



 AHELP for CIAO 3.4

ptsrc2d

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Synopsis

A 2-D file-based point-source fitting model.

Description

PTSRC is a file-based model that may be used in fitting image data, to determine, e.g., if they are point-like or extended.

This model cannot be used as an instrument model.

FITS formats are allowed for the input model file. The current implementation requires that the image bins of the data and the PTSRC2D model file are the same.

Assume that the PSF is provided in a FITS image (file) of size $N_x * N_y$. N_x and N_y may be much larger than the PSF size in pixels. An optimally sized sub-image of size $xsize * ysize$ can speed up the computation of model amplitudes.

If $xoff = yoff = 0$, the sub-image is extracted from the center of the original image contained in file. The user may find that changing $xoff$ and/or $yoff$ can result in his or her being able to extract a smaller optimally sized sub-image if, say, the PSF is too asymmetric to be fit easily into a centered rectangle.

If $norm$ is thawed its best-fit value for a point-like source will be approximately equal to the number of detected counts from the source.

The parameters $xpos$ and $ypos$ indicate where the center of the sub-image is to be placed in the data image that is to be analyzed, i.e., they should be set to the location of the source centroid. Note that the initial values of the $xpos$ and $ypos$ are estimated using the input dataset.

PTSRC Parameters

Number	Name	Description
1	file	input FITS file name
2	xsize	x-width of the subset region of kernel file to use in convolution
3	ysize	y-width of the subset region of kernel file to use in convolution

4	xoff	x-direction offset
5	yoff	y-direction offset
6	xpos	x-position of the centroid in data image coordinates
7	ypos	y-position of the centroid in data image coordinates
8	norm	normalization defined as a sum over the model image

Example

The example below shows the initial parameter values for the PTSRC2D model. Note that the default xsize and ysize values are set to 32. After reading the data file these parameter can be adjusted to expand the image and include most of the PSF fraction. Notice after image command indicates the fraction of PSF included in the sub-image.

```

sherpa> ptsrc2d[p2]
sherpa> show p2
ptsrc2d[p2] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  file string: "none"
  2  xsize frozen      32         1     1024
  3  ysize frozen      32         1     1024
  4  xoff frozen       0        -512     512
  5  yoff frozen       0        -512     512
  6  xpos thawed     128.5         0.5    256.5
  7  ypos thawed     128.5         0.5    256.5
  8  norm thawed       1           0     1000

sherpa> p2.file=psf2.fits
sherpa> show p2
ptsrc2d[p2] (integrate: on)
  Param  Type      Value      Min      Max      Units
  -----
  1  file string: "psf2.fits"
  2  xsize frozen      32         1     1024
  3  ysize frozen      32         1     1024
  4  xoff frozen       0        -512     512
  5  yoff frozen       0        -512     512
  6  xpos thawed     128.5         0.5    256.5
  7  ypos thawed     128.5         0.5    256.5
  8  norm thawed       1           0     1000
sherpa> image p2
NOTE: PSF fraction for (xsize,ysize): FRAC = 0.984733

sherpa> p2.xsize=64
sherpa> p2.ysize=64
sherpa> image p2

```

Bugs

See the [Sherpa bug pages](#) online for an up-to-date listing of known bugs.

