Passive Filters

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Purpose

This lab will give practice in dealing with filters, however in this case we will be using complex frequency dependent impedance Z instead of frequency independent resistance R.

Results

Actual data will be in red and theoretical data will be in blue
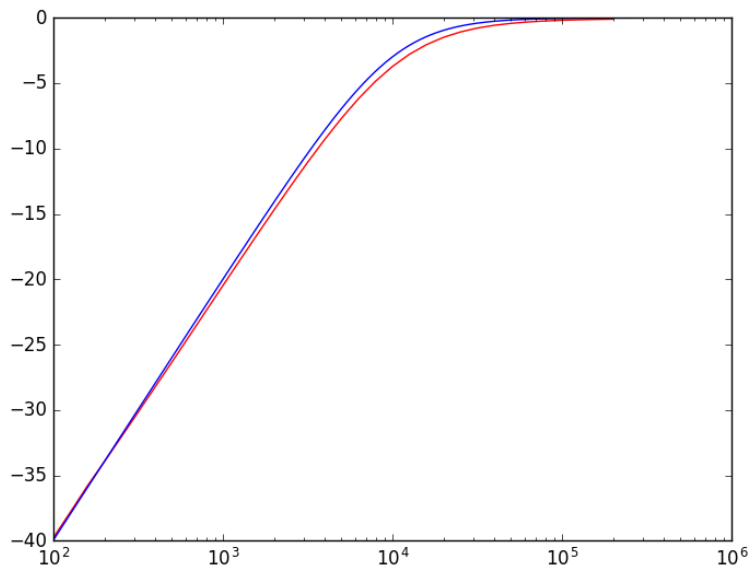

Figure 1: High Pass Frequency vs Gain

With a resistor with a higher ohmic value the transition maximum seems lower but that may be an artifact of our data points. However, the central frequency is the about the same and the bandwidth is much sharper.
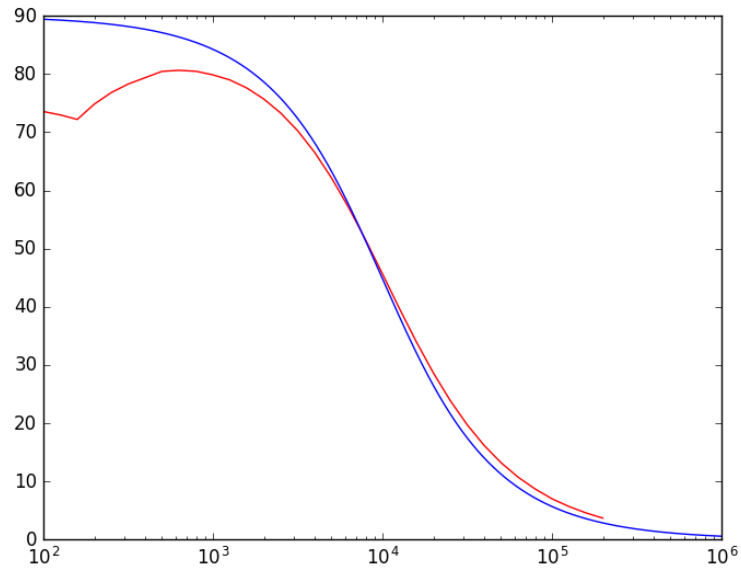
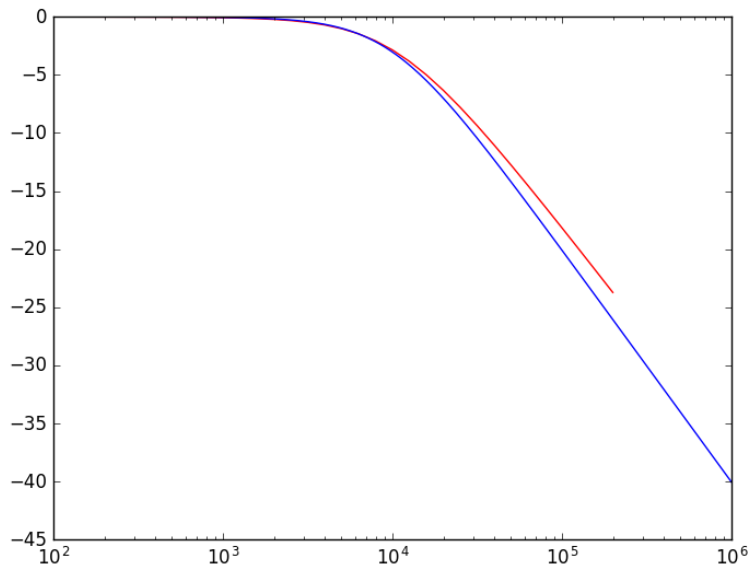Figure 2: High Pass Frequency vs Phase shift

