Fitting data with Excel

These instructions apply to Excel and, with minor modifications, to OpenOffice or LibreOffice.

1. Generate a delimited text file from LabVIEW, a text editor, or directly in a spreadsheet application) with the x values (time) in the first column and the y values (temperature) in the second column. You can also include the uncertainties in the y values in the third column but Excel won't use them for anything. The default tab delimiter in LabVIEW is a reasonable choice but a comma delimiter will also work.

   If you save your file with a ".csv" extension, Excel will load it while assuming that it is comma-delimited. If you used the tab delimiter, the load will fail. It is possible to import a tab-delimited file, but you may have to select "tab" explicitly as the delimiter in the import screen.
2. After starting Excel open a new spreadsheet (if one is not already open). Click on `Data` (top menu list), then select `From Text`. Select the file you wish to load (delimited values and either tab or comma delimited.
3. Select the desired columns of data for the x and y axes, select `Insert` from the top menu, and `Scatter Plot` with straight lines and markers.
4. You should have your expected x values (time) along the x-axis and the expected y values (voltage) along the y-axis. If the choice of data is incorrect, you can right-click on the graph and select `Select Data` to change the selections.
5. Click on the graph, then select the "+" to the right of the graph (`Chart Elements`). Select `Axis Titles` to display the default titles. You can assign appropriate titles to each axis by clicking on the default title and editing it. An example would be "Temperature (K)" – the title should include both the descriptive name of what the numbers on that axis represent as well as the units for those numbers. You should also remove the `Legend` if it is checked.
6. Right-click on each axis, select `Format Axis` and set the axis limits to remove extra white space in the graph if necessary.
7. Either select `Trendline` from the `Chart Elements` or right-click on the data in the chart and select `Add Trendline`. Choose the desired regression type (for example, `Linear` for a diode calibration). Also, click on the entries `Display Equation on chart` and `Display R-squared value on chart` at the bottom of the menu. Note that there is no option to get uncertainties in the fitting parameters. *If you are generating a plot for inclusion in a document, it is best not to have the equation displayed on the chart and provide that information in either the figure caption or in the body of the document.*
8. The trendline equations usually gives you fixed point numbers with four digits after the decimal. This is not always adequate. It is usually better to right click

on the equation display, select `Format trendline label`, select `Scientific` (under the `Number` tab) and set `Decimal places` to at least 3 or 4 depending on the desired accuracy.

9. You will probably need to drag the trendline equation display to a convenient location on the plot.
10. Do NOT (usually) put a title on the chart if you are going to include it in a paper – the information commonly found in the title should be in the (usually required) caption for the figure. If you are generating a graph to put in your lab notebook, a title would be appropriate as a way to label the graph.
11. Once you have the chart you can use copy and paste to get it into a document or to put it where you can print it for your notebook. You can also get a reasonably formatted file by copying the graph to a separate sheet and either printing that sheet using the "Adobe PDF" (for a pdf file) or "Metafile to EPS Converter" (for encapsulated postscript) printer drivers. You can also directly export the graph to a pdf file by selecting `File` ⇒ `Export` ⇒ `Create PDF/XPS`.

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