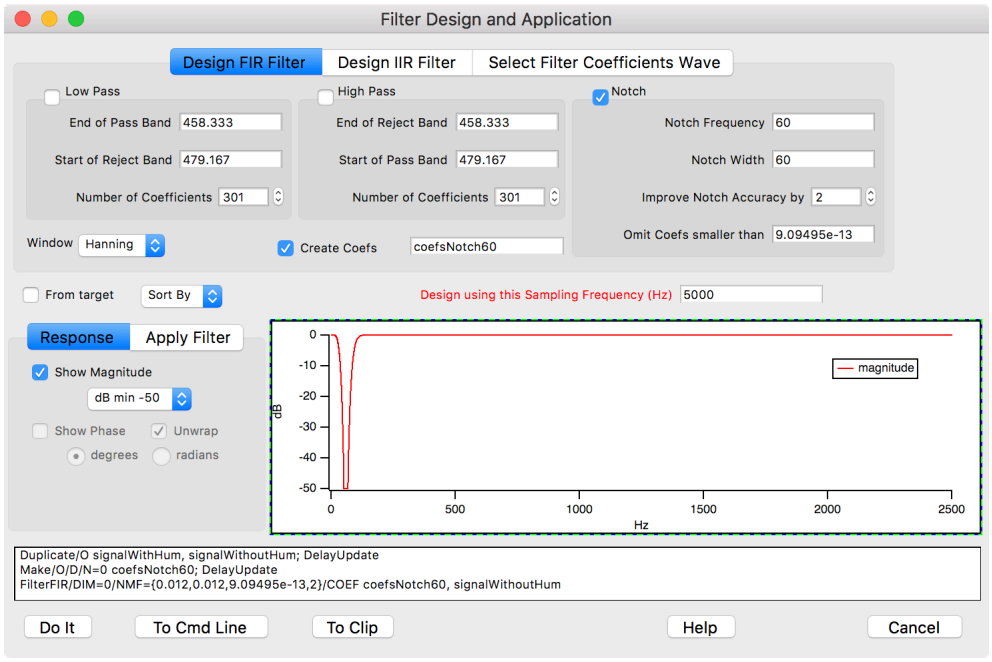
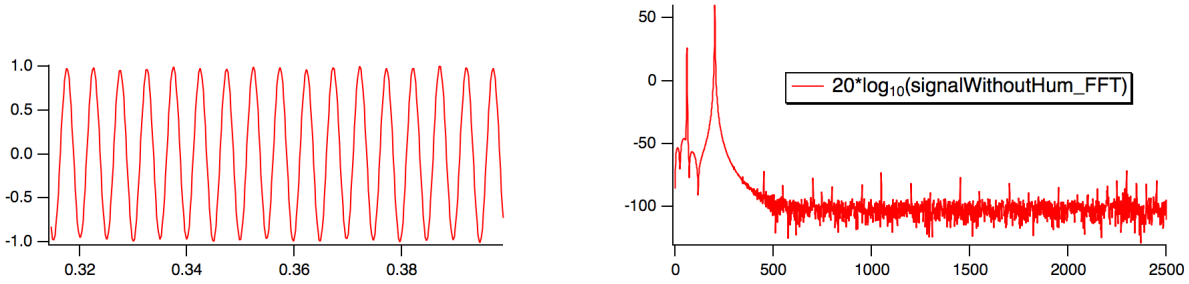


The FilterFIR operation uses high-precision calculations to get a deep notch at the selected frequency, preferring to adjust the frequency to get deeper notches. The Improve Notch Accuracy value (nMult in the **FilterFIR** documentation) indirectly sets the number of coefficients used to implement the notch.

Here is the result of this filter design:



The frequency response on the right does not look all that different but the filtered signal on the left has much less of the interfering 60 Hz signal.

Other FIR Designs using IFDL

The FIR filters created using the Filter Design and Application dialog are simple filters created by applying a "window" shape - such as the Hanning **WindowFunction** - to truncated sin(x)/x kernels.

The filters are functional but require a lot of coefficients to get high performance (steep filter transition bands, good rejection of unwanted frequencies). Often these aren't important shortcomings, but if the designed filter is intended for actual electronic implementation, those extra coefficients get expensive.

High-performance FIR filters using far fewer coefficients can be computed by using the Igor Filter Design Laboratory package. It optimizes both filter response and the number of filter coefficients using the Remez Exchange algorithm as described in the seminal paper by [McClellan], Parks, and Rabiner. See the **Remez** operation for additional references. See the “Igor Filter Design Laboratory” help file for details.