

INTRODUCTION TO EECS II

DIGITAL

COMMUNICATION

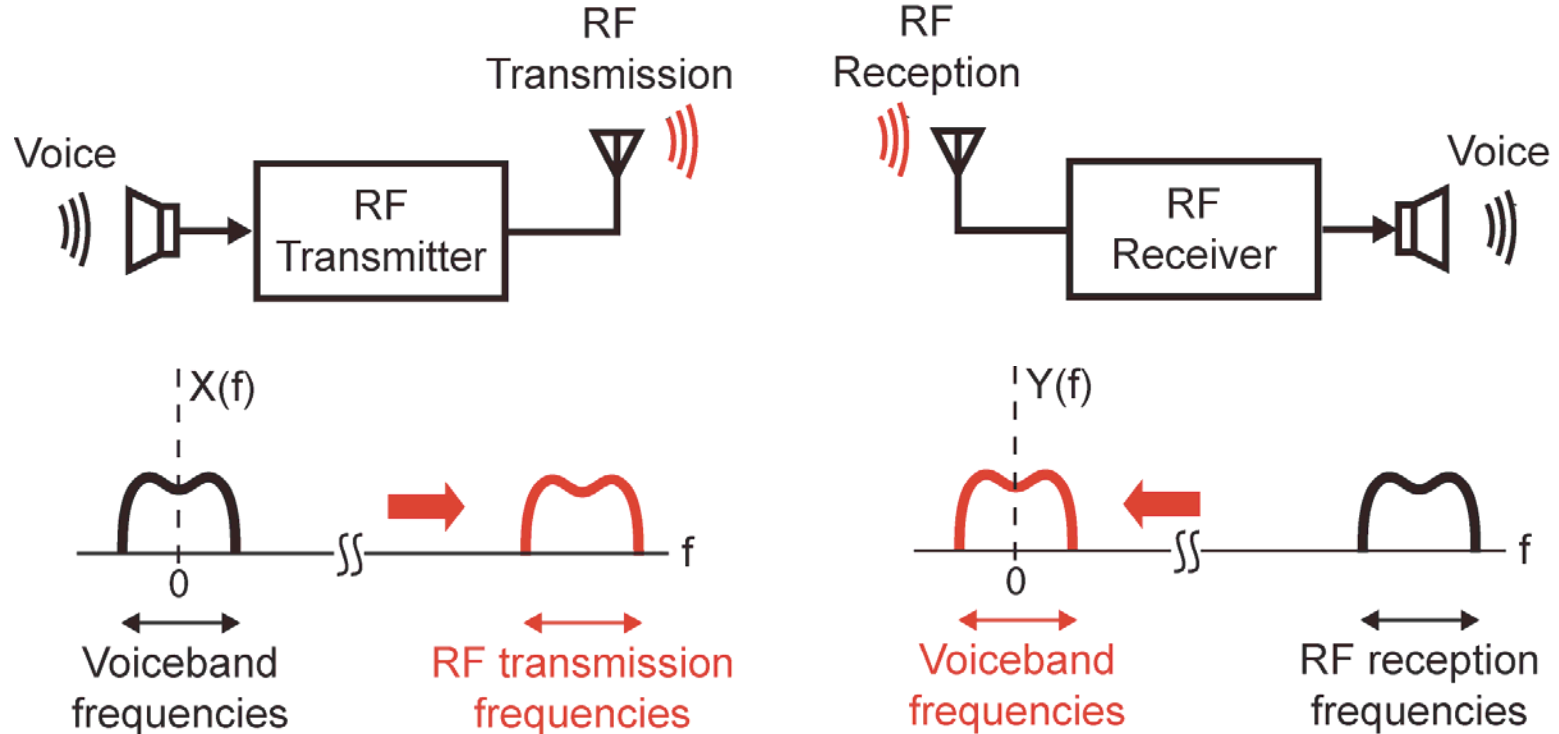
SYSTEMS

6.02 Spring 2009

Lecture #16

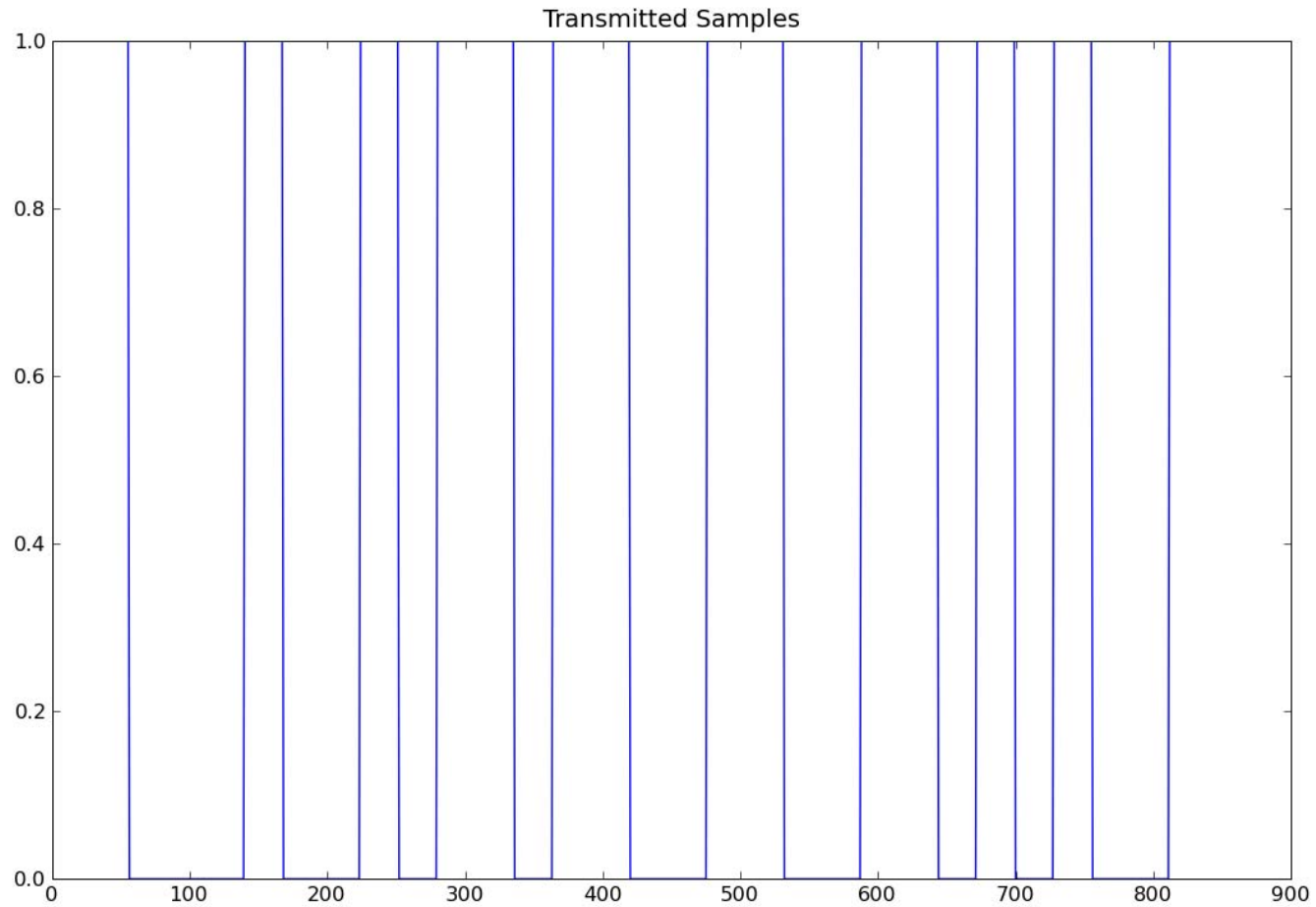
- Modulation Step-by-Step
- Phase Coherency Issue