Figure 3: Low Pass Frequency vs Gain

These notch filters would be very good at removing the noise from any data you are trying to obtain as long as that noise has some specific frequency.
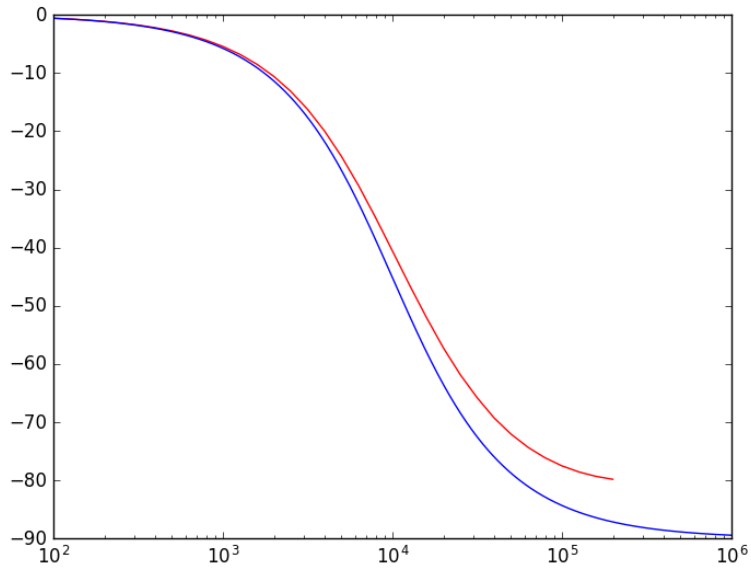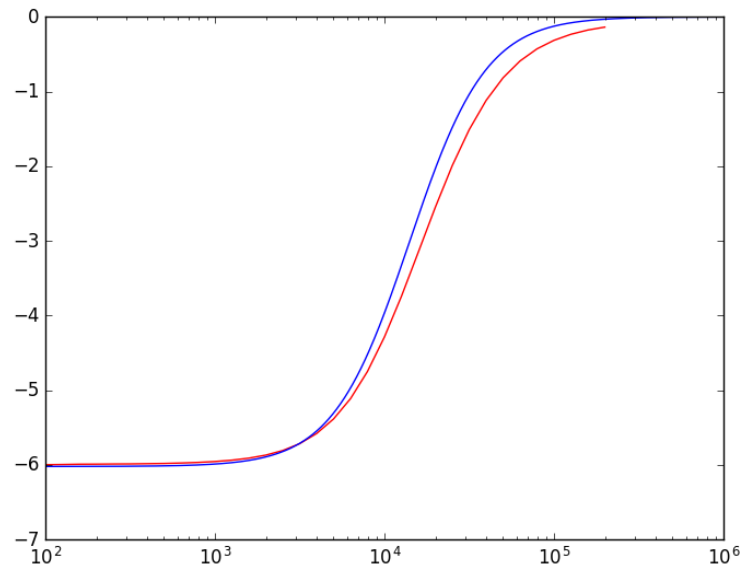
Figure 4: Low Pass Frequency vs Phase shift

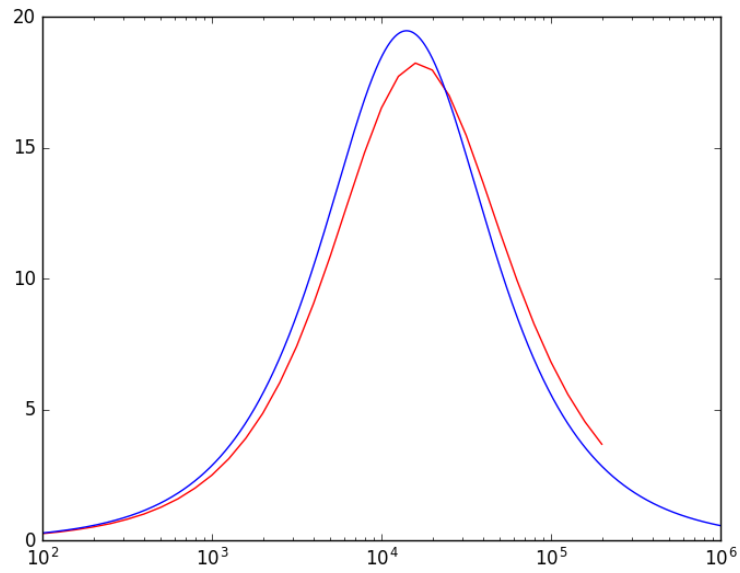Figure 5: High Emphasis Frequency vs Gain

