future project activities within the boundaries of the adopted saving options.

The Report of the Project Scientist led UG to plan discussions on the evaluation and separation of Large and Very Large Proposals, for the 2nd day (see **Recommendation 2013-05-17/01** below). The problem of having only one OTAC panel to discuss the proposals submitted to the Cosmology, Extragalactic Deep fields



and Large Areas was also addressed because this fact can create conflicts of interest between panel members and proposal authors. However, it was understood that the possibility to have two panels in this category is not feasible due to the number of proposals not being large enough. Other possibilities, mainly to have this category merged with one of the other extragalactic categories had shown in the past less efficient to select the best science and the current categories were established following OTAC recommendations; going back to earlier categories was therefore considered inappropriate. It was noted by the Project Scientist that this category contains almost only Large or Very Large programmes and as such, all are evaluated by another panel, normally in either the AGN or the Clusters category, where multiple panels allow selecting a non-conflicted panel. This was considered by the UG good enough to ensure a good resolution of conflicts.

N. Schartel presented after his report results of an assessment of the scientific impact of the cost reduction plan. UG took note of this for their resolution, see below.

The presentation on User Support and Mission Planning was followed by a question on the external interest in SAS workshop participation: the number of pre-registration has not changed significantly over the last years. UG decided to address the importance of SAS workshops in their resolution. UG took note of the high success rate of C-target observations in AO-11 to be further discussed on the 2nd day (see **Recommendation 2013-05-17/02** below).

After the presentation on Calibration, X. Barcons acknowledged the work of the calibration team and decided to discuss and propose priorities for future calibration activities on the 2nd day.

After the presentation on the SAS Developments and Future Plans, UG expressed their opinion that SAS threads (recipes jointly prepared by members of the Science Support Team at SOC) are important for the users and have to be maintained and updated as soon as possible after every SAS release. UG expressed their opinion that a reduction of supported platforms and operating systems for SAS builds could be envisaged. However this may need to be announced sufficiently in advance, hopefully one year before stopping the support.

M. Watson presented the status of the Survey Science Consortium highlighting especially the activities related to the generation of the 3XMM Serendipitous EPIC Source Catalogue, which is planned for release in the next 6-8 weeks. SSC future activity plans will be discussed in a SSC meeting in about a month. X. Barcons congratulated SSC for the completion of the 3XMM catalogue.

After the talk on the Slew Survey EPIC Source Catalogue, UG was pleased at seeing the scientific output of this project.

N. Schartel presented the HST Frontier Fields project and invited UG to provide him with a recommendation on this topic (see **Recommendation 2013-05-17/03** below). Also Calibration & Post-operations Requirements that are to be based on science goals should be discussed and prioritized together with UG (see **Action-Items 2013-05-17/01** and **02** below). F. Jansen explained that the currently available post-operations plan is very general and was formulated long ago and at a time when XMM-Newton was assumed to finish operations 2 years after launch. Whereas UG felt comfortable in making a recommendation on the HST Frontier Fields already after discussions on the 2nd day, they felt the need for inaugurating working groups to elaborate requirements for calibration goals related to scientific goals. For the post-operations phase, UG felt fine with giving comments to a requirements document that the Project Scientist may prepare.

INPUT FROM THE COMMUNITY

C. Done reported again on an issue (brought forward already during the UG Meeting of last year) seen when comparing EPIC-pn fast mode data of bright sources with RXTE data: a fit to Crab observations in the energy



band 3-10 keV results in a best fit single power-law with index 1.95 for EPIC-pn data, whereas the RXTE fit gives an index of 2.1. R. Mushotzky commented that he does not consider Crab being a good calibration source: the power-law index is known to vary with position over the source extent. There are as well known issues related to the RXTE calibration, as explained in last years UG and in the documentation in the XMM-Newton web site. The importance of getting a good cross calibration between EPIC-pn and RXTE is appreciated, but unfortunately it seems difficult to revisit RXTE calibration. NuSTAR is involved in cross-calibration activities and there are several simultaneous observations with EPIC such that there is potential for independent checks; efforts are already been put in this regard.