Motivation for High Frequency Modulation

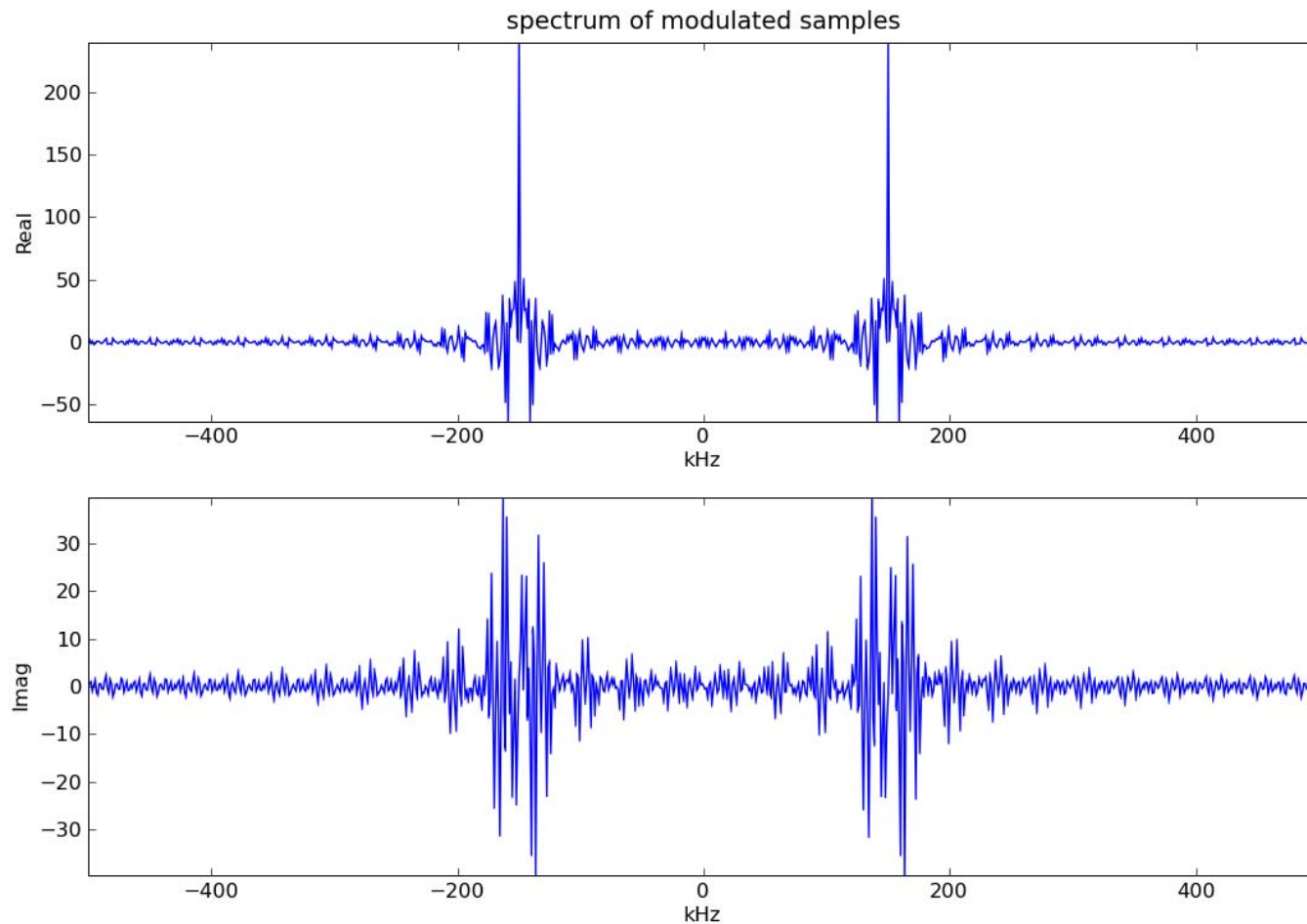


- Modulation is used to change the frequency band of a signal
 - Enables RF communication in different frequency bands
 - Used in cell phones, AM/FM radio, WLAN, cable TV,
 - Note: higher frequencies lead to smaller antennas
 - 3GHz, 10cm wavelength, 2.5cm antenna (1/4 wavelength)

