Subject: Re: Fourier back to real space
Posted by Craig Markwardt on Tue, 25 Oct 2011 03:16:19 GMT
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On Oct 24, 11:46 am, Anne <anne...@gmail.com> wrote:
> Hi,
>
> I have an images with periodic stripes with various orientation which
> I would like to find the periodicity of. I've Fourier transformed the
> image and found the peak in the transform (via a radial average) so I
> have the q value (in I assume pixels^-1) corresponding to my stripe
> periodicity. I now need to get a real space value out but I'm lost as
> to where the factors of 2pi etc go. Can anyone point me in the right
> direction? I've read the help files online but I'm still horribly
> confused.

Assume your original image has a linear size of L in whatever units you want. Let's say you have a satellite image that covers 7 km x 7 km. Then L = 7 km. Let's also say that your image has N pixels.

The FFT() produces Fourier coefficients which are a function of "frequency" which in this case is (1/length). (in physics we would call that a wavenumber)

The fundamental frequency is 1/L. Every fourier coefficient is an even multiple of that frequency. So if you have N real pixels, there are N/2 unique fourier coefficients, and they have a frequency assignment like this:

Coeff #: 0(DC) 1 2 3 4 ... N/2
Frequency: 0 (1/L) (2/L) (3/L) (4/L) ... (N/(2*L))

Once you determine the frequency of your stripes, the linear size corresponding to that frequency is just (1/frequency).

For example, if the stripes on our 1 km image have a fourier peak at sample 42, that is equal to frequency of 6.0 km^(-1), and a linear size of (1/6) km = 0.167 km.

Craig

Subject: Re: Fourier back to real space
Posted by Anne[2] on Tue, 25 Oct 2011 12:54:33 GMT
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On Oct 25, 4:16 am, Craig Markwardt <craig.markwa...@gmail.com> wrote:
> On Oct 24, 11:46 am, Anne <anne...@gmail.com> wrote:

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> size of (1/6) km = 0.167 km.
>
> Craig

Thank you for the solution, I'd lost the factor of l but I've now
included it and all is well.

Anne
