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

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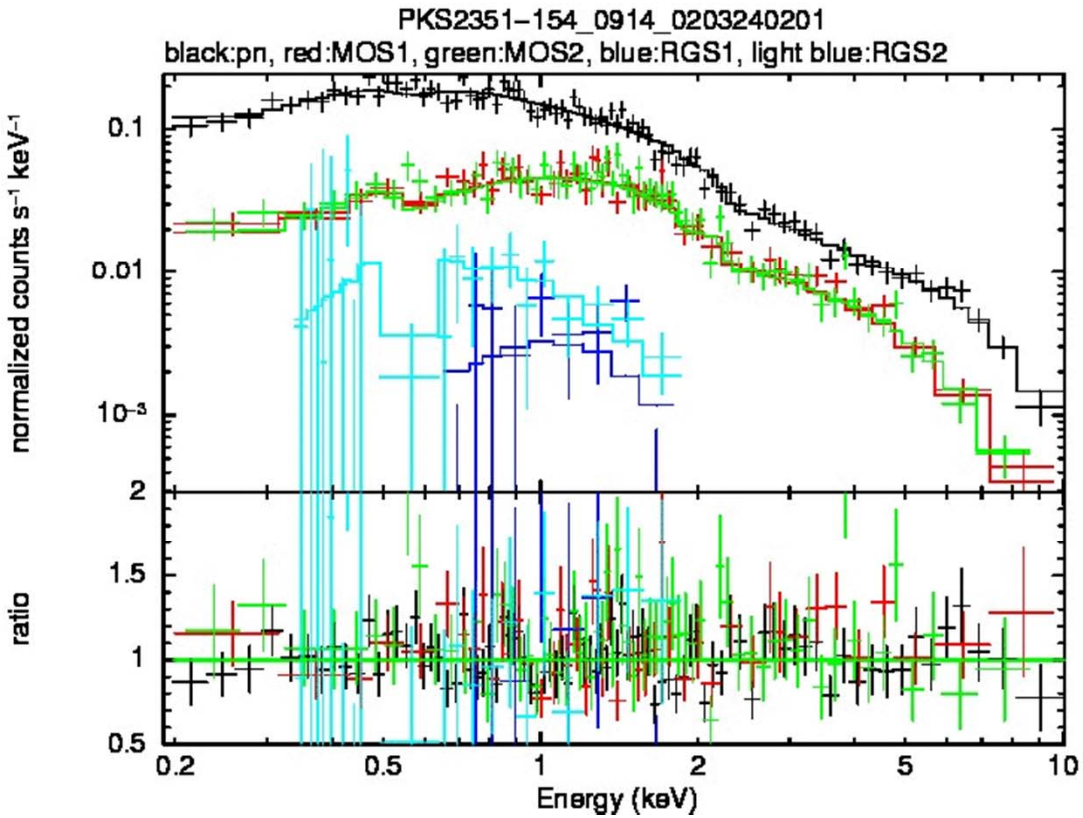
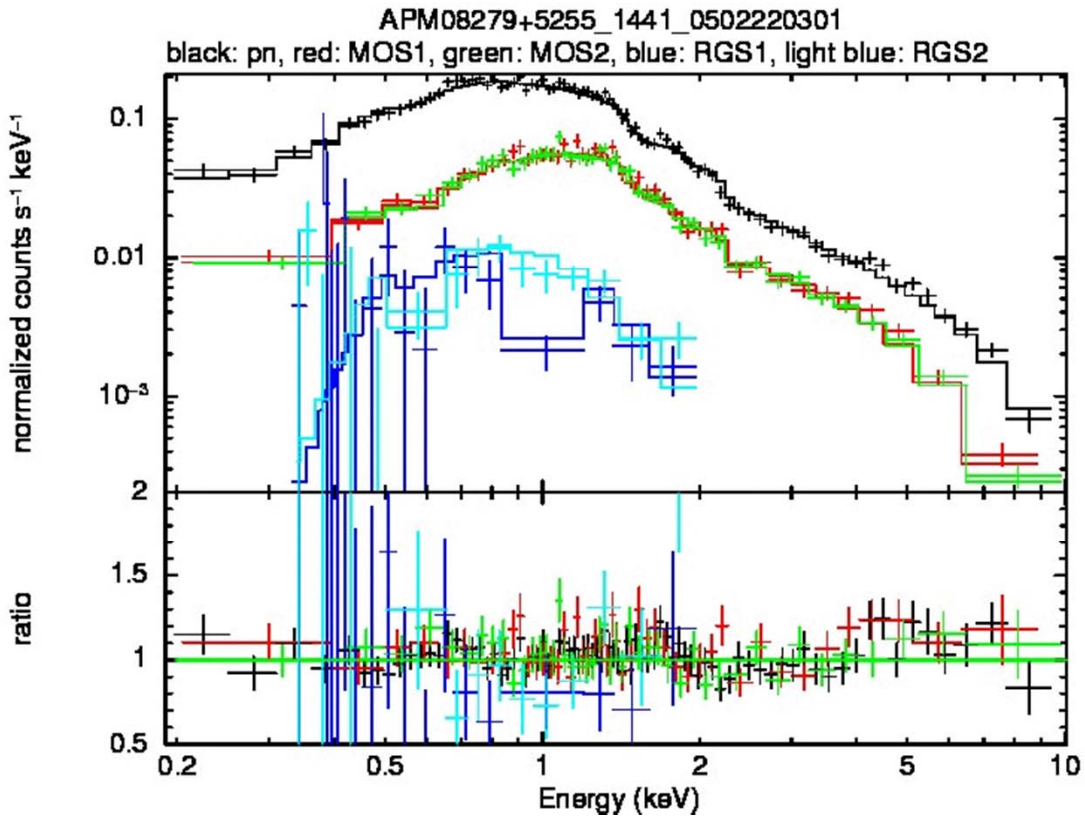
10.04.2015

Examples: AGN

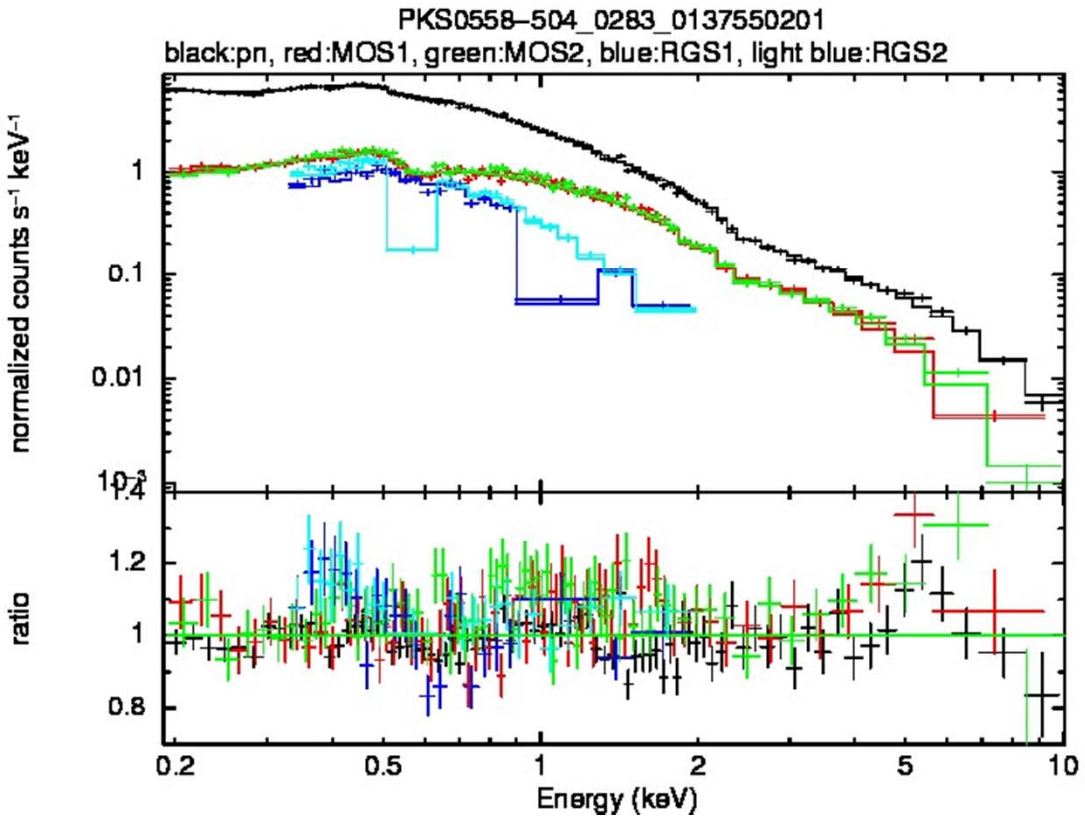
- All EPICs in FF mode without pile-up.

