



The Chandra Source Catalog 2.0



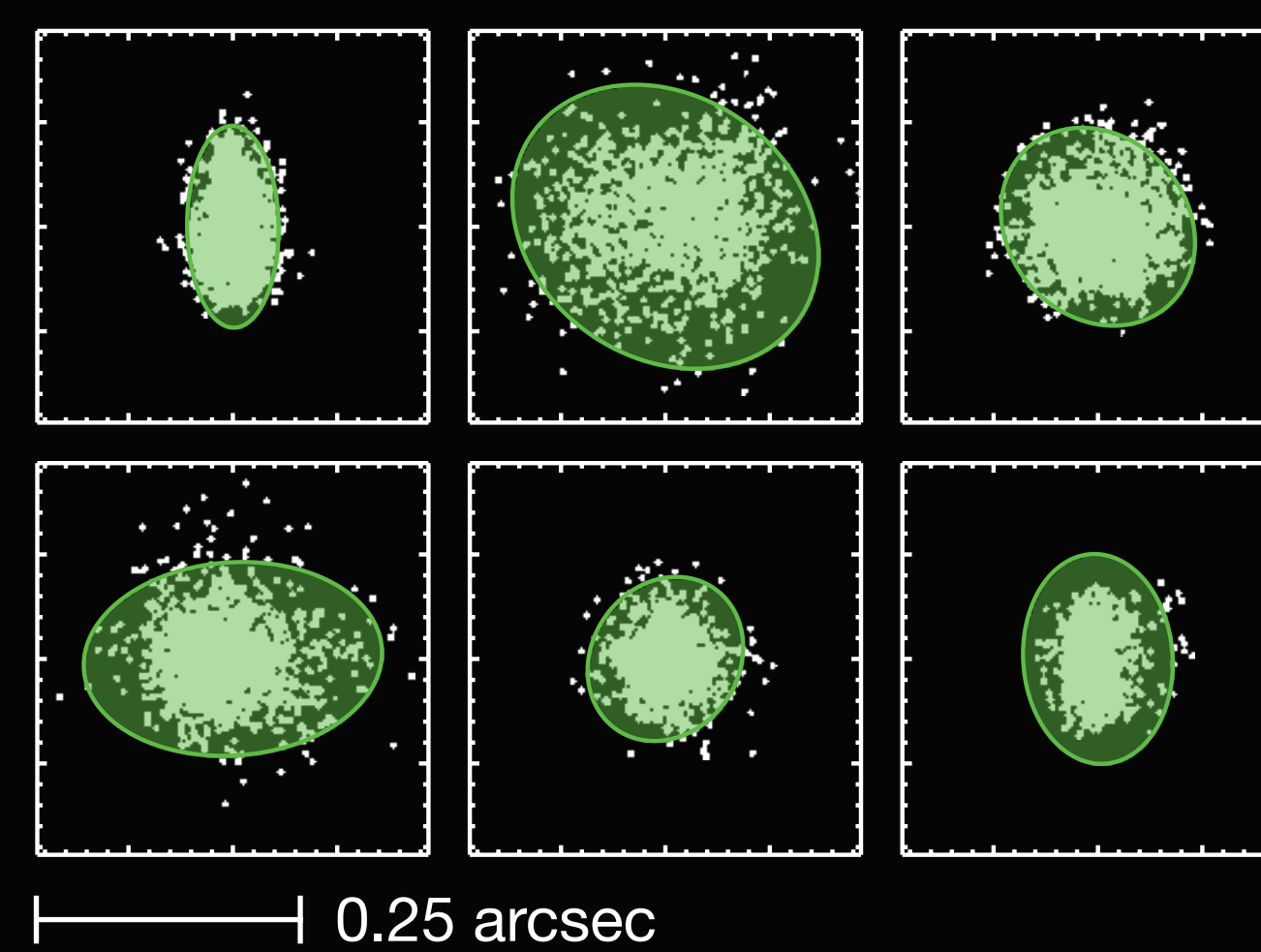
