Cas A

Andy Beardmore

University of Leicester

IACHEC14, 2019-05-22
Yes, the Cas A SNR might not be the most ideal source to be thinking about for calibration (e.g. ±15 eV velocity variations across the remnant at Si-Kα), but sometimes beggars can’t be choosers...

*Swift*-XRT needs some way to make column-by-column trap measurements in WT mode.

Cas A diameter is approx half size of our WT window width
- Perform 2 × 10ks each bottom, middle, and top to get trap depth estimates at 6 positions

Other instruments with lower angular resolution (e.g. ASTROSAT SXT, SMiLE, EP, THESEUS) are interested in such a model

Other SNRs
- e.g. Kepler → 10× fainter
Cas A

- Took MOS1 data XMM observation from obsid 0097610501 (2000-07-25) – large window (0.9s readout) meant extraction radius restricted to 141 arcsec; extended source ARFs; no checks to see if pile-up is an issue

Model stands at: $\text{TBABS} \ast (4\ \text{BREMS} + 17\ \text{GAUSS})$

- No physics!
- Identical extraction region for pn gives const factor of 0.95 plus some residuals
  - pn spectrum is shifted by 12 eV to lower energies compared to MOS1 at Si-K$_\alpha$
- 4 arcmin extraction region for pn gives a const factor which is 1.17 higher than 141 arcsec one
- **MOS1 (pattern 0)**
Cas A

- pn (pattern 0)

Cas A (pn p0)

Black: 141 arcsec; red: 4 arcmin

Normalized counts s\(^{-1}\) keV\(^{-1}\)

Energy (keV)

Ratio

Normalized counts s\(^{-1}\) keV\(^{-1}\)

Ratio