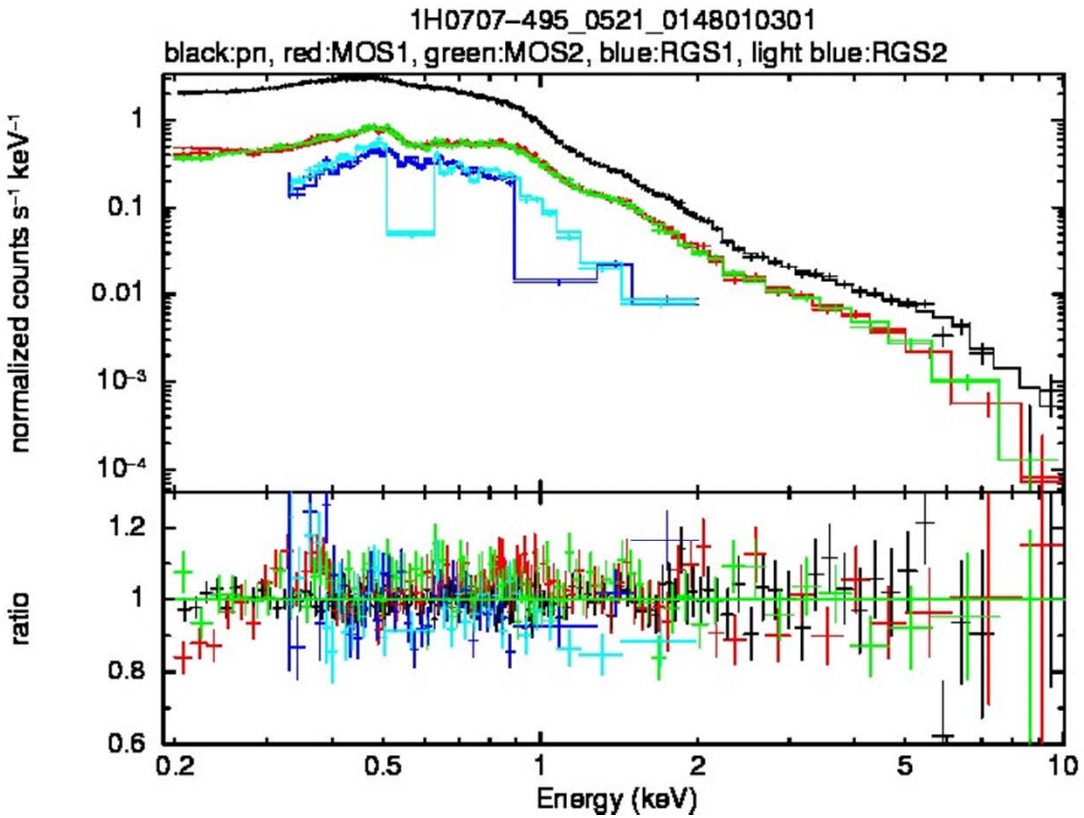




Examples: AGN

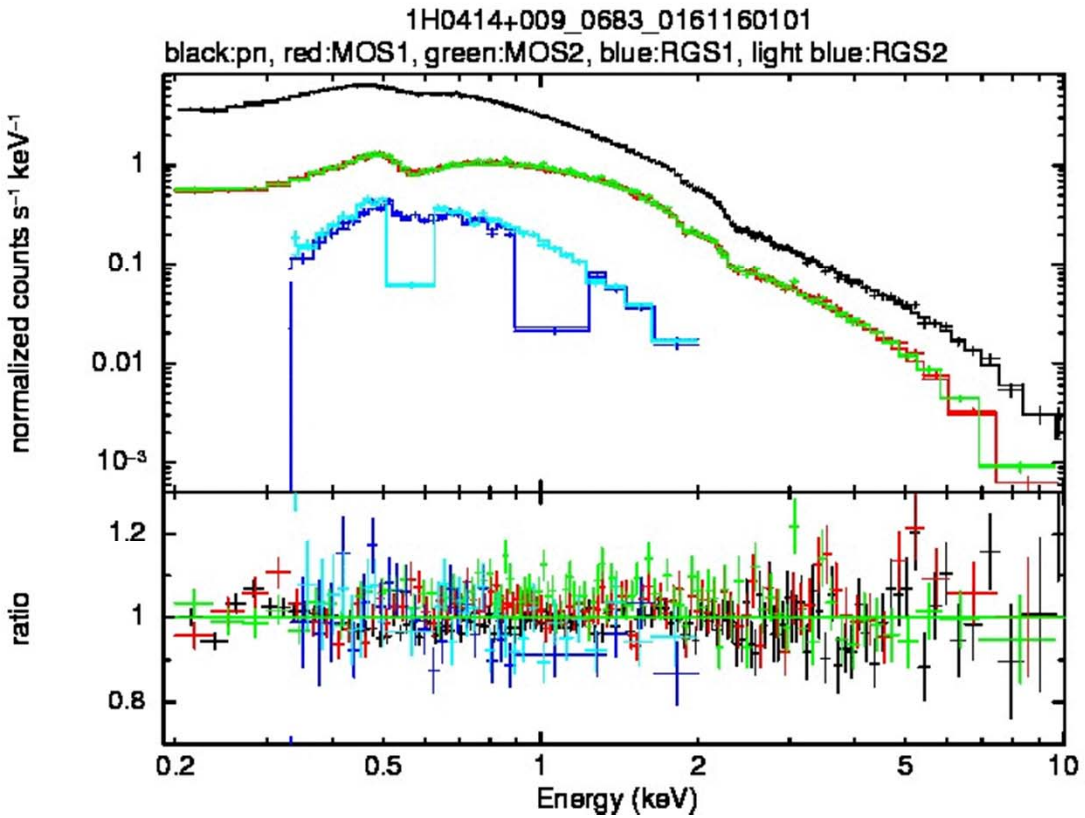
- All EPICs in FF mode with pile-up (10 arcsec).