As a 2nd input item, C. Done showed an example of a bright source observed in pn fast mode showing a spectrum significantly varying from SASv10 to v11 and when using different PSF calibrations in v12. R. Saxton explained that between v10 and 11 the way the PSF for timing mode was applied had changed. M. Guainazzi reminded that a dependence on the PSF model for bright sources had just recently been detected and work is on-going, as described in his presentation. Documents on the EPIC fast modes exist (XMM-SOC-CAL-TN-0083 for pn and XMM-SOC-CAL-TN-0082 for MOS, available at http://xmm2.esac.esa.int/external/xmm_sw_cal/calib/documentation/index.shtml#EPIC) describing the specialities of these modes. They are kept aligned with calibration updates as much as possible, and it is planned to keep them so with future calibration updates, e.g. CCF releases. The scientific community is invited to contact the SOC, via helpdesk, and let SOC know about their findings, that eventually can even go into those documents.

B. Stelzer asked about the quality of PPS pipeline products: M. Santos explained that they can be used for scientific analysis if they have been generated with the latest Pipeline version (which is always intended to be based on the latest SAS) and calibration files. Pipeline version used and time of processing is given in the Quality Report accompanying each PPS data set. If some time has passed since pipeline processing of the ODF and if no bulk re-processing happened, products may be based on a too old SAS version and calibration and then re-processing by the user is recommended.

H. Böhringer mentioned an issue of different fluxes found for extended sources due to a not correct handling of bad pixels in exposure maps. R. Saxton explained that a s/w change request on the SAS has already been submitted and is currently under approval by the SAS Configuration Control Board.

X. Barcons noted that further community requests related to the stability of EPIC MOS and pn and the cross-calibration with Chandra had been explicitly addressed by M. Guainazzi in his presentation on calibration.

The meeting finished, without any AOB, on the 1st day at 17:10.

DEDICATED DISCUSSION:

Discussions continued on May 17th starting at 10:00 and addressed the following items:

- Saving options and priorities
- Setting of priorities in the area of calibration, SAS and User Support

These first two items resulted in the formulation of a dedicated UG **Resolution**, available at http://xmm.esac.esa.int/external/xmm_user_support/usersgroup/20130517/resolution.pdf

- OTAC related questions:
 - o Amount of observed priority C-targets; resulting in **Recommendation 2013-05-17/02** (see below)



- o Large and Very Large Programmes in OTAC Chairpersons Meeting; resulting in **Recommendation 2013-05-17/01** (see below)

- New UG chairperson needed; see **Action-Item 2013-05-17/03** below
- HST Frontier Fields; resulting in **Recommendation 2013-05-17/03** (see below)
- Requirements on calibration goals and definition of scientific goals for the post-operations phase; see **Action-Item 2013-05-17/01** and **Action-Item 2013-05-17/02** below.

RECOMMENDATIONS FROM PREVIOUS MEETINGS

In the UG's executive session that started at 13:30, M. Ehle presented, and UG revised, the status of recommendations formulated in previous meetings. Their disposition grouped by topic is as follows:

On Calibration: quoting the minutes of UG meeting in 2012:

"With regard to the calibration activities, the UG notes that there are three types of activities:

1. **On-going baseline calibration activities** of the 3 instruments, which should continue with the highest priority. These include, among others,

For EPIC:

- cross-calibration of the MOS and pn EPIC cameras,
- EPIC-MOS CTI and gain software enhancement,
- EPIC-MOS soft X-ray effective area,
- EPIC high-energy optics effective area determination,
- calibration and implementation of the variable boresight correction,
- pileup correction, if a solution is found by end of Autumn 2012, as planned (to be implemented in the next SAS release after SASv12);

For OM:

- OM sensitivity monitoring,
- OM fast mode PSF enhancement,
- V grism flux calibration up to H α ;

For RGS:

- further wavelength scale calibration, for the next SAS after SASv12
- improvement in SAS handling of bins of low effective area, for the next SAS after SASv12
- quantitative cool and warm pixel methods;

It is understood that the IACHEC cross-calibration activities with other missions should also continue on a "best-efforts" basis as part of the baseline calibration.

