

Using the Resample operation:

```
Duplicate/O wave0, wave2
Resample/DOWN=10/WINF=None/N=11 wave2      // no /UP means no interpolation
```

gives nearly identical results to the `wave1Centered = mean(...)` computation, the exceptions being only the initial and final values, which are simple end-effect variations.

The /WINF and /N flags of Resample define simple low-pass filtering options for a variety of decimation-by-smoothing choices. The default /WINF=Hanning window gives a smoother result than /WINF=None. See the **WindowFunction** operation (page V-1097) for more about these window options.

See **Multidimensional Decimation** on page II-98 for a discussion of decimating 2D and higher dimension waves.

## Miscellaneous Operations

### WaveTransform

When working with large amounts of data (many waves or multiple large waves), it is frequently useful to replace various wave assignments with wave operations which execute significantly faster. The **WaveTransform** operation (see page V-1090) is designed to help in these situations. For example, to flip the data in a 1D wave you can execute the following code:

```
Function flipWave(inWave)
    wave inWave

    Variable num=numPnts(inWave)
    Variable n2=num/2
    Variable i,tmp
    num-=1
    Variable j
    for(i=0;i<n2;i+=1)
        tmp=inWave[i]
        j=num-i
        inWave[i]=inWave[j]
        inWave[j]=tmp
    endfor
End
```

You can obtain the same result much faster using the command:

```
WaveTransform/O flip, waveName
```

In addition to “flip”, WaveTransform can also fill a wave with point index or the inverse point index, shift data points, normalize, convert to complex-conjugate, compute the squared magnitude or the phase, etc.

For multi-dimensional waves, use MatrixOp instead of WaveTransform. See **Using MatrixOp** on page III-140 for details.

## The Compose Expression Dialog

The Compose Expression item in the Analysis menu brings up the Compose Expression dialog.

This dialog generates a command that sets the value of a wave, variable or string based on a numeric or string expression created by pointing and clicking. Any command that you can generate using the dialog could also be typed directly into the command line.

The command that you generate with the Compose Expression dialog consists of three parts: the destination, the assignment operator and the expression. The command resembles an equation and is of the form:

```
<destination> <assignment-operator> <expression>
```