

Chapter III-8 — Curve Fitting

```
String/G root:myDataFolder:holdStr="1"
String myFunctions="{exp, expTerm1}"
myFunctions+="{exp, expTerm2, hold=root:myDataFolder:holdStr}"
myFunctions+="{exp, expTerm3, hold=root:myDataFolder:holdStr}"
FuncFit {string = myFunctions} expSumData/D
```

Fitting with Complex-Valued Functions

Prior to Igor Pro 9.00, to fit complex-valued functions to complex-valued data required writing a real-valued fit function that used a special organization of the data to pack real and imaginary parts into a single real-valued wave. Now Igor supports fitting to complex-valued fitting functions directly.

The basic requirement for fitting complex-valued functions is to write a fit function that returns a complex result. Igor supports the traditional format for a user-defined fit function (see **Format of a Basic Fitting Function** on page III-251) and all-at-once format (**All-At-Once Fitting Functions** on page III-256), but the return type of a basic fit function or the Y wave in an all-at-once fit function must be complex. Complex fitting functions are not supported by structure fit functions or by the sum-of-fit-functions format.

No Dialog Support for Complex Fitting

The Curve Fitting dialog does not allow you to select complex waves, or fit functions that return complex values. It may be possible to use a real-valued function and waves to set up a fit in the dialog, then click the To Cmd Line button to copy the generated command to the command line where you can edit the command. It's probably easier to read the reference documentation for the **FitFunc** operation and simply compose a command.

Complex Basic Fitting Function

The basic format for a complex-valued function looks like this:

```
Function/C F(Wave w, Variable xx) : FitFunc
  <body of function>
  <return statement>
End
```

The /C in "Function/C" tells Igor that the function returns a complex value. As shown above, the function takes a real-valued coefficient wave and a real-valued independent variable. If your particular function needs the coefficient wave and/or independent variable to be complex-valued, add /C to the parameter declaration:

```
Function/C F(Wave/C w, Variable/C xx) : FitFunc
  <body of function>
  <return statement>
End
```

We show here both the coefficient wave and the independent variable being complex; either one or both can be complex.

If you specify a complex independent variable, then you must supply a complex-valued X wave. Since Igor's wave scaling cannot be complex, if your fitting function requires a complex independent variable then you must have a separate X wave as input to the **FitFunc** operation.

Complex Basic Multivariate Fitting Function

As with normal real-valued fitting functions, you can write multivariate fitting functions that return complex values:

```
Function/C F(Wave w, Variable x1, Variable x2) : FitFunc
  <body of function>
  <return statement>
End
```