2. **New calibration activities, specifically the EPIC timing and burst mode calibration.** These modes make XMM-Newton the only X-ray instrument currently available to observe very bright sources and therefore their proper calibration will result in increased scientific return.
3. **Other calibration activities**, which are also important (and listed in M. Guainazzi's presentation), should be conducted if resources are available."

Recommendation 2012-04-20/01: UG urges the project to secure that expertise on all baseline calibration activities as listed above, existing either at ESAC or at the PI institutes, is kept and secured



regardless of the involvement of each of the partners. Baseline calibration activities are essential to continue guaranteeing the scientific capabilities of the observatory, and should be maintained with the highest priority. The EPIC timing and burst mode calibration should also proceed with the highest priority; with burst mode calibration following once timing mode calibration is solved.

All on-going as described in M. Guainazzi's presentation; **superseded by UG Resolution.**

Related to EPIC Point-Spread-Function:

Recommendation 2011-05-19/01: The XMM-Newton Project should continue its efforts on the following fronts with highest priority: (items a, b, d handled in **Recommendation 2012-04-20/01** above)
c) Improve the full 2-dimensional characterisation of the Point Spread Function. **Closed.**

Related to EPIC-pn Timing and Burst Mode background:

Recommendation 2010-05-12/02: It should be checked if EPIC-pn timing mode observations for possible background generation exist and can be made available to the community. **Closed**, pending PhD thesis by B. Mück (Uni. Tübingen).

Related RGS and forthcoming calls for observing proposals:

Recommendation 2011-05-19/02: The XMM-Newton Project should prepare a list of clear strategies for RGS observations that can help to exclude any negative effects from the existing warm pixels in the RGS CCDs on the observations. **On-going.**

On the 4 Reaction Wheel Study:

Recommendation 2012-04-20/02: The UG strongly recommends that in order to guarantee the correct operation of the mission, the 4 Reaction Wheel Drive option for the XMM-Newton spacecraft is implemented as soon as technically feasible. **On-going.**

On Joint Programmes:

Recommendation 2012-04-20/03: The UG endorses the implementation of the XMM-Newton/Swift joint programme that was offered to XMM-Newton by Swift, with a pool of 300 ks from Swift. This joint programme will highly enhance the scientific capabilities of both missions, and it is expected that this observing time will be in great demand. **Closed.**

Recommendation 2012-04-20/04: The UG recommends the XMM-Newton Project Scientist to get in contact with the NuSTAR project, at appropriate time, to discuss about any possible joint programme. **Closed.**

Recommendation 2012-04-20/05: The UG noted with satisfaction the success of the first trial call for XMM-Newton/HST joint proposals. The proposals approved are mostly working on the synergy, often simultaneous, between X-ray spectroscopy (XMM-Newton) and UV spectroscopy (HST) on diverse areas such as AGN or Exoplanets. In the view of the UG these joint proposals greatly enhance the capabilities of both XMM-Newton and HST. It is therefore recommended that the Project Scientist takes all necessary steps to secure the continuity of this programme. **Closed.**

On the Source Catalogue:

Recommendation 2012-04-20/06: The UG strongly encourages the SSC to continue working for the XMM-Newton source catalogue and recommends that close contact between SSC and SOC is maintained to secure a successful outcome of this joint venture. **On-going.**



On SAS and Pipeline development:

Recommendation 2012-04-20/07: The UG recommends the MPE EPIC-pn and Saclay MOS teams to work with SAS and pipeline teams to assess the possibilities of implementing one of the procedures and tools, previously established by those teams, to create exposure corrected flat-fielded images into the pipeline system. **On-going** with MPE (Saclay stays open to contribute if needed).

