Subject: better atan function?
Posted by R on Tue, 30 May 2000 07:00:00 GMT
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Greetings all,

I have found that the phase I get from the FFT has
a precision of only ~10e-8, and that the precision depends
on what value phase has.

I think I've traced this to the atan function, or perhaps the
division that takes place in the atan function.

Does anyone have a better atan function (more precise)?

Or is this merely the way it is when one is bumping up against
precision errors?

By comparison, my "simulation" does get the amplitudes
of the spectral components to a precision of ~10e-14 or so.
(as expected for double precision variables, and no noise)

cheers,
bob
stockwell (at) co-ra (dot) com

Subject: Re: better atan function?
Posted by Liam E. Gumley on Thu, 01 Jun 2000 07:00:00 GMT
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bjackel@phys.ucalgary.ca wrote:
>
> Hi Bob
>
> Hmm. A couple minutes playing with atan gives the following:
>
> IDL> help,atan(1.0d-12,1.0d0)
> <Expression>   DOUBLE   =   1.0000000e-012
>
> IDL> help,atan(1.0d-15,1.0d0)
> <Expression>   DOUBLE   =   1.0000000e-015
>
> IDL> help,!dpi/2.0d0 - atan(1.0d0,1.0d-12)
> <Expression>   DOUBLE   =   9.9986686e-013
>
> IDL> help,!dpi/2.0d0 - atan(1.0d0,1.0d-15)

> <Expression>   DOUBLE   =   8.8817842e-016
>
> So the small angle stuff is essentially perfect. The error
> at large angles is almost certainly due to subtracting two
> nearly equal quantities. This of course doesn't rule out
> something funny for moderate angles, but it'd be surprising.

Some interesting observations on computing elementary functions are
available at
 http://math.nist.gov/javanumerics/reports/jgfnwg-02.html#App endix-3

Cheers,
Liam.
http://cimss.ssec.wisc.edu/~gumley