

Guidance for Origin

Written by Martin Ma, 2019/5/8

Introduction

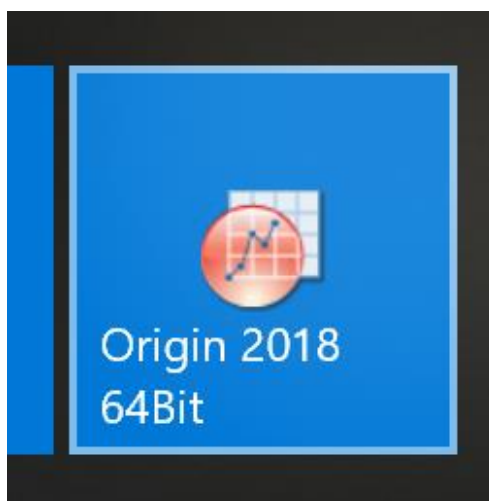
Origin is a data analysis and graphing software with a beginner-friendly interface. Origin graphs and analysis results can automatically update on data or parameter change, allowing you to create templates for repetitive tasks or to perform batch operations from the user interface, without the need for programming. Extend the capabilities in Origin by installing free Apps available from our website. Connect with other applications such as MATLAB™, LabVIEW™ or Microsoft® Excel, or create custom routines within Origin using our scripting and C languages, embedded Python, or the R console. [1]

Origin is only available for Window users. Mac and Linux users may consider alternatives like **SciDAVis** and **MATLAB**, but **you should always mind the significance level of confident intervals (usually 95%)**.

Installation

For limited time (6 months), OriginLab is currently giving away a special **OriginPro Learning Edition** for students. You can apply it with **valid SJTU university email address** at <https://www.originlab.com/OriginProLearning.aspx>.

You will receive an “OriginPro Learning Edition instruction” email which attaches full instructions. You may just follow it. Note that once the language is set, it cannot be changed. We strongly recommend you to use **English** since it is JI's official language.



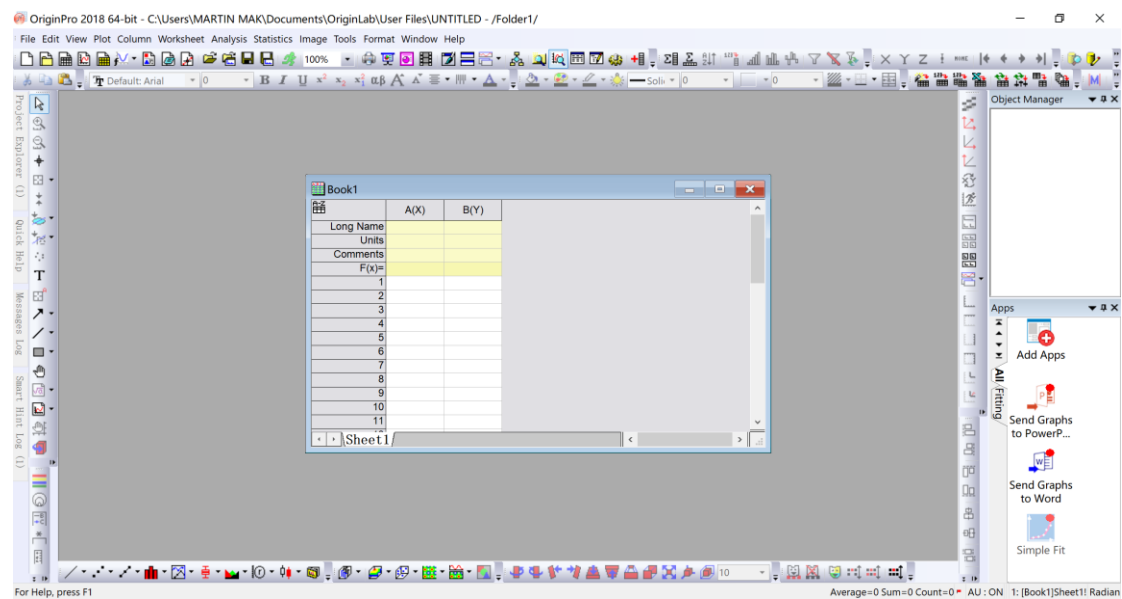
Linear Fit

Data Input

A full set of data for plotting consists of **X**, **Y**, **X error** and **Y error**. It can be input into the data book interface which is similar to Excel.

