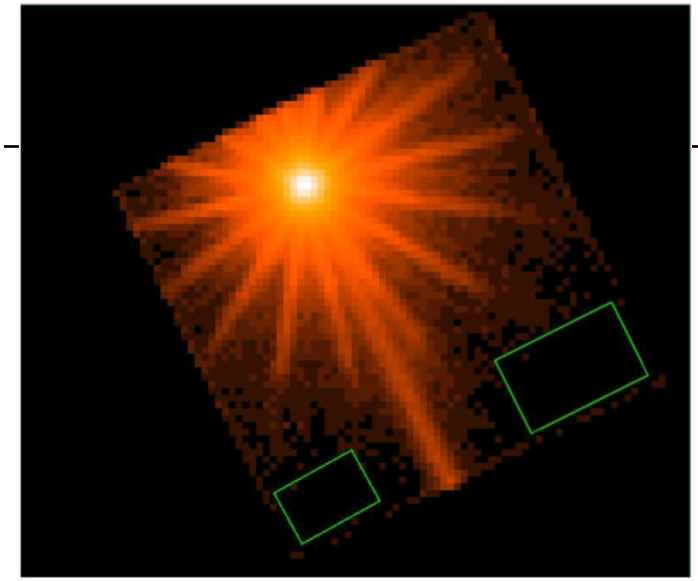
A new SAS background task

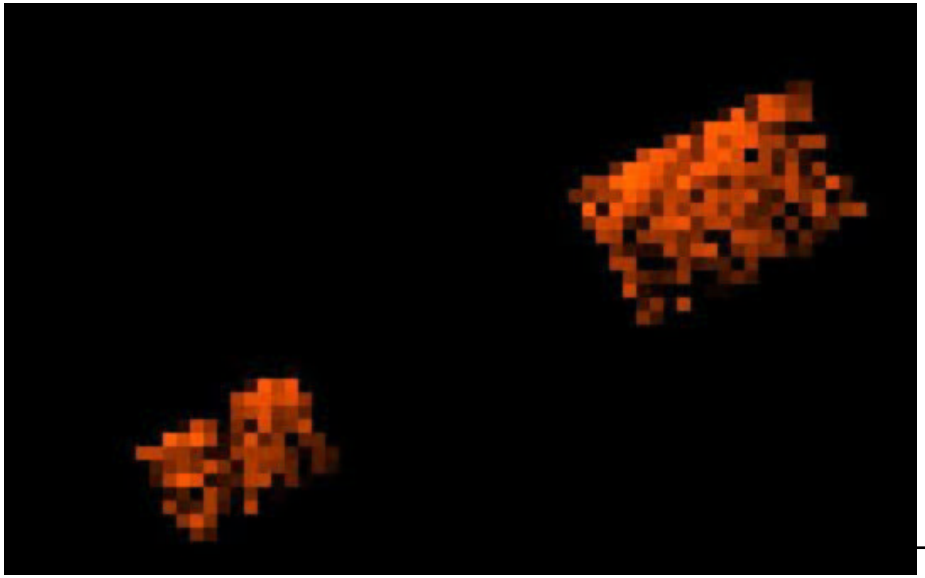
Why a SAS background task?

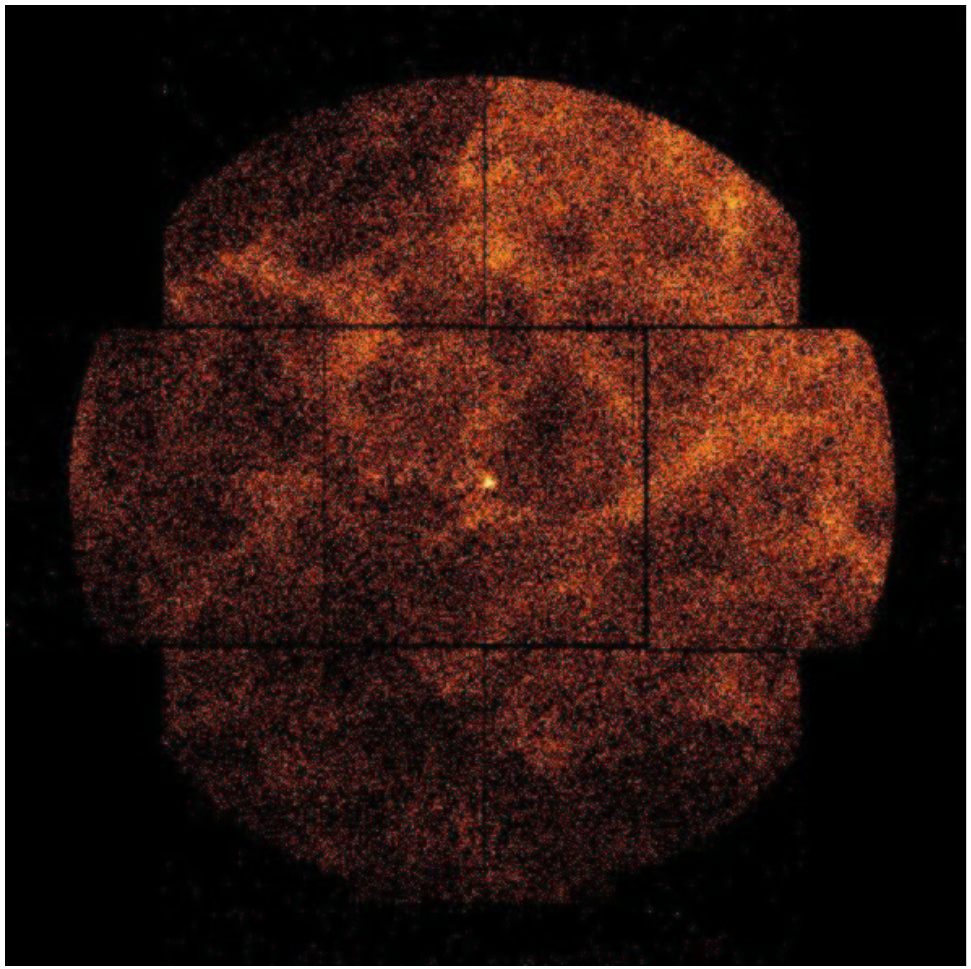
- Point sources in FF modes: Source and background regions could be well defined. Background subtraction possible.
- MOS SW mode: No background region in central CCD, but in peripheric CCDs. Background subtraction possible.
- PN SW: Could be very difficult to define background region. For very bright sources no background in SW area.
- Extended sources: If diameter of the source > FOV definition of background region impossible.

➔ background model needed.

Examples







Working scheme for PN FF/MOS

- Get particle+electronic background from out-FOV regions.
  (Sufficient statistics for short observations?)
- Scale particle background region to user defined background region.
- Subtract particle bkg from user defined bkg to get photon background.
- Correct photon background for vignetting effects.
- Add corrected photon bkg and particle bkg to total background.
- Scale total background to the user defined source region.

➔ Implementation as SAS task.

PN SW / Extended sources

- No out-FOV area: Template for particle background needed.
- Investigate rules when local background is available:

  - Source brightness: Possible count rate limit.

  - Position of the source inside the small window area.

- No local background available: background template needed.

  - Template for particle background.

  - Template for photon background.

➔ “Background button”

Problems of background templates

- Templates could be extracted using XMM data archive.

- Background is a composite of various components:
  - Electronic noise, proton flares, cosmic particles, CCD fluorescence, cosmic photon background

- Each component can show different spectral, temporal and spatial variability (see results of former background workshops).

➔ Good understanding of each background component is needed to understand how successful these templates can be used and how these templates can be used successfully.