
Subject: Re: xerr

Posted by [Wout De Nolf](#) on Thu, 18 Dec 2008 10:35:42 GMT

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On Wed, 17 Dec 2008 12:27:59 -0800 (PST), lakshmi <laxsri@gmail.com> wrote:

> I've been using mpfitfun to fit measured values of period (y) and
> distances (x) in a linear equation $y = a + bx$.
> I would like to know if we can include the measured uncertainties in x
> values too?

What you're looking for is called "Total least squares" or "orthogonal regression". Here is a reference + code you can use, translate to IDL and hopefully share it with use :-).

Article:

<http://www.iop.org/EJ/abstract/0957-0233/18/11/025>

Matlab (off course) code:

<http://www.mathworks.com/matlabcentral/fileexchange/17466>

It uses the method of the Lagrange Multipliers, so it should be possible to add constraints to the rico and intercept.

If you're lazy: here's a simple code (not tested and without calculating errors) using info from <http://mathforum.org/library/drmath/view/63765.html>. Change fixintercept to 1 when you want to fix the intercept.

```
pro odr
n=100
x=findgen(n)+RANDOMN(seed,n)
rico=1.2
intercept=3
fixintercept=0b
y=rico*x+intercept+RANDOMN(seed,n)
```

```
print,'Rico:',rico
print,'Intercept:',intercept
```

```
; Centroid: orthogonal distance
; regression line goes through it
n=n_elements(x)
data=transpose([x],[y])
centroid=total(data,2)/n
```

```
; Optional: Fix intercept
if fixintercept then centroid=[0,intercept]
```

```
data[0,*]=-centroid[0]
data[1,*]=-centroid[1]

SVDC, data, W, U, V

smallest_singularvalue=min(W,ind)
normal=reform(V[ind,*])

rico=-normal[0]/normal[1]
intercept=-rico*centroid[0]+centroid[1]

print,'ODR...'
print,'Rico:',rico
print,'Intercept:',intercept

window
plot,x,y,psym=1
oplot,x,rico*x+intercept
end
```