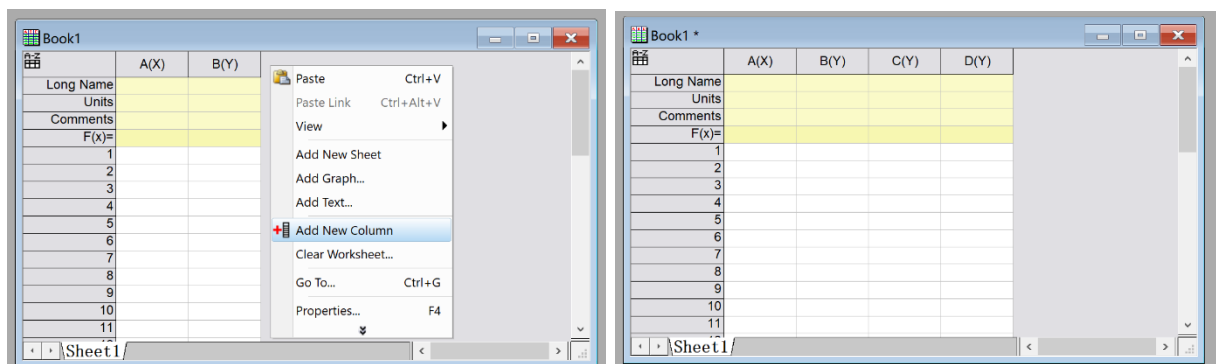
- Open the software

The interface should be an empty data book.



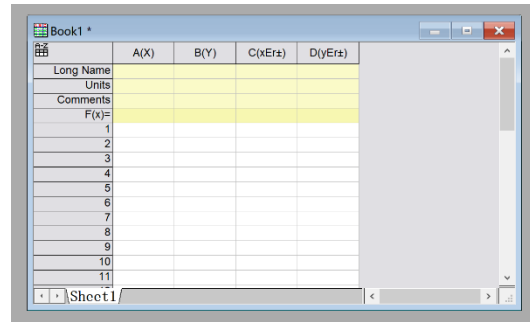
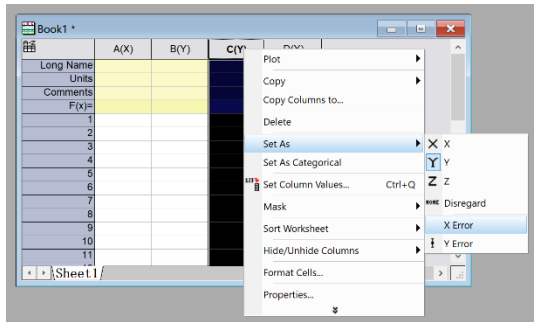
- Add columns

Right Click on the data book and choose 'Add New Column'.



- Define the columns

Select the column and Right Click on it. Choose 'Set As'. Set the new columns as 'X Error' and 'Y Error'.