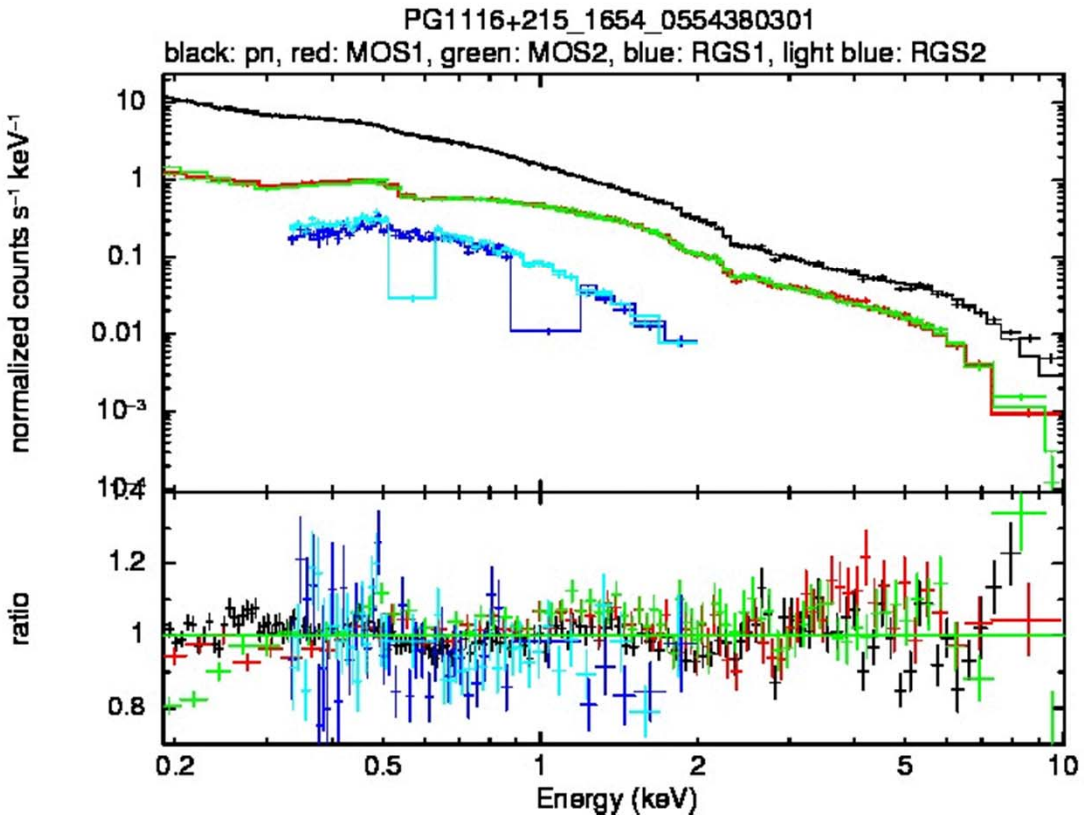




Examples: AGN

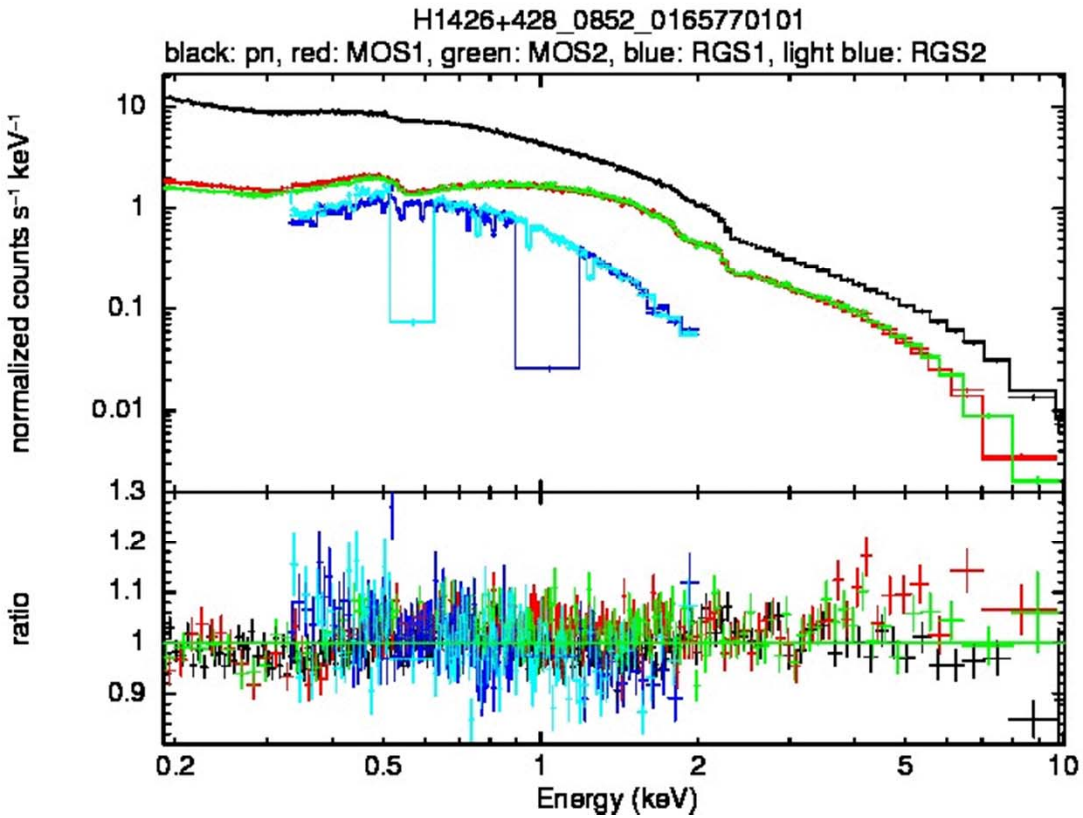
- All EPICs in SW mode without pile-up.