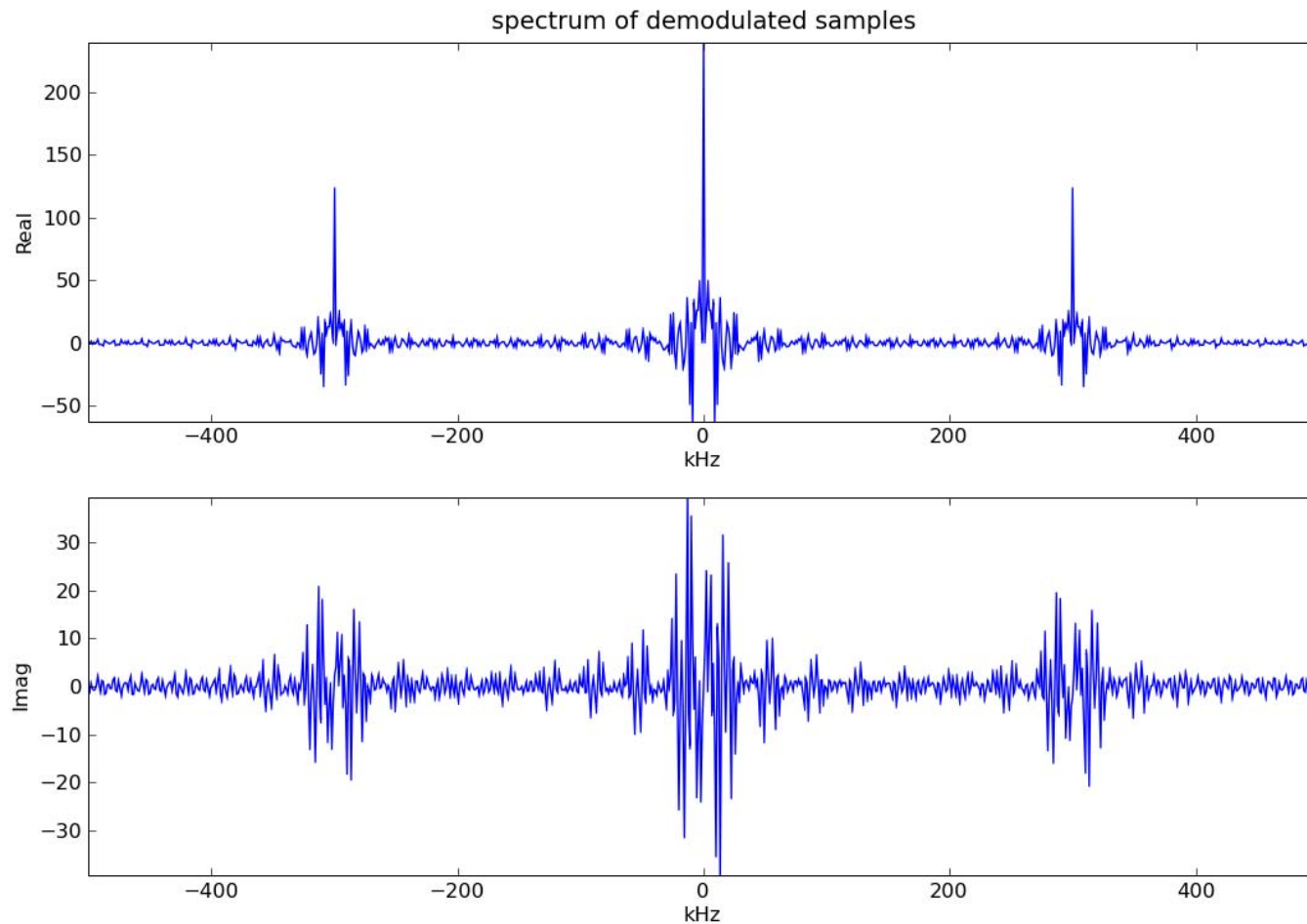
35000 Bits/Sec, 1M samples/sec



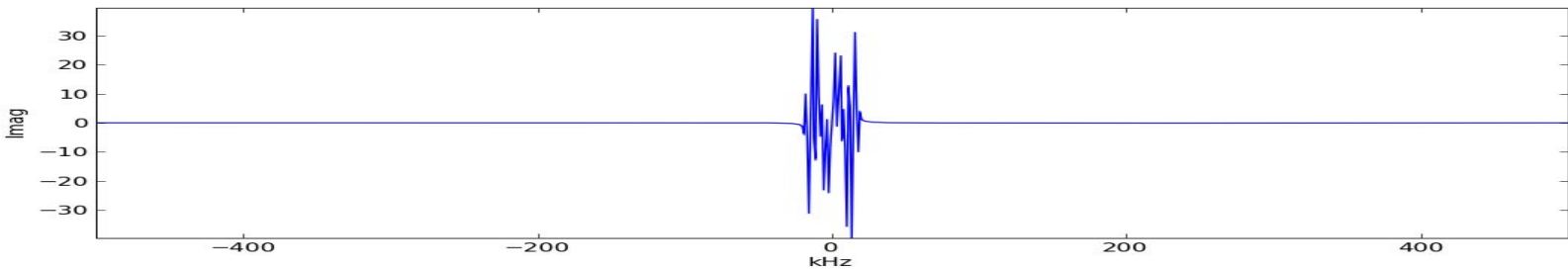
