Subject: Re: mpfit of parametric data?
Posted by Craig Markwardt on Mon, 16 Aug 2004 18:14:12 GMT
View Forum Message <> Reply to Message

"jamiesmyth_uni@yahoo.ca" <jamiesmyth_uni@yahoo.ca> writes:
> After two weeks of vacation I'm back at this. I've de-trended the
> original time series by fitting to a quadratic, and estimated the
> frequencies of the components by looking at the power spectrum.
> Unfortunately, I still cannot fit the amplitude and phase of a trivial
> sinusoid such as 'A*sin(2*!dpi*w*t+phi)'. How do I go about estimating
> the phase of the following trivial example?
>
> IDL> n = 2048
> IDL> t = dindgen(n) * 0.125 ; time
> IDL> freq = dindgen(n)/(n*0.128)
> IDL> p0 = [0.03, 0.06923, 2.3]
> IDL> data = p0(0)*sin( 2*!dpi*p0(1)*t + p0(2) )
> IDL> plot, t, data
> IDL> Ft_data = fft(data)
> IDL> plot, freq, abs(Ft_data)^2, xrange=[0,0.5] ; frequency estimate
> IDL> plot, freq, atan(double(Ft_data),imaginary(Ft_data)),
> xrange=[0,0.5] ; ?phase estimate?
>
> I think I understand what Craig said about a local-minimum but I'm a
> little surprised that such a simple problem (i.e. estimating the
> amplitude, frequency and phase of a sine wave) would be so difficult?
> How is it that my Lecroy/Tektronix scope can solve this in real time
> but I cannot do it with IDL and a dual xeon? Surely I must be missing
> something...

Jamie, since you don't have any call to MPFIT here, I am a little
confused about how your question relates to MPFIT.

Also, you have a mismatch in your FREQ and T variables, right?

The 2-argument version of ATAN accepts variables as ATAN(Y,X), not
ATAN(X,Y), so shouldn't you swap the order of the imaginary and real
components?

Finally, you are plotting the spectrum of phases. Don't you want the
phase at the maximum Fourier power? And, how do you know the phase is
wrong?

Craig

--
---------- ----------
Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu