

GetPlotData HowTo

This is a brief how-to for working with the GetPlotData software (<https://www.jahm.com/>). Most of the controls will show a tip if you hold your mouse over them.

Step 1: Start the program. (Figure 1.)

Step 2: Import a plot image (Figure 2)

- a) The image of the plot can be pasted from the clipboard using the paste icon on the toolbar (2nd icon). Windows version only.
- b) The image can also be read in from a file using the “File->Open image file” menu item.
- c) The larger your plot image the more accurate the values will be.
- d) There are 2 smaller images to the right of the main image. These show the region under the cursor at a zoomed in level of detail. These can help when selecting points. The upper image shows the region without any selected point to reduce the clutter, the lower shows the region with any selected points.
- e) There is a 3rd small image that shows the scan direction for the “auto find” option. You can change the scan direction using the radio buttons or by clicking on the image. This image can also be hidden under the “Options” menu.

Step 3: Define colors and the x and y axes. (Figure 3) This program works by scanning the image looking for matching colors.

- a) Set the colors of the plot background (gray in this example) and of the curve (red)
 - a. Check the “Curve” box then click on a point on the curve in the image to define this color.
 - b. These points can be defined in any order and can be changed at any time.
- b) Define the min/max values of the axes.
 - a. Click on a point corresponding to the minimum of the x and y axis. It will be shown by a green cross once selected.
 - b. Click on a point corresponding to the maximum of the x axis. It will be shown by a green cross once selected. You can hold down the ALT key while moving the mouse to constrain the cursor in the y direction.
 - c. Click on a point corresponding to the maximum of the y axis. It will be shown by a green cross once selected. You can hold down the ALT key while moving the mouse to constrain the cursor in the x direction.
 - d. When you are moving the cursor across the plot to define these points the angle of the axis line you are defining is displayed to help in your selection.
 - e. An indicator showing which point you are defining is given in the “Point Type” box.

- f. If you made an incorrect selection, click the “Reset All” button to begin at step a.
- g. Enter the “real values” of the min/max x and y axes.
- h. Select whether the axis is linear or logarithmic.

Step 4: Pick your data points off the plot. (Figure 4)

- a) There are 5 ways to select points, they can be used alone, or you can switch back-and-forth between these methods to get all of the data.
 - a. Auto-find. This is fastest and easiest...when it works. You click on a point next to the curve at the lowest value in x on your plot and then on a point next to the curve at the highest value in x. Then click the “Auto-find” button. The program will then scan and try to find the curve then move slightly and search again. You pick your starting and ending points based on your scan direction. For example, if you are scanning up, pick points just below the curve. This is the method shown in figure 4.
 - b. Semi-manual. You click at various x values and the program finds the curve. In this method you just start clicking next to the curve, the program scans until it finds a color match then enter the point in the table. If a match is found the color of the “Selection” box turns green indicating success.
 - c. Fully manual. The value from wherever you click is entered the table. This can be helpful if you have a faded plot, or several curves overlap where you want to read a point. Uncheck the “Accept green points” option to enable this.
 - d. Mouse-mode. While holding down the ‘shift’ key you can move the mouse across the image and points will be defined by the mouse path. If “Auto-find” is checked the program will scan to try and find the line. If “Auto-find” is not checked the path of the mouse will be used.
 - e. Pro-mode. This is the same as “Auto-find” except it automatically copies the data to the clipboard.
 - f. If after you have selected some or all of your points you notice that you defined the min/max real values of x or y wrong, or selected linear/log incorrectly, you can correct them and just press the “Recal data” button and the values in the table will be updated. You do not have to re-pick your points.

Other options.

- a) Point Search
 - a. “Point search->Search length”. The program will look within this number of pixels for the lower and upper surface of the curve. Try the different settings to see what works best for your plot. 30 is a good starting value.
 - b. “Point search->Direction”. This sets the direction the program will scan when looking for the line. You can change this at any time. For example, it “Up” is selected then you should click just below the curve and the program will scan up to find the line. For steep curves “left” or “right” work better than “up” or “down”. You can also pick the scan direction by clicking on the image with the large arrow.

- c. "Point search-># Auto-find pts". The number of auto-find points to find. This number is only an approximate value since sometimes the auto-find will not find a point and will skip ahead.
 - d. You can reorder the points from low to high or high to low by clicking the "Order Points" button. Each time you click it the order will be inverted. This is not necessary for the curve fitting but only provided as a convenience.
 - e. If you click on a point in the table, it will be highlighted on the plot in the "Plot Image" tab. You can then right click on the table and delete it if you want to remove it from the table and the curve fitting calculation. (Figure 5)
- b) Colors
- a. "Search color->Difference". This is the maximum color difference between your "Curve" color and the point the program will accept. "L" is low and the colors must be very close, "H" is high and the colors can be farther apart. Try the different settings to see what works best for your plot.
- c) General
- a. When picking your points, you generally use the mouse. However, for very fine positioning you can also use the arrow keys to move the cursor 1 pixel at a time and use the Enter key to accept a point.
 - b. You can rotate the image if needed. The green arrows rotate the image by 90 degrees. The blue arrows rotate the image in very small increments. Any rotation will reset the axis definitions. If the first axis point is defined, the image will be rotated about that point. If it is not defined the image is rotated about the lower left corner. It is usually best to define the first axis point then do the rotation.
 - c. When defining the axis, you can select to "constrain" and/or "extend" the cursor. It is usually good to check both options, so guidelines are displayed. These lines also help to decide if you need to rotate the image.

