User-Defined Fitting Function Formats

You can use three formats for user-defined fitting functions: the Basic format discussed above, the All-At-Once format, and Structure Fit Functions, which use a structure as the only input parameter. Additionally, Structure Fit Functions come in basic and all-at-once variants. Each of these formats address particular situations.

The basic format (see **Format of a Basic Fitting Function** on page III-251) was the original format. It returns just one model value at a time.

The all-at-once format (see **All-At-Once Fitting Functions** on page III-256) addresses problems in which the operations involved, such as convolution, integration, or FFT, naturally calculate all the model values at once. Because of reduced function-call overhead, it is somewhat faster than the basic format for large data sets.

The structure-based format (see **Structure Fit Functions** on page III-261) uses a structure as the only function parameter, allowing arbitrary information to be transmitted to the function during fitting. This makes it very flexible, but also makes it necessary that FuncFit be called from a user-defined function.

Basic Fit Function	All-At-Once Function	Structure Function
Can be selected, created, and edited within the Curve Fitting dialog.	Can be selected, but *not* created or edited, within the Curve Fitting dialog.	Cannot be used from the Curve Fitting dialog.
With appropriate comments, mnemonic coefficient names.	No mnemonic coefficient names.	Must be used with FuncFit called from a user-defined function.
Straight-forward programming: one X value, one return value.	Programming requires a good understanding of wave assignment; there are some issues that can be difficult to avoid.	Hardest to program: requires both an understanding of structures and writing a driver function that calls FuncFit.
Not an efficient way to write a fit function that uses convolution, integration, FFT, or any operation that uses all the data values in a single operation.	Most efficient for problems involving operations like convolution, integration, or FFT. Often much faster than the Basic format, even for problems that don't require it.	Very flexible: any arbitrary information can be transmitted to the fit function. More information about the fit progress transmitted via the structure.
See **Format of a Basic Fitting Function** on page III-251.	See **All-At-Once Fitting Functions** on page III-256.	See **Structure Fit Functions** on page III-261.

Format of a Basic Fitting Function

A basic user-defined fitting function has the following form:

```
Function F(w, x) : FitFunc
   WAVE w; Variable x

   <body of function>
   <return statement>
End
```

You can choose a more descriptive name for your function.

The function must have exactly two parameters in the univariate case shown above. The first parameter is the coefficients wave, conventionally called w. The second parameter is the independent variable, conventionally called x. If your function has this form, it will be recognized as a curve fitting function and will allow you to use it with the FuncFit operation.

The FitFunc keyword marks the function as being intended for curve fitting. Functions with the FitFunc keyword that have the correct format are included in the Function menu in the Curve Fitting dialog.