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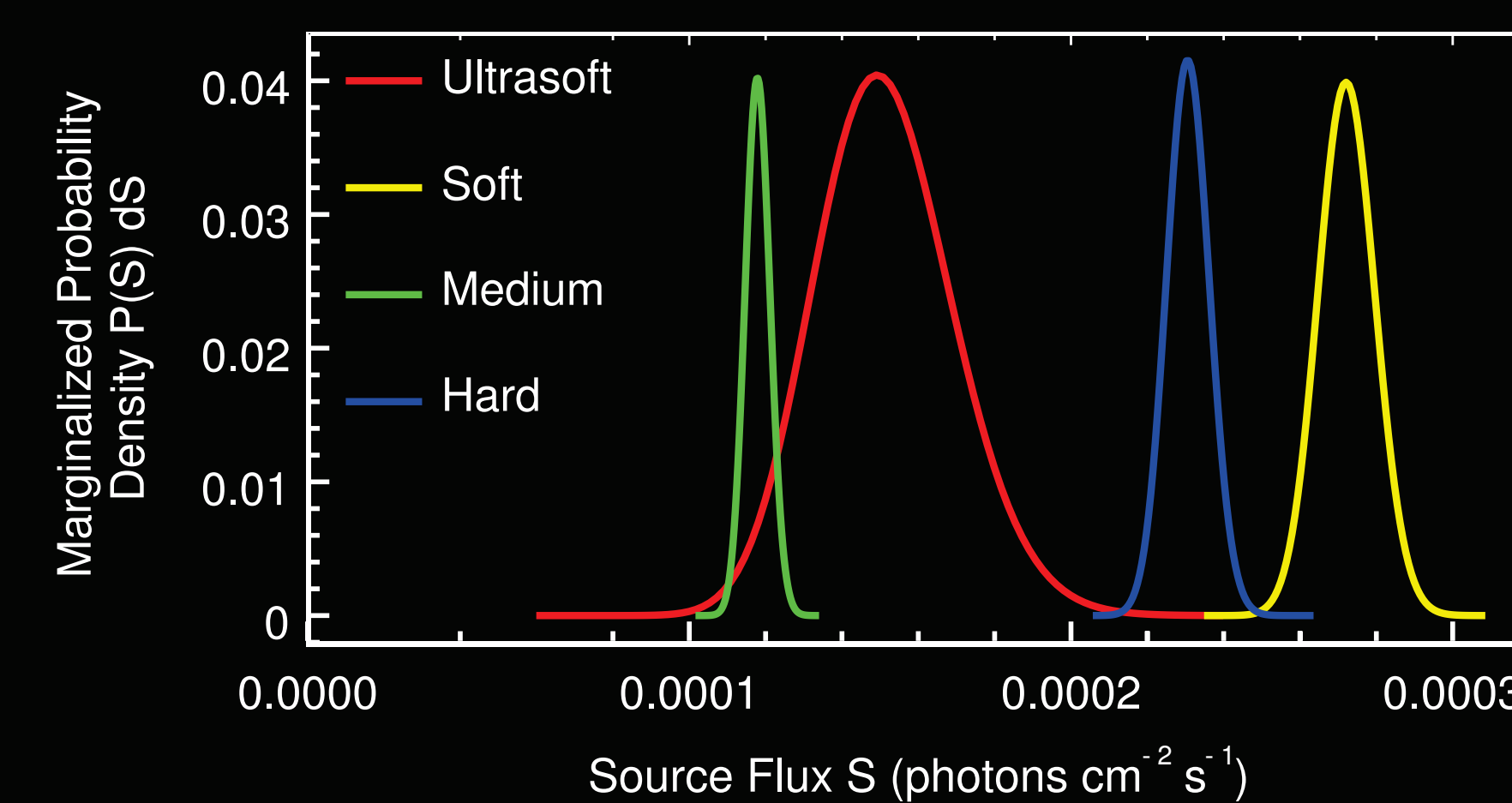
CSC 2.0 Highlights

