

eROSITA cross-calibration: SRG (eROSITA/ART-XC), XMM, NuSTAR, ...

- eROSITA \times 7 cameras
- eROSITA CalPV pointings / survey
- eROSITA \times 8 surveys
- eROSITA / ART-XC
- eROSITA / XMM-Newton
- eROSITA / NuSTAR
- eROSITA / IACHEC

In-orbit calibration subjects

- Commissioning
- Background (graded shield, calibration and monitoring, “Closed”, etc.)
- Plate scale and boresight of the 7 modules (star-trackers vs. mirror assembly)
- Filter integrity (launch, micrometeorites)
- Soft X-ray response and contamination monitoring
- Gain and CTI (calibration and monitoring, “CalClosed” Fe-55)
- PSF (on-axis, off-axis, survey)
- Power-law type spectrum (cross-calibration)
- Effective area, flat-fielding, and vignetting
- Optical loading by point sources
- X-ray baffle (mosaic, mini-survey in great circles)
- Absolute and relative timing (and operational tests like “mini-survey” in great circles for time-delays between star tracker and X-ray cameras, attitude reconstruction)
- XUV response and contamination monitoring
- Masked mode, etc.
- Performance verification / “early science” (interleaved with calibration observations)

eROSITA: 7 cameras: with different filters

- 7 cameras with 7 filter wheels with 7 mirror modules with 7 baffles
- 5 cameras with on-chip filter (200 nm Al + external 200 nm polyimide)
- 2 cameras without on-chip filter (external 100 nm Al + 200 nm PI)
- scientific parameters of celestial X-ray sources should finally be consistent within eROSITA instrumentation
- e.g.: source position and other parameters (e.g., fluxes, but not count rates) should be consistent

eROSITA: pointings and survey phase

- point spread function (and related parameters) for both modes should give consistent results
- usually: due to lack of statistics in survey: limited

eROSITA: 8 surveys

- scientific parameters of celestial X-ray sources should finally be consistent within surveys (for non-variable sources)
- usually: due to lack of statistics: individually limited
- statistically (large samples of sources): significant

eROSITA / ART-XC

- both observe “same” part of sky simultaneously
(2×7 modules, but different FOV, different energy band)
- significant overlap (some on-ground cross-calibration),
some celestial X-ray sources suitable for cross-calibration,
some (e.G. RXJ 1856) will be “invisible”) for ART-XC
- eROSITA Commissioning Light (LMC) is very useful for cross-calibration
- eROSITA will not observe sky during ART-XC commissioning and CalPV (but see above)
- ART-XC will follow eROSITA CalPV programme
- both instruments will be used for the SRG joint background analysis

eROSITA / XMM-Newton

- both have “similar” energy range, effective area, ...
- eROSITA does not have Small-Window or other “Fast Modes”
- eROSITA starts to suffer from pile-up at 1 mCrab (10 XMM cts/s)
- 18 years of data available for cross-calibration
- XMM-Newton will be used for absolute timing (1 pulsar)
- eROSITA will use XMM-Newton as monitor counter for variable sources: PSF and vignetting measurements possible in same observation
- agreement with XMM-Newton Project Scientist

eROSITA / NuSTAR

- PV targets may require simultaneous NuSTAR observation
- contact on PS level

eROSITA / IACHEC

- International Astronomical Consortium for High Energy Calibration
- founded in 2006 (M. Kirsch, M. Guainazzi, K. Madsen)
- working groups based on technical and scientific subjects:
CCD, contamination, timing, thermal SNR, isolated neutron stars, ...
- general support and feedback
- WG meetings via telecon, sometimes face-to-face at SPIE etc.
- next Consortium meeting: May 2019 in Japan