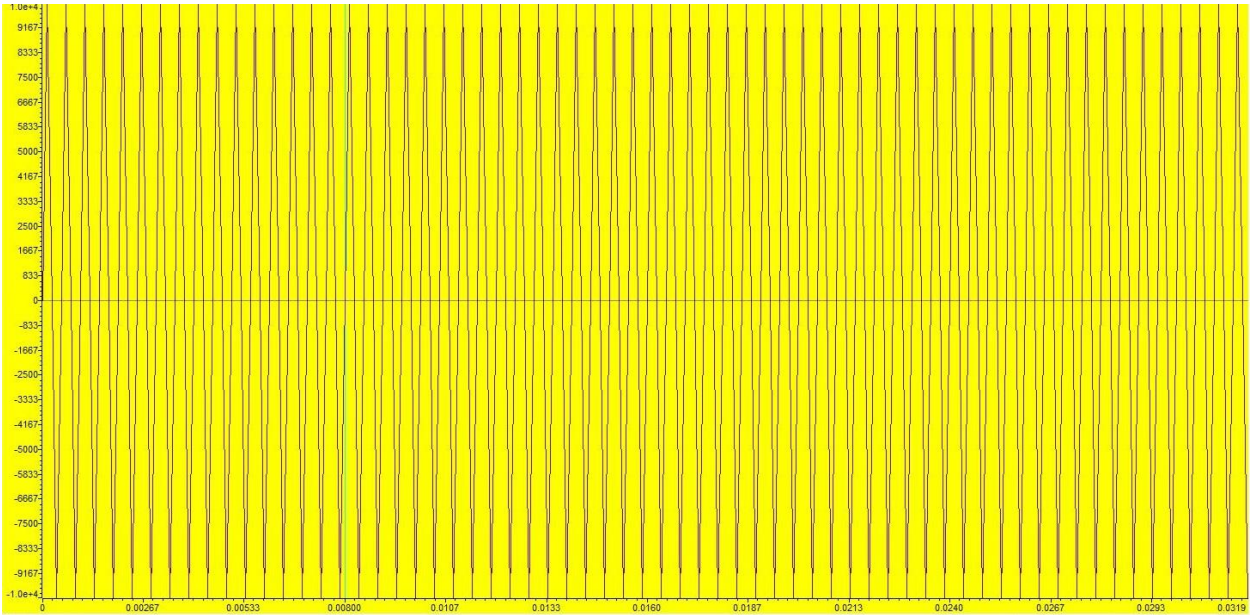
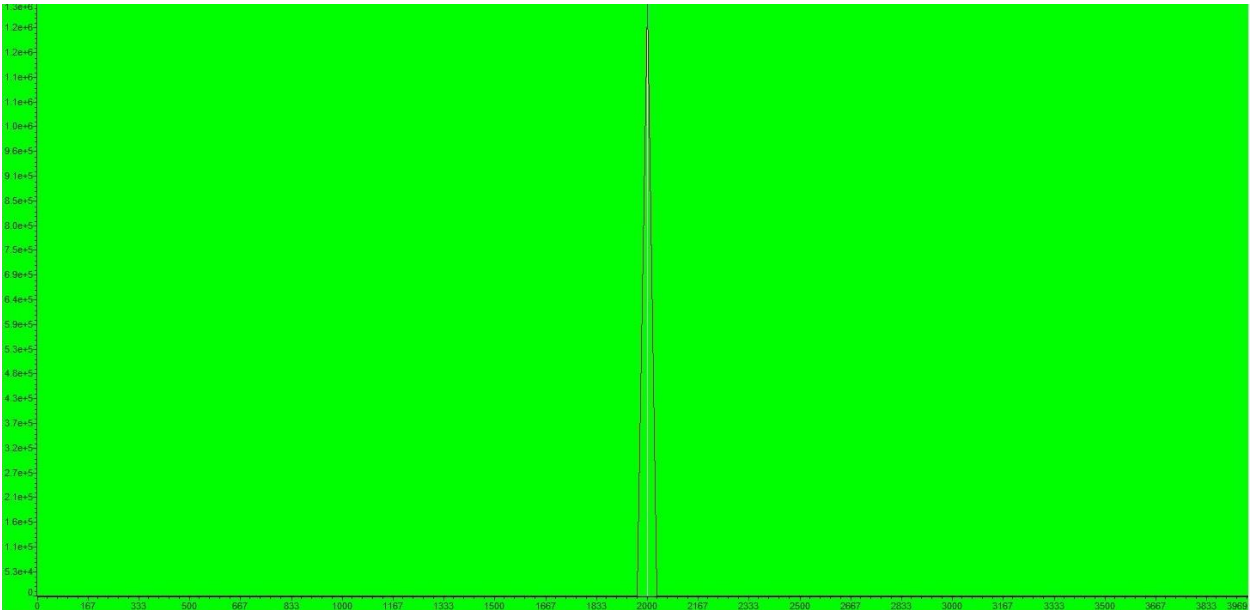