Step 5: Curve Fitting (Figure 6)

- a) Change to the "Curve Fitting" tab.
- b) You can change the order of the fit using the arrow buttons.
- c) You can change the curve fit type: linear-linear, linear(x)-ln(y), ln(x)-linear(y), ln(x)-ln(y).
- d) The fitted equation is displayed in Excel format and the coefficients are listed (in high->low and low->high) order in the table.
- e) You can change the Excel cell used for the x variable and the number of decimals in the terms.
- f) Figure 7 and Table I show a comparison of the real and fitted data. Figure 7 shows the plot used in this "howto" along with the actual equation plotted. The coefficients in Figure 6 were obtained by fitting the points picked-off this plot. While the coefficients are not exactly the same, a comparison of the actual and calculated values shown in Table I are in good agreement.
- g) You can use the image data as your "Data source" or paste your data into the left table in the "Xy Values" tab.

Fitting Larson-Miller Type Data

Step 1: Enter your data

- a) Change to the “Larson-Miller Data” tab and paste your data into the table (Figure 8).
- b) Change to the “Curve Fitting” tab, select “LMP” as the “Curve fit type” (Figure 9).
- c) The software will color code the data points by their temperatures. It has up to 14 different colors, if there are more than 14 different temperatures, they extra will be colored black.
- d) You can enter the “C” value directly or place your mouse in the textbox and use the mouse wheel to increment it by 0.5. Hold the shift key while scrolling to change the increment to 0.1 steps instead. Adjust the “C” value and the order of the fit using the large black arrows until you are satisfied (Figure 10).
- e) If you want to use the fitted equation directly in Excel, the stress is “exp(y)” where y is the value given by the equation and the “x” value is the LMP divided by 1000. So, for the example here:

$$\text{stress} = \exp(-3.644673377\text{E-}02 * A2^2 + 6.157148052\text{E-}01 * A2 + 4.358379301\text{E+}00)$$

where “A2” is the Excel cell with the LMP/1000 value.