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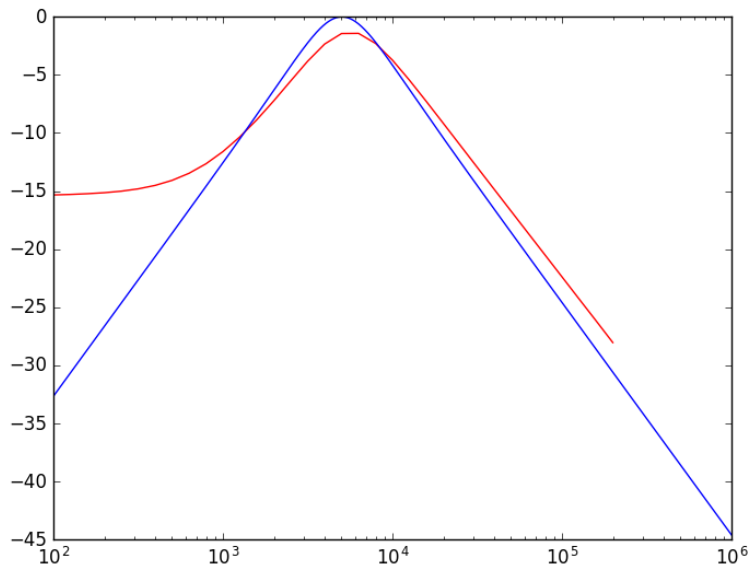Figure 6: High Emphasis Frequency vs Phase Shift
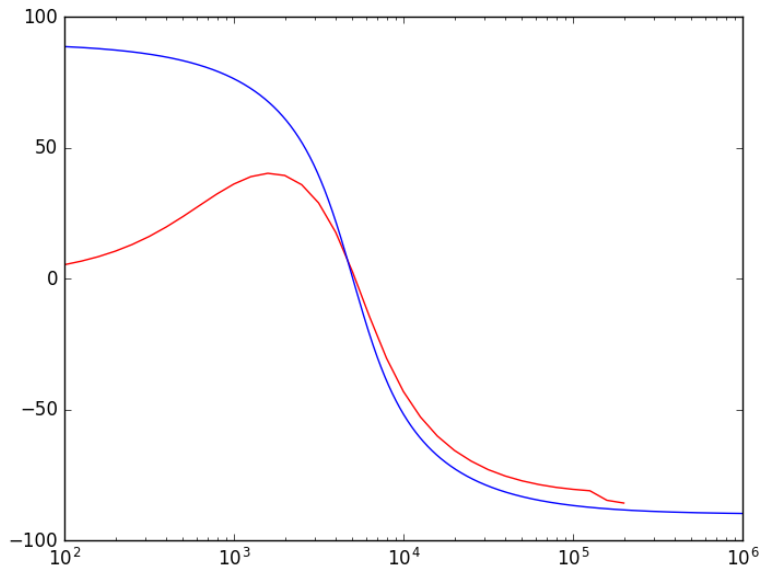

Figure 7: Band Pass Frequency vs Gain

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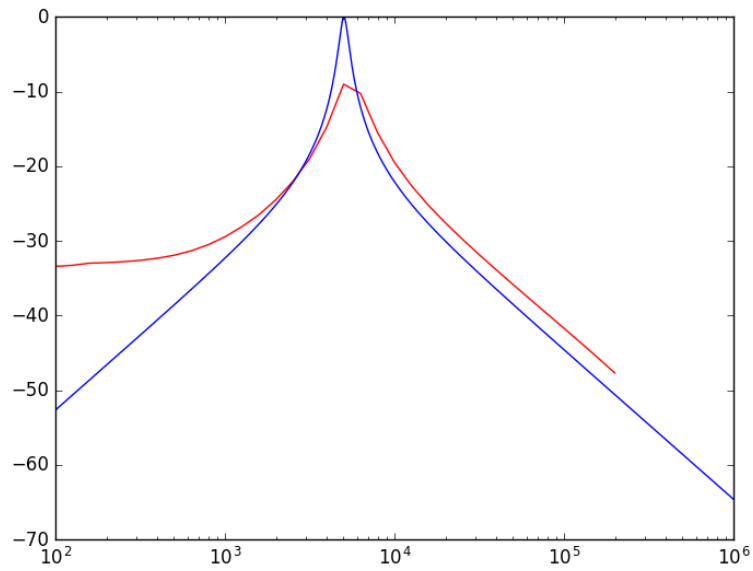Figure 8: Band Pass Frequency vs Phase shift

