Subject: Re: How to calculate 3SIGMA in Linfit!
Posted by Craig Markwardt on Mon, 11 Jun 2012 16:25:35 GMT
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On Monday, June 11, 2012 3:51:50 AM UTC-4, dave poreh wrote:
> Dear folks
> hi,
> i want to calculate 3sigma in linfit function. sigma function just give me the SD and i could not do 3*sigma to get 3sigma. As far as i understood first i need to transfer data to normal function and then i find SD and 3SD=3sigma.

I'm assuming you want to calculate a 3 sigma confidence limit. But of what? The slope coefficient? Offset coefficient?

As far as I understand, 3 sigma is indeed usually 3 times the 1 sigma error estimate. When your fitting function is non-linear it gets more complicated, but yours is not-nonlinear.

Craig

Subject: Re: How to calculate 3SIGMA in Linfit!
Posted by d.poreh on Tue, 12 Jun 2012 07:07:40 GMT
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On Monday, June 11, 2012 6:25:35 PM UTC+2, Craig Markwardt wrote:
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I want to measure velocity of the time series that means i would have a velocity and +- 3sigma error.
Cheers,
Dave

Subject: Re: How to calculate 3SIGMA in Linfit!
Posted by Craig Markwardt on Tue, 12 Jun 2012 14:53:03 GMT

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Assuming:
* the errors are gaussian; (and uncorrelated)
* the data error bars are the correct size; and
* the linear function is a good model for the data;

then the formal parameter errors reported by LINFIT() will be an unbiased estimate of the true parameter errors. And the 3 sigma confidence limits will be the same as the 3 x (1 sigma) confidence limits.

If that is not occurring, then one of the assumptions above is not applicable.

Craig

Subject: Re: How to calculate 3SIGMA in Linfit!
Posted by Craig Markwardt on Tue, 12 Jun 2012 17:54:26 GMT
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On Tuesday, June 12, 2012 10:53:03 AM UTC-4, Craig Markwardt wrote:
> On Tuesday, June 12, 2012 3:07:40 AM UTC-4, dave poreh wrote:
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>> I want to measure velocity of the time series that means i would have a velocity and +- 3sigma error.

As a practical matter, I recommend that you subtract the average time value (or center-time value) from the time column of your samples.

The result returned from LINFIT() will then be mean position at the center time, and the mean velocity at the center time.

If you don't subtract the mean time value, then that can introduce some nasty correlations between the slope and offset coefficients.

Craig

Subject: Re: How to calculate 3SIGMA in Linfit!
Posted by d.poreh on Tue, 12 Jun 2012 18:10:16 GMT
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On Tuesday, June 12, 2012 10:54:26 AM UTC-7, Craig Markwardt wrote:
> On Tuesday, June 12, 2012 10:53:03 AM UTC-4, Craig Markwardt wrote:
>> On Tuesday, June 12, 2012 3:07:40 AM UTC-4, dave poreh wrote:
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I have noticed that, and i thought it is a statistical matter. Why it is like that. Is this thing (subtracting mean()) some kind of normalization or what?
Cheers,
Dave

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Posted by Craig Markwardt on Tue, 12 Jun 2012 19:35:25 GMT
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On Tuesday, June 12, 2012 2:10:16 PM UTC-4, dave poreh wrote:
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It's a correlation between parameters.

A linear fit has a slope term and an offset term, which is measured at the origin of the X axis. If the origin of the X axis is very far from the measured data positions, then a very small error in the slope will trigger a large error in the offset, and vice versa.
