Subject: Best fit line for sinusoid
Posted by liam.steele on Wed, 30 Sep 2015 14:22:57 GMT
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Hi all,

I was wondering if there was a 'simple' way to get IDL to plot a best fit line for a sinusoidally-varying data set. For example, say temperatures were recorded each hour for 5 days at a certain location, with each measurement having an error of 2 deg C. Then we would have something like:

```
day = findgen(121)/24
temp = 15 + 10*sin(10*!pi*findgen(121)/120) + 5*randomu(seed, 121)
error = fltarr(121)+2
```

Is it possible from these three arrays for IDL to work out and plot a best fit line? I have searched online, and can't really find what I'm looking for. (surprisingly I have never had to plot a best fit line to anything before!)

Cheers,

Liam

Subject: Re: Best fit line for sinusoid
Posted by David Fanning on Wed, 30 Sep 2015 14:37:45 GMT
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liam.steele@gmx.co.uk writes:

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You will do well to start here:

http://cow.physics.wisc.edu/~craigm/idl/fitting.html

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Best fit line for sinusoid
Posted by liam.steele on Wed, 30 Sep 2015 14:51:31 GMT
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On Wednesday, 30 September 2015 15:37:47 UTC+1, David Fanning wrote:
> liam.steele@gmx.co.uk writes:
>
>> I was wondering if there was a 'simple' way to get IDL to plot a best fit line for a sinusoidally-varying data set. For example, say temperatures were recorded each hour for 5 days at a certain location, with each measurement having an error of 2 deg C. Then we would have something like:
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> David
> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
> Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Aha! That looks far more useful than anything I found. Thanks very much.

Subject: Re: Best fit line for sinusoid
Posted by chris_torrence@NOSPAM on Wed, 30 Sep 2015 15:19:43 GMT

On Wednesday, September 30, 2015 at 8:51:33 AM UTC-6, liam....@gmx.co.uk wrote:
> On Wednesday, 30 September 2015 15:37:47 UTC+1, David Fanning wrote:
>> liam.steele@gmx.co.uk writes:
>>
>>> I was wondering if there was a 'simple' way to get IDL to plot a best fit line for a sinusoidally-varying data set. For example, say temperatures were recorded each hour for 5 days at a certain location, with each measurement having an error of 2 deg C. Then we would have something like:
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>> David Fanning, Ph.D.
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>
> Aha! That looks far more useful than anything I found. Thanks very much.

Hi Liam,

Once you've done your fit, you can do an error bar plot like this:

```
day = dindgen(121)/24
temp = 15 + 10*sin(10*!pi*findgen(121)/120) + 5*randomu(seed, 121)
error = fltarr(121)+2
p = errorplot(day, temp, error, linestyle='none')
yfit = ...
p1 = plot(day, yfit, '2', /overplot)
```

Cheers,
Chris

Subject: Re: Best fit line for sinusoid
Posted by liam.steele on Wed, 30 Sep 2015 16:07:24 GMT
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On Wednesday, 30 September 2015 15:23:01 UTC+1, liam....@gmx.co.uk wrote:
> Hi all,
>
> I was wondering if there was a 'simple' way to get IDL to plot a best fit line for a sinusoidally-varying data set. For example, say temperatures were recorded each hour for 5 days at a certain location, with each measurement having an error of 2 deg C. Then we would have something like:
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>
> Cheers,
>
> Liam

Thanks for the tips everyone. I've managed to get something which I think looks correct, so that's good! I'll add the error bar plot when I work on the real data. The code I used was this:

```
day = findgen(121)/24
temp = 15 + 10*sin(10*!pi*findgen(121)/120)+5*randomu(seed, 121)
error = fltarr(121)+2
meanval = mean(temp)

expr = 'P[0] + P[1]*sin(P[2]*2*!pi*findgen(P[3])/(P[3]-1) + P[4])'
start = [meanval, (max(temp)-min(temp))/2, 5., 121, 0.]

result = MPFITEXPR(expr, day, temp, error, start)
fitline = result[0] +  result[1]*sin(result[2]*2*!pi*findgen(result[3])/(result[3]- 1) + result[4])

plot, day, temp, psym=sym(2)
oplot, day, fitline
```