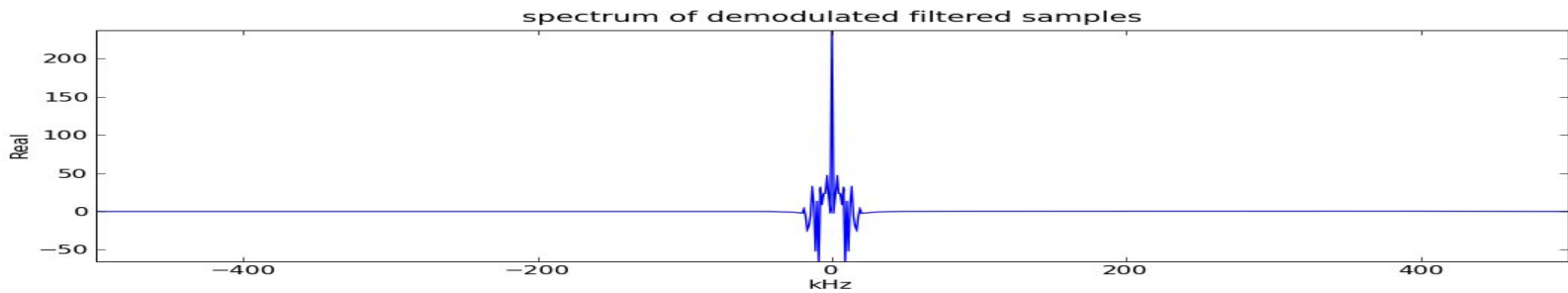
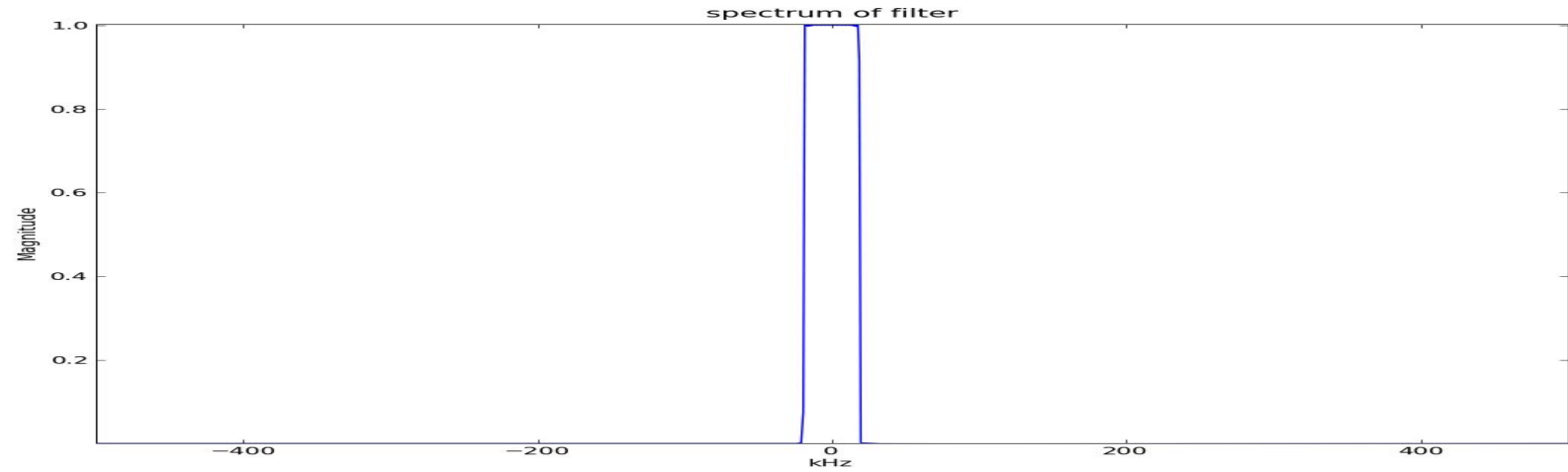
Post 150Khz Modulation (1M Sample Rate)



