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date de la réunion

Meeting place	**Palermo**	chairman	A. Read
lieu de la réunion		*présidant*	

Minutes' date	12.04.2007
dates de minute	

Participants

Andy Read (AR): scientific chair, EPIC (Leicester)
Jenny Carter (JC), EPIC calibration and BGWG Support (Leicester)
Steve Snowden (SS), XMM-Newton US-Guest observers facility (Goddard)
Matthias Ehle (ME), ESA coordination (ESAC)
Ulrich Briel (MPE)
Alberto Leccardi (AL,INAF Milano)

This minutes plus related documents will all be available on the web:
http://www.src.le.ac.uk/projects/xmm/technical/

Subject/*objet*	Minutes of meeting EPIC Background Working Group 5	copy/*copi*	Minutes by M. Ehle
		M. Kirsch, M. Freyberg, M. Turner, S. Sembay, W. Pietsch,	
		N. Schartel, A. Parmar	

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1.0 Action Items from last meetings (AR)

AI_EPIC_BG_WG_01_01: SS to provide by October 2005 to SOC

- Proton screening tool
- Use of multiple light curves for screening
- Provide list of st. candles for BG analysis comparison with different tools

- By end of December 2005 a SAS task version will be available for DT, aiming release for SAS 7.0 – **OVERDUE** (SAS task by B. Perry for DT; there was a problem with Perl numerical recipes & PGP key for upload) – see new AI_EPIC_BG_WG_03_07
- list of BG candles - **ONGOING**

AI_EPIC_BG_WG_01_04: AR to invite other BG experts to next meetings and to provide possibly scripts/tasks - **ONGOING**

AI_EPIC_BG_WG_01_12: 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, no news from MF** - Interface TBD (MF & RS)

AI_EPIC_BG_WG_02_01: MK to ask RGS if RGS BG light curve could help EPIC screening
OPEN: MK shortly discussed with A. Pollock: **no news from MK,** A. Pollock should be involved later (invite him for one of the next meeting)

AI_EPIC_BG_WG_02_03: ME to test and transfer WPs script of 01_11 to SOC thread
ONGOING, to be used/tested by SAS-WS participants; AI is now part of the project of a Young Graduate Trainee (YGT) working with ME at ESAC, see Section 2.5 below.

AI_EPIC_BG_WG_02_10: all to provide proposal to AR to link relevant papers to the BG component table – **CLOSED** (duplicates AI_EPIC_BG_WG_03_02)

AI_EPIC_BG_WG_02_11: ME to check with mission planning if criterion can be added for SWCX avoidance – (offline between mission planning & SS)
An AO5 observation (100ks) in June should help to constrain model
First Results reported by SS: A beautiful data set without any high radiation nor SWCX signatures! $\Rightarrow$ only upper limits can be extracted
CLOSED

AI_EPIC_BG_WG_03_02: On all: provide AR with additional links & more papers for BG component table - **ONGOING**

AI_EPIC_BG_WG_03_03: on AR/JC: to explain on blank sky web page when to use filled and/or unfilled data sets (recommendations) - **CLOSED**

AI_EPIC_BG_WG_03_05: on AR: to test if sky-recast tool is working correctly on specific data set (i.e a cluster) – **3/4 CLOSED**

AI_EPIC_BG_WG_03_07: on ME: test soft proton screening s/w SAS tool "espfilt"
OPEN – v0.7 is available in SAS development track now: 1st test on A1795 MOS data looks OK, pn check still TBD

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, no news from MF**

AI_EPIC_BG_WG_03_10: on SM: provide BGWG with script on bkg treatment in spectral analysis (after publication of related paper) – **OPEN** $\Rightarrow$ see talk by AL, section 2.4

AI_EPIC_BG_WG_03_11: on AR: check HK parameters for anomalous MOS FWC data - **OPEN**

AI_EPIC_BG_WG_04_00: on all: send presentations to AR **- CLOSED**

AI_EPIC_BG_WG_04_01: on SS/K. Kuntz: delivery of tools for MOS to merge data and for improved soft proton handling by March 2007 – **CLOSED**, see section 2.1

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**

AI_EPIC_BG_WG_04_03: on JC: discuss introduction of DATE-OBS keywords (if and what values) in the blank-sky event lists - **CLOSED**

AI_EPIC_BG_WG_04_04: on JC/AR: specify which filter has been applied on blank-sky event lists to remove flaring background periods: give selection express and explain why it is different from the one given in SAS threads and SAS Manual - **CLOSED**

