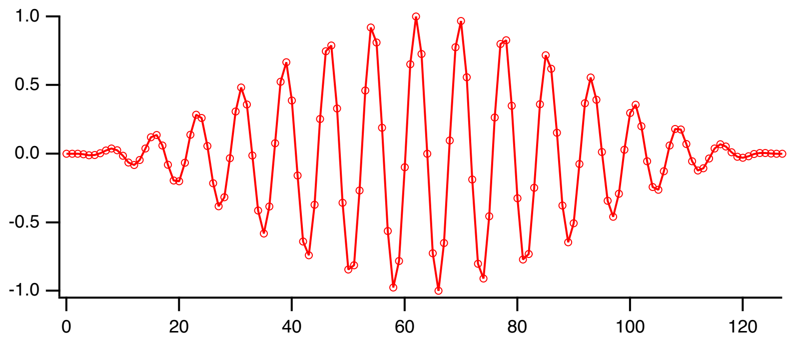


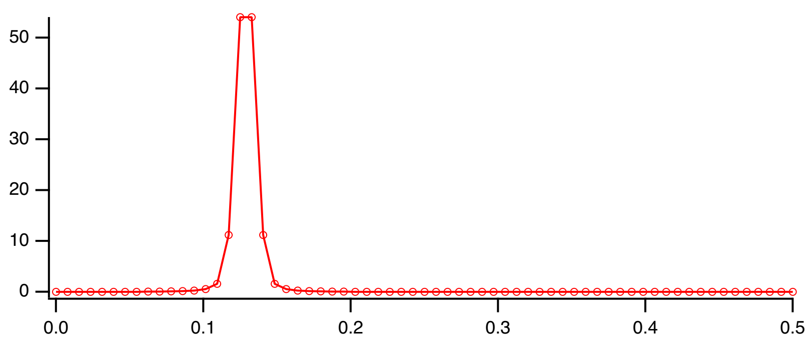
By smoothing the ends of the wave to zero, there is no discontinuity when wrapping around the ends.

In applying a window to the data, energy is lost. Depending on your application you may want to scale the output to account for coherent or incoherent gain. The coherent gain is sometimes expressed in terms of amplitude factor and it is equal to the sum of the coefficients of the window function over the interval. The incoherent gain is a power factor defined as the sum of the squares of the same coefficients. In the case that we are considering the correction factor is just the reciprocal of the coherent gain of the Hanning window

$$coherent\ gain \equiv \int_0^1 \frac{1-\cos(2\pi x/N)}{2}dx = 0.5$$

so we can multiply the FFT amplitudes by 2 to correct for them:

```
cosWave *= 2                              // Account for coherent gain
FFT /OUT=3 /DEST=cosWaveH cosWave
Display cosWaveH
ModifyGraph mode=4, marker=8
```



Note that frequency values in the neighborhood of the peak are less affected by the leakage, and that the amplitude is closer to the ideal of 64.

Other Windows

The Hanning window is not the ultimate window. Other windows that suppress more leakage tend to broaden the peaks. The FFT and WindowFunction operations have the following built-in windows: Hanning, Hamming, Bartlett, Blackman, Cosa(x), KaiserBessel, Parzen, Riemann, and Poisson.