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date de la réunion

Meeting place	Mallorca, Santa Ponsa, Hotel Delfin Mar	chairman	A. Read
<i>lieu de la réunion</i>		<i>président</i>	

Minutes' date	15.04.2009	Participants Andy Read (AR): scientific chair, EPIC (Leicester) Jenny Carter (JC), EPIC calibration and BGWG Support (Leicester), Kip Kuntz (KK, Johns Hopkins & GSFC), Christoph Tenzer (CT, IAAT), Hubert Chen (HC, CEA), Wolfgang Pietsch (WP, MPE) Matthias Ehle (ME, XMM-Newton SOC), Carlos Gabriel (CG, XMM-Newton SOC), Matteo Guainazzi (MG, XMM-Newton SOC) and some guests from the EPIC-CAL team
<i>dates de minute</i>		
		<p>This minutes plus related documents and presentations are available on the web at http://www2.le.ac.uk/departments/physics-and-astronomy/research/src/Missions/xmm-newton/technical/bg-meetings#bgmeetings</p>

Subject/objet	Minutes of meeting EPIC Background Working Group 8	copy/copi	Minutes by I. de la Calle & M. Ehle
		<i>U. Briel, S. Sembay, S. Snowden, K. Kuntz, W. Pietsch, M. Freyberg, S. Molendi, M. Guainazzi, M. Santos-Lleo, N. Scharfel, A. Parmar</i>	

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o Participants

Apologies from S. Snowden (SS), M. Freyberg (MF) and I. de la Calle (IdC).

1 Action Items from last meetings (AR)

- AI_EPIC_BG_WG_01_12: on MF: Once any BG or Closed fits files had been obtained, the user can change their CCF_PATH etc. setup so that a new cifbuild would incorporate these extra files. This enables the BG/Closed events files (e.g. the ones used in SS's task) to be used in the SAS, without them having to be included in the CCF files. - **ONGOING** - Interface TBD (MF & RS, **CG: for esas in SAS**)
- AI_EPIC_BG_WG_03_07: on ME: test soft proton screening s/w SAS tool "espfilt" v0.8.2 available in SAS 7.1: MOS & pn data looks OK, some plotting range adjustments needed – **CLOSED (in SAS 8)**
- AI_EPIC_BG_WG_03_08: on MF: UHB update section 3.2.4: outside FoV eff. area (up to 80 arcmin), Update of CCF (currently not supported, calview, 15 arcmin, TBC) **OPEN** – provide numbers from simulations by B. Aschenbach
- AI_EPIC_BG_WG_03_10: on SM: provide BGWG with script on bkg treatment in spectral analysis (after publication of related paper) – **OPEN**
- AI_EPIC_BG_WG_03_11: on AR/HC: check HK parameters for anomalous MOS FWC data- **ONGOING**
- AI_EPIC_BG_WG_04_02: on SS/K. Kuntz: try to extend MOS tools such that they also work for EPIC-pn by about June 2007 – **ONGOING (see presentation KK)**
- AI_EPIC_BG_WG_04_08: on AR: trigger the generation of smaller sub-sets of EPIC-pn FWC data (with M. Freyberg) ⇒ update of FWC web page needed – **ONGOING (low priority as no user demand)**
- AI_EPIC_BG_WG_06_01: On SS/KK: After reception of more 10 ksec FWC data, re-discuss observing strategy: is it useful to collect FWC at start/end of orbit or during slew observations? - **CLOSED (new strategy, see talk by IdC)**
- AI_EPIC_BG_WG_06_03: On SS/ME: release of a new ESAS (MOS only) version updated for SAS v7.1 - **DROPPED (ESAS will be converted into a SAS task, see talk by CG)**
- AI_EPIC_BG_WG_06_05: On WP: ask M. Bauer about the possibility to convert the new BG handling method into a script/tool for general usage - **CLOSED (released as web page at MPE, link added from BGWG page)**
- AI_EPIC_BG_WG_06_06: On WP: ask M. Bauer to compare the new method with the principal method used by XMM-ESAS, i.e. not subtracting but modelling of the background; SS is interested to help when files are available from M. Bauer – **DROPPED (M. Bauer left astronomy)**
- AI_EPIC_BG_WG_06_07: On SM: to provide new threshold numbers for the Fin/Fout tool to AR to allow him another update of that script (specifically to account for the MOS1 CCD6 loss) – **OPEN**

