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 yfit = $EXP(a+b^*x)$.
- > where a and b are constants which i would like found. Any ideas on how
- > to do this?

```
ab = LinFit(x, y)

a = ab[0]

b = ab[1]
```

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:

EXPONENT thing there. :-(

```
> 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 yfit = EXP(a+ b*x).
>> where a and b are constants which i would like found. Any ideas on how
>> to do this?
>
> ab = LinFit(x, y)
> a = ab[0]
> b = ab[1]
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
```

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 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 yfit = EXP(a+ b*x).

>> where a and b are constants which i would like found. Any ideas on how

>> to do this?

> ab = LinFit(x, y)

> a = ab[0]

> b = ab[1]

> Cheers,

> David

> -
> David Fanning, Ph.D.

> Fanning Software Consulting, Inc.

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

Thanks for getting back to me David,

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 correct when considering the EXP? Or am i getting confused going from real space to log space!

Cheers Andv

Subject: Re: IDL - EXP fitting function

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

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:
>>> Greetings everyone! My first post! I have some data x, y, that i would
>>> like to fit to a fitting function of the kind yfit = EXP(a+b^*x).
>>> where a and b are constants which i would like found. Any ideas on how
>>> to do this?
>> ab = LinFit(x, y)
>> a = ab[0]
>> b = ab[1]
>
> 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
> 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.")
```

Its ok :-) and thank you.

Subject: Re: IDL - EXP fitting function Posted by Christopher Thom on Thu, 26 Mar 2009 22:55:14 GMT View Forum Message <> Reply to Message

Quoth glen_andy@hotmail.com:

```
    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 yfit = EXP(a+ b*x).
    >> where a and b are constants which i would like found. Any ideas on how
    >> to do this?
```

```
>> ab = LinFit(x, y)
>> a = ab[0]
>> b = ab[1]
>> 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.")
>
> Thanks for getting back to me David,
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> an 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!
No, linfit() fits a linear model of the form y = A + B^*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:
>>> Greetings everyone! My first post! I have some data x, y, that i would
>>> like to fit to a fitting function of the kind yfit = EXP(a+ b*x).
>>> where a and b are constants which i would like found. Any ideas on how
>>> to do this?
```

```
>>> ab = LinFit(x, y)
>>> a = ab[0]
>>> b = ab[1]
>>> 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.")
>
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>> real space to log space!
> No, linfit() fits a linear model of the form y = A + B*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
```

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

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

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...@oddjob.uchicago.edu>
>> Quoth glen_a...@hotmail.com:
>>
>>
>>> 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 yfit = EXP(a+ b*x).
>>> > where a and b are constants which i would like found. Any ideas on how
>>>> > to do this?
>>
>>> ab = LinFit(x, y)
>>>> a = ab[0]
>>> b = ab[1]
>>
>>>> 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.")
>>> Thanks for getting back to me David,
```

```
>>
>>> 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
>>> correct when considering the EXP? Or am i getting confused going from
>>> real space to log space!
>>
>> No, linfit() fits a linear model of the form y = A + B^*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
> 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
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```

```
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:

>>>> 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 yfit = EXP(a+ b*x).

>>>> > where a and b are constants which i would like found. Any ideas on how

>>> > to do this?

>>>> > ab = LinFit(x, y)

>>>> > b = ab[0]

>>>> > b = ab[1]
```

```
>>>> > 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.")
>>> Thanks for getting back to me David,
>>> 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
>>> correct when considering the EXP? Or am i getting confused going from
>>>> real space to log space!
>>> No, linfit() fits a linear model of the form y = A + B^*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
>> 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
```

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 View Forum Message <> Reply to Message

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>
>>> wrote:
>>>> Quoth glen_a...@hotmail.com:
>>
>>> > 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 yfit = EXP(a+ b*x).
>>> > > where a and b are constants which i would like found. Any ideas on how
>>>> > > > to do this?
>>
>>> > ab = LinFit(x, y)
>>>> > > >
>>>> > > >
>>>> > 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.")
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>>> No, linfit() fits a linear model of the form y = A + B^*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
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>>
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>> 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
```

> 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

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>
>>>> wrote:
>>>> > Quoth glen a...@hotmail.com:
>>> > 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 vfit = EXP(a+ b^*x).
>>> > > > where a and b are constants which i would like found. Any ideas on how
>>>> > > > to do this?
>>> >> > ab = LinFit(x, y)
>>>> >>> >>
>>>> >>> >
>>>> > > 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.")
>>>> > Thanks for getting back to me David,
```

```
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>>> > No, linfit() fits a linear model of the form y = A + B*x, so it will not
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>>> Paolo
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>> the measured values, like this:http://mathworld.wolfram.com/LeastSquaresFittingExponen
tial.html
>
> Interesting... but I still do not see how they handle negative
> values...
>
> Ciao.
> Paolo
How about using yiprime = yi - min(yi) + 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
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```

```
On Mar 27, 9:03 am, Vince Hradil <vincehra...@gmail.com> wrote: > 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>
>>>> > wrote:
>>>> > Quoth glen a...@hotmail.com:
>>> > > On Mar 26, 5:12 pm, David Fanning <n...@dfanning.com> wrote:
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>>>> > > > Greetings everyone! My first post! I have some data x, y, that i would
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>>> > > > where a and b are constants which i would like found. Any ideas on how
>>>> > > > > to do this?
>>>> >>> >>> ab = LinFit(x, y)
>>>> >>> >>>
>>>> >>> >>>
>>>> > > > Cheers,
>>>> > > David
>>>> > --
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>>>> > > >
>>> > > > > 1
>
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```

```
>>> > solve the non-linear equation.
>>>> I disagree. If you have negative measurements, or positive
>>>> but very small measurements, you will get bad results.
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>> Interesting... but I still do not see how they handle negative
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>
>> Ciao.
>> Paolo
> How about using yiprime = yi - min(yi) + 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^]- Hide quoted text -
> - Show quoted text -
```

Thanks guys for the suggestions. I dont need to worry about negative values. Al;though 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 abd b parameters have changed.