

SRCTOOL updates

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SRCTOOL

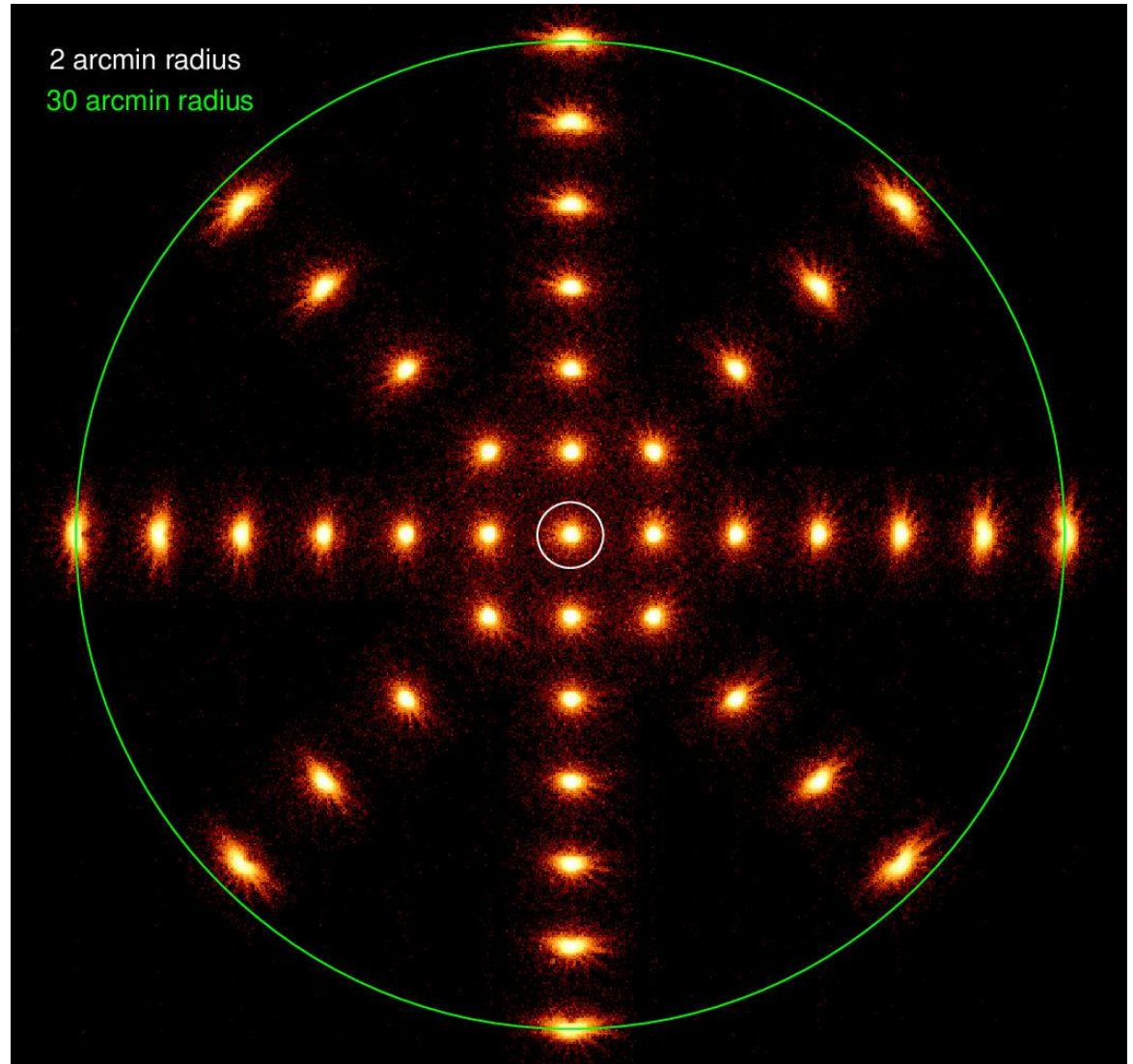
- SRCTOOL is responsible for
 - Spectral extraction
 - Lightcurve extraction
 - RMF and ARF generation
- Designed to work in both scanning and pointed observations
- Takes calibration into account (e.g. PSF, bad pixels, vignetting...)
- Developed by T. Dwelly. Now maintained by J. Sanders

