Meeting date 24.-25.09.2003  ref./réf. XMM-SOC-CAL_EPIC-MIN-0012  page/page 1/5

date de la réunion

Meeting place Saclay CEA  chairman S. Sembay
lieu de la réunion

Minute’s date 07-10-2003  Participant

dates de minute

Subject/objet EPIC CAL Meeting 12  copy/copi

F. Jansen
1 Epoch dependency of the MOS QE and RMF and cross-calibration with the pn S. Sembay)

- Further investigation of MOS Low energy problem indicates presence of a QE and redistribution change introducing a Carbon edge and changing the optical depth of the O edge can explain the phenomenon.
- Linear increase of the C edge.
- Systematic comparison of AGN with smooth continuum shows better agreement in the energy range from 0.6-1.5 keV for the slopes of the three instruments using the new QE. (+- 0.1)
- For the energy range from 3-10 keV systematic differences for the MOS 1 of -0.1 in slope.
- Variation in oxygen edge: increase in optical depth. slight indication in 3C273 for an O-edge., don’t use that source for further o-edge calibrations
- Both MOS cameras show evolution in QE at “carbon” and oxygen
- Pn seems unaffected
- Carbon /oxygen ration and differences in epoch dependency not consistent with a single compound
- Both MOS cameras show evolution in energy redistribution
- ASAP NRCO on RXJ 0720 for further checks

2 Routine Cross Calibration at Vilspa (M. Kirsch)

- Systematic analysis has been started at VILSPA by the Calibration scientists
- ~25 targets will be used to establish a report on the current status of cross calibration for the X-ray instruments.
- Work will be carried out interacting with the PI teams.

3 Analysis of the X-ray psf (A. Read)

- spectra from annuli at 0, 5, 10, 15,...40 pixels of MCG-6-30-15
- created appropriate RSPs and ARFs
- fit (power-law modelling) on the 2-10 keV single events.
- derived spectral slope for non-piled-up point sources is not independent of the extraction radius

4 Analysis of the optical psf (B. Altieri)

- MOS optical loading assessment in PHS-tools: OK for on-axis sources
  fraction of optical light in central pixel = ~1% (vs 2% in Lumb’s model) but threshold raised to 50 ADUs/frame/pixel since AO1. Too conservative for off-axis sources - unchanged
- EPIC-pn optical loading assessment in PHS-tools was much too conservative by a factor 6. Threshold raised for AO3 from 50 to 100 counts/frame/pixel
- New diagnostics in THIN-filter this summer on OM cal. stars seems to show that optical loading is overestimated but contradictory results so far ...
5 Vignetting (M. Kirsch)
- Optical axis values derived from Coma have been implemented in MISCDATA CCFs
- New BS misalignment angles have been calculated
- Astrometry was checked with OMC2/3
- Vignetting correction for 3C58 for MOS1 /2 checked. Better than 1-2 %
- Further checks for pn underway (G21.5 and Coma)

6 MOS Timing Mode (M. Kirsch)
- 1E0102-7219 in rev. 447 in LW and Timing mode for both cameras
- energy in Timing mode is overcorrected by up to 1.5 %
- differences between both MOSs in LW mode less than ~0.7 %
- differences between both MOSs in Timing mode less than ~0.5 %
- proposal: fix differences between LW and Timing mode with an energy dependent tuning function (as also successfully done for the pn)

7 Flickering Pixels in MOS2 (J. Ballet)
- Up to 8% flickering pixels for the different CCDs for MOS2
- Not present for MOS1

8 Spatial and Temporal variation of the EPIC pn energy scale (K. Dennerl)
- Recipe for energy correction for pixels effected by corrupted values of the offset map, using offset table or 20ADU image
- superposition of Vela SNR observations confirms the presence of energy shifts in a ring-like structure with a similar shape as the ventilation hole in the electronic board below the CCDs:
- explanation: systematic deviations from exponential charge loss caused by optical/infrared light shining through the ventilation hole, which reduces the charge loss in this area due to partial saturation of traps
- evidence for degradation of CTI, weaker time dependence (quadratic might be needed)
- sporadic shifts of up to 20 eV over the mission for the CALCLOSED data, could be related to high cosmic BG
- evidence for change in energy resolution: Mn 1 eV per year
9 BG and SAS 6.0 pn  (M. Freyberg)