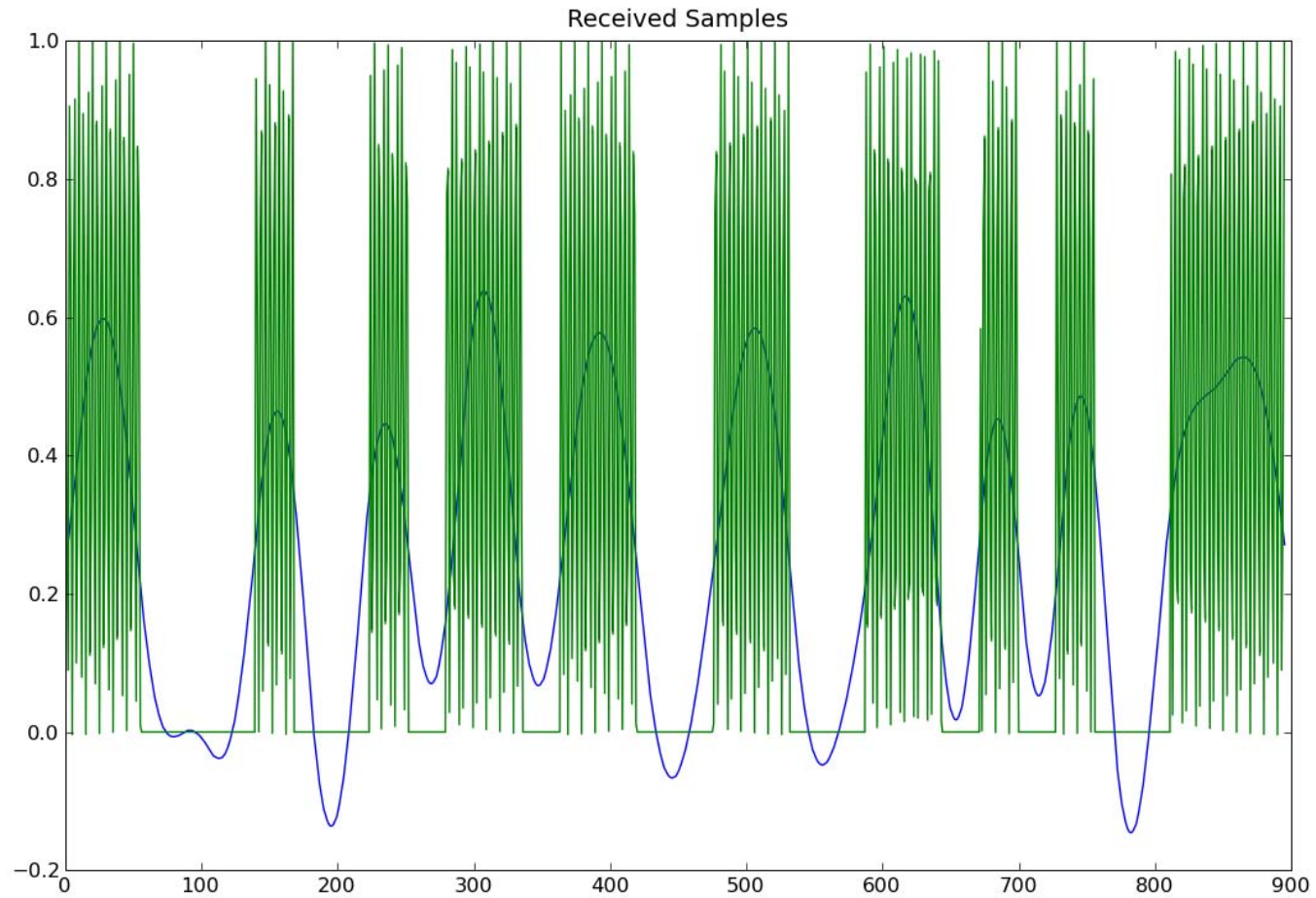
Spectrum of Demodulated Signal



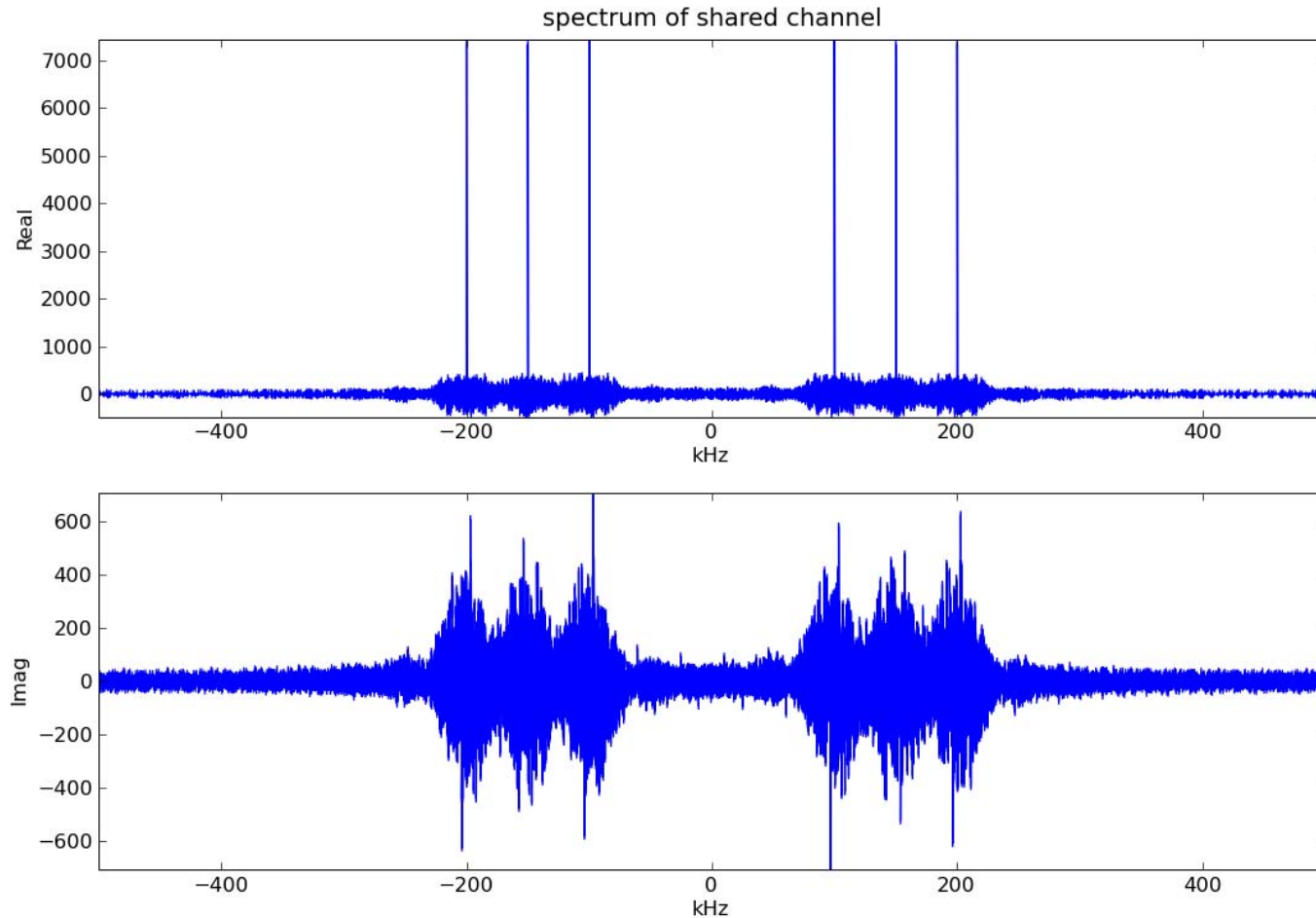
