
Subject: PSF Energy inside circle
Posted by [mayer](#) on Wed, 23 Jul 2008 18:03:30 GMT
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Dear all,
as so often I am either too blind to find existing stuff or puzzled
(if non-existing), that nobody did before what looks like a very usual
task.

What I want to know:

Where in an image array (usual 2d-array with values, e.g. a CCD image)
containing a centered 2d-gaussian light pulse lies the circle that
contains 80 % (for example) of the "energy" of all the light on the
image? I even only need it for the ideal situation where the center of
the CCD aligns with the center of the 2d-gaussian light distribution.

What I did so far:

- Collected useful procedures like `psf_gaussian`, `dist_circle` and `tvcircle`.
- Found the algorithm how to integrate from the center pixel towards
outside, summing up the frame of pixels next to the previous frame. So
my cumulative sum contains the sum of the data of 1, 9, 25 ... pixels.

But I would like to go in circles, not squares! :)

So how could I find and integrate the next "ring" of pixels? How would
I even calculate the ever growing circumference correctly, taking into
account that I have to sum up ever more pixels?

Sounds like a horrible coding work and I am hoping somebody did all
that already, because somehow that is something one would need to see
how good an optical PSF is, or not?

As usual, I am grateful for any help or hint to literature, procedures
or calibration data of other experiments that might have done the
same.

Best regards,
Michael

Subject: Re: PSF Energy inside circle
Posted by [pgrigis](#) on Thu, 31 Jul 2008 14:27:32 GMT
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Michael Aye wrote:

- > I tried your method, it works fine, thanks!
- > A side question:
- > For a 1D Gaussian, 68 % of events/energy/.. lies inside 1 sigma, how
- > is this number for a 2D Gaussian? I have a hard time to find
- > statistical tables for 2D Gaussians? And is it possible to get that

I think that the number is $1 - \exp(-1/2)$ or about 39.3 %.

Ciao,
Paolo

> number analytically?
> Best regards,
> Michael