- Includes almost all ACIS and HRC-I imaging observations from the period 1999–2014 (~560 deg² sky coverage).
- Source detection is performed on stacked (co-added) observations obtained using the same instrument, and with pointings co-located within a 60" diameter circle (because the *Chandra* PSF varies significantly with off-axis angle).
- The detection limit is ~5 net counts for on-axis sources with low-background exposures (typically < ~15 ks).
- Detection properties are evaluated at both the stack and single observation level, and are combined to compute "best estimate" properties for each source on the sky.
- Key databased properties include positions and position errors, significance, processing flags/codes, extent, multi-band aperture photometry (total and net counts, count rates, photon and energy fluxes, model fluxes [multiple spectral models]), hardness ratios, multiple spectral model fits, inter- and intra-observation temporal variability.
- Numeric properties have associated independent lower and upper confidence limits; most properties are evaluated in 5 energy bands for ACIS, 1 for HRC-I.
- ~25 million science-ready FITS data products (~32 TB), including merged detection lists, detection region event lists, exposure maps, responses, spectra, light curves, aperture photometry PDFs, position error MCMC draws, per-Bayesian blocks properties, limiting sensitivity maps.

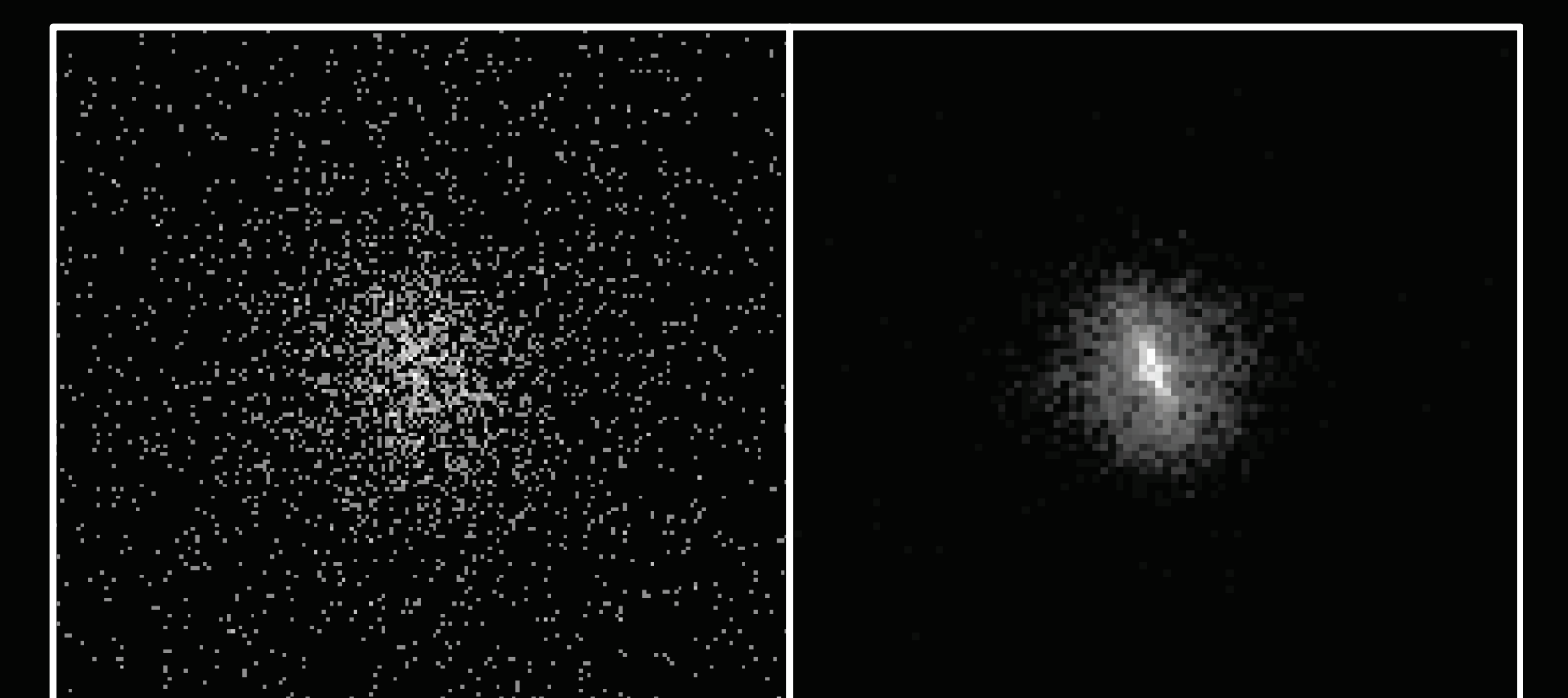
Position error ellipses computed from position confidence MCMC draws