Recent changes (versions 1.19-1.26)

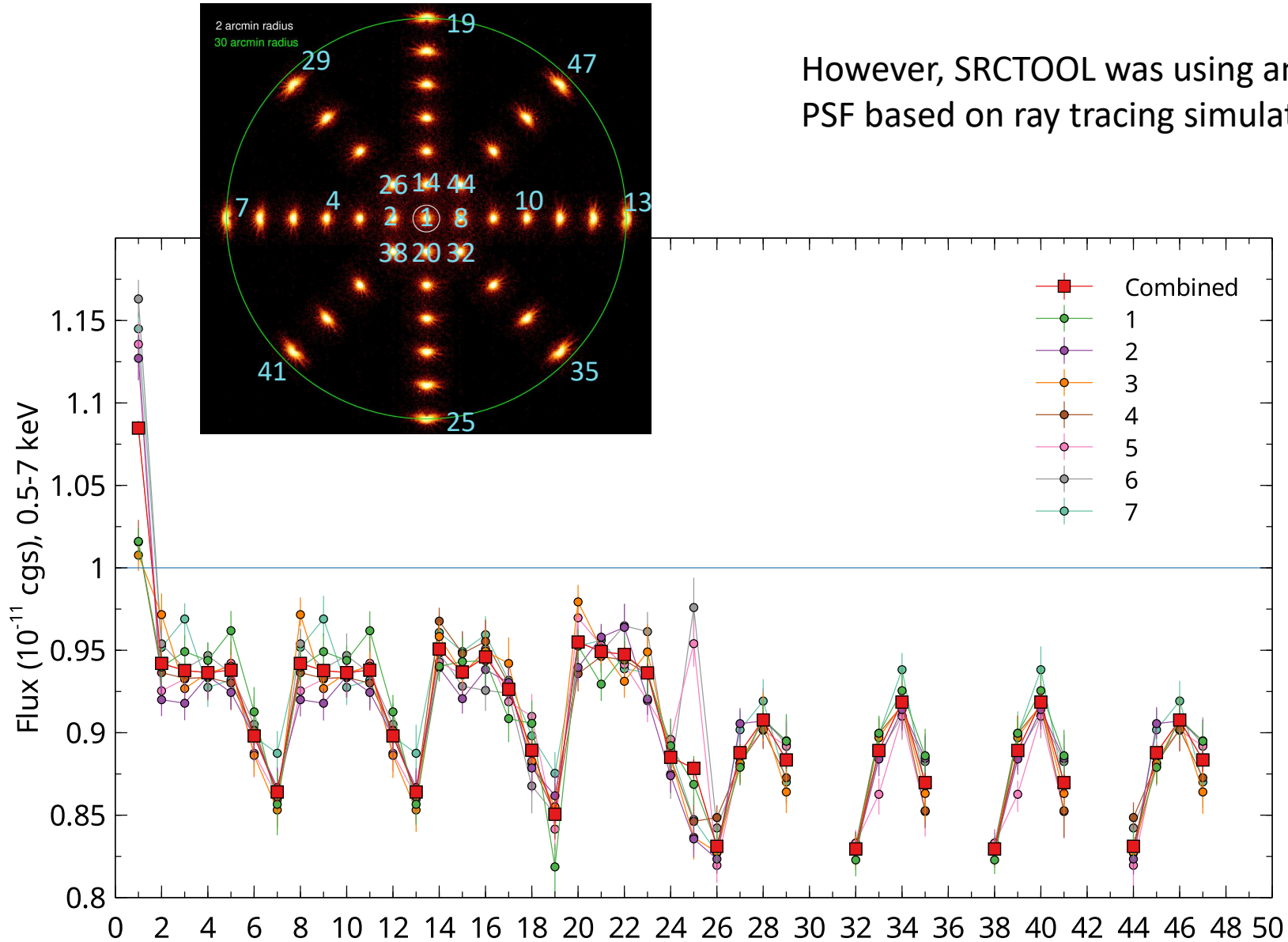
- Code clean-ups, speedups, documentation improvements, bug fixes, and general improvements (T. Dwelly)
- Handle event ownership (MPE, IKI, MPE+IKI, INVALID or MIXED) in output products (J. Sanders)
- Expose parameters used in automatic region selection for testing and choosing optimal values (J. Sanders)