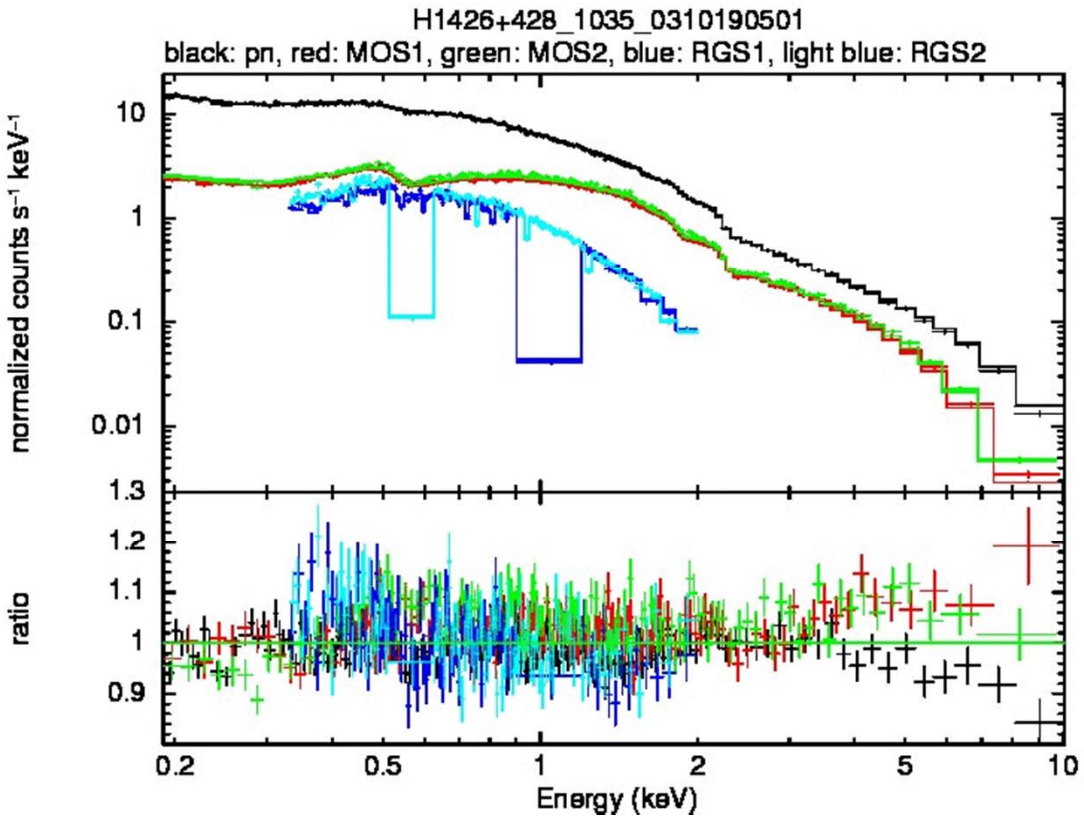




Examples: AGN

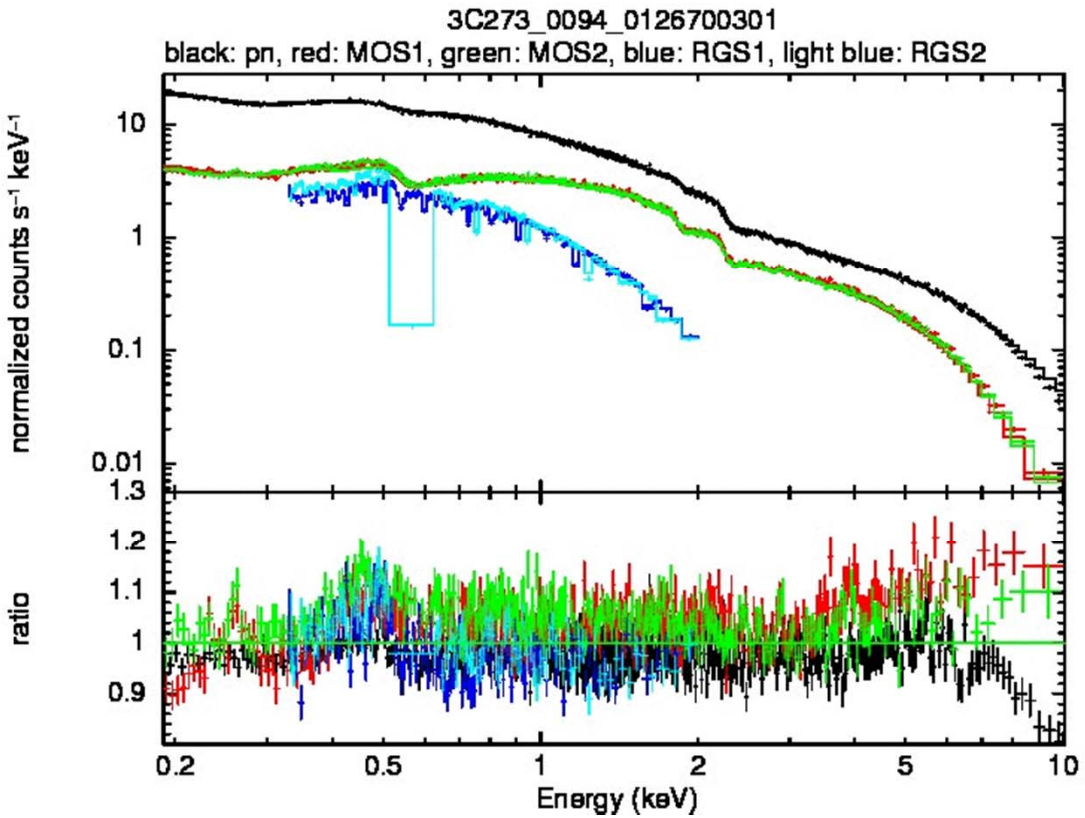
- All EPIC in SW mode with increasing pile-up: **H1426+428**, 3C273, PKS2155-304

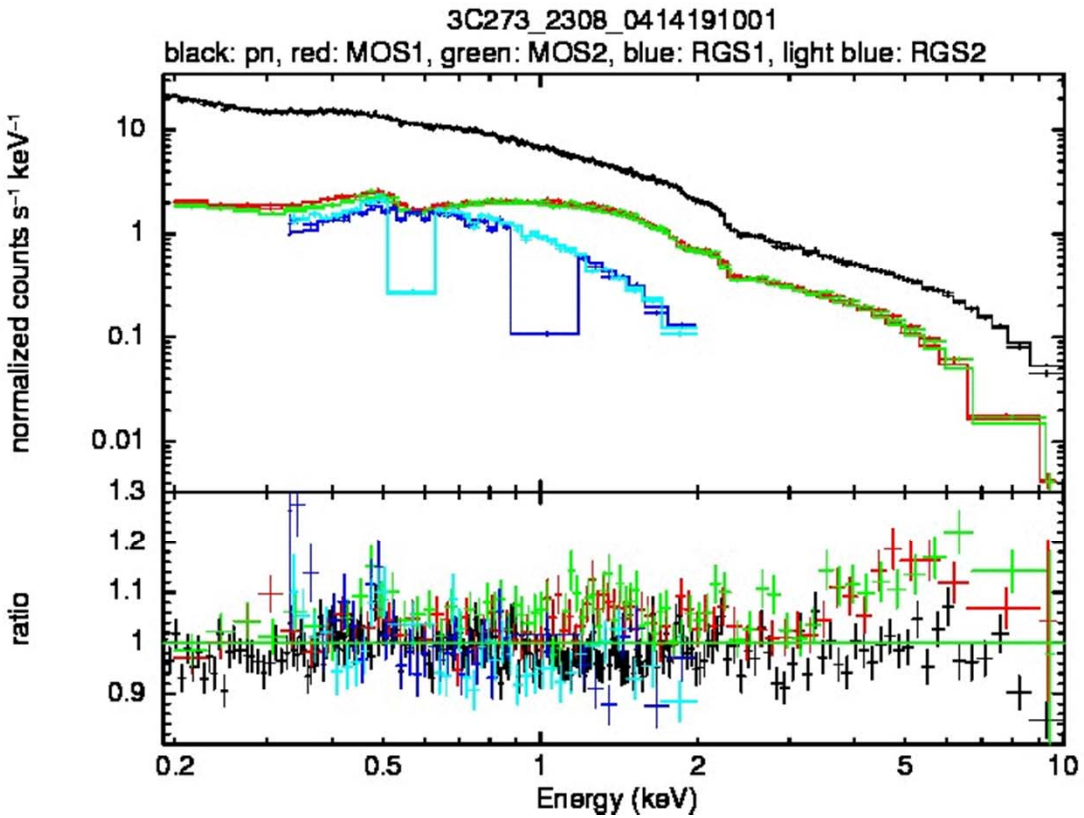




Examples: AGN

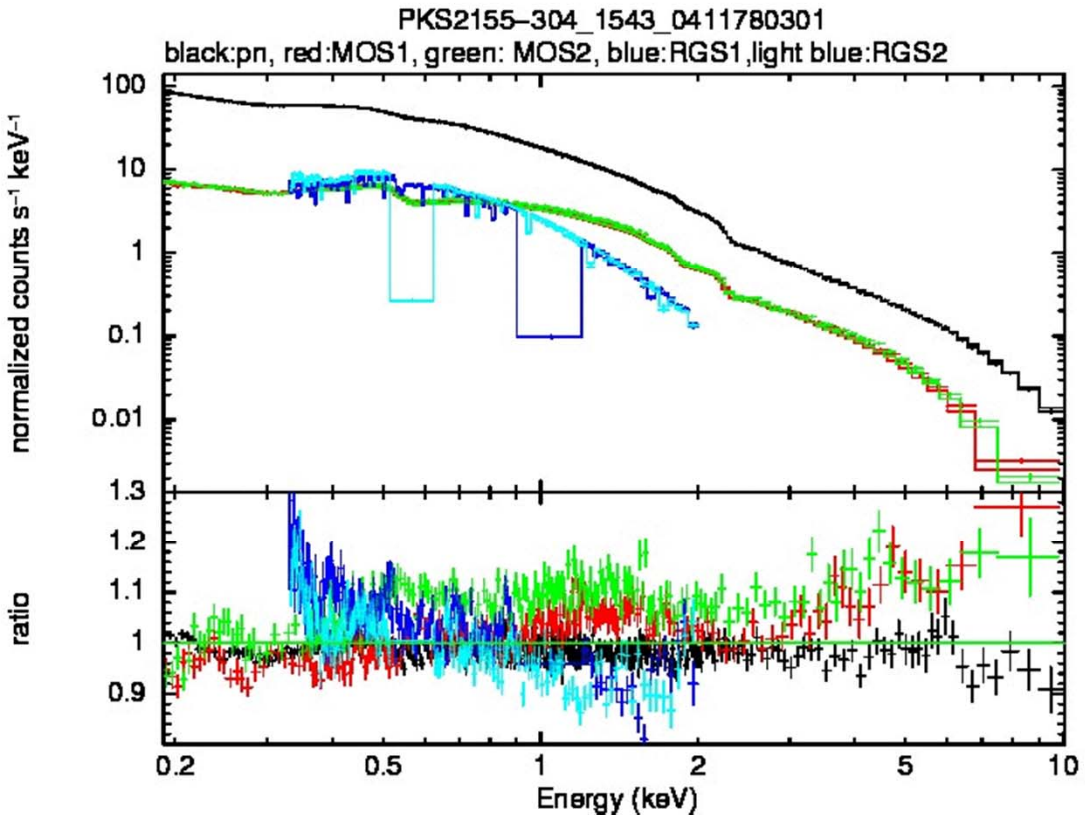
- All EPIC in SW mode with increasing pile-up: H1426+428, **3C273**, PKS2155-304