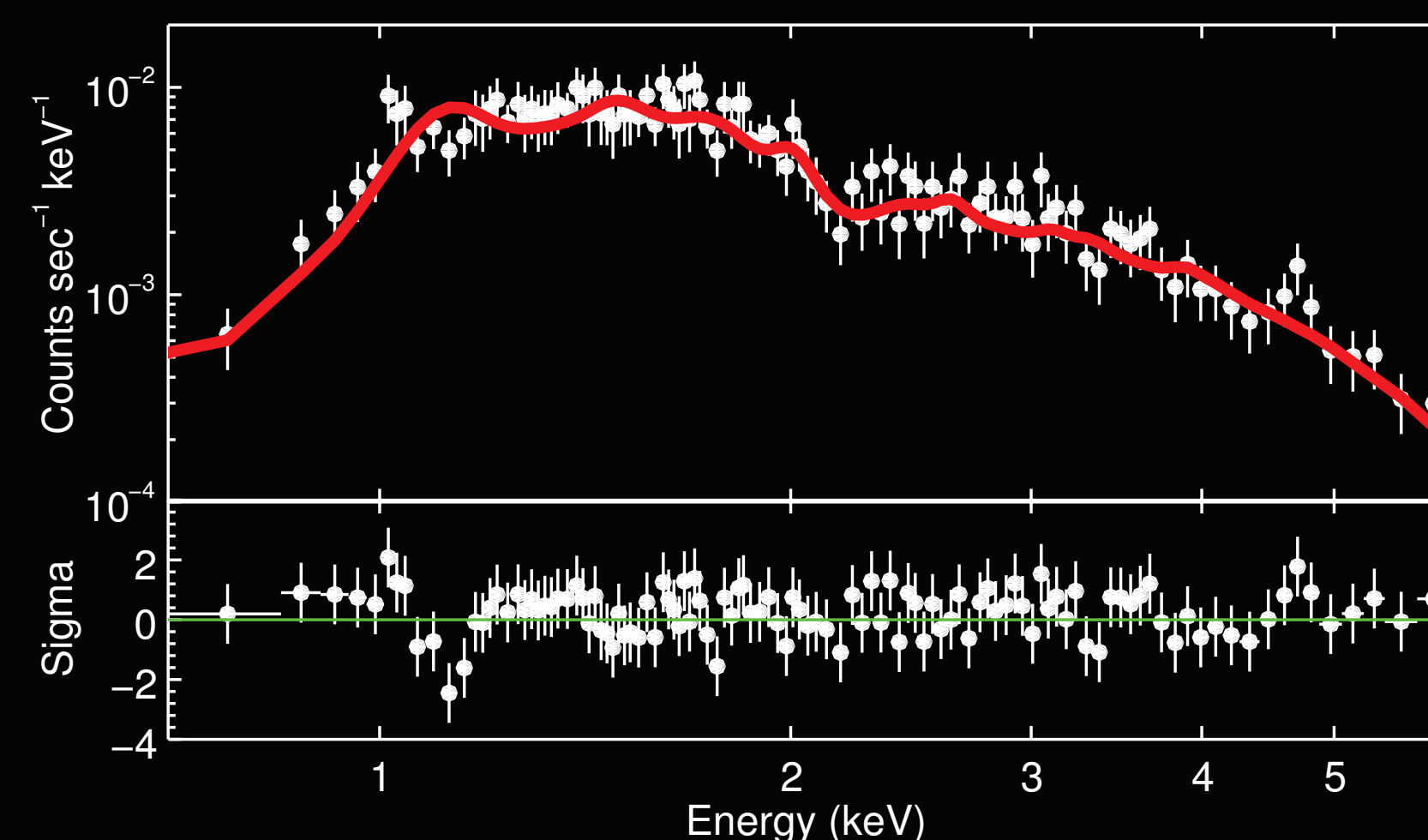
Multi-band X-ray aperture photometry with Bayesian probability density functions