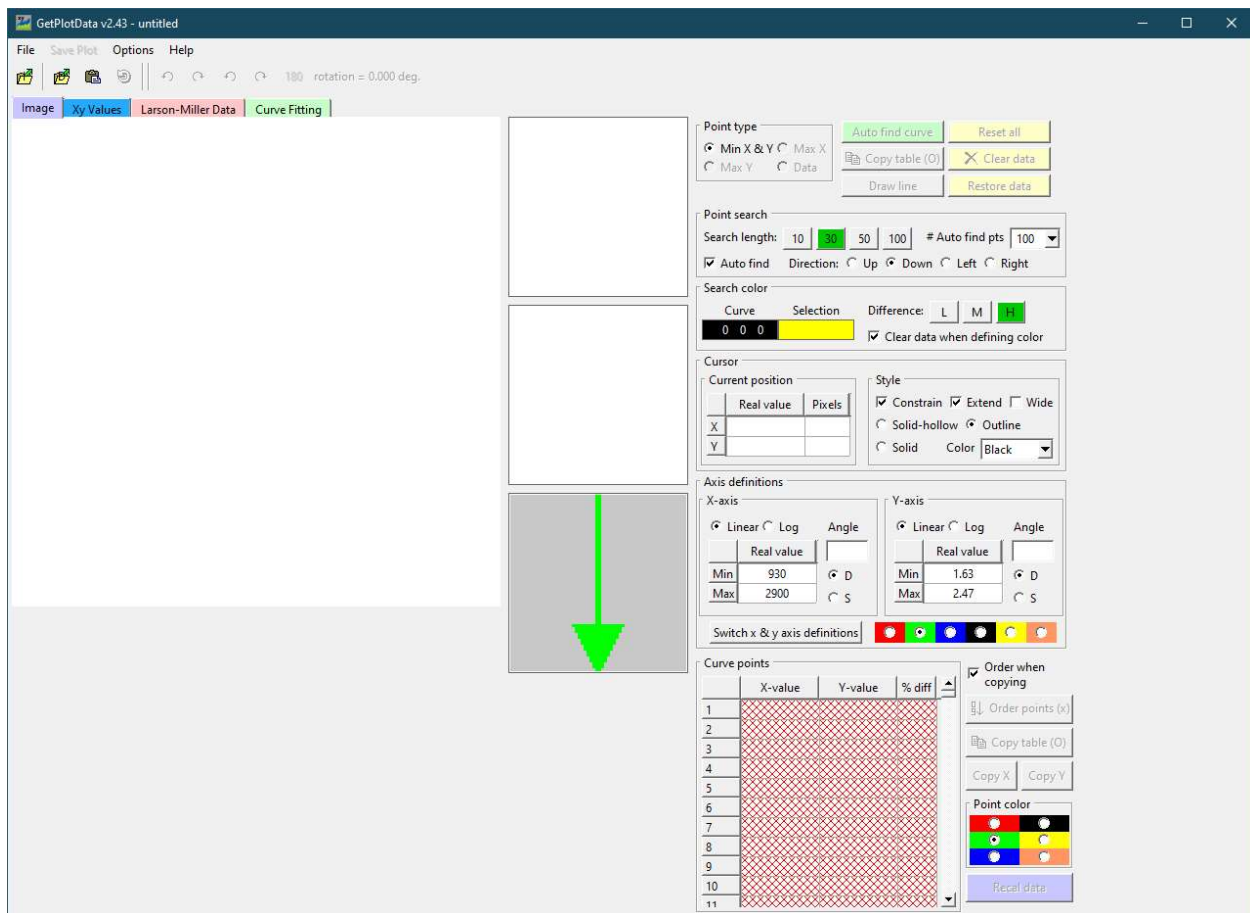


Figure 1. Startup screen.

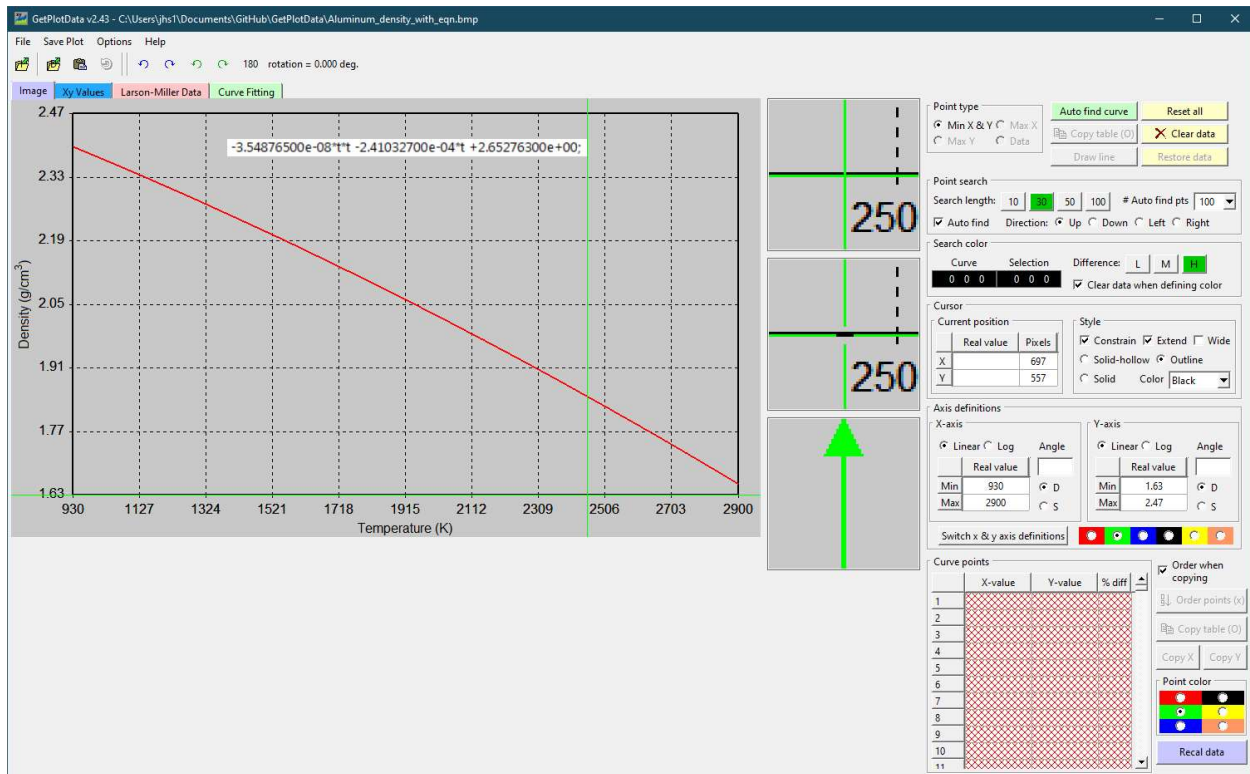


Figure 2. Main with plot.