Flux tests between SIXTE and SRCTOOL

- Simulate grid of sources with SIXTE to check fluxes can be reproduced when spectral fitting
- Here chosen to be powerlaws with
 $f_{X,0.5-7 \text{ keV}} = 10^{-11} \text{ cgs}$
Phot. index $\Gamma = 1.7$
 $N_{\text{H}} = 2 \times 10^{20} \text{ cm}^{-2}$
- 10 ks pointed exposure
- 2 arcmin extraction radii

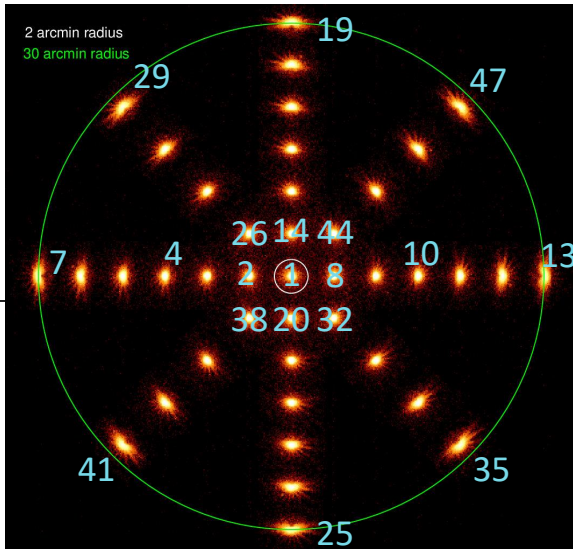


Fluxes of spectra as a function of position



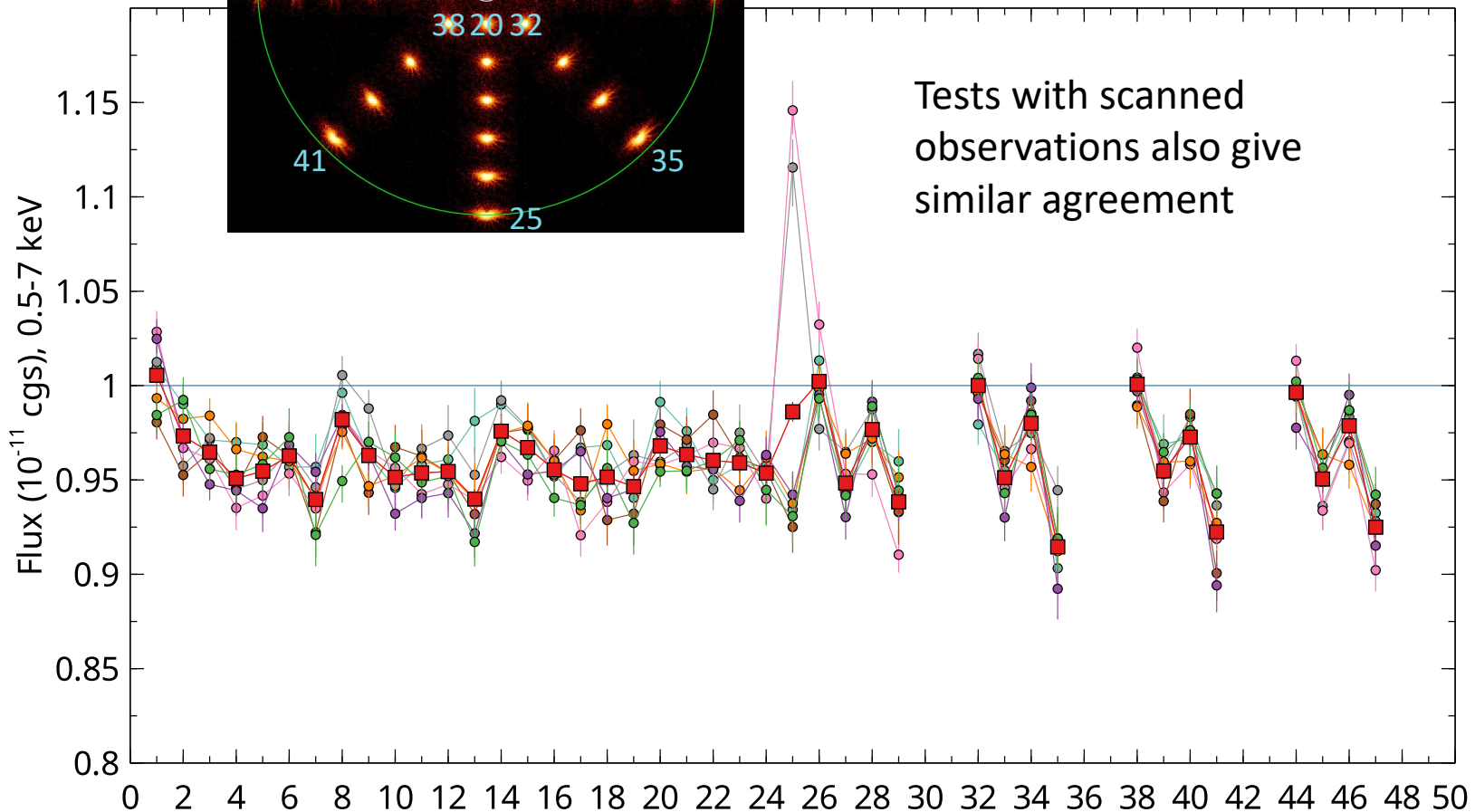
However, SRCTOOL was using an old PSF based on ray tracing simulations

Fluxes of spectra as a function of position



Updated SRCTOOL PSF using PANTER images to better match SIXTE PSF

Now agrees to around 5%



Spectral test (using interpolated PANTER PSF)