LPF and Spectrum After LPF



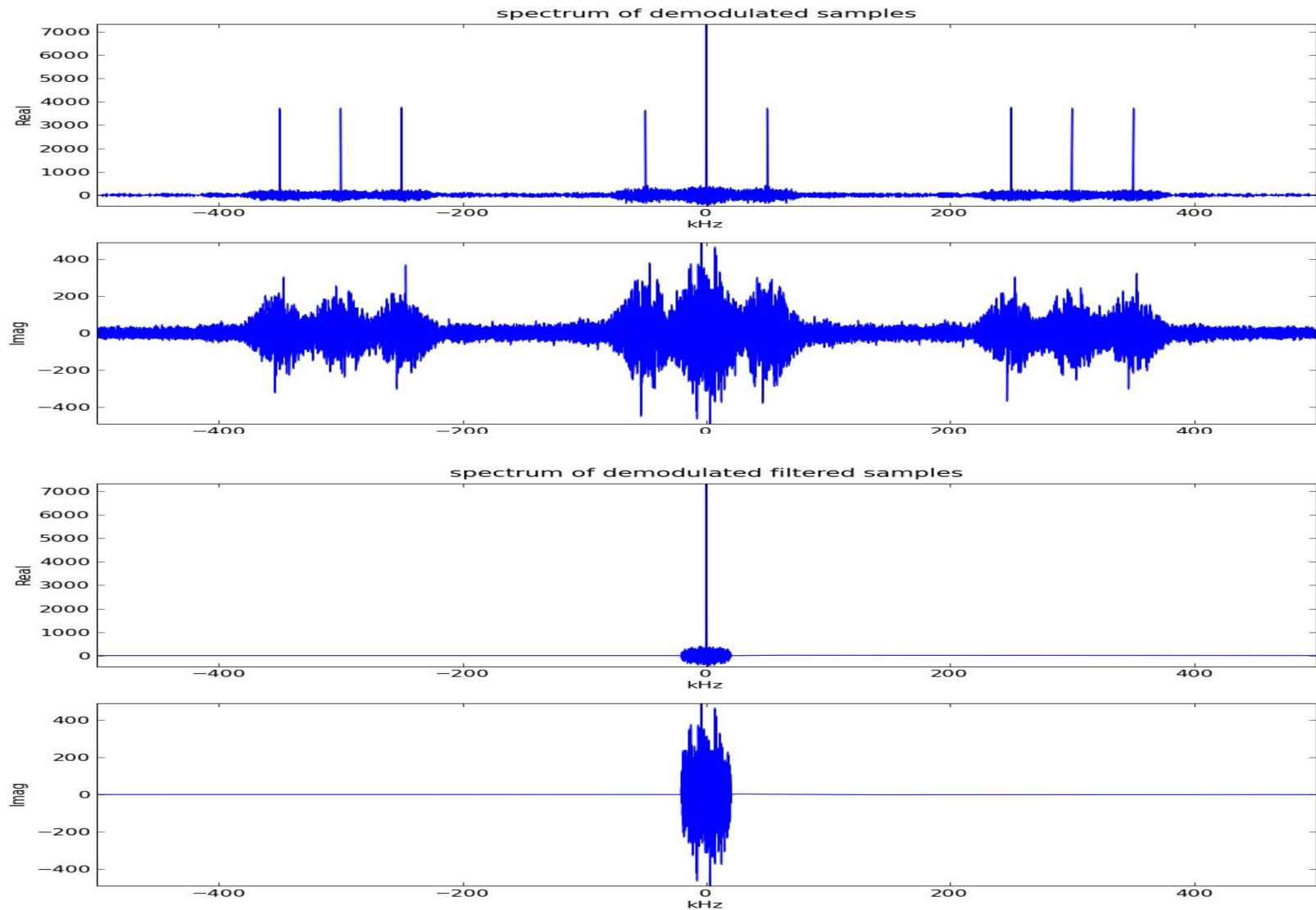
Received samples pre and post LPF



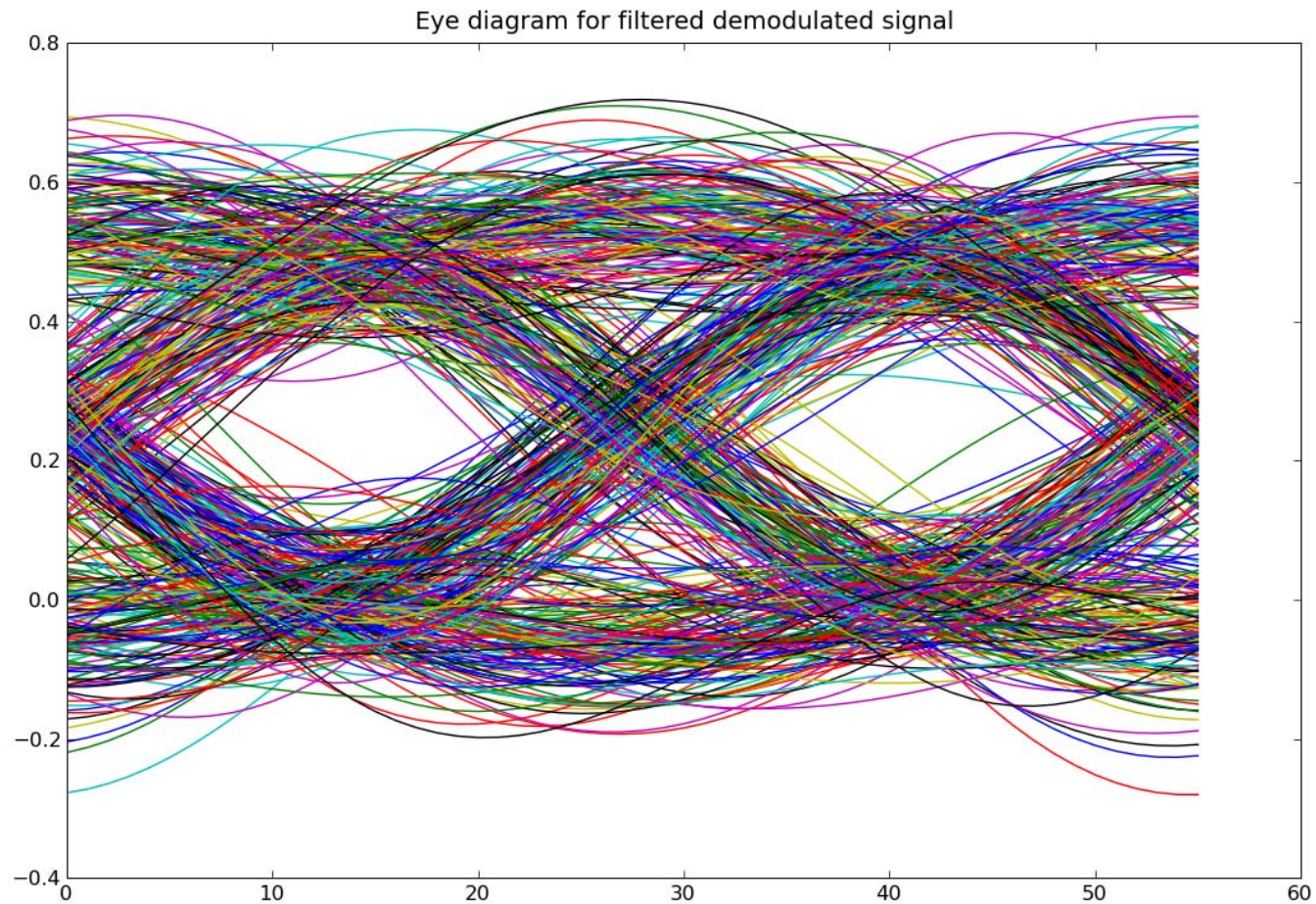