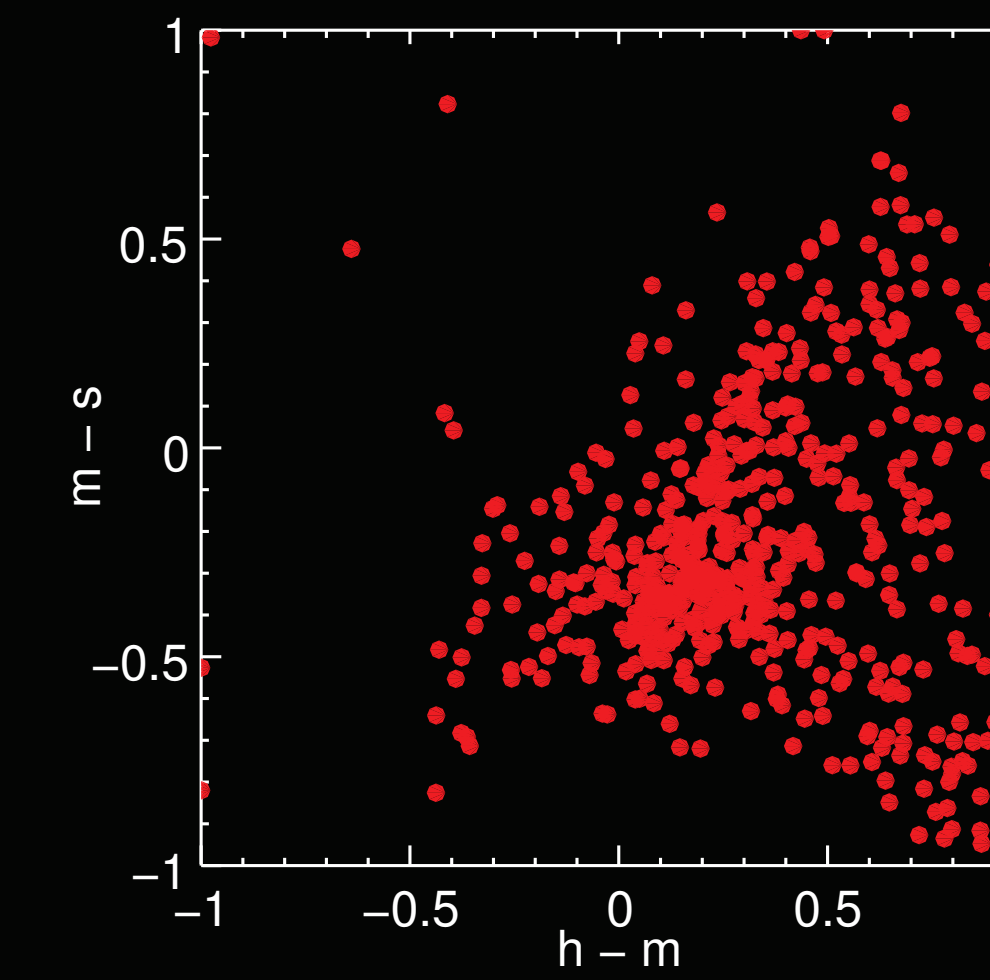
Source extent and local PSF models for every detection and energy band



