Subject: Re: Convolution Kernel
Posted by MC on Fri, 03 Dec 2010 10:23:16 GMT
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On Dec 3, 6:35 am, Gray <grayliketheco...@gmail.com> wrote:
> Hi all,
>
> Maybe my calculus is screwy, but this doesn't make sense to me.
> Here's my issue:
>
> I have two astronomical images (of stars). I've fit an average PSF as
> a Moffat profile for each of the two images. I want to find the
> optimal convolution kernel to match the two psfs, so I call on my old
> friend Mr. Fourier. If MA is the Moffat profile for image A and MB is
> the Moffat profile for image B (both 2d), and K is my optimal kernel,
> then I can do this:
>
> MA ** K = MB --> ** is convolution in this scenario
> F(MA**K) = F(MB) --> F() is the Fourier transform
> F(MA) * F(K) = F(MB)
> K = F^-1(F(MB)/F(MA))
>
> With me so far? So I do this in IDL.
> IDL> ma = moffat(params_a)
> IDL> mb = moffat(params_b)
> IDL> fma = fft(ma) & fmb = fft(mb)
> IDL> k = fft(fma/fmb,/inverse)
> IDL> mc = convol(ma,k)
>
> What I get, however, is that MC is a 2d delta function. Why...? It
> happens with 2d Gaussians, as well. Thanks for your help!
>

Hmm, not sure what Moffat does, but maybe the division by fmb terms
with small amplitudes could be the problem? What happens if you add a
small constant to fmb? If you want to match the OTF of the two images
could you just convolve a with the psf of b and convolve b with the
psf of a?

Hope this helps
MC