
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:

>

>> 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

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

Anne