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- AI_EPIC_BG_WG_07_01 On JC: to provide ME with a list on major performed updates on blank sky files (as input for next UG meeting report) - **CLOSED**
- AI_EPIC_BG_WG_07_02 On ME: to draft next UG presentation and distribute to AR/SS for check and Comments - **CLOSED**
- AI_EPIC_BG_WG_07_03 On JC: to draft a section on the release of BGSelector for an XMM-Newton Newsletter - **CLOSED**
- AI_EPIC_BG_WG_07_04 On JC: to provide descriptions of limitations of refilled blank-sky event files on the blank sky web page (Watchout section) – **this part CLOSED** - and continue investigation of possible solutions to ghosting problem - **ONGOING**
- AI_EPIC_BG_WG_07_05 On JC: to provide descriptions on the scaling of exposure maps and on the workaround for the skycast problem (both related to blank sky fields) on the blank sky web page - **CLOSED**
- AI_EPIC_BG_WG_07_06 On JC & AR: to include descriptions mentioned under AI_WG_07_05 also in related scripts and tools- **CLOSED**
- AI_EPIC_BG_WG_07_07 On CG & IdC: to check BGWG pages from a users point of view and to provide ideas for further improvement of the documentation – **OPEN**
- AI_EPIC_BG_WG_07_08 On CG & IdC: to consider preparation of simple analysis threads and recipes for the analysis of extended sources (mentioning complexity & different approaches) – **ONGOING (documentation of esas SAS task & thread needed)**
- AI_EPIC_BG_WG_07_09 On CG: clarify (with R. Saxton) arfgen problem reported by S. Snowden which is related to the planned ESAS update - **CLOSED**

2 Reports

2.1 The Status of the Blank Sky files and software (JC)

The new request, generation and delivery system of user defined tailor-made Blank Sky files via the submission of a Web based request form has been operational since October 2008. The previously available Blank Sky web page was restructured significantly to document this major change. The transition and update was announced in XMM-Newton Newsletter #84 on 14-Nov-2008.

At the time of this meeting, in total 69 user requests have been received that were addressed within a three day period. Some problems that needed to be clarified were: users asking for blank sky files exactly corresponding to their own observation, i.e. resulting in very small data requests; some users made very wide selections – in the beginning such users were contacted to advise for re-submission, now files are generated based on judgement on file sizes, applying as much of the original requested selection as possible.

Based on the experience gained since the availability of the new system, some (minor) improvements have been identified, see action items AI_08_01 – 03 below.

2.2 The EPIC-MOS background (KK)

An update was given on the work carried out regarding Quiescent Particle Background (QPB) and FWC data.

QPB: Using data in the 0.3-10 keV energy range from corner pixels, evidence was shown of rate increase and softening of the spectra with time. Three 'epochs' are clearly visible in the time evolution of these two quantities. Up to rev. ~725 both quantities are stable. Between revs. ~725 and ~1100 there is a steady increase in rate and spectral softening. From rev. ~1100 until the present time both rate and spectral softening keep increasing at a slightly higher rate. This behaviour is seen in both MOS1 and MOS2 and in all 2 to 7 outer CCD chips with similar trends. However, three CCDs deviate from the average behaviour, called 'anomalous' state, characterized by strong evolution of higher rates and spectral softening, meaning a more erratic behaviour with larger fluctuations between observations. The chips affected by this so-called anomalous states are:

MOS2-5: currently (since rev. ~725) in anomalous state, spectral shape stable but high intensity in the soft band

MOS1-5: incidence of anomalous state currently low, spectral shape unstable

MOS1-4: currently in anomalous state for 50% of the time, spectral shape stable

The recommendation that came out of this study is to discard chips in anomalous states for analysis of low surface brightness sources.

Last, the PN QPB shows little sign of temporal variations.

FWC Data: Image/spectral variability has been studied in FWC data. Images prior and after rev. 1130 have been compared. The results show no sign of temporal variability in either pixel coordinates or spectra.

2.3 Integrating ESAS into SAS (CG)

In order to improve the maintenance of the ESAS software (provided by S. Snowden and KK as standalone package, see previous meetings for details) which encounters difficulties whenever SAS is changing (cf. AI_06_03), the transfer of ESAS into a proper SAS task has been started. The motivation for doing so is to ease and secure the future maintenance, to avoid diverging development and to make ESAS more user friendly.

In a meeting between SAS developers (CG, A. Ibarra) with S. Snowden (in September 2008) the transfer was discussed and it was agreed that ESAS will be integrated into SAS (aiming for release as part of SAS version 9) as a single package, called "esas", which includes all programs and scripts, complemented by a workflow scheme. This processing chain could be included as a new workflow in existing SAS meta-tasks, e.g. "psechain". The further maintenance of "new" code is foreseen to be done by S. Snowden directly inside the SAS environment.

ESAS/esas include a rather large set of calibration files (filter wheel closed data, quiescent particle background data and soft proton flare data). Currently the data is stored in a repository outside the CCF. The plan is that ESAS/esas calibration files can be simplified (see AI_08_5) and then included in the SAS CCF file structure. If this is done, f77 code of esas will need to be modified such that calibration files can be accessed in the 'SAS-way', i.e. via the DAL instead of using ftools.

Future work on esas both for SAS version 9 (first release) and version 10 (lower priority and more time demanding) is detailed in the presentation and are AI for the SAS development team, see also AI_07_08.

