Error Shading

In Igor Pro 7 or later, you can use shading in place of error bars. In the Error Bars subdialog, check the "Use shading instead of bars" checkbox to enable shading.

Shading mode fills between either the +error to -error levels or from +error to data and data to -error depending on the parameters used with the shade keyword.

These commands illustrate multiple and overlapping error shading with transparency:

```
Make/O/N=200 jack=sin(x/8), sam=cos(x/9) + (100-x)/30
Display /W=(64,181,499,520) jack,jack,sam
ModifyGraph lsize(jack)=0,rgb(sam)=(0,0,65535)
ErrorBars jack shade={0,0,(0,65535,0,10000),(0,0,0)},const=2
ErrorBars jack#1 shade={0,0,(0,65535,0,10000),(0,0,0)},const=1
ErrorBars sam shade={0,0,(65535,0,0,10000),(0,0,0)},const=1
```

On Windows shading does not work with the old GDI graphics technology. See **Graphics Technology** on page III-506 for details.

These commands illustrate different +error and -error shading as well as the use of pattern:

```
Make/O jack=sin(x/8)
Display /W=(64,181,499,520) jack
ErrorBars jack shade={0,73,(0,65535,0),(0,0,65535),11,(65535,0,0),(0,65535,0)},const=0.5
```

See the shade keyword for the **ErrorBars** operation for details.

Error Ellipses

In Igor Pro 9.00 and later, you can specify error ellipses instead of bars or boxes. Error ellipses show both X and Y errors along with correlation between X and Y.

You must provide the data for error ellipses via a three-column wave with a row for each data point. This wave is labelled Ellipse Wave in the Error Bars dialog. It is identified by ewave=*ew* in the **ErrorBars** operation.

Each row of *ew* contains information for the error ellipse for one data point. The interpretation of the columns of *ew* depends on the mode, labelled Data Type in the ErrorBars dialog and identified by the mode parameter of the ELLIPSE keyword in the ErrorBars operation.

mode=0: *ew* contains the standard deviation in X, the standard deviation in Y, and the correlation between X and Y.

mode=1: *ew* contains the variance in X, the variance in Y, and the covariance of X and Y.

When specified via the ErrorBars operation ew, may include a subrange specification so long as it results in effectively a 2D wave with three columns and a row for each trace data point. See **Subrange Display Syntax** on page II-321.

Error Ellipse Color

The color of each error ellipse is taken from the color of the data point to which the ellipse is attached. Usually that is simply the trace color. You can change the color of individual data points and their corresponding ellipses using the trace **Color as f(z)**, or by point customization (see **Customize at Point** on page II-306).

You can specify the opacity of all error ellipses for a given trace using the Fill Alpha setting in the Error Bars dialog which ranges from 0 (fully transparent) to 1.0 (fully opaque). This specifies the fill color alpha for all error ellipses, overriding the data points' alpha. In the ErrorBars operation, you specify alpha as a value from 0 (fully transparent) to 65535 (fully opaque) using the ELLIPSE keyword. For background information on alpha, see **RGBA Values** on page IV-13.