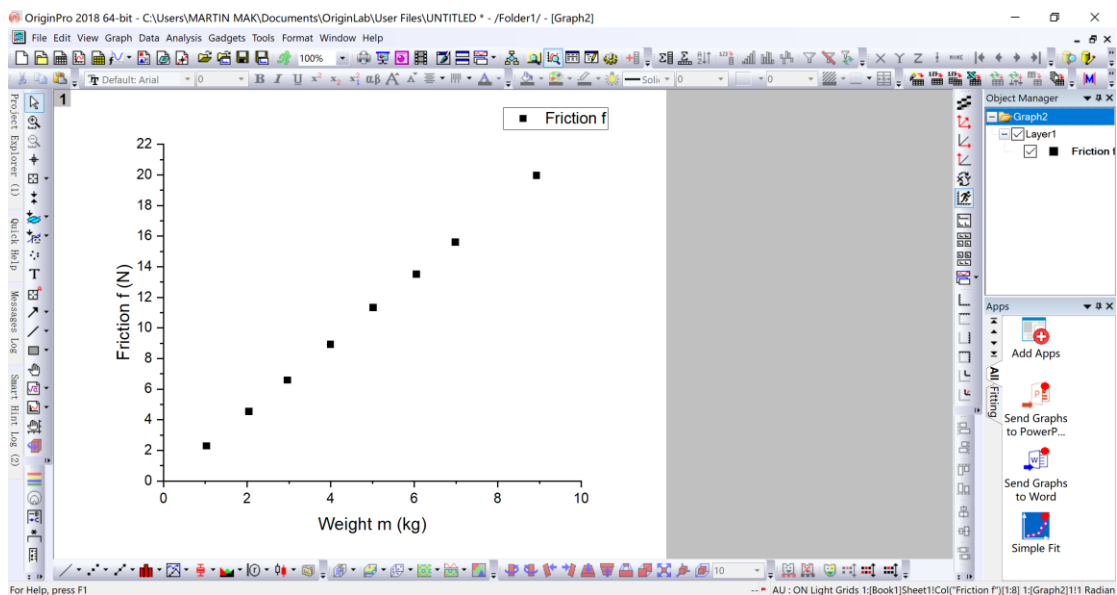
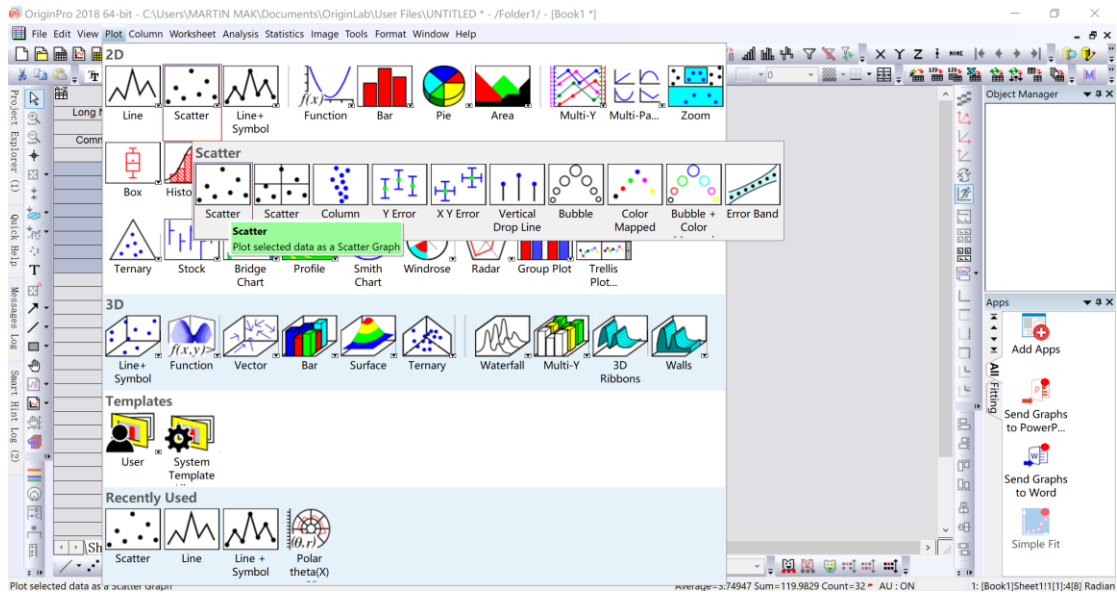
- Input the data
Input the data into corresponding cells.

	A(X)	B(Y)	C(xEr±)	D(yEr±)
Long Name	Weight m	Friction f		
Units	kg	N		
Comments				
F(x)=				
1	1.02	2.3012	0.01	0.0017
2	2.04	4.557	0.01	0.002
3	2.96	6.612	0.01	0.003
4	3.99	8.941	0.01	0.004
5	5.01	11.344	0.01	0.005
6	6.05	13.534	0.01	0.005
7	6.98	15.631	0.01	0.005
8	8.92	19.981	0.01	0.006
9				
10				

- Plot the Scatter Graph
1. Select all the data to be displayed.

	A(X)	B(Y)	C(xEr±)	D(yEr±)
Long Name	Weight m	Friction f		
Units	kg	N		
Comments				
F(x)=				
1	1.02	2.3012	0.01	0.0017
2	2.04	4.557	0.01	0.002
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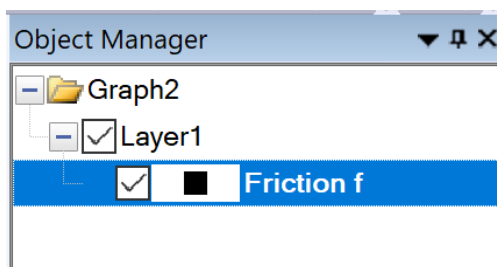
- On the menu, choose 'Plot'. In the first row '2D', choose the second block 'Scatter', and finally choose the **first** display style. A graph window would pop up.
Notes: To switch back to data book, press **Alt+1** to wake up the project explorer.



