
Subject: Re: IDL - EXP fitting function

Posted by [David Fanning](#) on Thu, 26 Mar 2009 22:12:44 GMT

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glen_andy@hotmail.com writes:

> Greetings everyone! My first post! I have some data x, y, that i would
> like to fit to a fitting function of the kind $y_{fit} = \text{EXP}(a + b \cdot x)$.
> where a and b are constants which i would like found. Any ideas on how
> to do this?

```
ab = LinFit(x, y)
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a = ab[0]
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b = ab[1]
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Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: IDL - EXP fitting function

Posted by [David Fanning](#) on Thu, 26 Mar 2009 22:15:42 GMT

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David Fanning writes:

> glen_andy@hotmail.com writes:

>

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> b = ab[1]
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Whoops! Hang on. Trying to do too many things at once. :-)

Give me a couple of minutes and I'll see if I can find the right answer here. Didn't notice that EXPONENT thing there. :-(

Cheers,

David

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Subject: Re: IDL - EXP fitting function

Posted by [glen_andy](#) on Thu, 26 Mar 2009 22:25:51 GMT

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On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:

> glen_a...@hotmail.com writes:

>> Greetings everyone! My first post! I have some data x, y, that i would

>> like to fit to a fitting function of the kind $y_{fit} = \text{EXP}(a + b \cdot x)$.

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> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Thanks for getting back to me David,

Does the linfit function work when i would like my data to be fitted to an $\text{EXP}(a + bx)$ function? I didn't think that a linear function would be correct when considering the EXP? Or am i getting confused going from real space to log space!

Cheers

Andy

Subject: Re: IDL - EXP fitting function

Posted by [glen_andy](#) on Thu, 26 Mar 2009 22:33:37 GMT

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On Mar 26, 5:15 pm, David Fanning <n...@dfanning.com> wrote:

> David Fanning writes:

>> glen_a...@hotmail.com writes:

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>>> Greetings everyone! My first post! I have some data x, y, that i would

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> once. :-)

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Its ok :-) and thank you.

Subject: Re: IDL - EXP fitting function

Posted by [Christopher Thom](#) on Thu, 26 Mar 2009 22:55:14 GMT

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Quoth [glen_andy@hotmail.com](#):

> On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:

>> glen_a...@hotmail.com writes:

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> correct when considering the EXP? Or am i getting confused going from
> real space to log space!
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No, linfit() fits a linear model of the form $y = A + B \cdot x$, so it will not "just work". why don't you just fit a linear model in logspace?

```
res = linfit(x, alog(yfit))
a = res[0]
b = res[1]
```

cheers
chris

Subject: Re: IDL - EXP fitting function
 Posted by [Vince Hradil](#) on Fri, 27 Mar 2009 02:11:43 GMT
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On Mar 26, 5:55 pm, Christopher Thom <ct...@oddjob.uchicago.edu> wrote:

> Quoth glen_a...@hotmail.com:

>
>
>

>> On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:

>>> glen_a...@hotmail.com writes:

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```

I'll second that. This is really a linear problem, so no need to solve the non-linear equation.

Subject: Re: IDL - EXP fitting function
 Posted by [Maarten\[1\]](#) on Fri, 27 Mar 2009 10:13:52 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Mar 26, 11:55 pm, Christopher Thom <ct...@oddjob.uchicago.edu> wrote:

```

>> Does the linfit function work when i would like my data to be fitted to
>> an EXP(a + bx) function? I didn't think that a linear function would be
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```

```
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Be very careful with that. Small offsets (on measured data, usually way below the noise level) will throw this fit way off. A non-linear fit will probably give better results, especially if you have a realistic error model (Poisson noise on a decay signal for instance).

At the very least plot the fit over the data, and plot the residuals for visual inspection.

Maarten

Subject: Re: IDL - EXP fitting function
Posted by [pgrigis](#) on Fri, 27 Mar 2009 13:27:38 GMT
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Vince Hradil wrote:

```
> On Mar 26, 5:55 pm, Christopher Thom <ct...@odjob.uchicago.edu>
> wrote:
>> Quoth glen_a...@hotmail.com:
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>>> On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:
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> I'll second that. This is really a linear problem, so no need to
> solve the non-linear equation.

```

I disagree. If you have negative measurements, or positive but very small measurements, you will get bad results. Also the result will not be the least-squares best fit.

Ciao,
Paolo

Subject: Re: IDL - EXP fitting function
 Posted by [Vince Hradil](#) on Fri, 27 Mar 2009 13:38:08 GMT
[View Forum Message](#) <> [Reply to Message](#)

```

On Mar 27, 8:27 am, Paolo <pgri...@gmail.com> wrote:
> Vince Hradil wrote:
>> On Mar 26, 5:55 pm, Christopher Thom <ct...@oddjob.uchicago.edu>
>> wrote:
>>> Quoth glen_a...@hotmail.com:
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>>>> On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:
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It can still be fit as a linear system - just weight the residuals by the measured values, like this: <http://mathworld.wolfram.com/LeastSquaresFittingExponential.html>

Subject: Re: IDL - EXP fitting function
 Posted by [pgrigis](#) on Fri, 27 Mar 2009 13:50:53 GMT
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Vince Hradil wrote:
 > On Mar 27, 8:27 am, Paolo <pgri...@gmail.com> wrote:
 >> Vince Hradil wrote:

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Interesting... but I still do not see how they handle negative values...

Ciao,
Paolo

Subject: Re: IDL - EXP fitting function
Posted by [Vince Hradil](#) on Fri, 27 Mar 2009 14:03:49 GMT
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On Mar 27, 8:50 am, Paolo <pgri...@gmail.com> wrote:
> Vince Hradil wrote:
>> On Mar 27, 8:27 am, Paolo <pgri...@gmail.com> wrote:
>>> Vince Hradil wrote:
>>>> On Mar 26, 5:55 pm, Christopher Thom <ct...@oddjob.uchicago.edu>
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> Interesting... but I still do not see how they handle negative
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> Ciao,
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```

How about using $y_{\text{prime}} = y_i - \min(y_i) + \text{eps}$? Or does that change the whole thing. It's too early - and I still have to get a cuppa. I'll be back 8^]

Subject: Re: IDL - EXP fitting function
 Posted by [glen_andy](#) on Fri, 27 Mar 2009 16:13:53 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Mar 27, 9:03 am, Vince Hradil <vincehra...@gmail.com> wrote:
 > On Mar 27, 8:50 am, Paolo <pgri...@gmail.com> wrote:
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```

>
>
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> the whole thing. It's too early - and I still have to get a cuppa.
> I'll be back 8^]- Hide quoted text -
>
> - Show quoted text -
```

Thanks guys for the suggestions. I dont need to worry about negative values. Although i am considering small numbers. Typically in the range between 1E-5 and 1. I am trying to fit to this function to match a current method which has been applied to the same type of data sets for modelling purposes. I am trying to compare experimental results to that model and see how different the a and b parameters have changed.