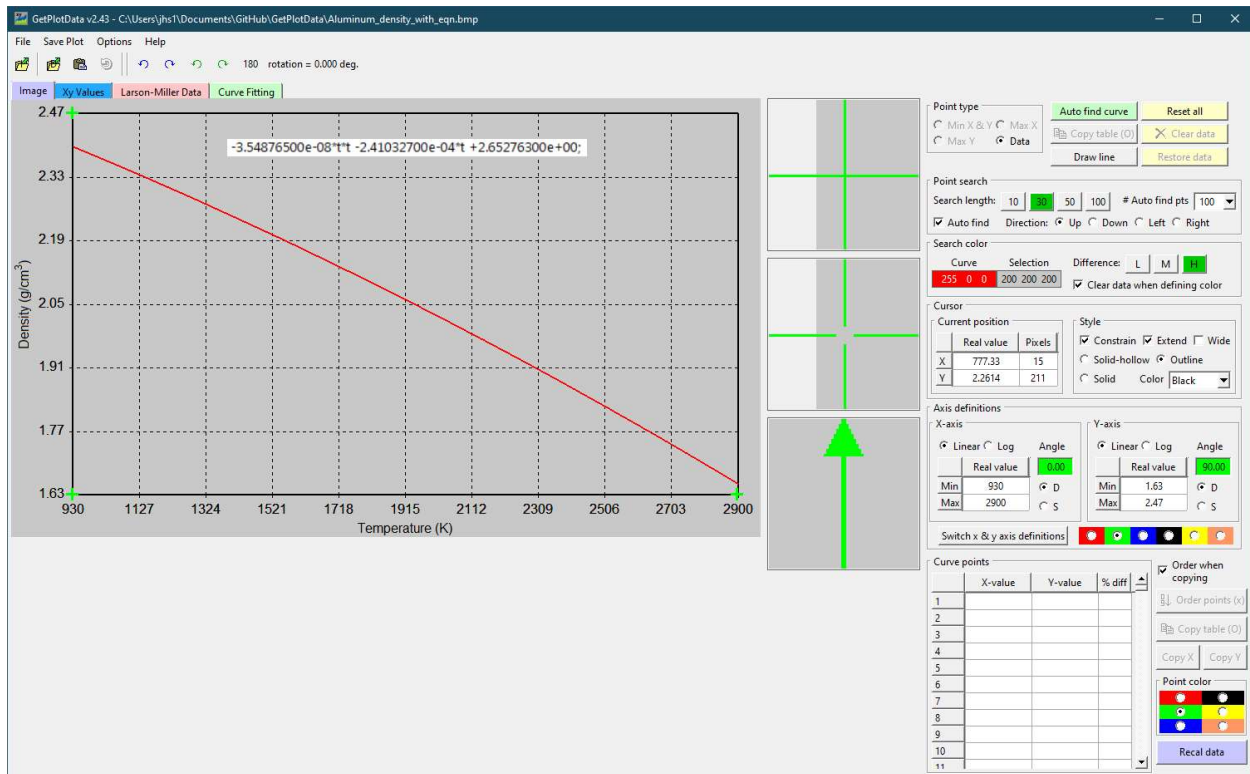


Figure 3. Define colors and axis.

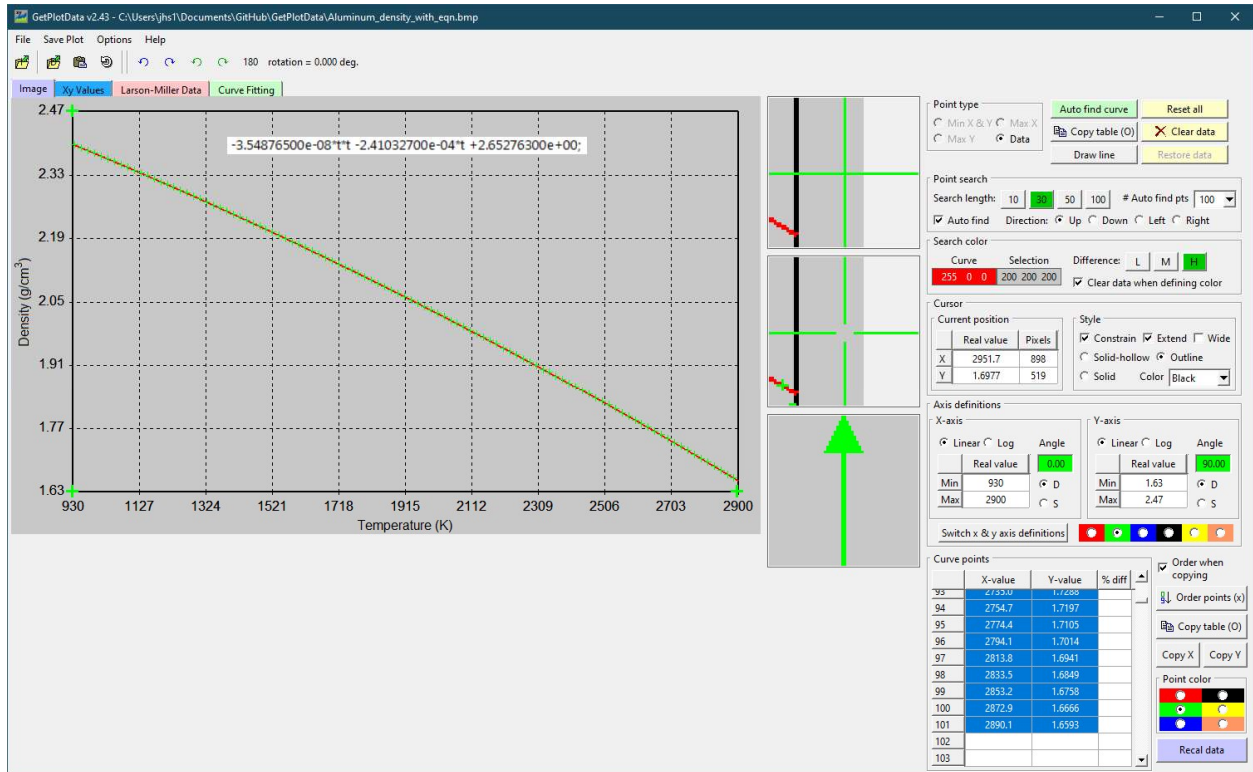


Figure 4. Auto find data points.

