

# *The Linear Analysis Panel:*

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This panel contains the tools with which you can fit a line to your data. It works with the Active Data Set.

If the Active Data Set has not been fit then this panel will be disabled except for the *Show Fit Line* button which fits a line to the Data Set. When you fit a Data Set a line is placed into that Data Set's Plot (see below) if you do not like this fit then you may wish to tweak it. You can do this by dragging one of the knobs on the Fit Line or dragging the Fit Line itself which causes only the Y-intercept to change. When this is done the ***Fit is Tweaked*** text is displayed as shown above and the appropriate values are recalculated and redisplayed. To get your original fit back simply click *Show Fit Line* again.

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To fit the Data Set using a different minimization method for the sum of the squares click on one of the X Squares, Y Squares, or Perpendicular items and refit the data with *Show Fit Line*.

You can Plot the residuals of the Data Set's Fit Line (the difference between the y value in the Fit Line and the data) by clicking on the *Plot Residuals* button. The residuals will be placed into the Active Plot if there is one and it belongs to the Document that the Active Data Set belongs to - otherwise a new Plot is created for the Document and the residuals are shown in it.

## Building an Inverse:

If you note the equation displayed in the section of the Linear Analysis panel below you might get the idea that you would like to look at your original data plotted against the solution for the shown equation. If our original X had been the Column *time* and our original Y had been the Column *mass* and what we really fit was  $\exp(\text{mass} * a)$  vs. *time* (*a* here is a variable we threw in), we might like to see just what *mass* vs. *time* plotted along with this equation solved for *mass*,  $\ln(1(X) + 111.804501) / a$ , (we substitute X for time and let you range the X values using the controls shown below) looks like. To do this set the X range like you want (it should have good default values regardless), select a variable to solve for, and click *Show Inverse*. The inverse fit will be placed into the Active Plot if there is one and it belongs to the Document that the Active Data Set belongs to - otherwise a new Plot is created for the Document and the inverse fit is shown in it. Now it is up to you to place your *time* and *mass* data into the new Plot using the Data Set Inspector so you can see what the fit to the original data looks like. Data Sets remember where their inverse fit is and reuse it if you do another inverse fit on the same Data Set.

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