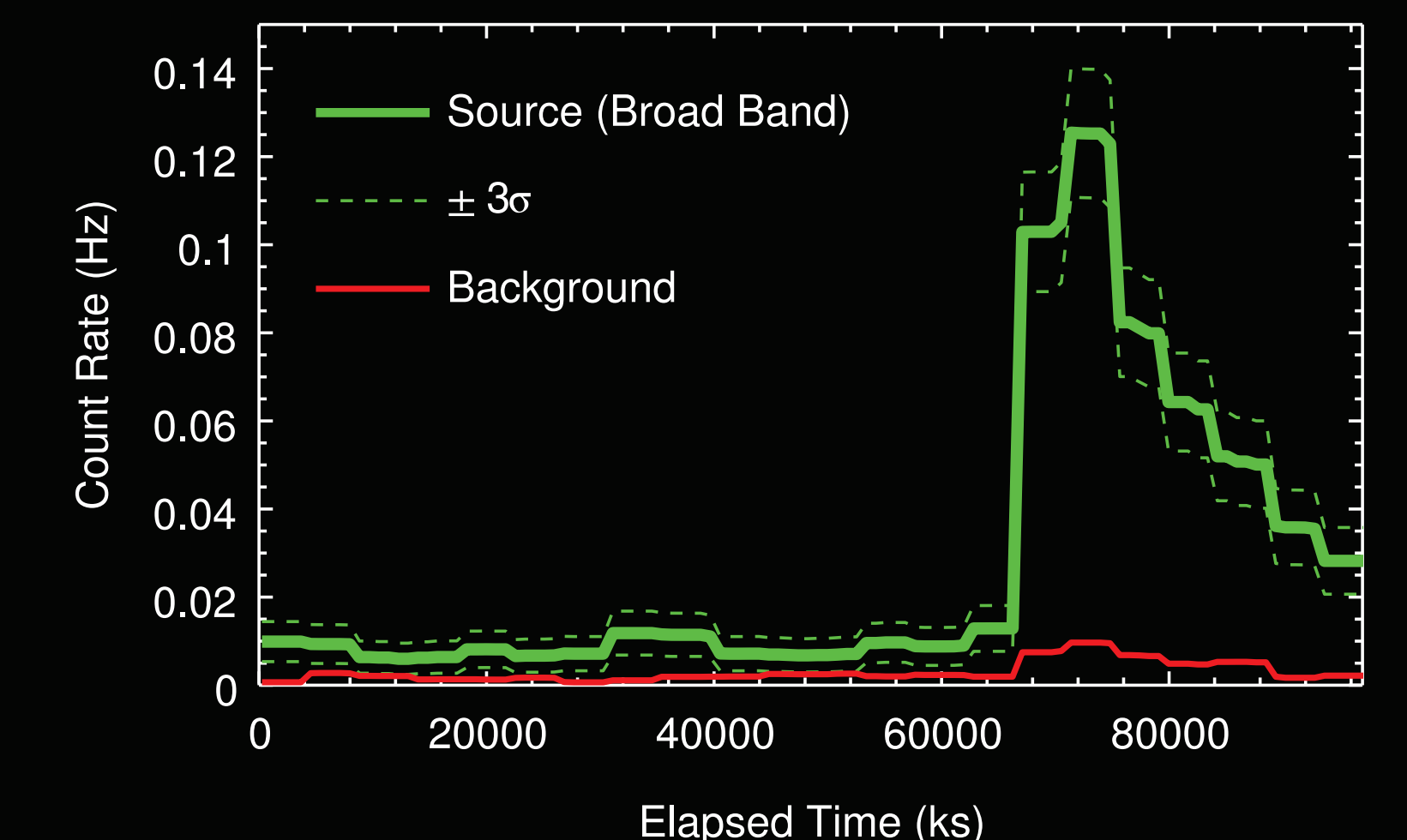
Spectral model fits and model energy fluxes determined using multiple source models