Spectrum: 100, 150, 200Khz transmitters



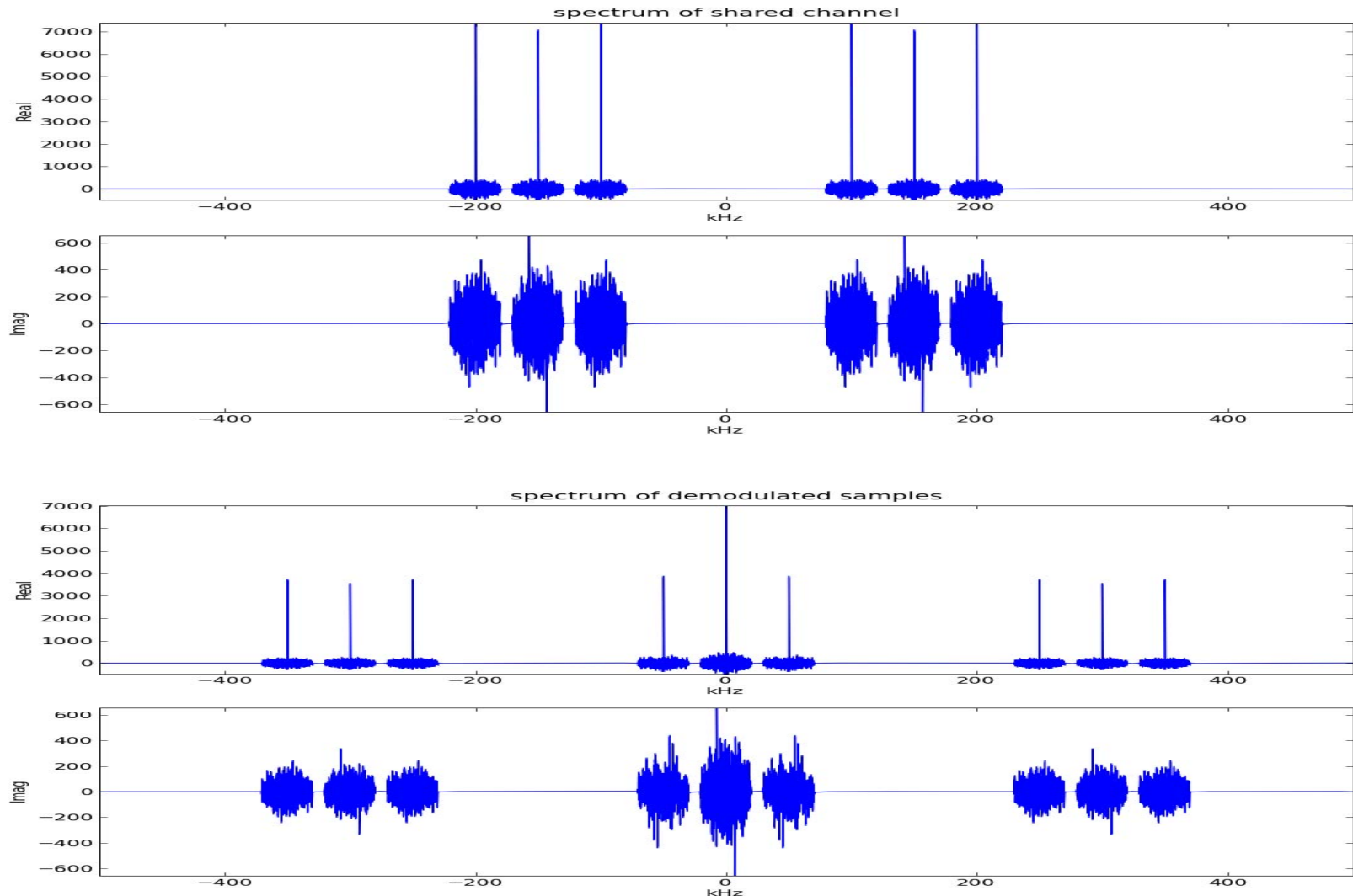
Demod Spectrum Before and After LPF



Eye Diagram for Received Bits



Transmit Filtered Spectrum, Pre/Post Demod



Eye Diagram received bits, transmit filters