AI_EPIC_BG_WG_04_05: on JC/ME: test if location selection tool for blank-sky fields can be installed at ESAC – **ONGOING**

AI_EPIC_BG_WG_04_06: on JC/AR: check if 'ghosting' script can be made available to all users via the BGWG script page – **ONGOING**

AI_EPIC_BG_WG_04_07: on AR: trigger the generation of full field-of-view FWC MOS data by K. Kuntz (standard mode), and make them available to ME for an update of the FWC web page and related Newsletter announcement – **ONGOING**

AI_EPIC_BG_WG_04_08: on AR: trigger the generation of smaller sub-sets of EPIC-pn FWC data (with M. Freyberg) $\Rightarrow$ update of FWC web page needed - **OPEN**

AI_EPIC_BG_WG_04_09: on AR: provide further explanation of the output of the f_in-f_out script together with some advise to the user on what to do next - **CLOSED**

AI_EPIC_BG_WG_04_10: on SS: ask K. Kuntz to include a figure on the dependence of the flaring MOS background on the orbital position of XMM-Newton in the planned paper – **ONGOING**

AI_EPIC_BG_WG_04_11: on ME: discuss with MS problem of undetected high energy noisy hot pixels and see if they can be detected in badpixfind or if SAS thread for background removal needs modifications $\Rightarrow$ **CLOSED:** see AI_EPIC_CAL_17_04

AI_EPIC_BG_WG_04_12: on SS to trigger on B. Perry that "espfilt" avoids the hot flickering pixel in pn CCD 11, column 63 (and eventually other bad regions of detectors) – **DROPPED**, cf. AI_EPIC_CAL_17_04

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2 Progress Reports

2.1 An XMM-Newton XMM-ESAS software update (SS)

A new version of the XMM-ESAS (XMM-Newton Extended Source Analysis Software) is to be released in the near future after final tests (see AI_EPIC_BG_WG_05_04), finalisation of the documentation and adding of an example on how to handle merged data sets (e.g. M101).

The new version now makes use of SAS tasks to convert between detector and sky coordinates and supports the handling of mosaic-type observations.

Comparing ESAS (EPIC-MOS) derived galaxy cluster temperatures with Chandra values show differences: Chandra finds higher temperatures above 5-6 keV; differences are increasing with increasing temperatures. Discrepancies remain even when cross-talk RMFs are applied also to Chandra data. A first rough analysis of pn data apparently shows good agreement between MOS and pn suggesting that differences might be due to Chandra calibration uncertainties.

Future development plans for ESAS are:
- start extending the background tools also to pn data; a statement on the feasibility should become available in time for the next BGWG meeting, end of October 2007
- include the use of the SAS task "emosaic" to merge mosaic-type observations (instead of the currently used Fortran programme)
- add a call to the f_in/f_out script to measure the remaining soft proton contamination
- use the soft proton model derived from an outer annulus only.

2.2 Kip Kuntz's view of soft proton flaring (SS)

Results were presented at the previous BGWG meeting and show the same trend as the monitoring of pn and RGS data (see XMM-SOC-USR-TN-0014): A high soft proton flux can be expected just inside the magneto-sheet; chances for low background radiation observations are higher in winter.

2.3 Filter wheel closed (FWC) data (SS)

Some "anomalous" states are not detectable in corner data (known as an anonymous anomalous state). This has been identified in MOS1 CCD 4 and may occur in others.

Therefore there is a need for regular short FWC exposures to detect these anonymous states. Monthly FWC exposures of 10ks would produce enough counts for some tracking of the state $\Rightarrow$ AI on future calibration, see AI_EPIC_BG_WG_05_06)

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2.4 Update on Blank Sky work plus soft proton flaring analysis (JC)

Blank Sky event lists, related files, tools and descriptions have been made available at
http://xmm.esac.esa.int/external/xmm_sw_cal/background/blank_sky.shtml in May 2006.