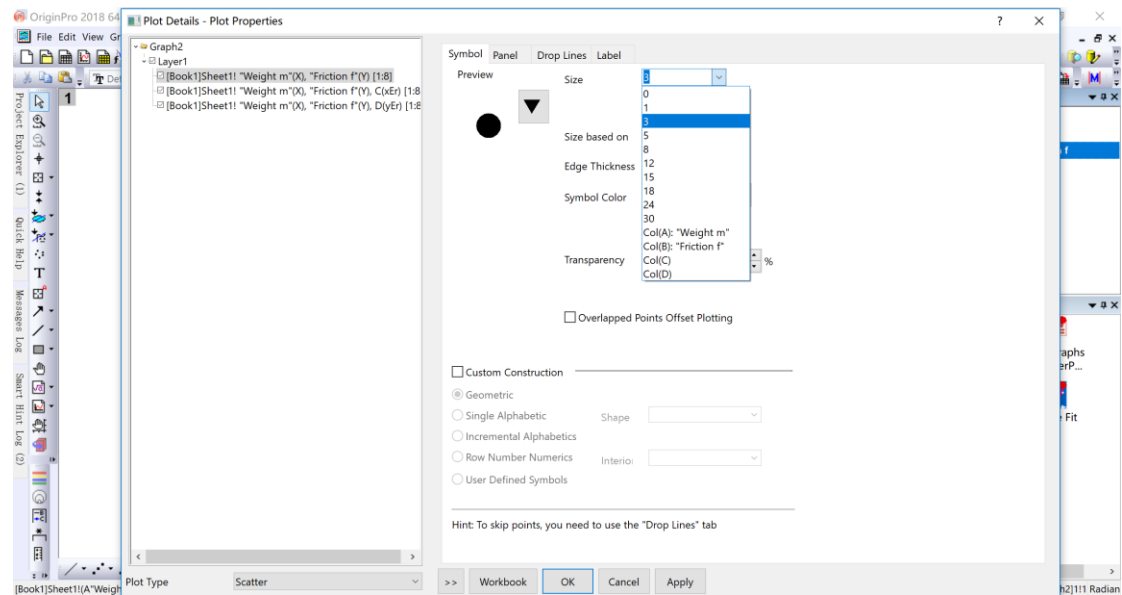
- Adjust the plot

We noticed that the size of data points is too large, which covers the error bars. Hence, we need to scale the plot for clarity.

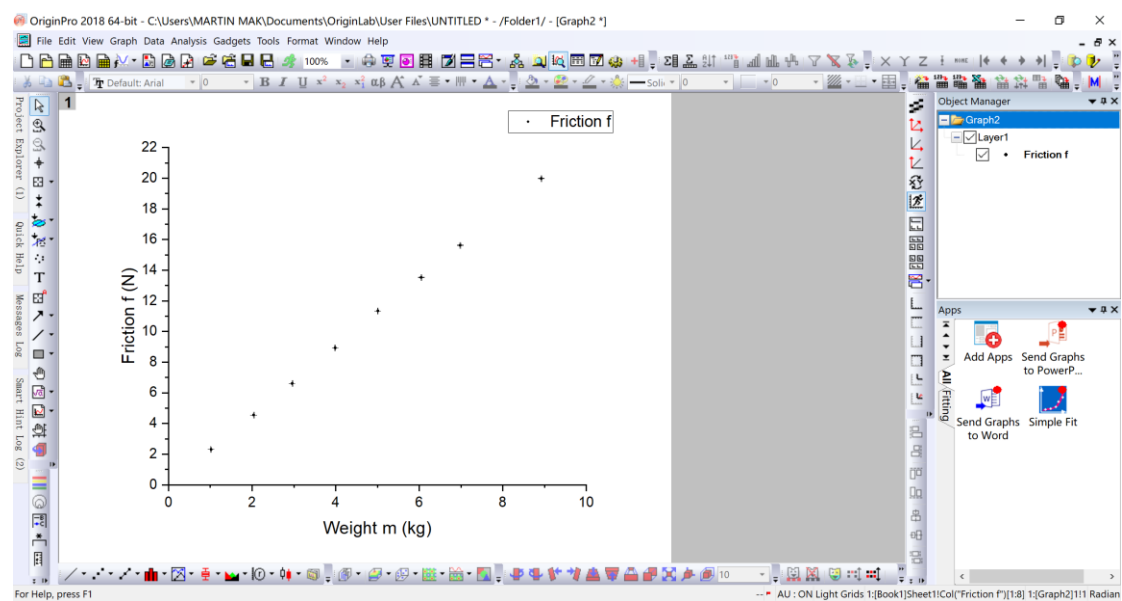
1. Double click on the data symbol in **Object manager** (On the right of your screen) to wake up **Plot Property** Window. You can also double click the data dots for the same effect.



