
Subject: Re: question relating to FFT

Posted by [R.G. Stockwell](#) on Wed, 04 Mar 2009 21:12:59 GMT

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"Hu" <jhaohu@gmail.com> wrote in message

news:65755654-c680-4de8-b611-6b75ace9fa75@n20g2000vba.google groups.com...

> Hi, there

> I try to use FFT function to smooth a curve (an array), and the code

> is like this:

>

>

> FUNCTION FOURIER,ARRAY ;*****FAST FOURIER FLITER

> FILTER=1.0/(1.0+DIST(152)/4.0)^2

> newARRAY=FFT(FFT(ARRAY,-1)*FILTER,1)

> RETURN,newARRAY

> END

>

> when I got an array X (has 152 elements) and use this function like :

>

> Y = FOURIER(X)

>

> I got an result Y with 152 elements, but all the elements are complex

> number, but How can I got an array filled with regular number, not

> complex number?

>

> I mean, I want to use the result to calculate regression relationship

> with other array.

There are many issues here.

Filter is 2D (152 by 152), array is 1D (152) and the function could have a better name :)

First of all, FFTs are complex.

To filter a real valued signal in the fourier domain, you need to ensure you filter is symmetric (and conjugate) about the origin. (where positive frequencies come first, followed by the negative frequencies)

It seems that the above code approximates that, although I don't know if that is by design or by luck.

Then your result will be a complex variable, with all zeros (approx) in your imaginary component.

You should check for that and flag an error if that is not true.

Lasly, DIST is a terrible filter. Even with the unusual use of IDL matrix multiplication rules.

Check out the digitil_filter routines in IDL.

Cheers,
bob
