
Subject: Re: Fourier analysis of the Data with some gaps
Posted by [R.G. Stockwell](#) on Mon, 13 Apr 2009 16:10:35 GMT
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"Kenneth P. Bowman" <k-bowman@null.edu> wrote in message
news:k-bowman-5F7B9B.10442113042009@news.tamu.edu...

> In article
> <7cfa22f4-1133-48a1-9562-a84a0d932a6e@i28g2000prd.googlegroups.com>,
> "duxiyu@gmail.com" <duxiyu@gmail.com> wrote:
>
>> Dear all,
>>
>> I want to take FFT on the data.
>> But there are some shorts data gaps during this data interval.
>> How should I deal with these gaps?
>>
>> Best regards,
>>
>> jdu
>
> This is a very general question and there is no unique answer. You
> need to be aware of the characteristics of the data.

I agree, and would go a bit further. There is no unique answer, and
no good answer.

> You can interpolate to fill the gaps. (Many methods.)

This is fine if the gaps are not too common, or too large.

> You can use least-squares instead of FFT.

The Lomb Scargle technique is often misused in this case.
It does a fit of a single sinusoid, and calculates the significance
of it. It should not be used to calculate the spectrum (which of course
is exactly what the Numerical Recipe book does).

An actual least squares fit to all the fourier components, where there
is gappy data, is almost always an ill posed matrix. The sinusoids are
orthogonal
with regular sampling, but when you remove a point in the time series, those
sinusoids are no longer orthogonal.

Perhaps a local spectral technique would be appropriate, which gives
one the spectrum where there is data, and gaps where there are gaps.

Cheers,
bob