On behalf of S. Snowden, a brief status report on the further development of ESAS, namely to allow also the processing of EPIC-pn data was presented: the pn-part of the software is "nearly complete". Open issues are: more testing needed on additional data sets; background might be over-estimated in some cases; useful energy range might be restricted to ~0.4 – 7.2 keV.

Interesting results were presented regarding the Soft Proton characteristics in the pn data.

2.4 SOC view of the Filter Wheel Closed (FWC) data (ME on behalf of IdC)

In order to monitor the instrumental background of the EPIC cameras, and supported by the User Group Recommendation 2007-06-08/45, monthly 10 ksec dedicated FWC calibration observations are performed since Sep 2007. As these were scheduled in the 'good' parts of the orbits, these observations are taking a significant amount of science time. Related BGWG AI_06_01 was discussed via e-mail, noting that based on the data obtained so far, pn does not see temporal variations, but MOS still does.

Therefore, the following alternative approach was presented:

Reduce the dedicated FWC observations to 2 x 10 ksec (1/semester) and, additionally, during some slews, set all MOS exposures to FWC (currently MOS slew exposures are in calclosed, pn is used for scientific slew exposures). In case of a significant change of the instrumental background, non-routine calibration observations shall be requested.

The change of MOS slew exposures can actually be done via a change of the 'Rules & Constraints File' (RCF) used whenever a revolution is scheduled: two versions of the RCF could be prepared and selected alternatively. It is possible then to change the default RCF (with calclosed) to a version with FWC every n^{th} revolution on a best effort basis. The recommendation from the BGWG is every 4th revolution. The impact (less time in MOS calclosed, less amount of FWC data, especially for pn) was highlighted.

The new approach was accepted by the BGWG and passed to the Cal team for discussion, resulting in AI_08_06.

3 Discussion

3.1 Blank Sky Files

With respect to the new Blank Sky files request and delivery system, the question of medium and long-term planning of maintenance and support was discussed. AR and JC confirmed that their support for the semi-automatic file generation can be provided at least for the next couple of years, provided that demand does not exceed the current levels. The need to plan a transfer from semi- to full-automatic file generation was seen but is currently not yet an issue, see AI_08_04.

3.2 Web Pages

AR highlighted the changes introduced on the BGWG Web pages since the last meeting:

- As usual, material presented and minutes of the previous meeting have been published (new URL!)
- Under section 'Further EPIC Background Scripts' a link to a new Web page at MPE (prepared by M. Bauer, see AI_06_05) describing a new method of "EPIC PN Background correction for faint extended emission" (see Bauer et al. 2008, A&A 489, 1029) has been added.

3.3 Changes to BGWG FWC Files

As users were reporting problems using BGWG FWC file ("strange" sky coordinates due to the fact that events are collected from different pointings) all data have now been skycast (via attcalc) to RA=Dec=Pa=0 by IdC . Files have been updated in the BGWG repository replacing the older versions.

4 Final session: - Summing up

4.1 Presentation at next XMM-Newton User Group (UG) Meeting

The next UG meeting will take place at ESAC on May 6th and 7th, 2009. XMM-Newton SOC has been asked again to report on the status and progress of the BGWG activities. This year the talk will be given by IdC (taking over from ME). A draft version of the presentation will be iterated with AR and SS, see AI_08_07.

4.2 Next Meeting

Date and Location will be attached to the next EPIC Cal/Ops meeting, currently planned for spring 2010 in TBD: The next EPIC Cal/Ops meetings will likely take 2 days so a 0.5 day BGWG meeting can be scheduled (preferably) before or after this.

New Action Items resulting from this meeting:

AI_EPIC_BG_WG_08_01 On JC: Add example current Blank Sky files to web form so that 'standard' requests might be fulfilled avoiding duplications of such requests

AI_EPIC_BG_WG_08_02 On JC: Implement some changes to web page text taking into account user

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AI_EPIC_BG_WG_08_03 On JC: Add to Blank Sky request response page information on the exposure weighted NH from the used component files

AI_EPIC_BG_WG_08_04 On AR & JC: Consider and plan the long term support for the Blank Sky delivery system, i.e. a transfer from the semi- to a full-automatic system

AI_EPIC_BG_WG_08_05 On KK & CG: Discuss possibilities to simplify the calibration files for esas

AI_EPIC_BG_WG_08_06 On ME: Take care of the implementation of the new approach for FWC observations at the SOC: Change of Routine calibration Plan, two versions of RCFs, scheduling procedure

AI_EPIC_BG_WG_08_07 On IdC: Prepare a draft version of the planned report of BGWG activities to the XMM-Newton User Group meeting in May 2009, and iterate it with AR

AI_EPIC_BG_WG_08_08 On KK: Look at whether anomalous MOS cases can come and go within observations.