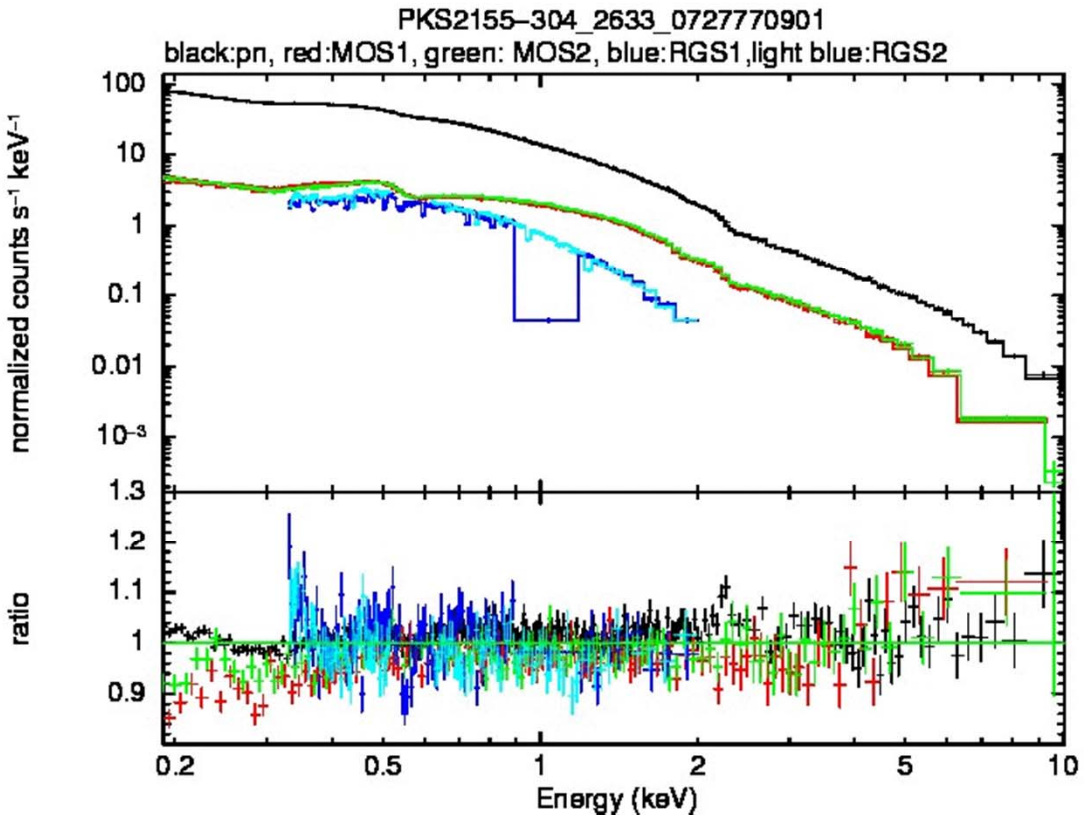




Examples: AGN

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





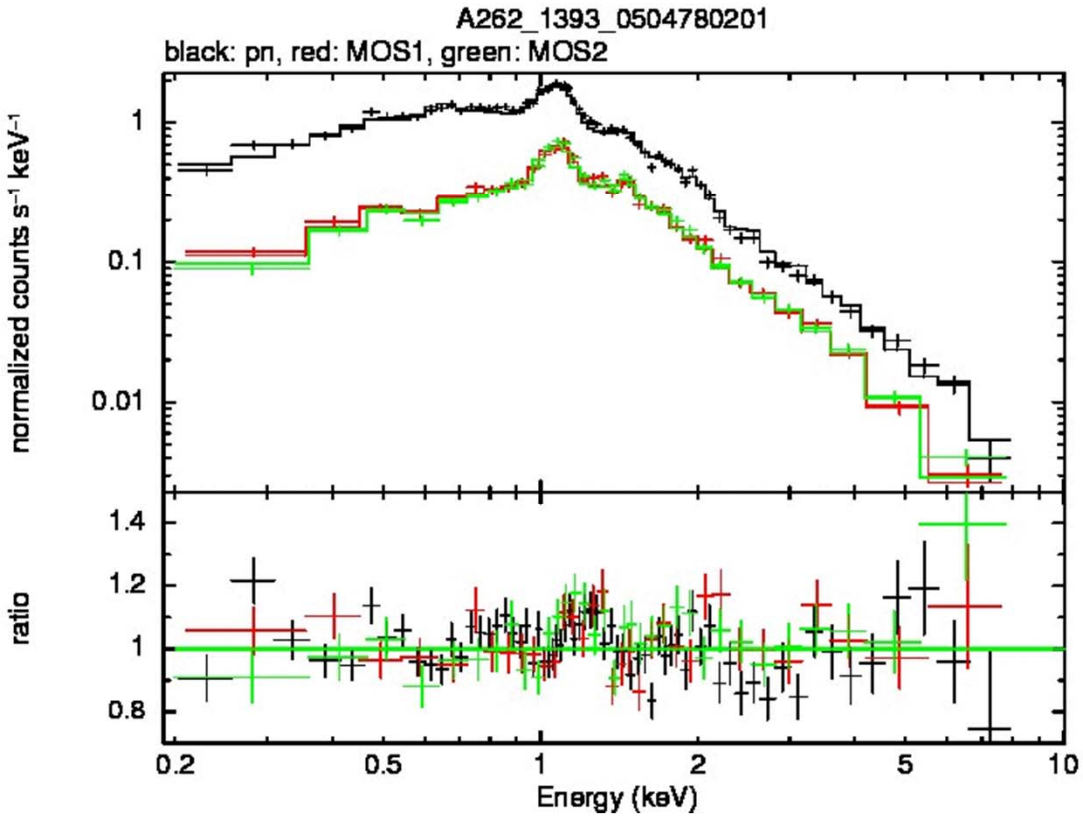
2-10 keV fluxes: $4.9*10^{-11}$ ergs/cm2s

