Subject: Re: Minimum and location of minimum through interpolation
Posted by Craig Markwardt on Mon, 30 Jan 2012 15:26:28 GMT
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On Jan 30, 3:33 am, Els <elias.rous...@gmail.com> wrote:
> Here is where the problem are:
>
> Due to undersampling, the actual minimum standard deviation may occur between two x-values, so I want to determine this through interpolation. That is not so difficult, but one additional problem is that "x" is an angle, so I can have jumps from 360 deg to 0 deg. If the mimimum is around eg. 358 deg and I have undersampling, interpolation may give me a result of ~180 deg, which is obviously wrong.

You could try unwrapping your series first, for example by using
PHUNWRAP, and then doing your minimum-finding procedure with the
modified series.

Craig

http://www.physics.wisc.edu/~craigm/idl/math.html#PHUNWRAP

Subject: Re: Minimum and location of minimum through interpolation
Posted by Russell[1] on Mon, 30 Jan 2012 21:18:59 GMT
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On Jan 30, 10:26 am, Craig Markwardt <craig.markwa...@gmail.com>
wrote:
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You could take the derivative of the std.dev. with respect to x and
find the points where ds/dx = 0. Obviously, that'll never happen (for

the undersampling issue you said), so instead interpolate that:

dsdx = deriv(x,std)
minx = interpol(x,dsdx,0.0)

Now, the catch is since there might be multiple extrema, you'll need to be careful with this, but shouldn't be too hard. You just need to find the points where the sign goes from negative to positive. If your sample is smallish (say <10000), then you can probably do this by a brute force search, and compare the sign of successive elements. Every time you find a sign flip (in the right sense to avoid local maxima), then log it. Next loop over the minima and do the above 2 lines.

Russell