Appendix

1) Upsampling and downsampling a)



Time domain plot $F_s=8$ KHz

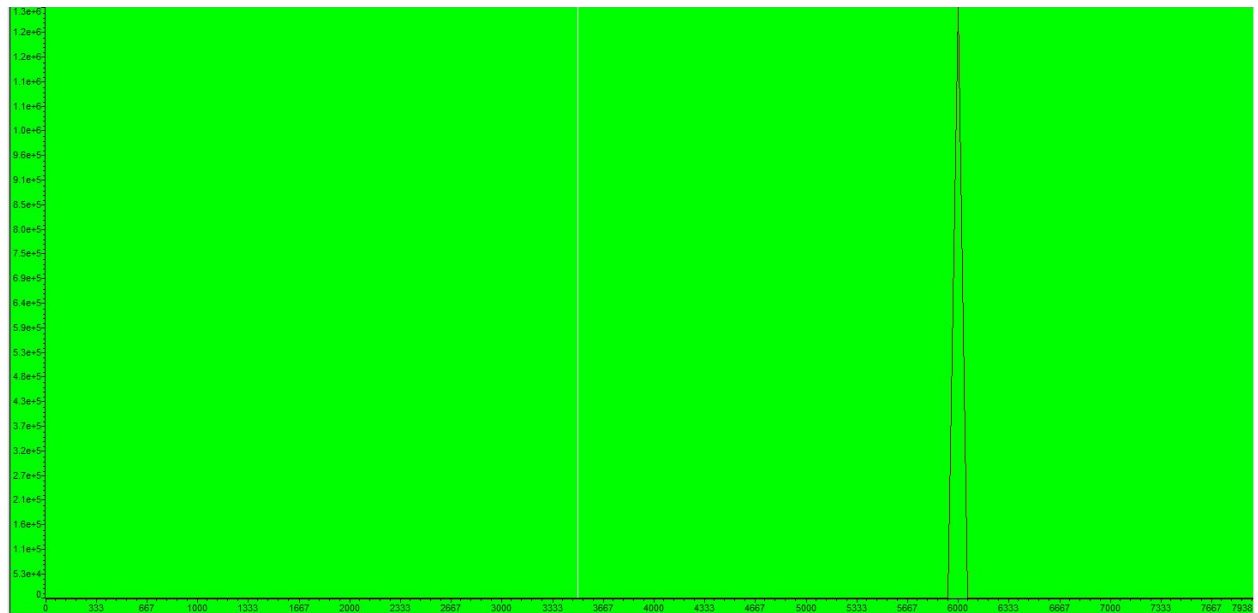


Frequency domain plot $F_s=8$ KHz

b)