Hardness ratios



Intra- and inter-observation variability measures and light curves



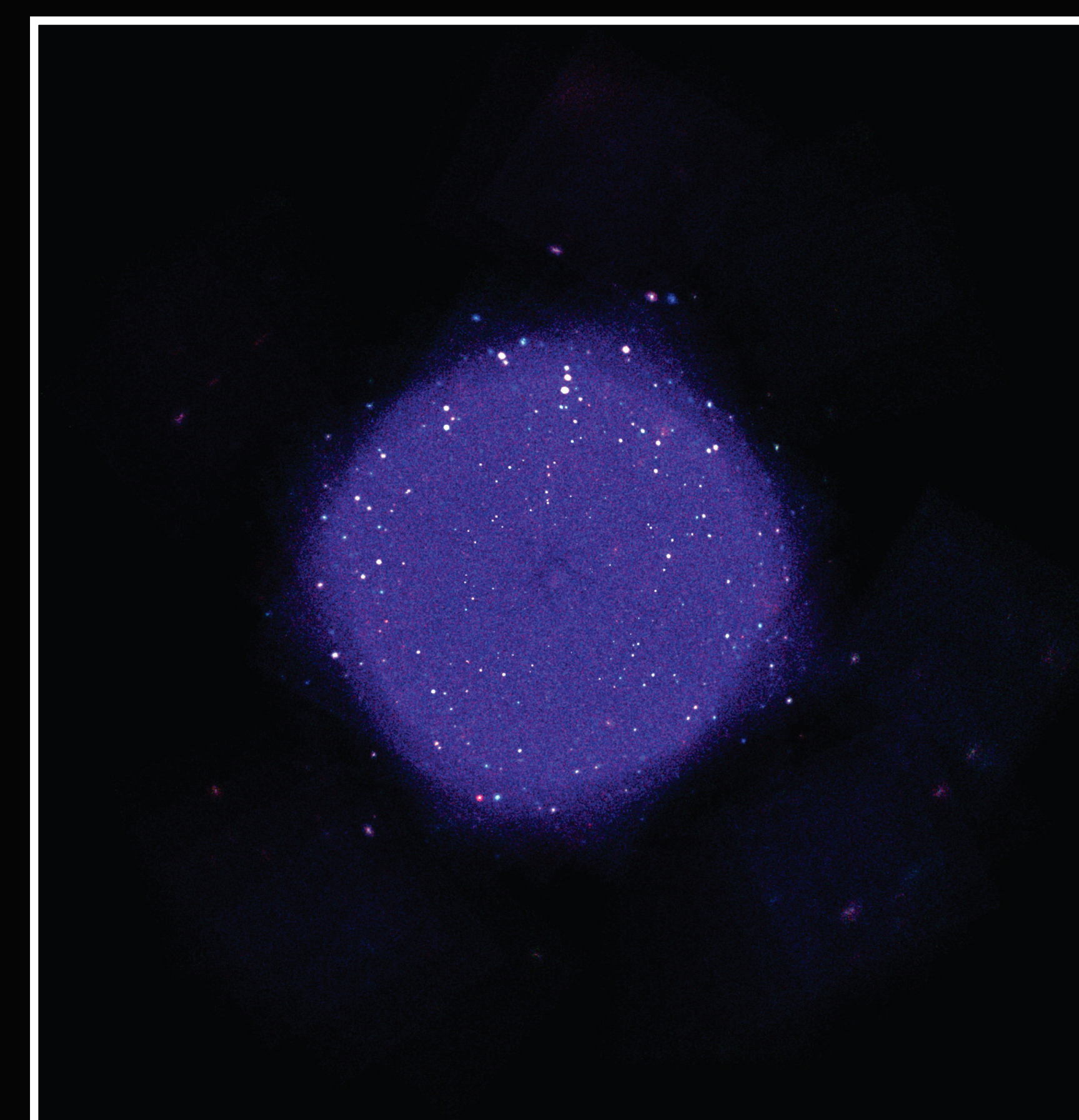
Comparison With CSC 1.1

	Release 1.1	Release 2.0
Number of Sources	106,586	315,875*
Number of Detections	158,071	374,349*
Observation Dates	1999–2009	1999–2014
Source Detection Performed On	Individual Observations	Stacked Observations
Number of Observations	5,110	10,382
Number of Stacks	N/A	7,287
Largest Stack	N/A	81 Observations
Longest Effective Exposure	190 ks	5.8 Ms
Limiting Source Counts (on-axis)	~10	~5