Central source in
100 ks pointed
simulation, again
with 10^{-11} cgs flux

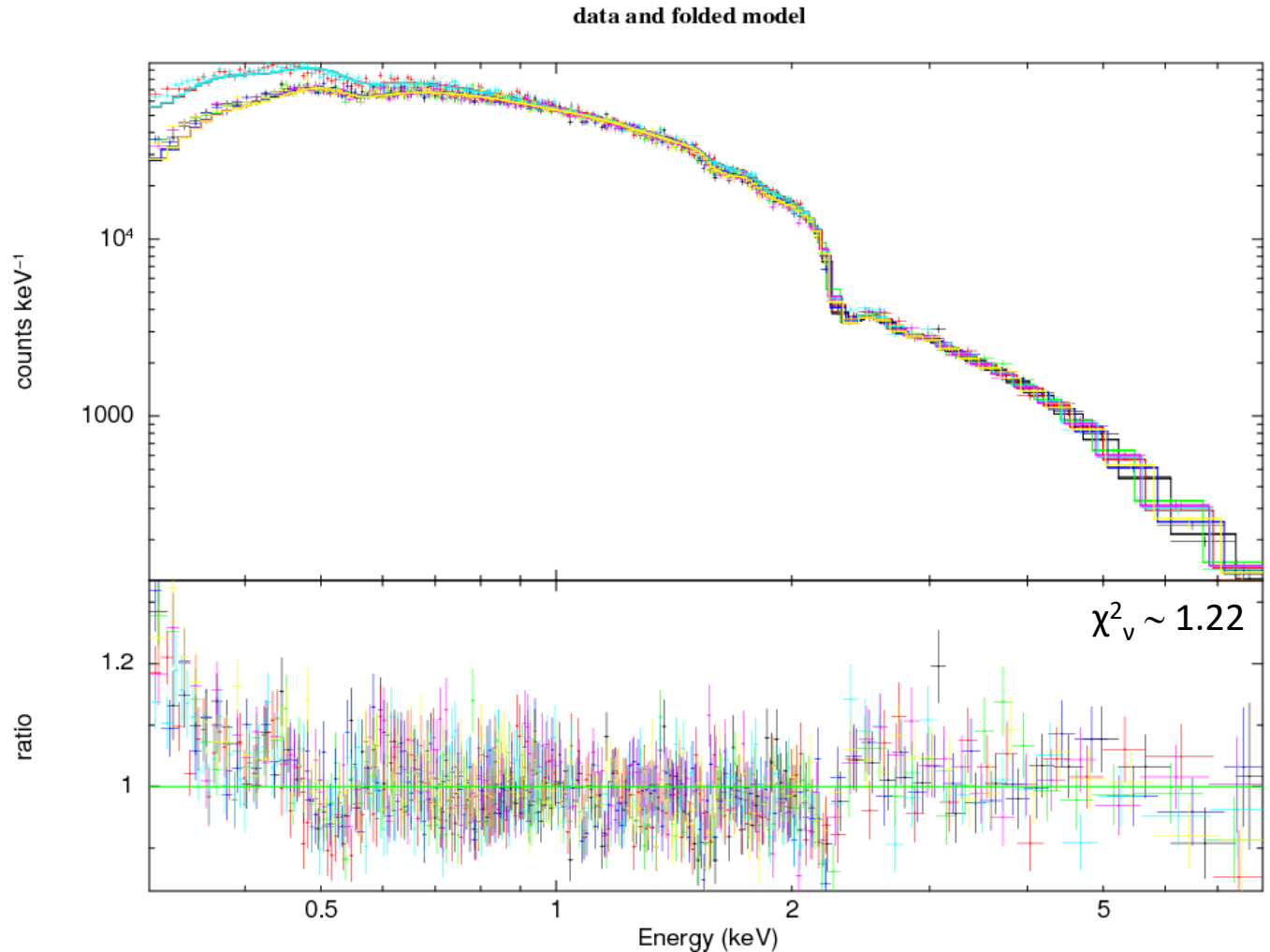
2 arcmin radius
extraction region

NH and Γ fixed to
input parameters

Flux returned to 3%

20% soft excess
below 0.5 keV

Recovered Γ agrees
to 2%



Bonn comments on SIXTE and eSASS (1)

- Calculation of EXPOSURE and BACKSCAL
 - It is correct that calculation requires ARF to be made
 - Without the ARF, EXPOSURE=0 and BACKSCAL=1
 - Seem reasonable defaults
- Slow speed on large source extraction
 - SRCTOOL parallelises multiple sources, not individual ones
 - Possibility to further parallelise, but requires work
- GTI for background regions
 - Uses source GTI, rather than a GTI for the background
 - Seems the right approach to have the same time period as the source, as there could be flaring

Bonn comments on SIXTE and eSASS (2)

- For large background regions, probably better to extract the background as a separate region
- ARF for point sources
 - Were issues reproducing fluxes and spectra
 - Likely much better with new SIXTE (reduced soft excess?) and updated PSF (fixing PSF wings)