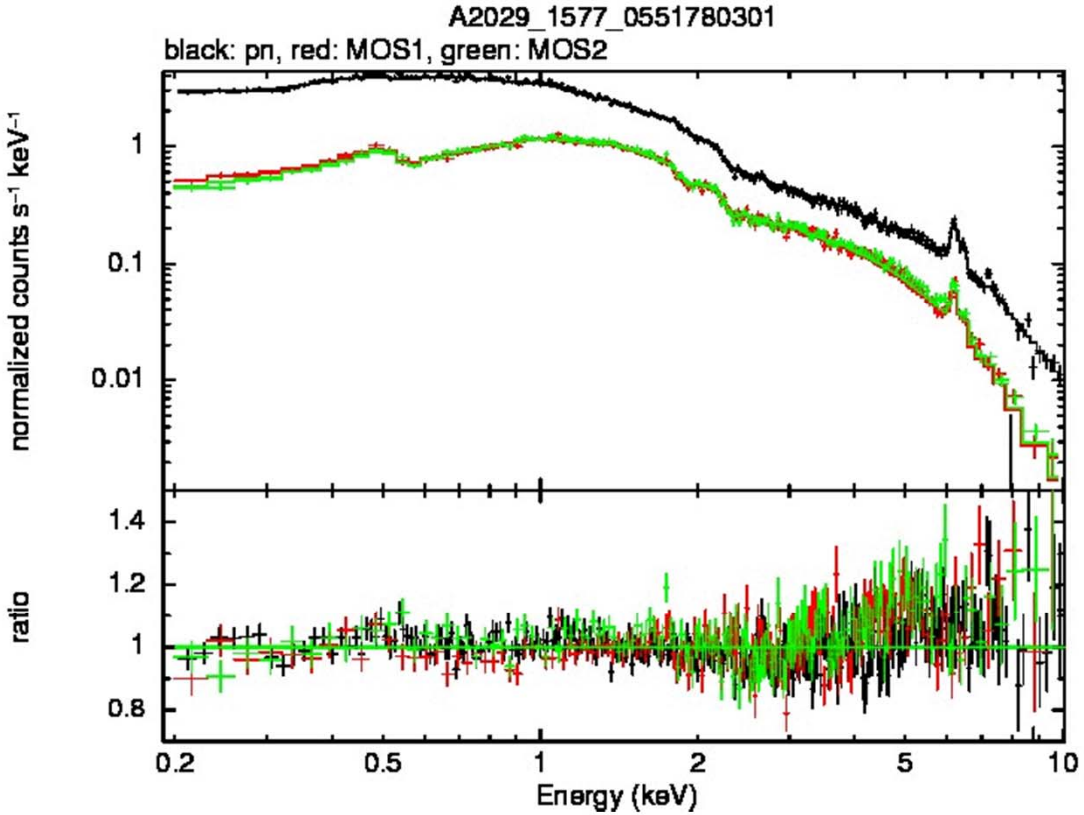
$9.7*10^{-12}$ ergs/cm2s

Examples: Galaxy clusters

- FF mode annuli. Single mekal model.

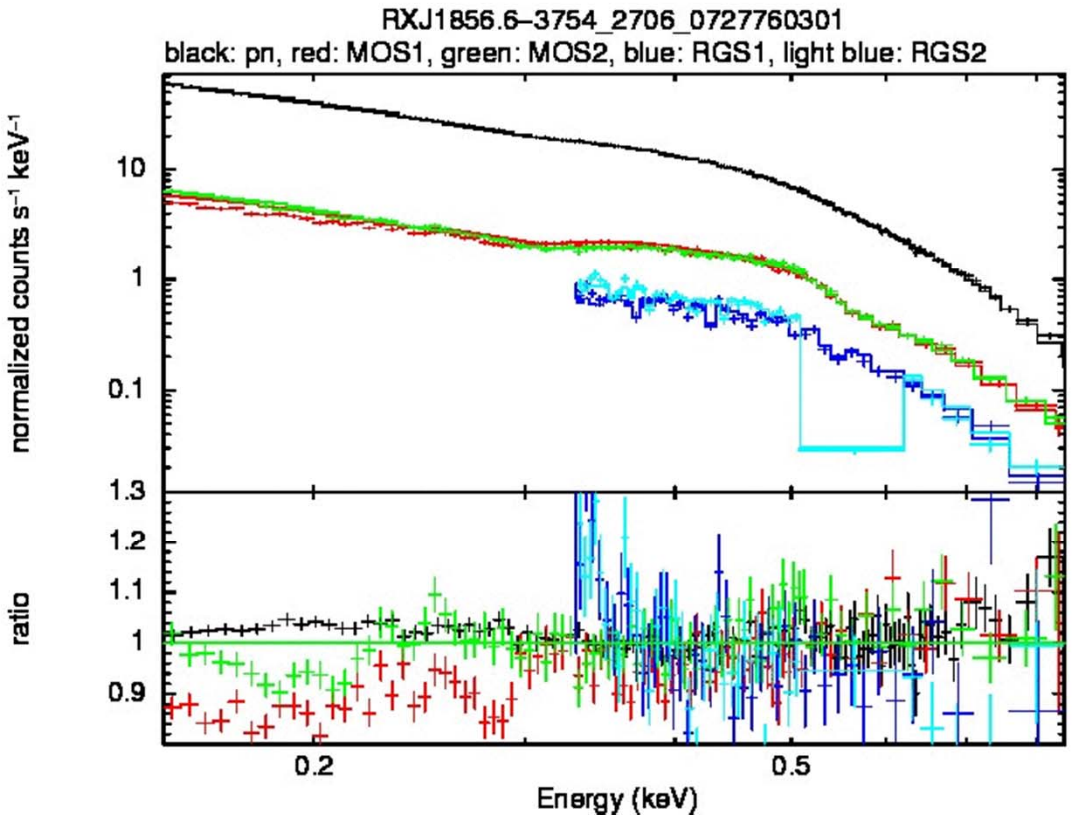
- A2029: kT ~ 7.1 keV
- A262: kT ~ 2.3 keV