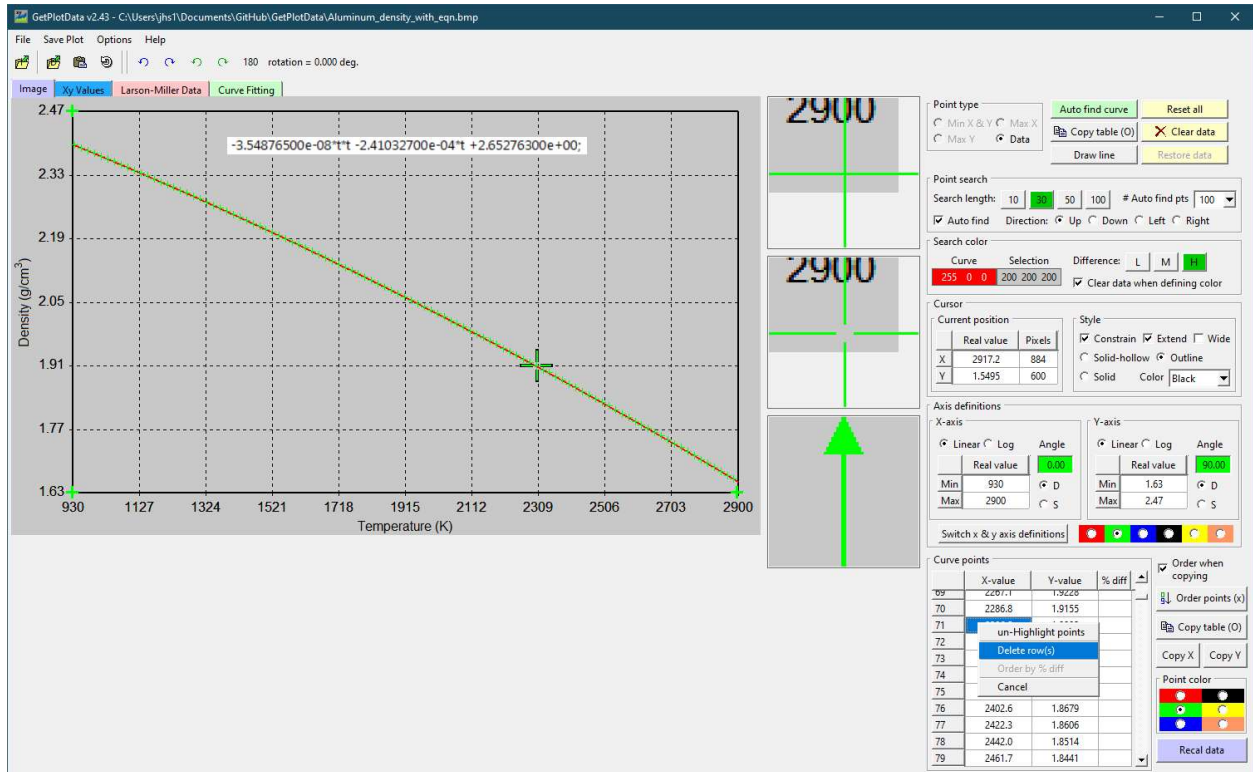


Figure 5. Highlight and delete a point.

