Subject: Re: What are the errors in the FFT?
Posted by Paul Van Delst[1] on Thu, 08 Feb 2007 18:43:23 GMT
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monty@lanl.gov wrote:
> For a given function f(t) I am finding:
>
> FFT(FFT(f(t),-1),1) -f(t) varies between about 10^-7 to 1-^-8 for
> floating point
> and about 10^-14 to 10^-16 for double precision

What are the magnitudes of the original f(t)? If close to one, sounds like "simple" accumulation of precision errors.

> (I.e. the inverse transform of the transform deviates from the
> original function)

Depends on your definition of "deviates".

> Is this aproblem with the IDL implementation of the FFT, or is this a
> more fundamental issue with the algorithm itself?

Depending on your input function magnitudes, it's more likely a (the? :o) fundamental issue with floating point arithmetic. There are ways of minimising this sort of error accumulation (and I assume FFT algorithms do it already), but you can't remove it entirely.

cheers,

paulv

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Paul van Delst Ride lots.
CIMSS @ NOAA/NCEP/EMC Eddy Merckx