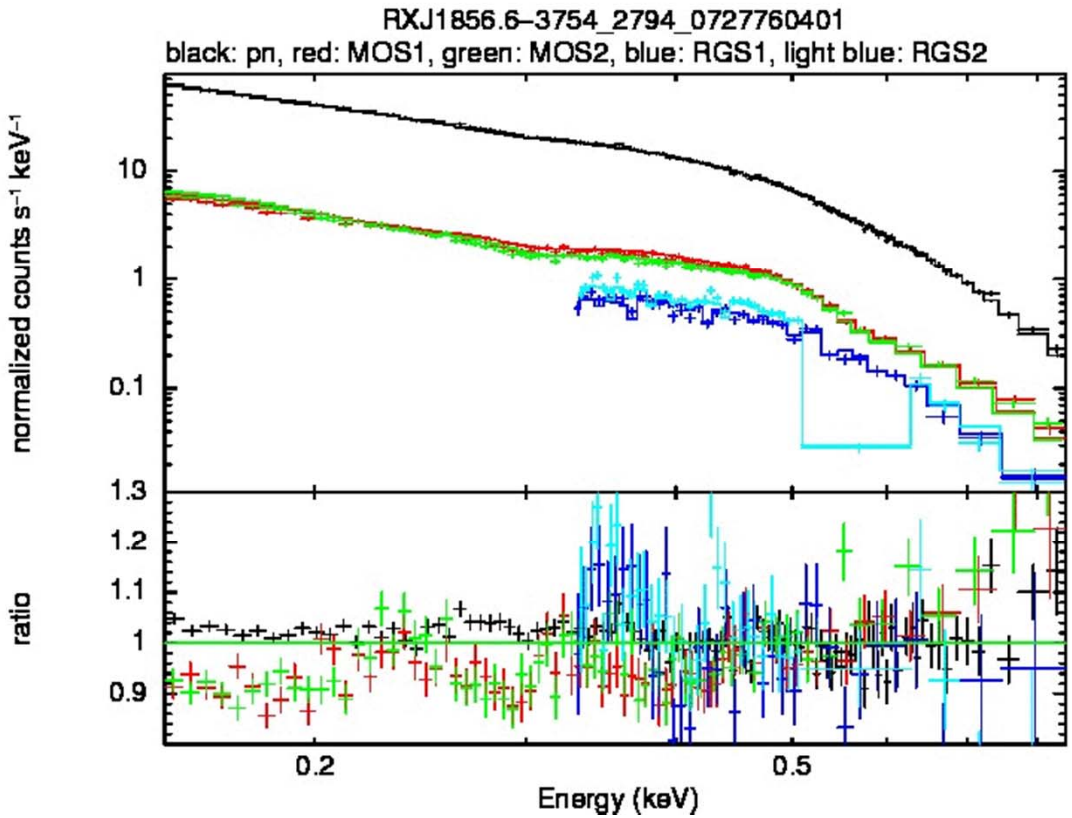


Example: NS RXJ1856.6-3754

- Especially for MOS2: cross-calibration results to EPIC-pn show mode dependence



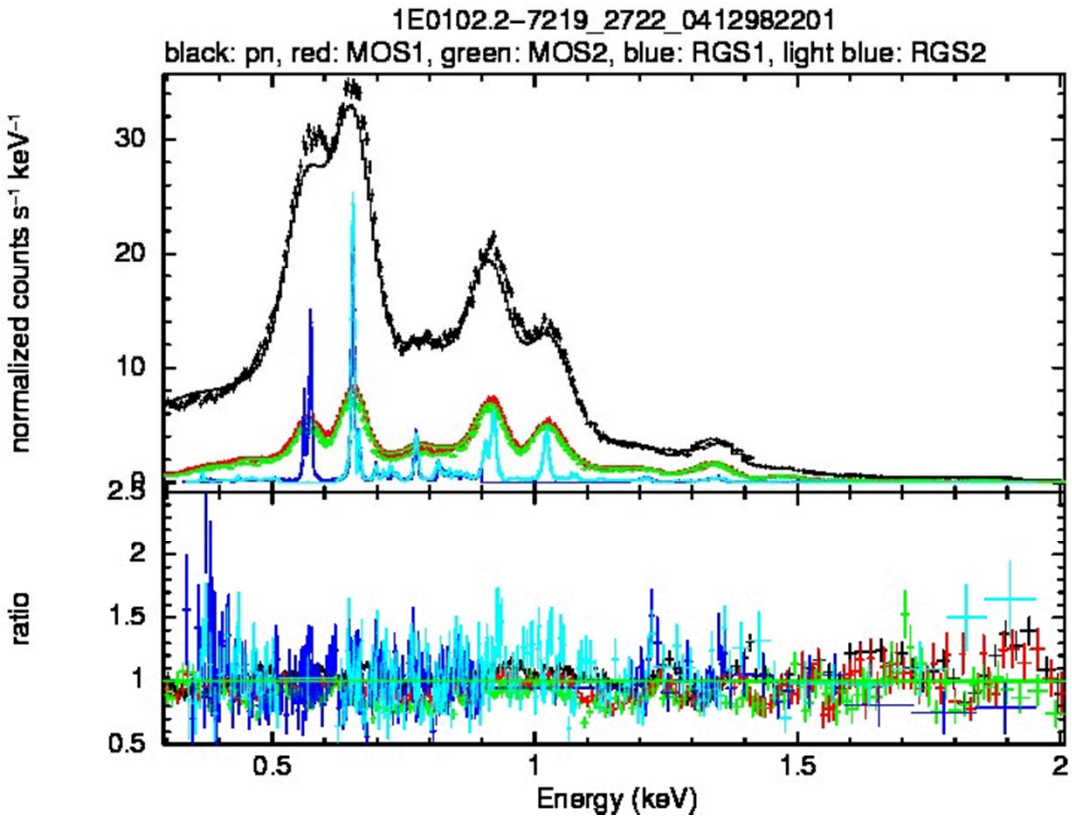
SW mode (no pile-up: full PSF)



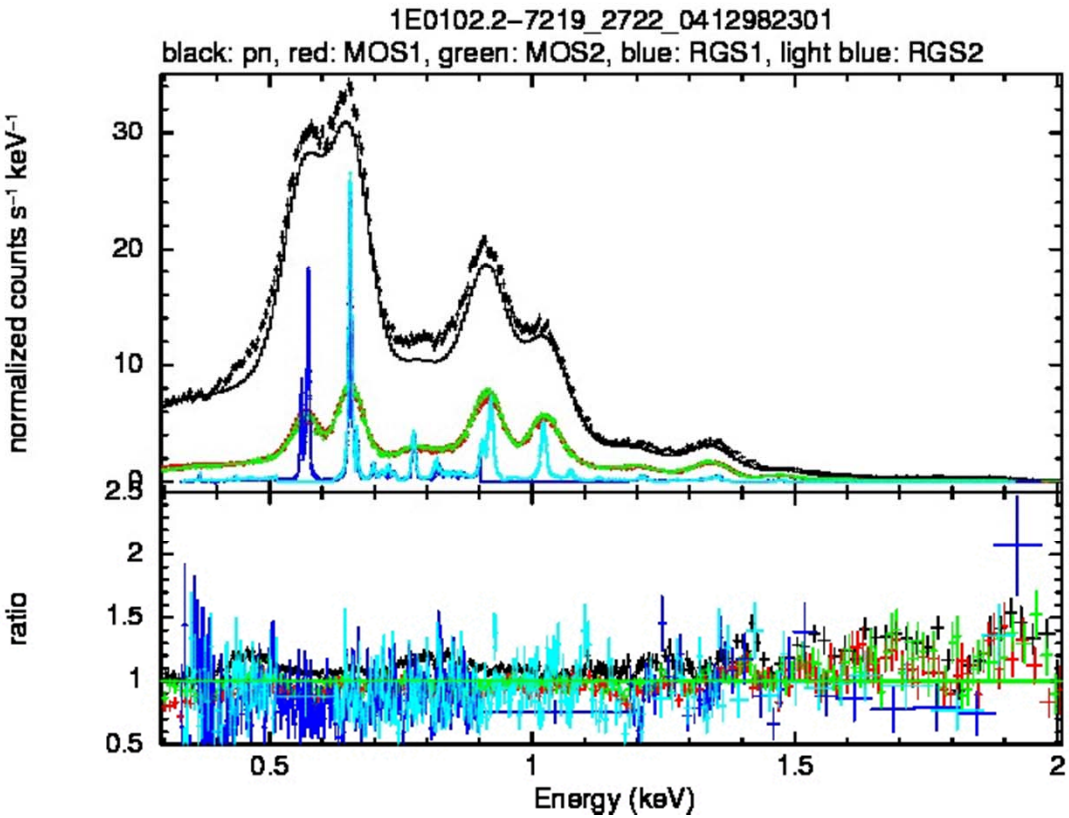
LW mode (pile-up: 5”-core excised)