- Set the size of the symbol. Usually **size 3** is an appropriate size. Press OK after settings.

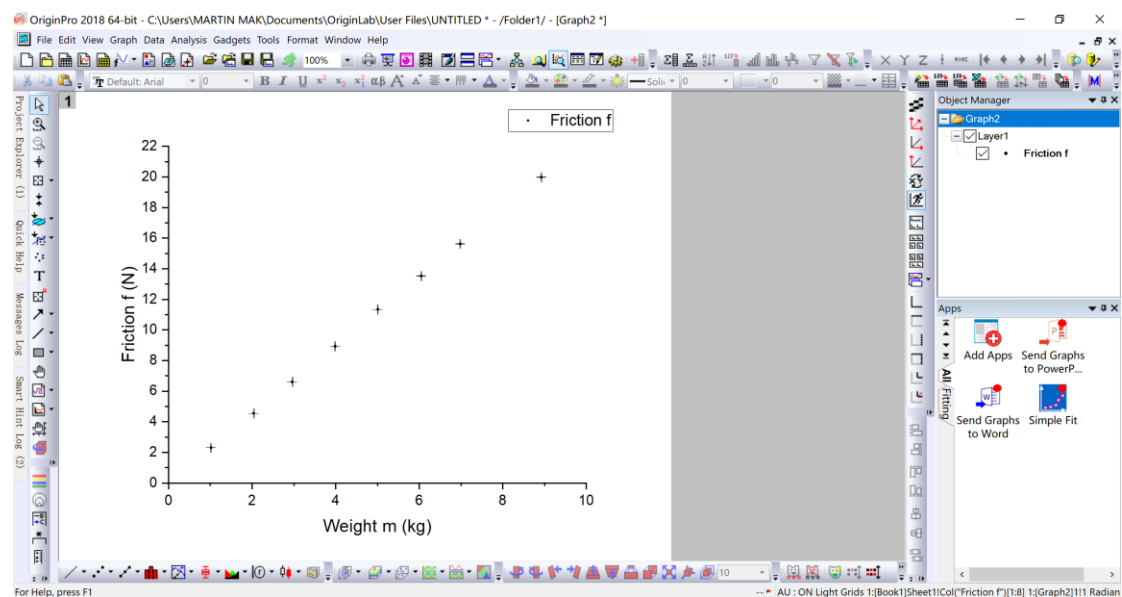
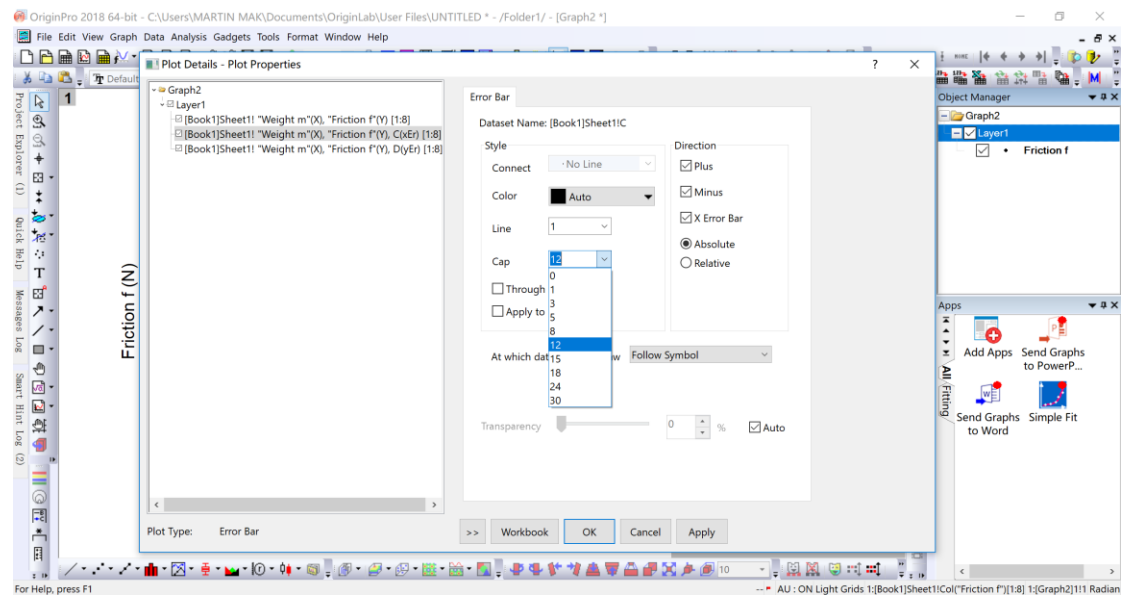