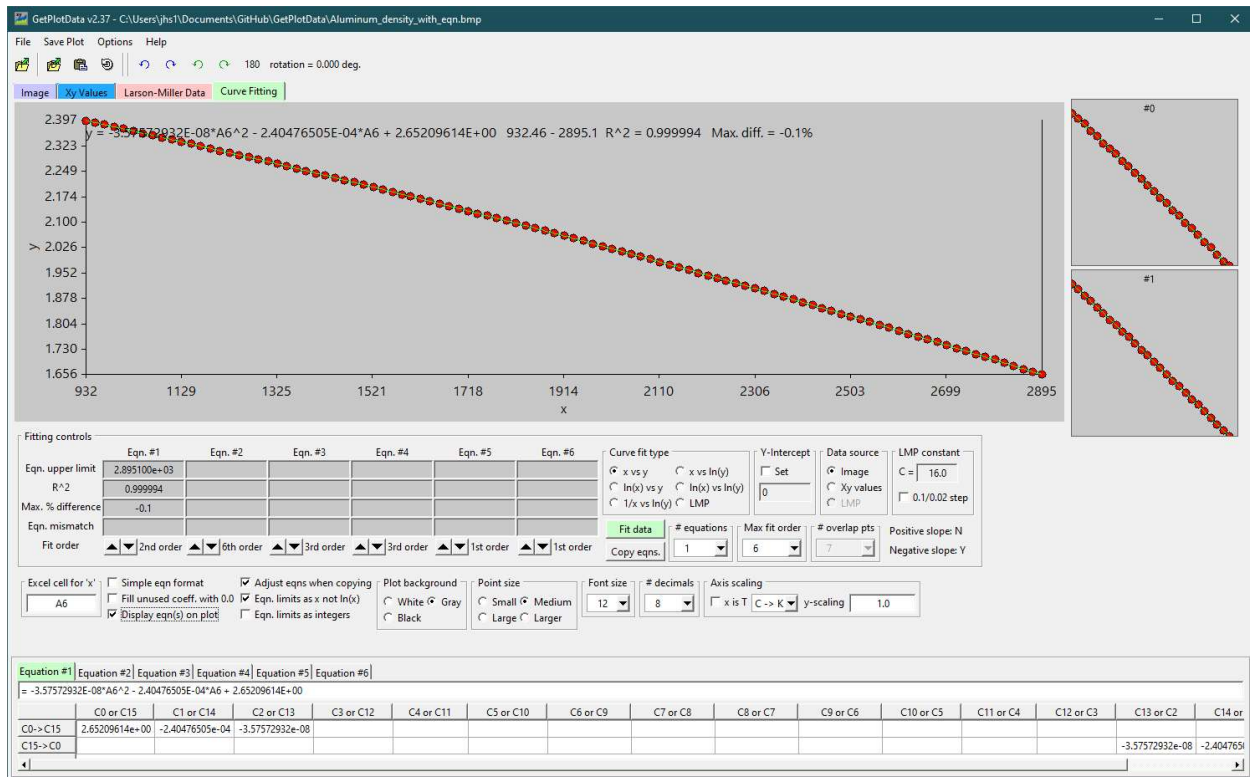


Figure 6. Curve fit.

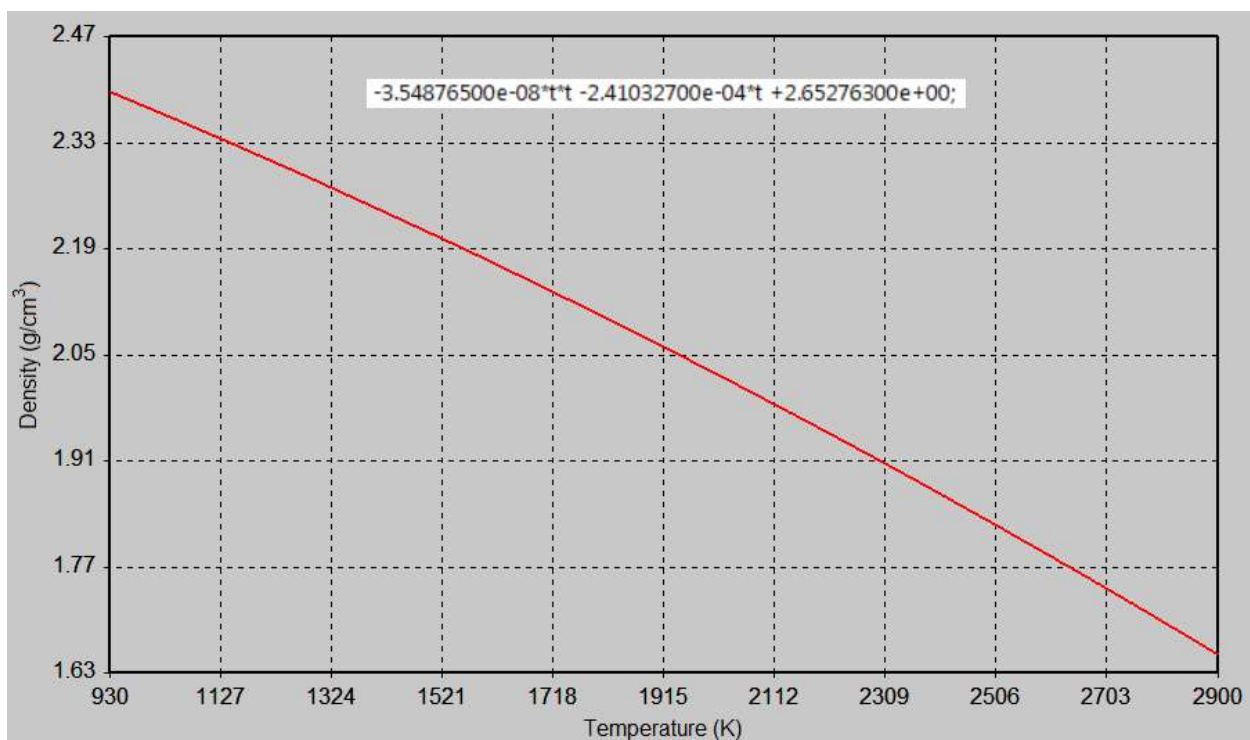


Figure 7. Actual equation plotted.

Table I. Comparison of “real” data (from the equation displayed on the plot image) and values from the curve fit from this program.

