Status of XMM-Newton cross-calibration using SASv14.0

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Examples: AGN

- All EPICs in FF mode without pile-up.
Examples: AGN

- All EPICs in FF mode with pile-up (10 arcsec).
Examples: AGN

- All EPICs in SW mode without pile-up.
Examples: AGN

- All EPIC in SW mode with increasing pile-up: **H1426+428**, 3C273, PKS2155-304
Examples: AGN

- All EPIC in SW mode with increasing pile-up: H1426+428, 3C273, PKS2155-304
Examples: AGN

- All EPIC in SW mode with increasing pile-up: H1426+428, 3C273, **PKS2155-304**

2-10 keV fluxes: $4.9 \times 10^{-11}$ ergs/cm²s

9.7$ \times 10^{-12}$ ergs/cm²s
Examples: Galaxy clusters

- FF mode annuli. Single mekal model.
- A2029: $kT \sim 7.1$ keV
- A262: $kT \sim 2.3$ keV
Especially for MOS2: cross-calibration results to EPIC-pn show mode dependence.

- SW mode (no pile-up: full PSF)
- LW mode (pile-up: 5″-core excised)
Example: SNR 1E0102.2-7219

- IACHEC model: pn dependence of extraction radius

![Graphs showing energy spectra for off-patch and on-patch conditions.](image)

- off-patch: all EPIC 75” radius
- on-patch: MOS 75”, pn 40” radius
Flux distributions

- SASv14.0 versus SASv13.5 (chi²-statistic)
Change in EPIC high energy ratios caused by XRT3 PSF update: PSF wings were adjusted to return stable fluxes for energies >2 keV independent of amount of columns used in timing mode.

Incorrect XRT3 update or XRT1/2 updates required?
No change in cross-calibration between instruments between SASv13.5 and SASv14.0 except for the highest energy band.

For more recent epochs, EPIC-MOS contamination model might need a revisal.

For highest energies, MOS and pn diverge more than before: origin traced back on XRT3 PSF update (XRT3_XPSF_0016.CCF): PSF wings were adjusted to return stable fluxes for energies >2 keV independent of amount of columns used in timing mode.

Current ongoing investigations whether we overcorrected pn PSF or we need corrections for MOS PSFs, too.