Several updates on the Blank sky web page have been performed closing action AI_EPIC_BG_WG_04_03
and 04_04 and several individual queries by users have been addressed (for details, see presentation by JC)

Future Plans:
- s/w improvements: selection too, e.g. by location (RA, Dec), see AI_EPIC_BG_WG_04_05:
This could be done in the form of a java web based tool: as files are big, it might be good for the user not to
have the need to transfer all blank sky files before running the selection tool at his/her location; instead the
idea is to offer a tool that runs at the SOC, creating a result output file there and restricting the needed data
transfer to this single output file only – on hold
- the script used to fill holes caused by extracted point sources (used as 'ghosting' script for the blank sky
file generation) might be of interest to all users (see AI_EPIC_BG_WG_04_06); IDL script is available at
http://www.star.le.ac.uk/~jac48/tools/tools_index.html

Sidenote: JC has started working on the analysis of pn soft proton flaring similar to KK's work regarding
the MOS

2.4 Analysis of low surface brightness sources with EPIC (AL)

AL gave a presentation on their method on how to analyse low surface brightness sources with EPIC (see
his presentation for all the details): It was underlined that for the analysis of observations where the
background dominates and the source spectra have few counts, it is important to apply the correct statistics,
i.e. Cash statistic where the background has to be modelled. This method (the tripled method) is discussed
in a paper by Leccardi & Molendi, 2007 A&A submitted. In addition, systematic uncertainties were
discussed which are less important here as hot galaxy clusters can be studied using the energy band above 2
keV. Their method on how to address different background components in this energy band was explained
as well.

2.5 New version of image generation script (ME)

Based on a script by W. Pietsch & M. Bauer (MPE) a Young Graduated Trainee (YGT) supervised by ME
at ESAC has created an improved version (bash shell script) that allows input via user-defined parameters.
In addition, the script has now been divided into sections which can be executed separately. The motivation
for this YGT project was to produce attractive and scientifically valid images that can be used by scientists
to illustrate their work and finally to populate the XMM-Newton Image Gallery. The script is currently
under testing and will be released to beta testers (BGWG members) within the next 1-2 weeks. Afterwards
the script, together with documentation and auxiliary files, will be released to the public via a dedicated
SOC web page and announced in a future XMM-Newton Newsletter.

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3 Discussion

for details, see presentation by AR available on-line at http://www.src.le.ac.uk/projects/xmm/technical/

3.1 Web Pages

The current layout and contents of the BGWG web-pages was shown and changes since the previous meeting were highlighted: text changes, new scripts, etc.

3.2 BG components Synopsis Table

No update, see AI_EPIC_BG_WG_03_02.

3.3 Filter wheel closed (FWC) data

Some users were requesting that not only MOS CCD specific files are available; also combined full field-of-view data sets are needed (see AI_EPIC_BG_WG_04_07). As soon as the combined event lists are there, the FWC data will be announced.

4 Final session: - Summing up

4.1 AOB

None.

4.2 Plans for next period

An estimate of the to be expected EPIC background in low background periods can also be derived from blank sky background event files: For each of the blank sky files (based on the instrument-filter-mode classification) count rates have been derived in the standard SSC/PPS energy bands. These count rates are very useful for the XMM-Newton proposal preparations, especially for the feasibility study and should be made available from the blank sky count rates page in time for AO7 (see AI_EPIC_BG_WG_05_02).

Extend the XMM-ESAS tools to pn (see AI_EPIC_BG_WG_05_05).

4.3 Next meeting
- Date and Location will be attached to the next EPIC Cal/Ops meeting, currently planned for 5-7 November 2007 in Mallorca: These meetings usually take 1.5 days so that a 0.5 day BGWG meeting can be scheduled before or after this.

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New Action Items resulting from this meeting:

AI_EPIC_BG_WG_05_00: on all: send presentations to AR

AI_EPIC_BG_WG_05_01: on ME: continue testing of espfilt task with the goal of a first public release in SASv7.1

AI_EPIC_BG_WG_05_02: on ME/AR/JC: prepare a web page with plots of count rates derived in the standard SSC/PPS energy bands

AI_EPIC_BG_WG_05_03: on AR: test combined full FoV MOS FWC data before public release

AI_EPIC_BG_WG_05_04: on SS/ME: release of a new ESAS (MOS only) version

AI_EPIC_BG_WG_05_05: on SS: try to extend functionality of ESAS for pn and deliver a progress report for the next BGWG meeting

AI_EPIC_BG_WG_05_06: on AR/SS/ME: formulate request for more FWC calibration data

AI_EPIC_BG_WG_05_07: on ME: prepare web page & Newsletter item to announce 'images' script

Possible future AI (on R. Saxton+student)?
Use SciSim to simulate cluster & bkg and test different analysis methods on it (also for Chandra simulator).