Subject: Explanation for keywords of POLY_FIT?
Posted by Karlo Janos on Tue, 28 Oct 2008 16:41:26 GMT
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Hello everybody,

I am looking for an explanation for some of the keywords of POLY_FIT.
I understand SIGMA. But what are YERROR and YBAND in the mathematical
sense? How are these values calculated? And how does MEASUREMENT_ERROR
influence these output values?
Regards

Karlo

Subject: Re: Explanation for keywords of POLY_FIT?
Posted by Jeremy Bailin on Wed, 29 Oct 2008 13:50:59 GMT
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> I am looking for an explanation for some of the keywords of POLY_FIT.
> I understand SIGMA. But what are YERROR and YBAND in the mathematical
> sense? How are these values calculated? And how does MEASUREMENT_ERROR
> influence these output values?

It's been a while since I used it, so this is just off the top of my
head being refreshed by looking at the help page - I wouldn't be
shocked if it's wrong:

If your data points are X, Y and the fit is X, YFIT, then YERROR =
stddev(Y - YFIT).

The estimated error on the values YFIT is YBAND.

MEASUREMENT_ERROR only influences these via changes to YFIT, but the
form is complicated and depends on the degree of the polynomial... if
you need the detailed expression, I'd just follow the NR derivation
for linear least squares fit with whatever degree polynomial you need.

-Jeremy.

Subject: Re: Explanation for keywords of POLY_FIT?
Posted by Karlo Janos on Thu, 30 Oct 2008 08:06:58 GMT
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> If your data points are X, Y and the fit is X, YFIT, then YERROR =
> stddev(Y - YFIT).

That is not correct (as I found out now), but you gave me the hint for
finding the correct answer!

YERROR is the "Root Mean Squared Error" aka the "fit standard error".
Dr. Google gives the definition. ;)

> MEASUREMENT_ERROR only influences these via changes to YFIT, but the
> form is complicated and depends on the degree of the polynomial... if
> you need the detailed expression, I'd just follow the NR derivation
> for linear least squares fit with whatever degree polynomial you need.

I assume that this is "weighted linear least squares", when using
MEASUREMENT_ERROR.

Thanks for your help!

Karlo

Subject: Re: Explanation for keywords of POLY_FIT?
Posted by Jeremy Bailin on Thu, 30 Oct 2008 11:48:53 GMT
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>> If your data points are X, Y and the fit is X, YFIT, then YERROR =
>> stddev(Y - YFIT).
>
> That is not correct (as I found out now), but you gave me the hint for
> finding the correct answer!
>
> YERROR is the "Root Mean Squared Error" aka the "fit standard error".
> Dr. Google gives the definition. ;)

Aha! Yeah, that makes more sense anyways.

>> MEASUREMENT_ERROR only influences these via changes to YFIT, but the
>> form is complicated and depends on the degree of the polynomial... if
>> you need the detailed expression, I'd just follow the NR derivation
>> for linear least squares fit with whatever degree polynomial you need.
>
> I assume that this is "weighted linear least squares", when using
> MEASUREMENT_ERROR.

Yup, that should be right. Some of the fitting procedures
alternatively let you use a WEIGHT keyword instead, so you can
directly weight the data points instead (depricated, since it's not a
great idea, but can be convenient to explicitly set some to zero), but

it looks like POLY_FIT isn't one of them.

-Jeremy.