RTDSP Lab 4 Report

*Real-Time Implementation of FIR Filters*

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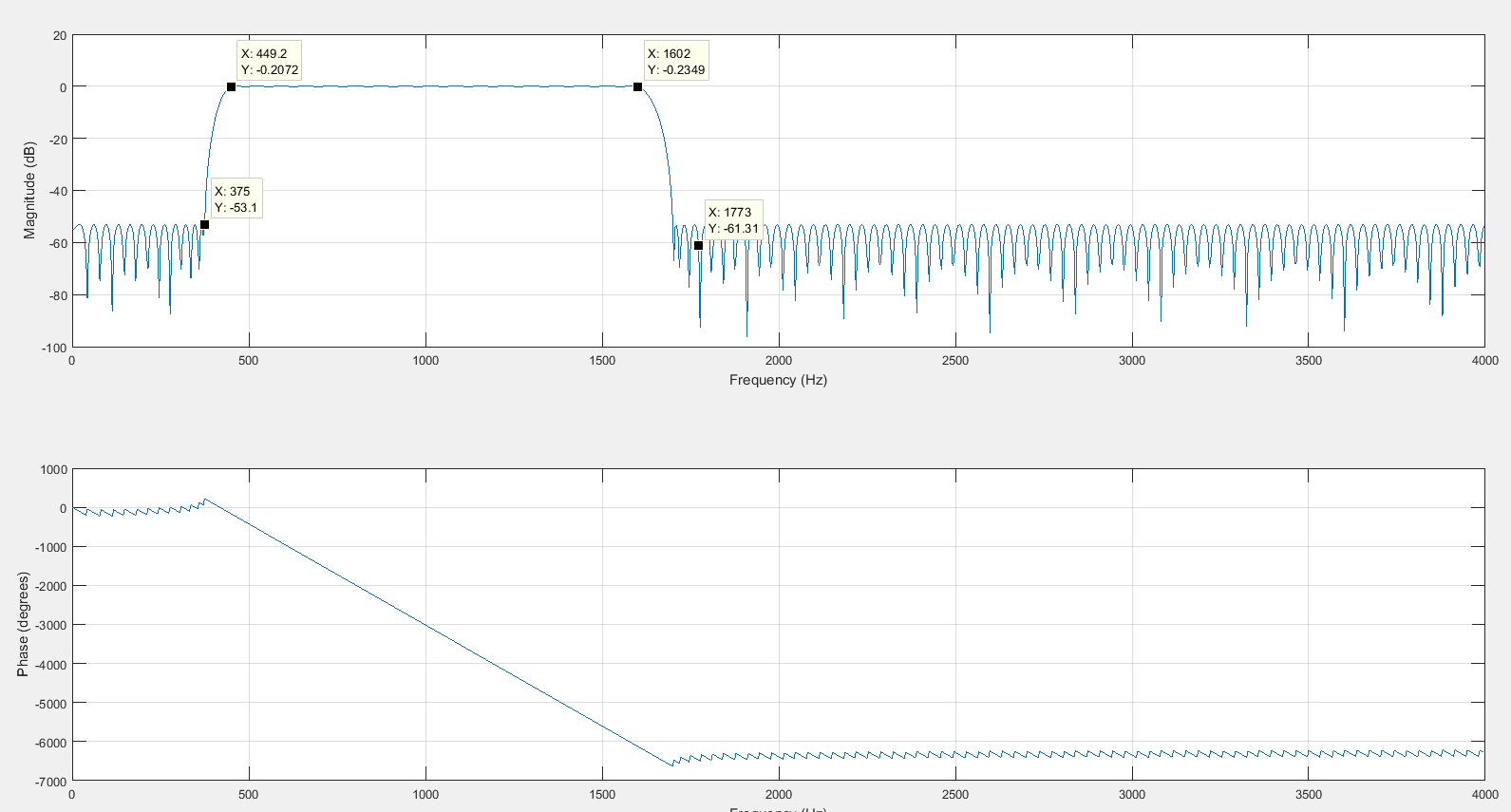
Real-Time Implementation of FIR Filters

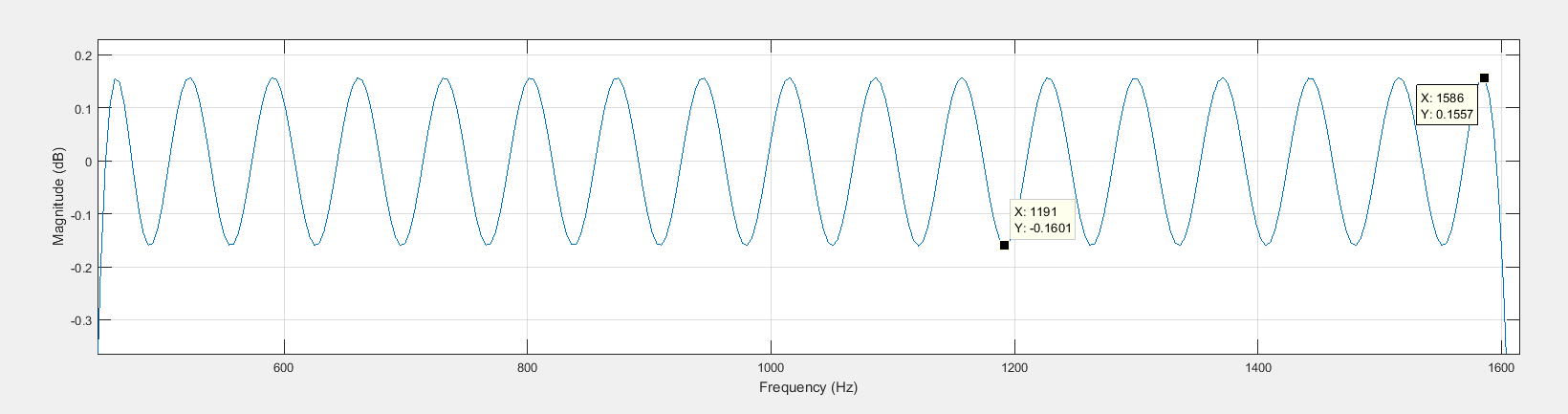
# Matlab Filter Design

We implemented the Parks-McClellen algorithm to produce our FIR filter in Matlab via the firpmord and firpm functions. Firpmord takes parameters that describe the desired cutoff frequencies and amplitudes of the stopbands/passbands of the filter, the allowed deviation from the desired amplitudes, and the sampling frequency. It returns parameters that can be passed to firpm to produce an array of frequency coefficients.

The parameters are slightly altered from the specification, as with the filter that was previously being produced, around the stop band edge of the first transition band, one of the lobes was not matching the specification according to the network analyser, even though it was correct in Matlab, so using some trial and error we reached values that create a more correct result. This may be due to delay in the ADC/DAC of the DSP board.

Figure 1 below shows the response of the filter adheres to the amplitude specification and Figure 2 is demonstrates that the passband ripple is within the 0.4dB required, by showing the amplitude of the highest/lowest points.





### APPENDIX A: Matlab Code