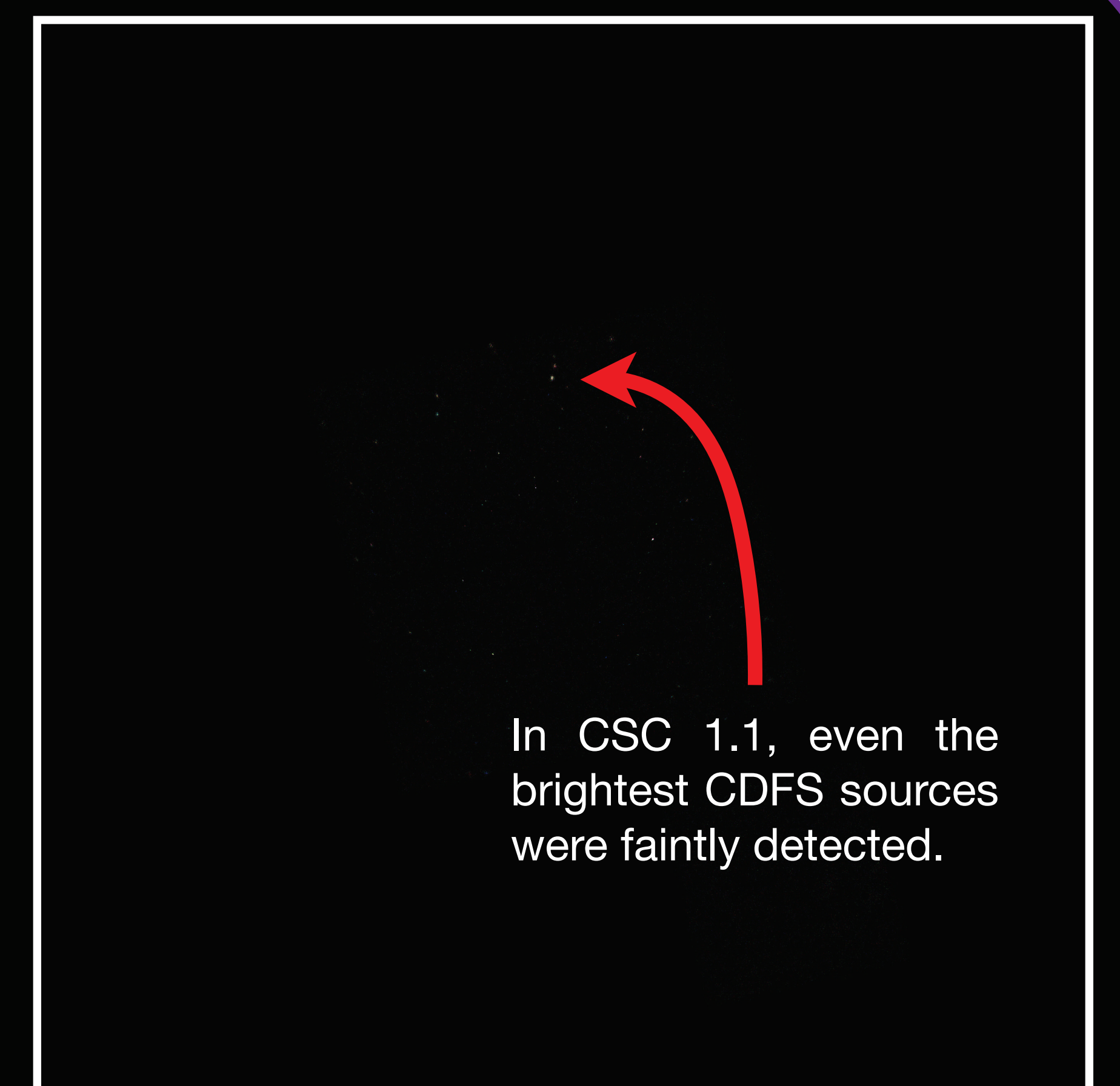
* The number of sources and detections included in the CSC 2.0 release may be reduced by <0.1% following final quality assurance processing.

Impact of Stacking

Near Right: The figure shows the deepest stacked image (81 observations) of the central region of the *Chandra* Deep Field South (CDFS) input to the CSC 2.0 source detection step (total exposure time ~5.8 Ms).



Far Right: For comparison, the figure shows the deepest image of the central region of the CDFS field input to the CSC 1.1 source detection step (exposure time ~141 ks) on the same scale.



In CSC 1.1, even the brightest CDFS sources were faintly detected.

CSC 2.0 is expected to be released in full in the first quarter of 2018, once the last phase of catalog processing is completed.

For more information about CSC 2.0, see <http://cxc.cfa.harvard.edu/csc2/>

Acknowledgement. This work has been supported by NASA under contract NAS 8-03060 to the Smithsonian Astrophysical Observatory for operation of the Chandra X-ray Center.

