Subject: Re: Time series with 75% missing observations Posted by Roman Schreiber on Thu, 18 Oct 2001 07:42:20 GMT View Forum Message <> Reply to Message

Craig Markwardt <craigmnet@cow.physics.wisc.edu> wrote in news:onpu7lub39.fsf@cow.physics.wisc.edu:

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Joe Means <joe.means@orst.edu> writes:
>
>> I have long data series with many random, missing values. These series
>> each have only one or two frequencies. As I read the IDL 5.4
>> documentation, time series analysis routines require all values to be
>> evenly spaced. The periodicities are not sinusoidal, but such an
>> assumption might well find them. How can I find these periodicities?
>
  Greetings!
>
 If your time series are regularly sampled, but have missing values,
  then it is relatively straightforward to proceed with the FFT.
>
  Theoretically, zeroes do not actually contribute to the FFT power, but
> in practice you get aliases of the DC power which contaminate all the
  other frequencies. Contamination is bad.
>
  The solution is to subtract off the mean value of the signal *from the
> non-missing values* before doing the FFT. Say you have a variable Y
> which contains the signal, and missing values are set to -1. First
> you would transform to a new variable, YP, which has the average value
  subtracted.
>
   yp = y*0
>
   wh = where(y NE -1, ct)
>
   if ct EQ 0 then message, 'ERROR: no valid points!'
>
   yp(wh) = y(wh) - avg(y(wh))
>
>
  Note that the original missing values are converted to zeroes, so
> overall YP should have a zero mean value itself. Then you just do
  your FFT as normal.
>
  ***
>
  The other possibility, is if you have irregularly sampled points.
> Then you are better off with something like the Lomb Scargle
> periodogram. It's in Numerical Recipes. I have a crude routine which
  does this, available by request.
> Craig
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>
>
Joe,
there is already Lomb periodogram function implemented in IDL 5.4 (LNP_TEST) based on routine fasper you may find in Numerical Recipes.
Best regards
Roman

Roman Schreiber e-mail: schreibe@ncac.torun.pl Copernicus Astronomical Centre PAS phone: 0-48-56-6219319 Astroph.Lab I fax: 0-48-56-6219381 ul.Rabianska 8 87-100 Torun POLAND