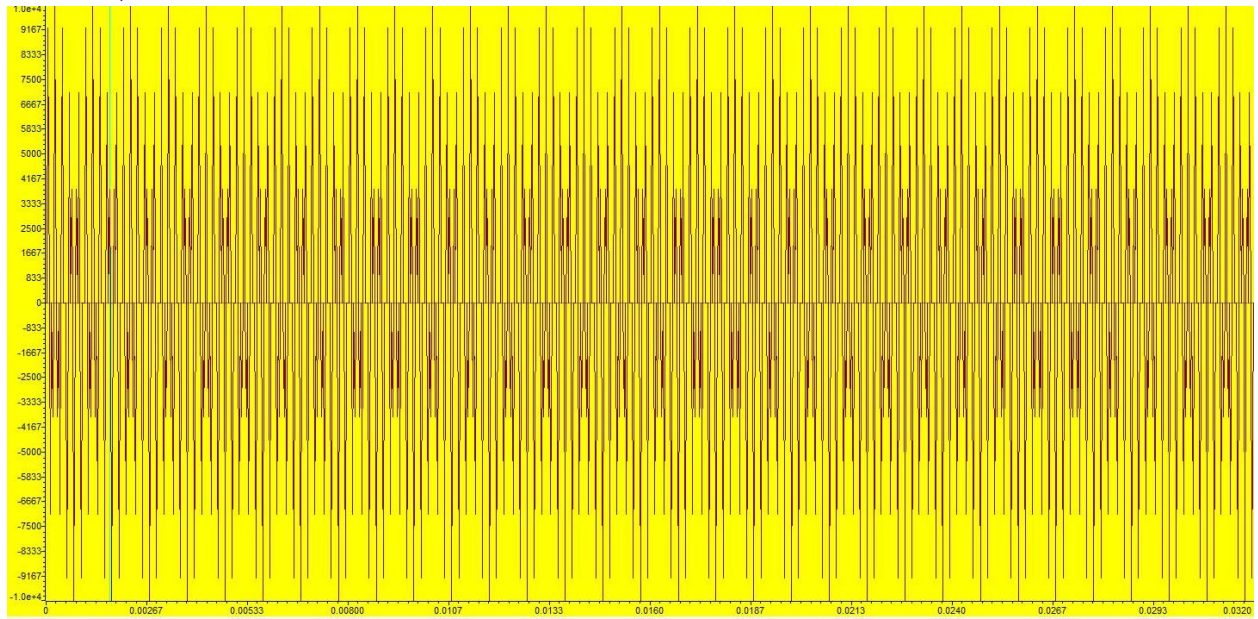


Time domain plot $F_s=8$ KHz

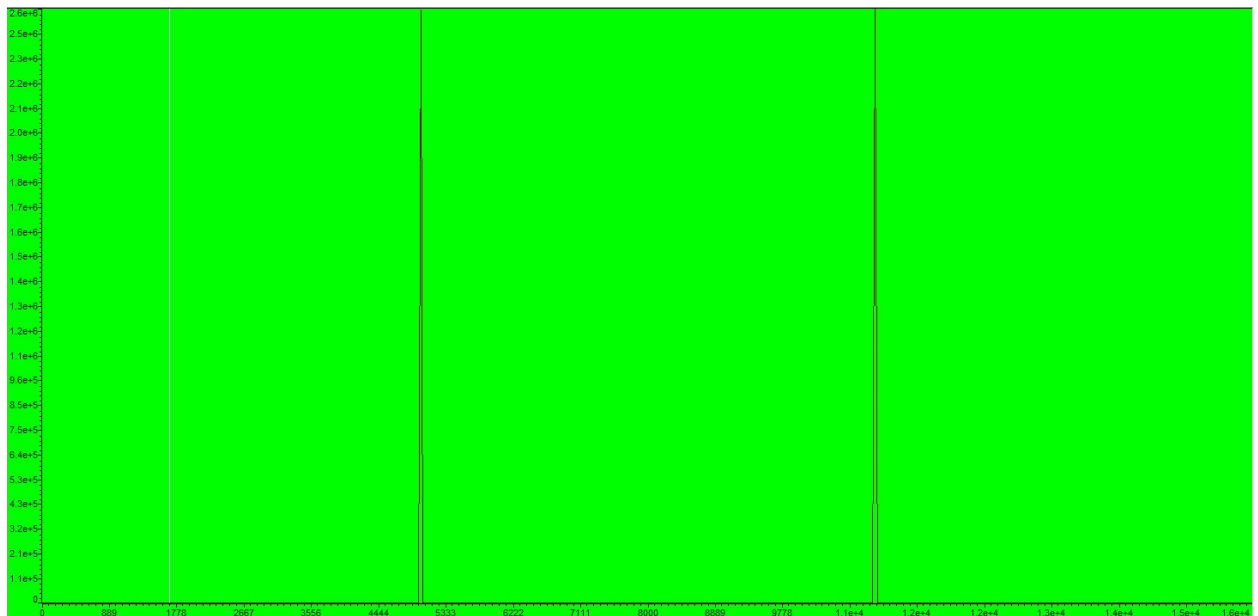


Frequency domain plot $F_s=8$ KHz

c)

