Subject: Re: PSF Energy inside circle
Posted by Kenneth P. Bowman on Wed, 23 Jul 2008 19:17:58 GMT
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In article
<8d5ea067-169e-4967-b3d9-29c2e14cf27e@f63g2000hsf.googlegroups.com>,
Michael Aye <kmichael.aye@googlemail.com> wrote:

> 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 date 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

Compute the x and y coordinates of each pixel.

```
x = REBIN(FINDGEN(nx), nx, ny)
y = REBIN(REFORM(FINDGEN(ny), 1, ny), nx, ny)
```

You might want to add 0.5 to locate the pixel centers.

Compute the distance from each pixel to the central pixel

```
d = SQRT((x - x0)^2 + (y - y0)^2)
```

Then find rings like this

```
i = WHERE((d GE d1) AND (d LE d2), count)
```

Do what you want with those pixels.

You can put the WHERE statement in a loop and increment
d1 and d2 over whatever values you want.

Ken Bowman
