



 AHELP for CIAO 3.4

tpsf
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Synopsis

A 2-D TCD-model-based instrument model.

Description

TPSF is a model-based 2D instrument model. It utilizes the predefined Gaussian, box, and top hat functions of the TCD library. It can represent the point-spread function (PSF), a redistribution function that maps photon spatial locations to image bins.

Note that the top hat function cannot be used in version 3.2

The convolution can be performed using either Fast Fourier Transforms (FFTs, the default), or the sliding cell technique (see the parameter `fft`). If the length of one axis is N and the length of the kernel axis is $M (= 2 * xsize + 1)$, then the computation time for the sliding cell goes as $N * M$, i.e. for large kernels the best choice is using the FFT. A rough rule-of-thumb for 2-D fits is to use the FFT if $M_1 * M_2 > 100$.

See the documentation on the INSTRUMENT command.

TPSF Parameters

Number	Name	Description
1	xsize	x-axis 1 sigma width (pixels)
2	ysize	y-axis 1 sigma width (pixels)
3	nsigma	kernel width in sigma (Gaussian only)
4	funcTyp	Gaussian (1) / box (2) / top-hat (3)
5	fft	convolution type: 1 = FFT / 0 = sliding cell

Example

This example illustrates the definition of the TPSF1D model.

```
sherpa> tpsf2d[t2]
```

```

sherpa> show t2
tpsf2d[t2]
  Param  Type      Value      Min      Max      Units
  -----
  1  xsize frozen      4         1     1024
  2  ysize frozen      4         1     1024
  3  nsigma frozen      2        1e-02     100
  4  funcTyp frozen      1         0         7
  5   fft frozen      1         0         1
The Function Type is: Gaussian.

```

The parameter funcTyp in t2 model indicate that the Gaussian function will be used. The 1 sigma width of the Gaussian is set to xsize=ysize=4 pixels and the total size of the Gaussian kernel is set to 2 sigma.

Bugs

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

See Also

sherpa

[atten](#), [bbody](#), [bbodyfreq](#), [beta1d](#), [beta2d](#), [box1d](#), [box2d](#), [bpl1d](#), [const1d](#), [const2d](#), [cos](#), [delta1d](#), [delta2d](#), [dered](#), [devaucouleurs](#), [edge](#), [erf](#), [erfc](#), [farf](#), [farf2d](#), [fpsf](#), [fpsf1d](#), [frmf](#), [gauss1d](#), [gauss2d](#), [gridmodel](#), [hubble](#), [jdpileup](#), [linebroad](#), [lorentz1d](#), [lorentz2d](#), [models](#), [nbeta](#), [ngauss1d](#), [poisson](#), [polynom1d](#), [polynom2d](#), [powlaw1d](#), [ptsrc1d](#), [ptsrc2d](#), [rsp](#), [rsp2d](#), [schechter](#), [shexp](#), [shexp10](#), [shlog10](#), [shloge](#), [sin](#), [sqrt](#), [steph1d](#), [steplo1d](#), [tan](#), [tpsf1d](#), [usermodel](#), [xs](#), [xsabsori](#), [xsacisabs](#), [xsapec](#), [xsbapec](#), [xsbody](#), [xsbodyrad](#), [xsbodyxray](#), [xsbodyriv](#), [xsbnpower](#), [xsbmc](#), [xsbremss](#), [xsbvapec](#), [xsc6mekl](#), [xsc6pmekl](#), [xsc6pvmkl](#), [xsc6vmekl](#), [xscabs](#), [xscemekl](#), [xscevmecl](#), [xscflow](#), [xscmpbb](#), [xscmpls](#), [xscmpst](#), [xscmptt](#), [xsconstant](#), [xscutoffpl](#), [xscyclabs](#), [xsdisk](#), [xsdiskbb](#), [xsdiskline](#), [xsdiskm](#), [xsdisko](#), [xsdiskpn](#), [xsdust](#), [xsedge](#), [xsequil](#), [xsexpabs](#), [xsexpdec](#), [xsexpfac](#), [xsgabs](#), [xsgaussian](#), [xsgnei](#), [xsgrad](#), [xsgrbm](#), [xshighecut](#), [xshrefl](#), [xslaor](#), [xslorentz](#), [xsmeka](#), [xsmekal](#), [xsmkcflow](#), [xsnei](#), [xsnotch](#), [xsnpshock](#), [xsnsa](#), [xsnteea](#), [xspcfabs](#), [xspgpwrlw](#), [xspexray](#), [xspexriv](#), [xspfabs](#), [xsplabs](#), [xsplcabs](#), [xspesm](#), [xspowerlaw](#), [xspshock](#), [xspwab](#), [xstraymond](#), [xsreden](#), [xsredge](#), [xsrefsch](#), [xssedov](#), [xssmedge](#), [xsspline](#), [xssrcut](#), [xssresc](#), [xssssice](#), [xsstep](#), [xstbabs](#), [xstbgrain](#), [xstbvarabs](#), [xsuvred](#), [xsvapec](#), [xsvarabs](#), [xsvbremss](#), [xsvequil](#), [xsvgnei](#), [xsvmcfow](#), [xsvmeke](#), [xsvmekal](#), [xsvnei](#), [xsvnpshock](#), [xsvphabs](#), [xsvpshock](#), [xsvraymond](#), [xsvsedov](#), [xswabs](#), [xswndabs](#), [xsxion](#), [xszbbody](#), [xszbremss](#), [xszedge](#), [xszgauss](#), [xszhighect](#), [xszpcfabs](#), [xszphabs](#), [xszpowerlw](#), [xsztbabs](#), [xszvarabs](#), [xszyfeabs](#), [xszyphabs](#), [xszwabs](#), [xszwndabs](#)

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