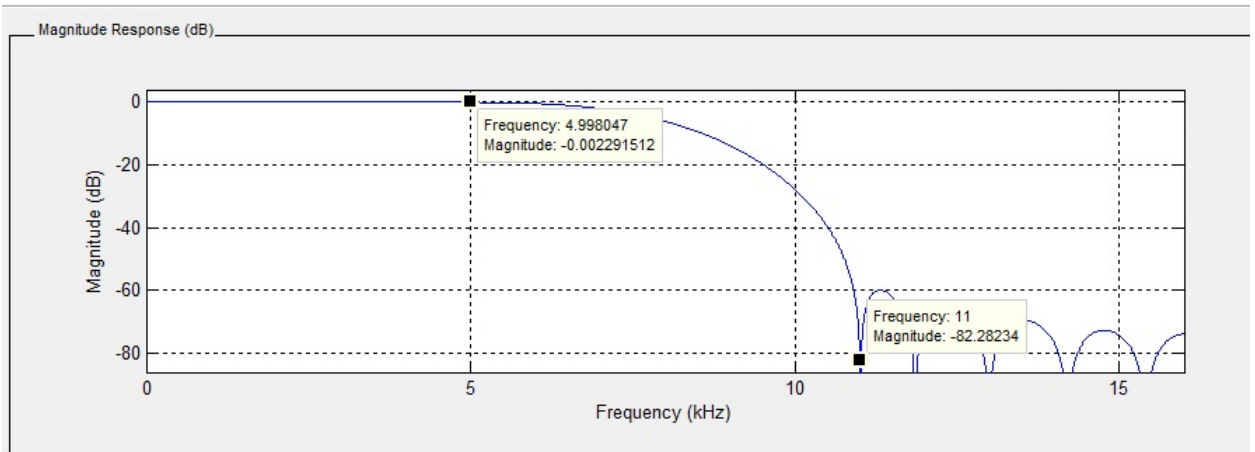


Time domain plot $F_s=32$ KHz



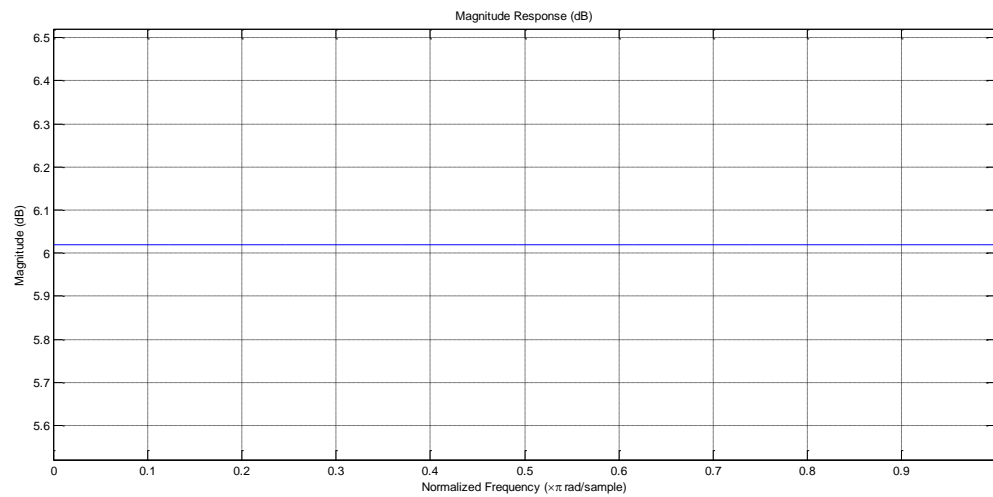
Frequency domain plot $F_s=32$ KHz

d)

