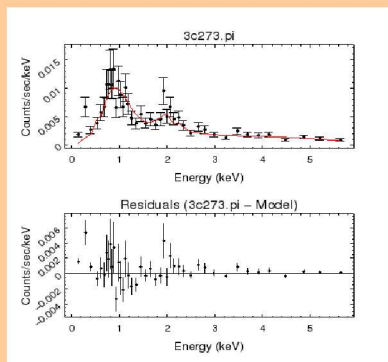# CIAO 4 Preview: Sherpa and ChIPS Demo

B. Refsdal, G. Germain, D. Burke, S. Doe, I. Evans, J. Evans, J. McDowell, W. McLaughlin,
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Fit to spectral x-ray source data (3C 273)

Spectral source data with an associated background file, ancillary response file, and response matrix file can be fit to a composite power law and XSpec photoelectric absorption model in *Sherpa*. In the upper plot, the count rate is corrected for the background, scale, and sensitivity. The lower plot displays the fit residuals.
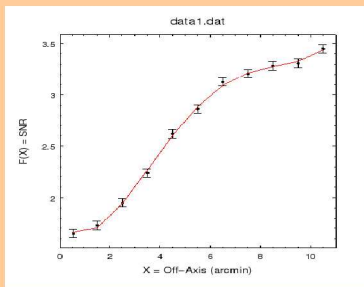
Fig. 1

Confidence region projection of 3C 273 fit
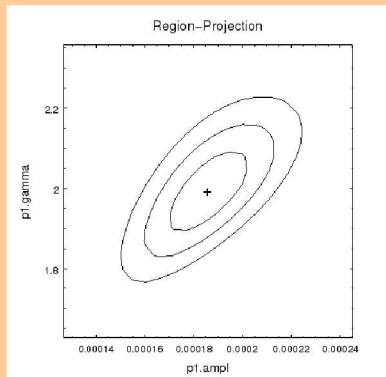
The correlation of two fit parameters can be shown by a ChIPS region projection contour. The current fit parameter values are shown by the cross while the concentric ellipses show the σ, 2σ, 3σ slices.

Fig. 2

Simultaneously fit source and background data with independent responses (M33)

Spectral data with unique instrument response files for the source and background data can be fit using *Sherpa*. The fits of the source count rate and background count rate are shown along with the respective residuals in a ChIPS multi-layer plot.
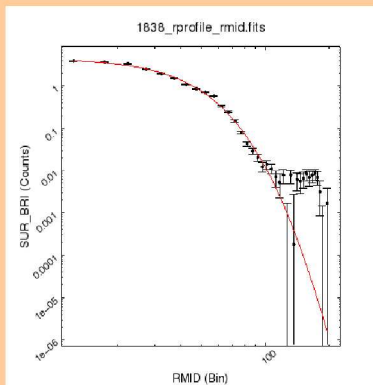
Fig. 3

Fit of ASCII data

Basic ASCII data can be read and fit using *Sherpa*.
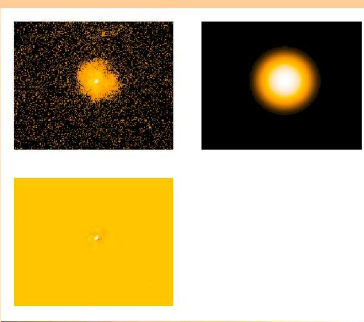
Fig. 7

Fit to radial profile of source (G21.5-0.9)

A model can be fit to a measured surface brightness profile using *Sherpa*. The surface brightness is determined by finding the net counts in a series of concentric annuli divided by the respective areas. The rmid is defined by the center of the annular region (midpoint of bin).
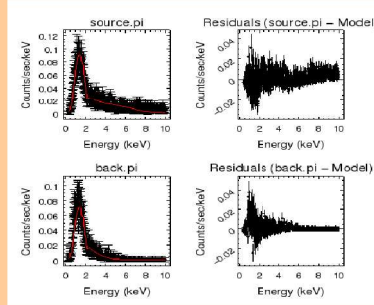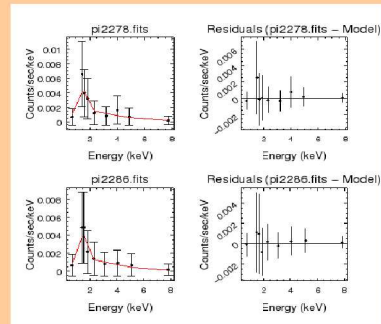
Fig. 4

Fit of source image data (G21.5-0.9)

Sherpa can also fit 2D FITS image data. The image data is viewed using DS9 (SAO Astronomical Data Visualization Application) via XPA (X Public Access). The image data is shown in the upper left with the fit in the upper right and residuals in the lower left using DS9.

Fig. 5

Simultaneous fit of x-ray spectral data (GCS 25 and GCS 28)

Sherpa can fit two datasets simultaneously with instrument responses for each. This method is identical to basic spectral fitting except that the datasets are tracked using unique IDs. Models, fits, and plots are associated with the dataset by the same ID. Two spectral fits with respective residuals are shown in a ChIPS multi-layer plot.

Fig. 6

ADASS XVI