Now we see that the error bars are observable.



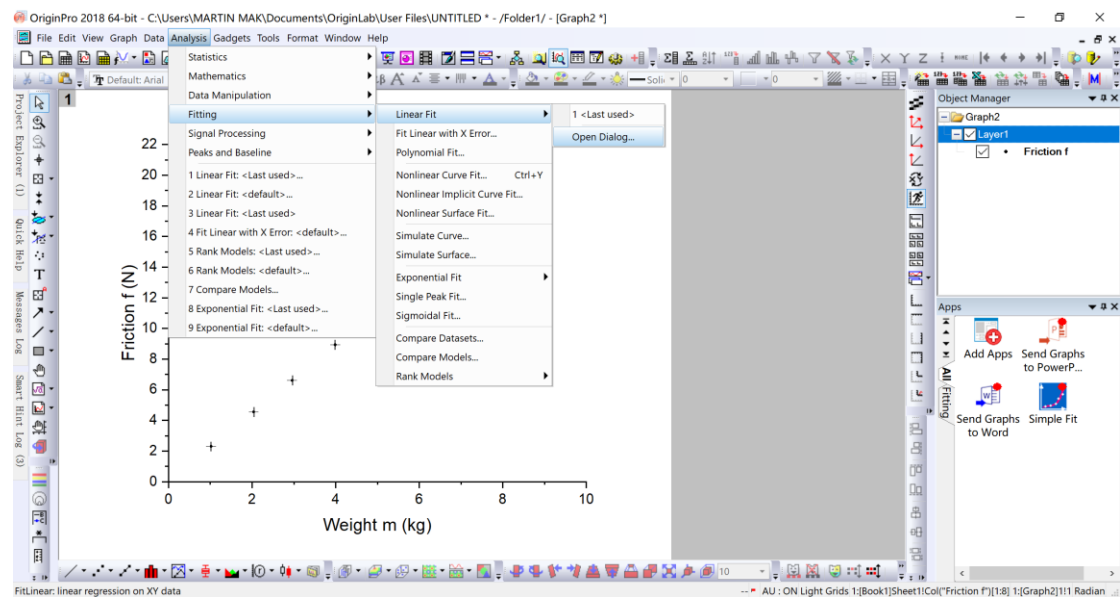
- If the Error bar is too small to observe, you can double click on the corresponding **Layers** in **Object manager** (On the right of your screen) to wake up **Plot Property** Window.

You can adjust the **cap size** and even the **line width** of error bars.