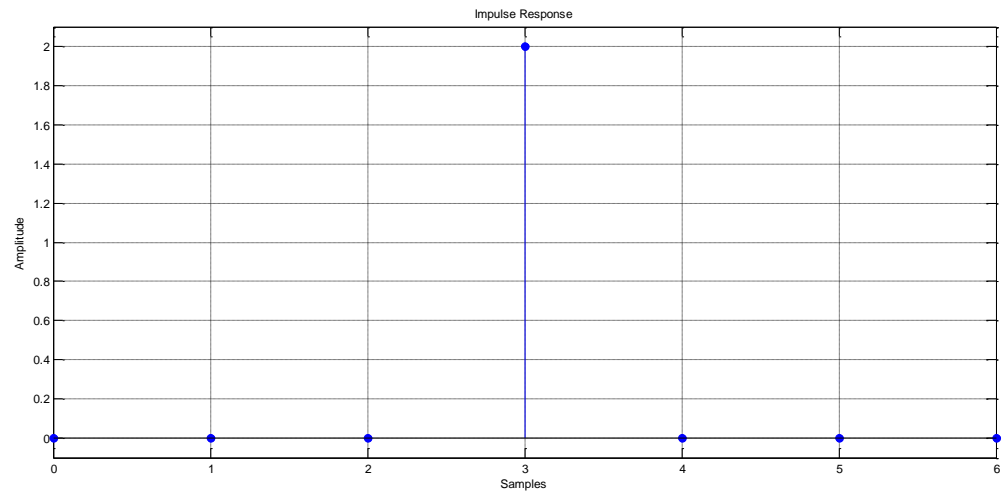


Magnitude response of the LPF

3) Analysis Filter Bank and Synthesis Filter Bank Coefficients

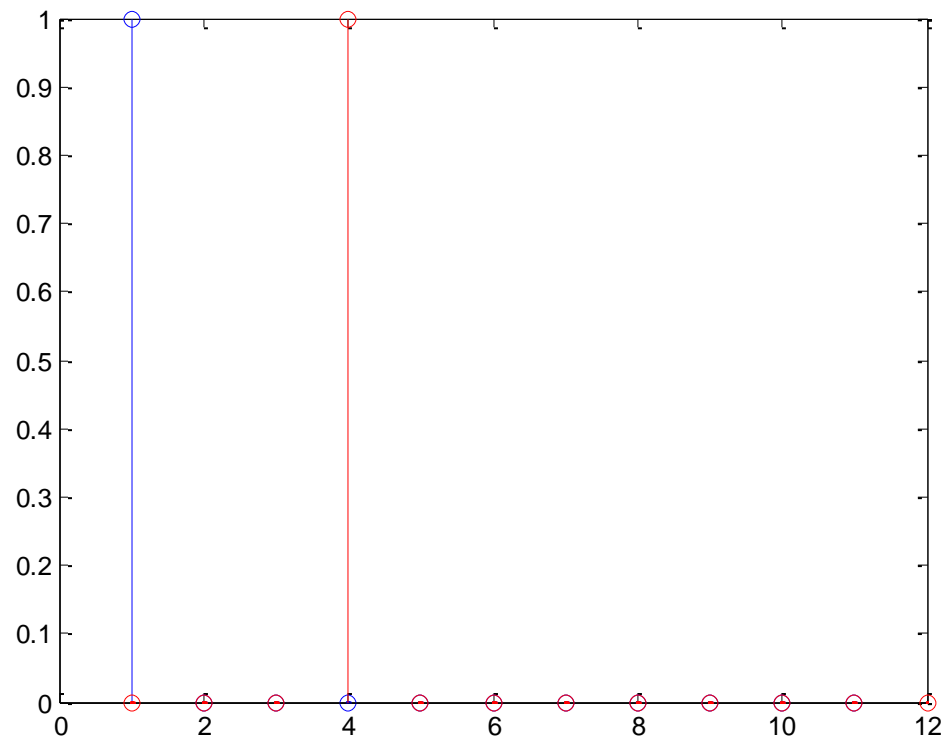


Magnitude response



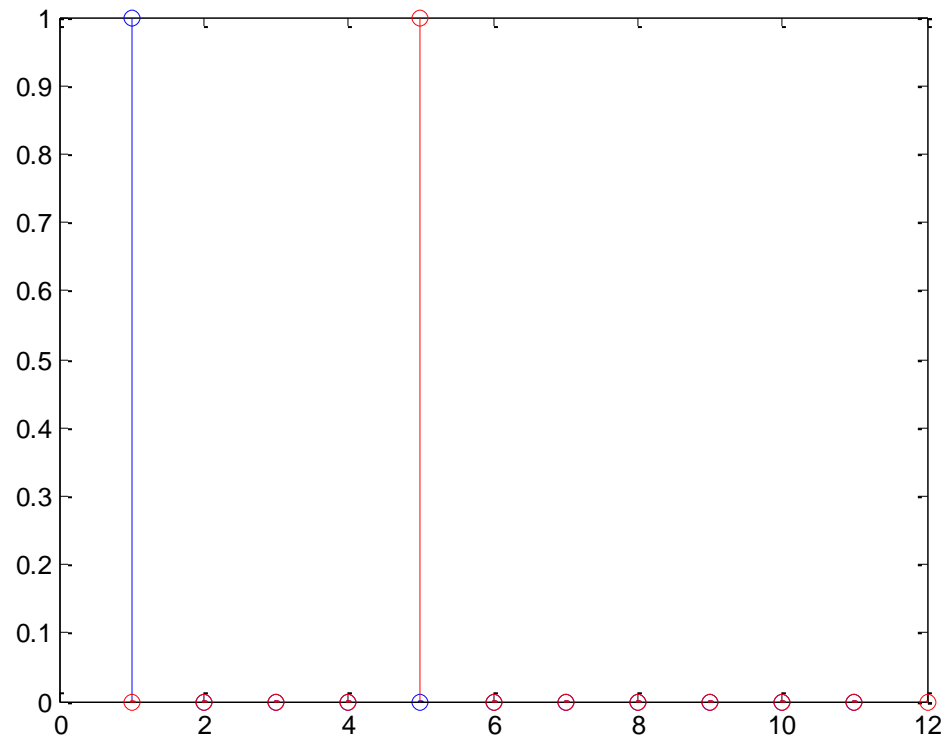
Impulse response

4) Non-efficient Implementation of Two-channel Filter Bank



Input (blue) and output (red) of the filter bank

5) Efficient Implementation of Two-channel Filter Bank



Input (blue) and output (red) of the filter bank