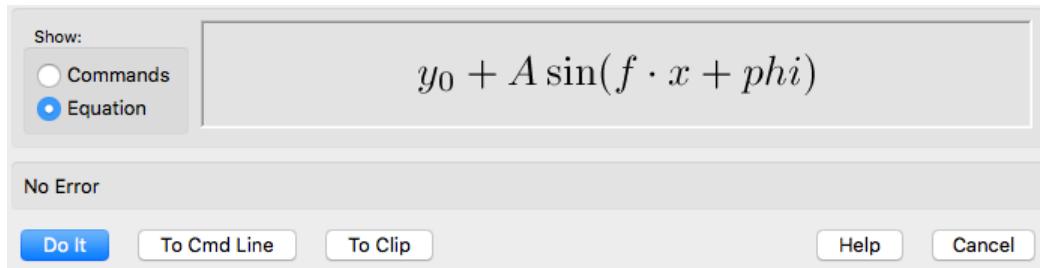


Chapter III-8 — Curve Fitting

Global Controls

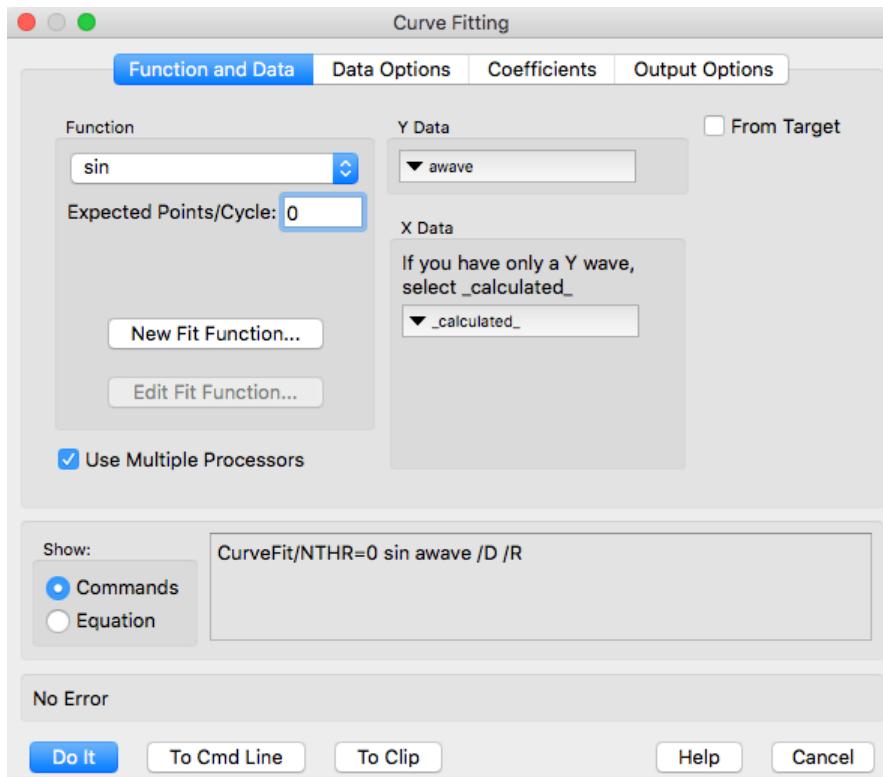
The controls at the bottom of the dialog are always available:



If you click the Commands radio button, Igor displays the commands generated by the dialog instead of the equation.

Function and Data Tab

The Function and Data tab has a variety of appearances depending on the function chosen in the Function menu. Here is what it looks like when the built-in sin function is chosen:



Function menu: The main purpose is to choose a function to fit.

The menu also has two items that control what functions are displayed in the menu.

Choose Show Multivariate functions to include functions of more than one independent variable.

Choose Show Old-Style Functions to display functions that lack the FitFunc keyword. See **User-Defined Fitting Functions** on page III-250 for details on the FitFunc keyword. You may need to choose this item if you have fitting functions from a version of Igor Pro older than version 4.

Some of the fit functions require additional information that is collected by customized items that appear when you select the function.

Polynomial Terms: Appears when you choose the poly function to fit a polynomial. Note that the number of terms is one greater than the degree — set this to three for a quadratic polynomial.

Set Constant X0: Appears when you select the exp_XOffset , dblexp_XOffset or poly_XOffset function. X0 is a constant subtracted from the X values to move the X range for fitting closer to zero. This eliminates numerical problems that arise when evaluating exponentials over X ranges even moderately far from zero. Setting X0 to Auto causes it to be set to the minimum X value in your input data. Setting to a number overrides this default behavior.

Expected Points/Cycle: Appears when you choose the sin function. Use it to set the approximate number of data points in one cycle of the sin function. Helps the automatic initial guess come up with good guesses. If it is set to less than four, Igor will use the default of seven.

2D Polynomial Order: Appears when you choose the Poly2D function to fit a two-dimensional polynomial (a multivariate function — only appears in the menu when you have chosen Show Multivariate Functions). Sets the *order* of the polynomial, not the number of terms. Because a given order includes a term for X and a term for Y plus cross terms, the number of terms is $(N+1)(N+2)/2$ where N is the order.

New Fit Function: Click this button to bring up a dialog in which you can define your own fitting function.

Edit Fit Function: This button is available when you have chosen a user-defined function from the Function menu. Brings up a dialog in which you can edit your user-defined function.

Y Data: Select a wave containing the dependent variable data to fit. When a multivariate function is chosen in the Function menu, the Y Data menu shows 1D waves and waves with dimensions matching the number of independent variables used by the function.

X Data: This area changes depending on the function and Y Data wave chosen.

With a **univariate function**, just the X data menu is shown. Choose *_calculated_* if you have just a Y wave; the X values will come from the Y wave's X scaling. The X Data menu shows only waves with the same number of points as the Y wave.

When a **multivariate function** and a **1D Y wave** are selected, it adds a list box below the X wave menu. You must select one X wave for each independent variable used by the fit function, or a single multicolumn wave with the correct number of columns. As you select X waves, they are added to the list. The order of waves in the list is important — it determines which is identified with each of the function's independent variables.

Remove waves from the list by highlighting a wave and pressing Delete (*Macintosh*) or Backspace (*Windows*).

With a **multivariate function** and a **multidimensional Y wave** selected, it displays four independent variable wave menus, one for each dimension that a wave can have. Each menu displays waves of length matching the corresponding dimension of the Y Data wave. Choose “*_calculated_*” if the independent variable values will come from the Y wave's dimension scaling.

From Target: When From Target is selected, the Y Data and X Data menus show only waves that are displayed in the top table or graph. Makes it easier to find waves in the menus when you are working on an experiment with many waves. When you click the From Target checkbox, it will attempt to select appropriate waves for the X and Y data.