- Still: in 2-7 keV range: \(10^{-1}\) cts s\(^{-1}\) keV\(^{-1}\) serendipitous calibration lines
- Spatial inhomogeneities of fluorescence lines
- Event pattern fractions dependence on mode, position and energy
- Decay of calibration source: longer exposures needed
- Discarded line counter vs. Background rate
- Archive reprocessing: DLI map analysis
- New time jumps created by improved OAL?!

10 Round table discussion on calibration observations and analysis strategy

- Proposal for low energy response monitoring MK
- Adjust MOS1 QE for higher energies to the pn SS
- RGS cross calibration
- CAS-A observation for EEF pn and MOS Timing
- Calibration of OFF axis: Silvano is interested: open issues: QE and redistribution:
  - Raster scans with N132D or 1E0102 needed to invest the OFF axis behaviour
  - Internal calibration source checks will be done by SM and DB
- BG workshop at Milano will have as output a thread to be made public at VILSPA BA, SM, ME
- WHAT will be in the new SAS 6.0
- Refinement of MOS Gain SS
- Chains versus procs

11 actions

AI_EPIC_12_1: MK to provide a proposal for MOS LOW energy problem follow up measurements.
AI_EPIC_12_2: MK to organise Cas-A observations for EEF calibration of pn
AI_EPIC_12_3: BA to provide status of RGS versus EPIC BS with proposal to go for one BS.
AI_EPIC_12_4: JB to provide VILPA with a tool to check MOS data for "3 missing raws" feature
AI_EPIC_12_5: TA to provide VILSPA with new sequences with old BS
AI_EPIC_12_6: MS/ME to make Offset maps available at VILSPA for the users & X-ray loading information.
AI_EPIC_12_7: MK to follow up time jump problem.
AI_EPIC_12_8: MK/LM to sort out possible resources for implementing Molendi/Sembay pile-up correction into SAS.
AI_EPIC_12_9: SS to provide VILSPA with time dependent new QE files.
AI_EPIC_12_10: SS to refine the ADUCONF files to cope with the slight over correction.
AI_EPIC_12_11: BA/MS to review limits for optical loading in UHB
12 Open old action items

AI_EPIC_CAL_11_6: RS to follow up the possible coordinate problem
AI_EPIC_CAL_11_7: MK to implement values from filter CCF_6 in a new CCF
AI_EPIC_CAL_11_8: EK/UB/MK to organise an observation with fixed offset upload in perigee
AI_EPIC_CAL_11_5: Frank to verify pn QE with the Crab

EPIC_CAL_WORKSHOP

AI_EPIC_CAL_021028_1: SS to check the implemented O edges
AI_EPIC_CAL_021028_2: SS to check the filter transmission concerning carbon edge
AI_EPIC_CAL_021028_3: SS to check if the excess between 1.8-2.2 keV could be cured with a different treatment of the Silicon edge, fluorescence, or gold edge.
AI_EPIC_CAL_021028_4: SS to check QE (thickness of MOSs) for high energies

13 Closed old action items in period of last Cal_meeting to this CAL-meeting

AI_EPIC_CAL_030204_1: MK to ask for a long Vela operation (100 ksec) in order to measure possible CTE effects related to optical loading in pn ventilation hole done
AI_EPIC_CAL_030204_2: MK/MS to follow up optical PSF/Xray PSF for PHS done
AI_EPIC_CAL_030204_3: RS Request on model output for epatplot done
AI_EPIC_CAL_030204_4: SS to provide MK with statement on low energy MOS flux problem done
AI_EPIC_CAL_030204_5: SM to provide MK with statement on PS problem done