T, K	Real	Fit	% diff
933	2.396988	2.396605	0.02%
1133	2.334118	2.333735	0.02%
1333	2.268409	2.268004	0.02%
1533	2.199861	2.199413	0.02%
1733	2.128474	2.127961	0.02%
1933	2.054248	2.053648	0.03%
2133	1.977182	1.976475	0.04%
2333	1.897278	1.896441	0.04%
2533	1.814535	1.813547	0.05%
2733	1.728953	1.727792	0.07%
2900	1.655317	1.653995	0.08%

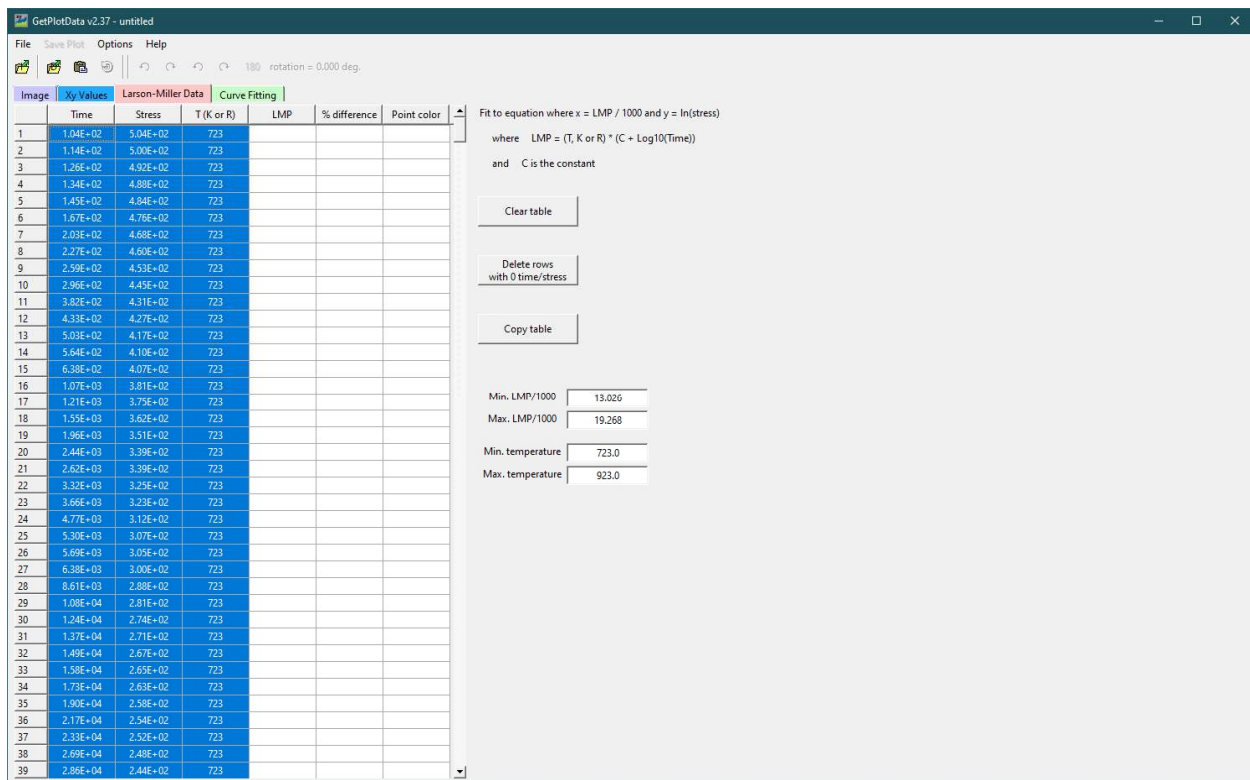


Figure 8 Enter data for the Larson-Miller fit.