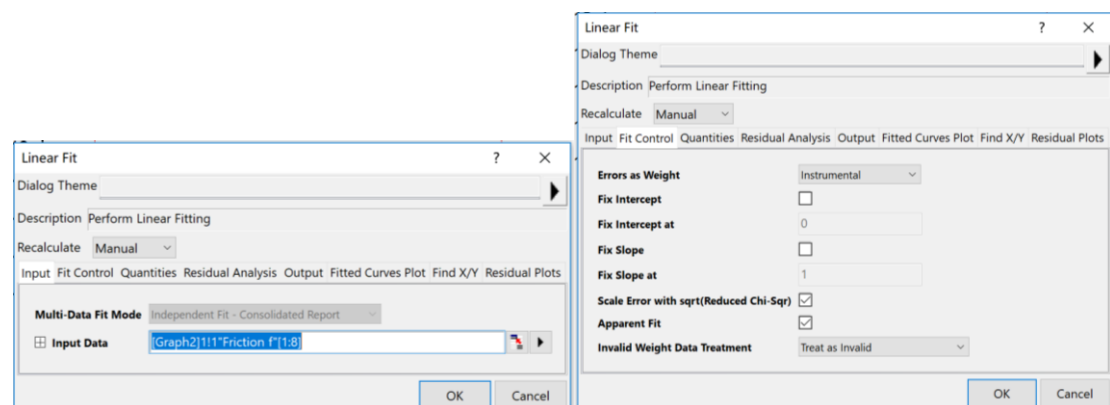
Linear Fit in Cartesian Coordinate

- To perform linear fit, choose '**Analysis**' in the menu, and find '**Fitting**' – '**Linear Fit**' – '**Open Dialog...**'

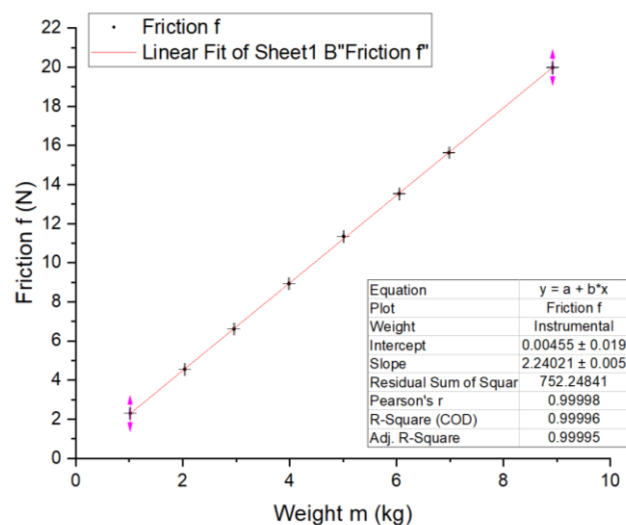


- Set the fitting parameters.

Generally, the default settings are what we want (Least Square Method). Just make sure we include all the data that should be involved in the fit and **do not set intercept zero** unless otherwise specified.



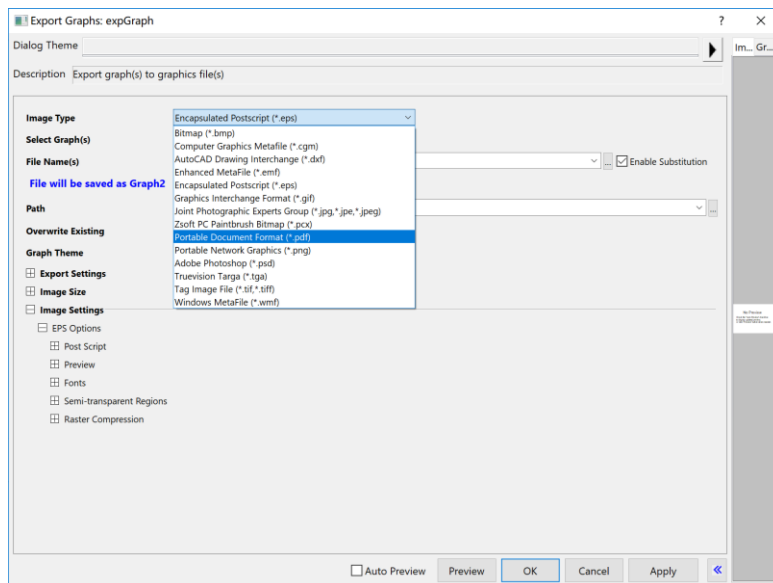
- Adjust the plot. Adjust the plot if necessary.



- Export the graph.

Click 'File' in the menu and choose 'Export Graphs' – 'Open Dialog...'.


Set the output **file type** and **path** in the window. We recommend you to output the image in **PDF**.



References

[1] OriginLab (2016). Origin and OriginPro Introductions. Retrieved from <https://www.originlab.com/index.aspx?go=Products/Origin>