On the XMM-Newton Science Archive (XSA):

Recommendation 2011-05-19/11: The XMM-Newton Project and ESA management should make sure that

1. Measures are taken now and in the future to secure that the XMM-Newton archive is to be available permanently, well after XMM-Newton operations finish.
2. The specific XMM-Newton Science Analysis Software (SAS) is maintained during a sufficiently long time scale after XMM-Newton ceases operations to ensure that the maximum scientific return from the archive is extracted.

Superseded, see **Action-Item 2013-05-17/02** below.

On the Slew Survey and associated catalogue:

Action-Item 2012-04-20/01: On the SOC, to report about the status of the Slew Survey and associated catalogue at the next UG meeting. **Closed**.

On the EPIC Background Working Group (BGWG):

Action-Item 2012-04-20/02: On UG, to prepare a support letter for EPIC Background Working Group activities at Leicester University, welcoming any additional contributions to the project based on national funding. **Closed**.

On Mission Extension:

Action-Item 2012-04-20/03: On UG members, to provide input for the science case of the XMM-Newton Mission Extension request. The Project Scientist will contact UG members about further details and deadlines. **Closed**.

Action-Item 2012-04-20/03: On A. Decourchelle, to contact experts in the astronomical community to prepare the scientific case for Galactic plane X-ray surveys with XMM-Newton, in order to provide the Project Scientist with input for the Mission Extension request. **Closed**.

RESOLUTIONS, RECOMMENDATIONS AND ACTION ITEMS

In addition to the UG **Resolution on Savings and Priorities** in the areas of calibration, SAS and user support, available at

http://xmm.esac.esa.int/external/xmm_user_support/usersgroup/20130517/resolution.pdf

UG appreciated the activities in the instrument consortium institutes, and expressed their concern that some of these (in particular linked to EPIC, but also to OM) might be discontinued shortly. Arrangements should be put in place in such a way that the loss of know-how is minimised.

The following recommendations and action items were formulated:



On Large (LP) and Very Large (VLP) proposals:

Recommendation 2013-05-17/01: In order to guarantee the large slate of proposals, panels should be asked to promote for discussion in the OTAC Chairs meeting a pre-allocated number of VLP+LP proposals, without distinction among them. The UG is willing to review the effect of implementing this change at its next meeting.

On Priority C targets:

Recommendation 2013-05-17/02: Given that about 40-50% of the priority C target observations are being executed at the moment, it is recommended that the time allocated to A+B proposals be increased to maximize the science output. The amount by which A+B time could be increased is to be explored by the project, given visibility constraints. The total time allocated to Priority-C targets should remain the same, but with a smaller fraction of them being actually executed.

On HST Frontier Fields:

Recommendation 2013-05-17/03: XMM-Newton would welcome receiving proposals through the OTAC to further exploit the HST frontier fields project, where XMM-Newton can be of real added value.

On Future Calibration Goals:

Action-Item 2013-05-17/01: In order to review calibration requirements formulated before the launch of XMM-Newton, a working group is to be appointed by the Project Scientist with the task of updating the original mission calibration requirements, taking into account the current science goals of the mission as well as a realistic estimate of the progress that can be achieved in meeting such calibration specifications in the future. The working group shall have members with a broad view and expertise in data reduction covering all XMM-Newton instruments, e.g. members from different OTAC panels and from the calibration team. UG members are asked to send their inputs and suggestions for memberships to the Project Scientist. Results from the working group shall be available and agreed upon well before the next UG meeting.

On Scientific Goals for the Post-operational Phase:

Action-Item 2013-05-17/02: In order to re-consider the XMM-Newton Post-operational Phase in the Cost at Completion, the Project Scientist agreed to draft requirements that he will distribute to UG members by the end of January 2014. UG members are invited to comment them. The aim is to have them ready for endorsement for the next UG meeting.

On Candidates for UG Chairperson:

Action-Item 2013-05-17/03: On UG members to send suggestions for the next chairperson of the XMM-Newton Users Group to the Project Scientist. Input should be provided before June 30th 2013, if possible.

The executive session ended on May 17th at 15:45.

Date of next meeting: April 10th (Thursday) and 11th 2014, starting at 10 am at ESAC.