Subject: Re: IDL FFT (spec -> interferogram)
Posted by Robert Stockwell on Sat, 06 Apr 2002 19:54:02 GMT
View Forum Message <> Reply to Message

Randall Skelton wrote:

> Hi all,
>
> Having read through all of the FFT posts that google groups keeps, I am no
> closer to understanding why I am unable to transform a spectrum into an
> interferogram using IDL. All of the data files, procedures, and pictures
> of this are at http://tulip.atm.ox.ac.uk/~rhskelto/fft-help/
>
> Given two files:
>
> 1) 'spec.dat' contains 512 points of complex spectral data
>
> 2) 'igm.dat' contains 512 points of complex interferogram data that was
> derived from 'spec.dat' using a prime factor FFT written in C. This is
> the correct interferogram as far as I am concerned. The plot

complex-valued interferrogram?

hmmmmm

to shed a little light on it [1], in interferometry, the interferrogram is
the autocorrelation function of the electric field vector.
The power spectrum is the fft of the autocorrelation function.
(this is a well known theorem, and if I only had a brain, I'd remember
the name of it)
Note the real value-ed-ness of "autocorrelation" and "power".
The interferrogram is an even function, the power spectrum is real-valued.

Of course, you can certainly have a spectrum that corresponds to a time series,
But that is just a fourier transform pair, nothing tricky there.

Cheers,
bob

[1] chortle chortle, i slay myself

There was a good book that I used to use. I don't think this is it:

Author Steel, W. H. (William Howard), 1920-
Title Interferometry
W.H. Steel Publisher Cambridge [Cambridgeshire] ; New York : Cambridge University Press, 1983. Edition 2nd ed

and of course I insist you read Brigham's fft books if you haven't already.