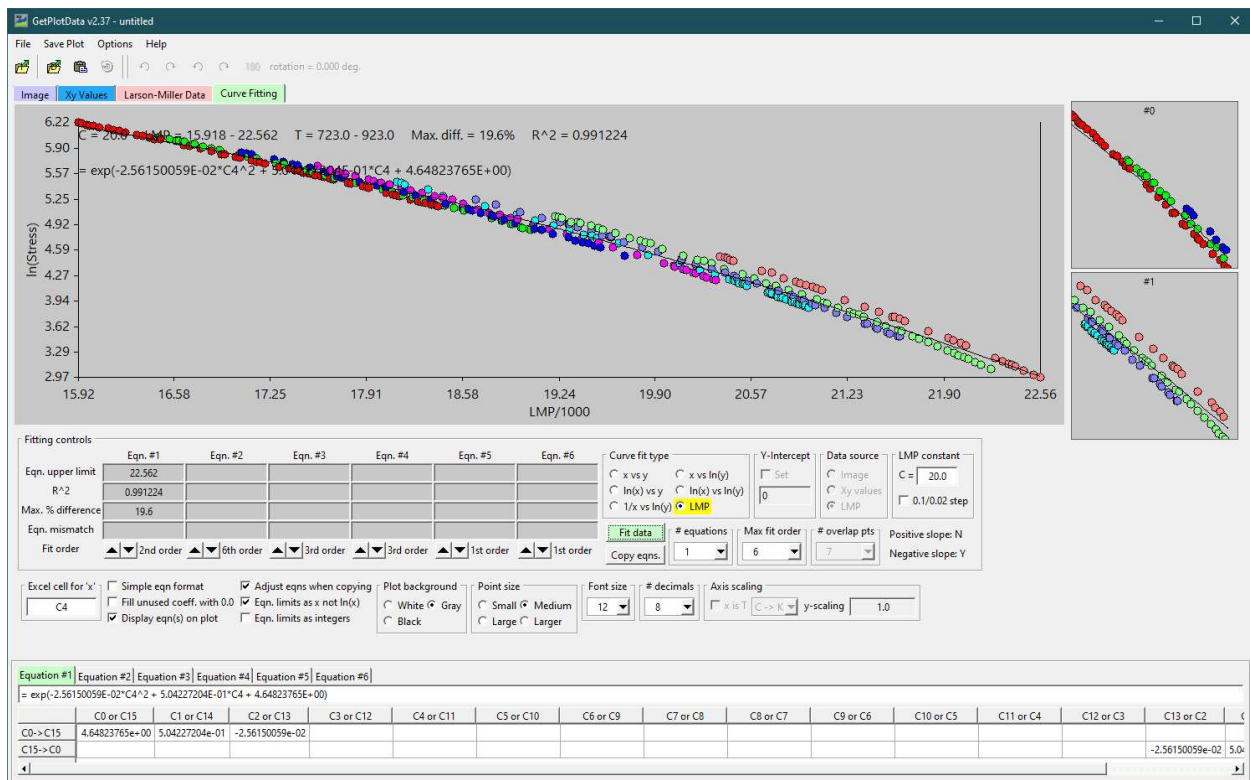


Figure 9. Larson-Miller curve fit.

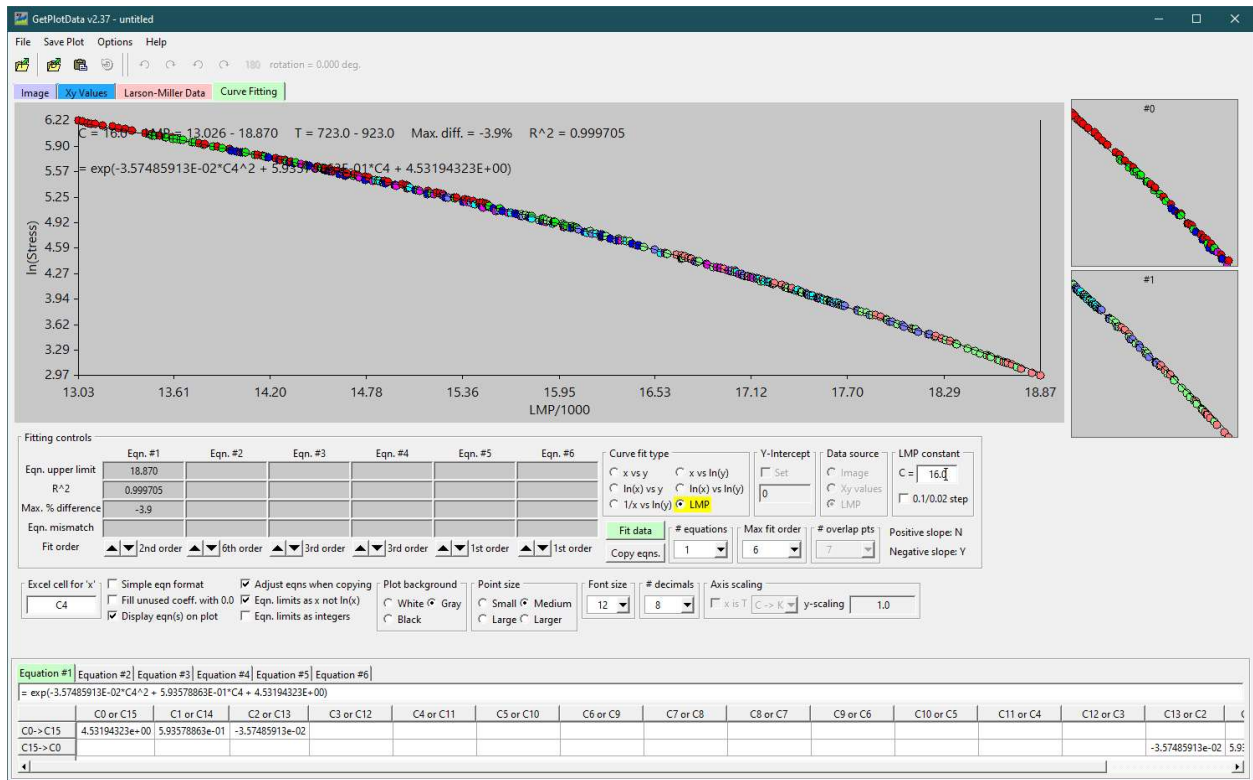


Figure 10. Larson-Miller curve fit adjusted.