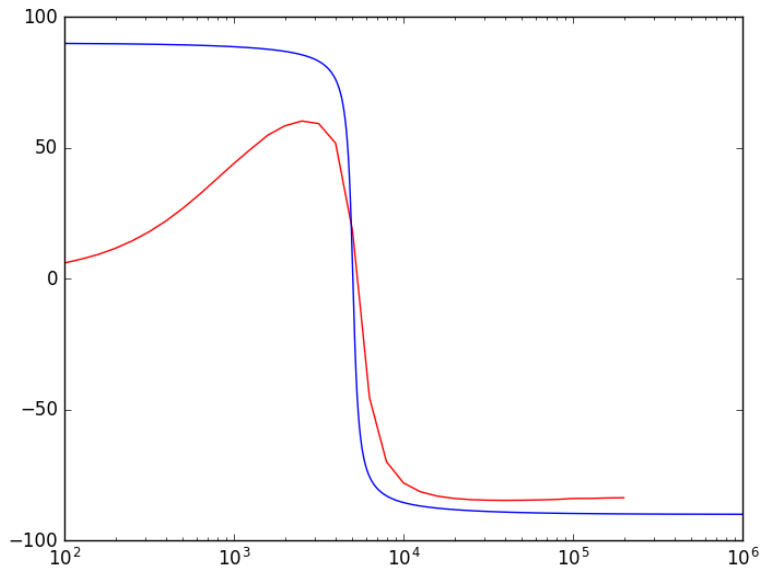
Figure 9: Band Pass High R Frequency vs Gain

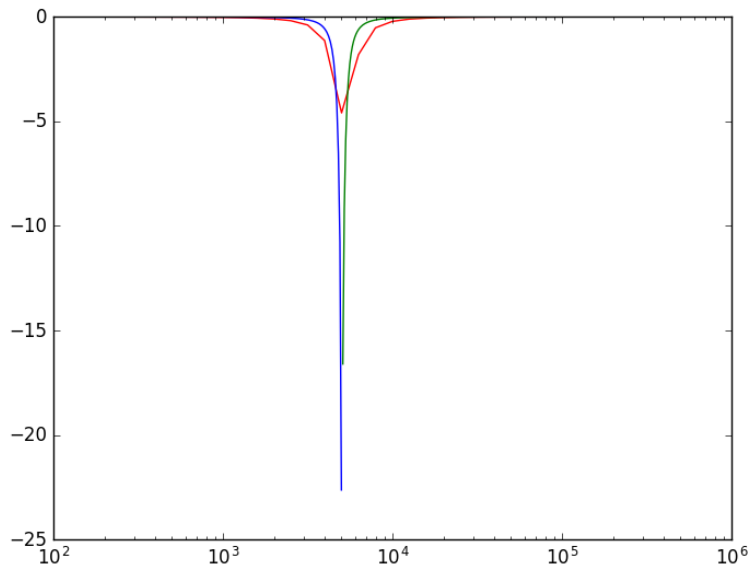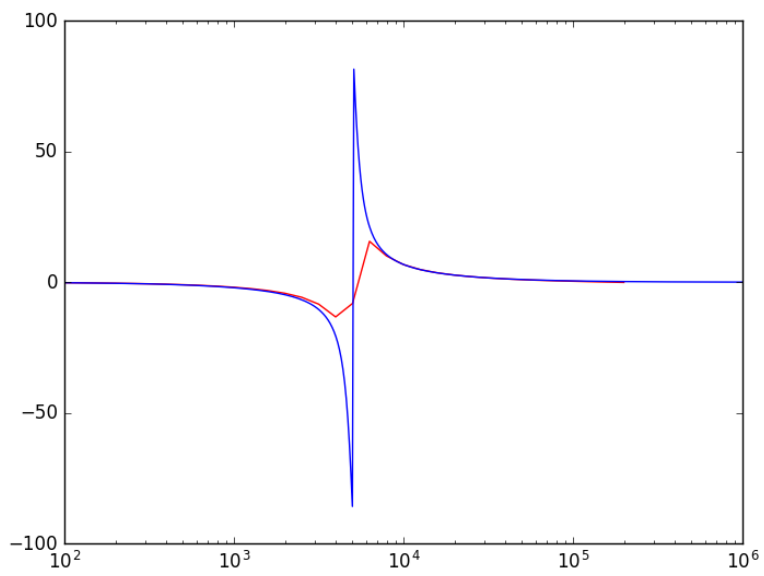Figure 10: Band Pass High R Frequency vs Phase

Figure 11: Notch Filter Frequency vs Gain

Figure 12: Notch Filter Frequency vs Phase shift