



imagestats Documentation

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Contents:

PRIMARY USER INTERFACE: IMAGESTATS

class `stsci.imagestats.ImageStats` (*image*, *fields='npix, min, max, mean, stddev'*, *lower=None*, *upper=None*, *nclip=0*, *lsig=3.0*, *usig=3.0*, *binwidth=0.1*)

Class to compute desired statistics from array objects.

Parameters

image : str

input image data array.

fields : str

comma-separated list of values to be computed. The available fields are the following.

image	image data array
npix	the number of pixels used to do the statistics
mean	the mean of the pixel distribution
midpt	estimate of the median of the pixel distribution
mode	the mode of the pixel distribution
stddev	the standard deviation of the pixel distribution
min	the minimum pixel value
max	the maximum pixel value

WARNING

Only those fields specified upon instantiation will be computed and available as an output value.

lower : float

Lowest valid value in the input array to be used for computing the statistical values

upper : float

Largest valid value in the input array to be used in computing the statistical values

nclip : int

Number of clipping iterations to apply in computing the results

lsig : float

Lower sigma clipping limit (in sigma)

usig : float

Upper sigma clipping limit (in sigma)

binwidth : float

Width of bins (in sigma) to use in generating histograms for computing median-related values

Notes

The mean, standard deviation, min and max are computed in a single pass through the image using the expressions listed below. Only the quantities selected by the `fields` parameter are actually computed.

```
mean = sum (x1, ..., xN) / N
      y = x - mean
variance = sum (y1 ** 2, ..., yN ** 2) / (N-1)
stddev = sqrt (variance)
```

The midpoint and mode are computed in two passes through the image. In the first pass the standard deviation of the pixels is calculated and used with the `binwidth` parameter to compute the resolution of the data histogram. The midpoint is estimated by integrating the histogram and computing by interpolation the data value at which exactly half the pixels are below that data value and half are above it. The mode is computed by locating the maximum of the data histogram and fitting the peak by parabolic interpolation.

Warning

This data will be promoted down to float32 if provided as 64-bit datatype.

Examples

This class can be instantiated using the following syntax:

```
>>> import stsci.imagestats as imagestats
>>> i = imagestats.ImageStats(image,
    fields="npix,min,max,mean,stddev",
    nclip=3,
    lsig=3.0,
    usig=3.0,
    binwidth=0.1
)
>>> i.printStats()
>>> i.mean
```

The statistical quantities specified by the parameter `fields` are computed and printed for the input `image` array. The results are available as attributes of the class object as well.

`getCenters()`

Compute the array of bin center positions.

`printStats()`

Print the requested statistics values for those fields specified on input.

class `stsci.imagestats.histogram1d.histogram1d(arrayInput, nbins, binWidth, zeroValue)`
Populate a 1 dimensional histogram from array object

`getCenters()`

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