Example: SNR 1E0102.2-7219

- IACHEC model: pn dependence of extraction radius



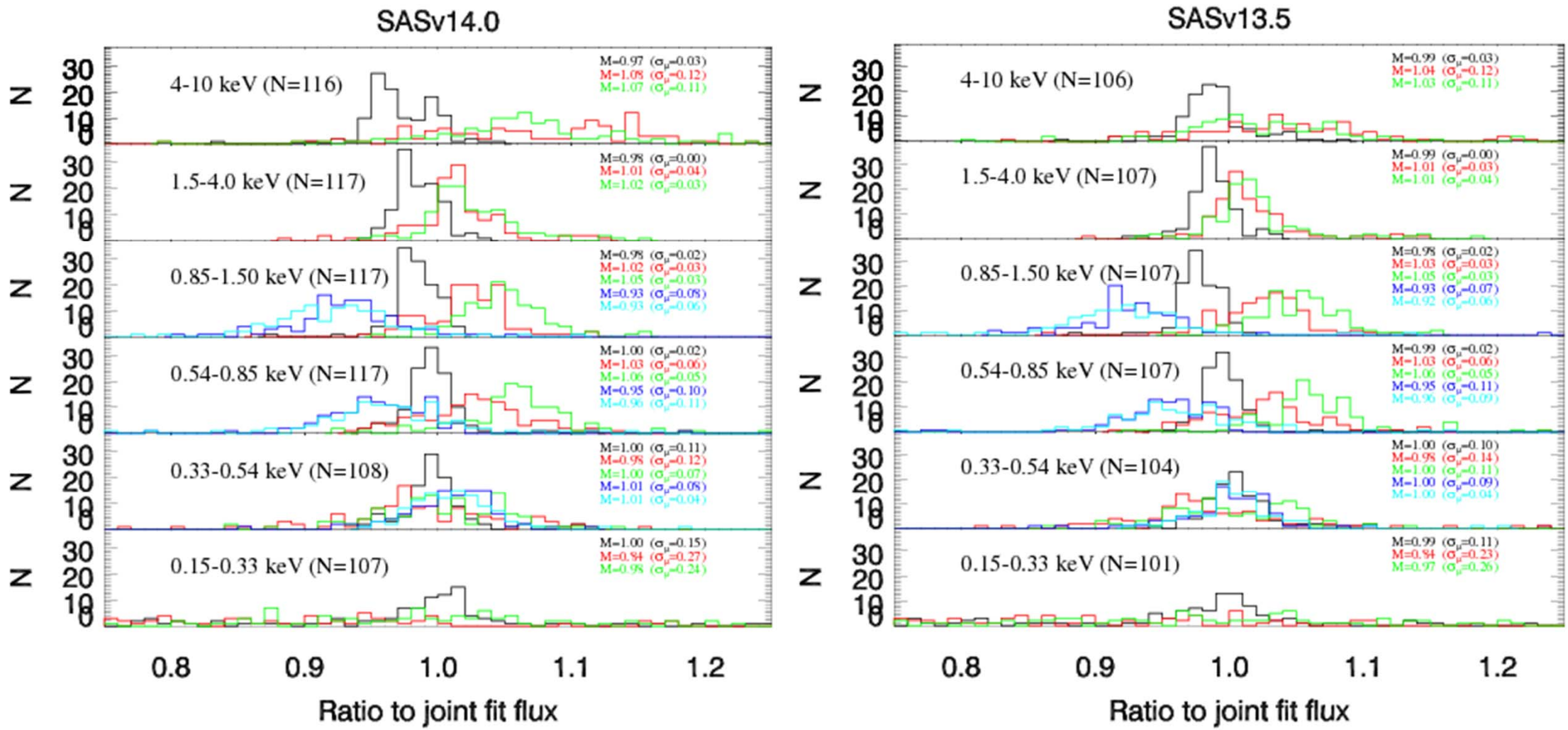
off-patch: all EPIC 75” radius



on-patch: MOS 75”, pn 40” radius

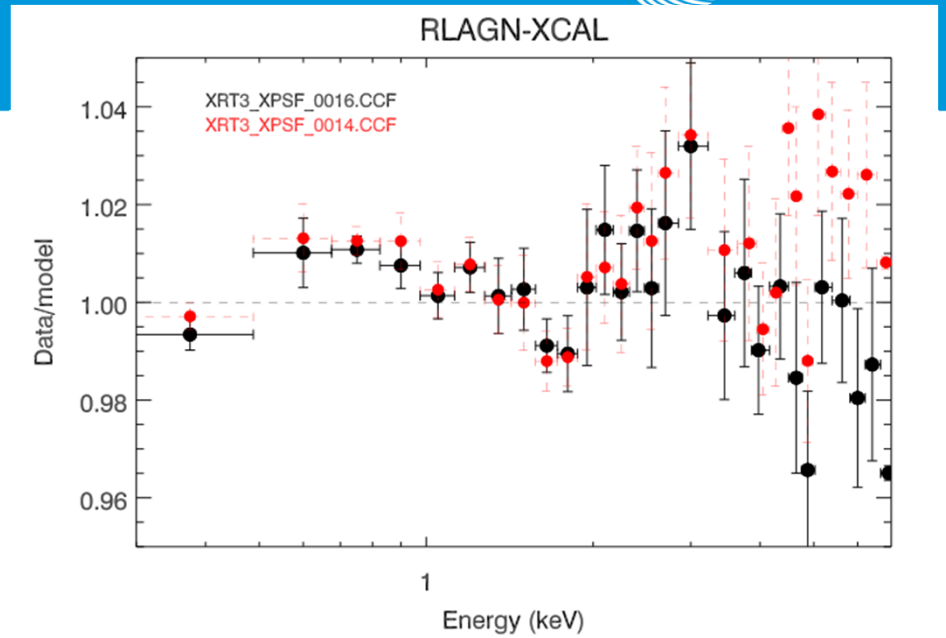
Flux distributions

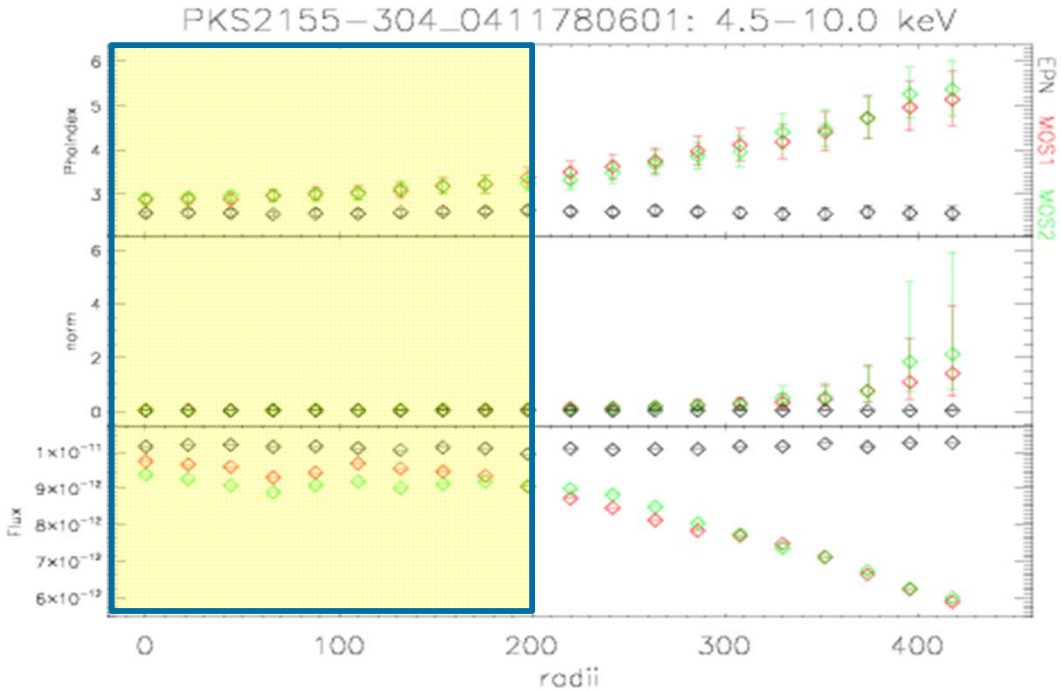
- SASv14.0 versus SASv13.5 (chi^2-statistic)

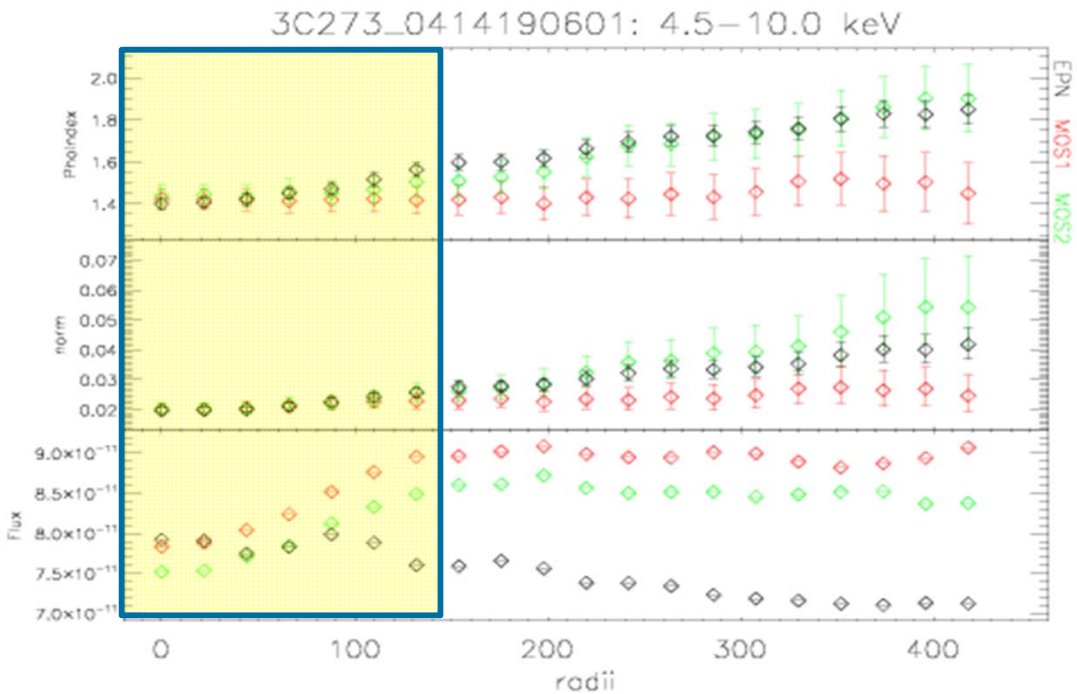


High energy discrepancy: XRT3_XPSF_0016.CCF

- 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?







Summary

- 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.