Table of Contents

Pulse Shaping 1
Parameters 1
FIR filters 1

Pulse Shaping

Time and frequency representation of the following signals: - Rectangular pulse. - Sinc. - Rised cosine. - Square root rised cosine (for Rx and Tx).

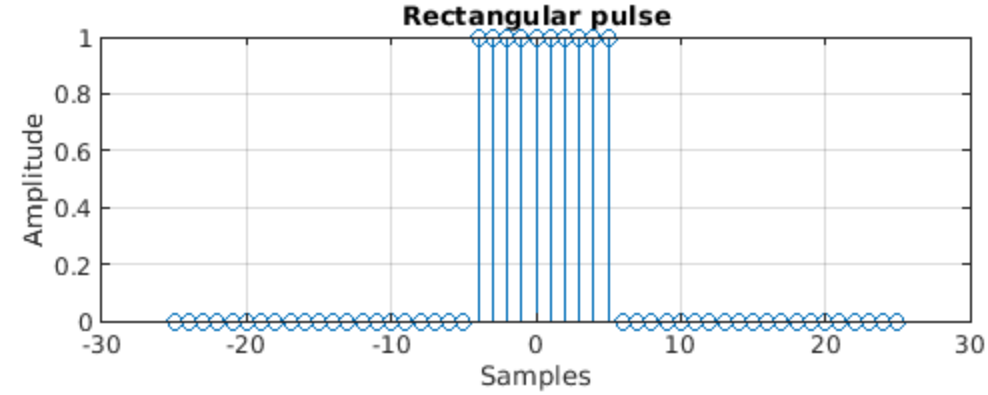
```
clc; clear; close all;
```

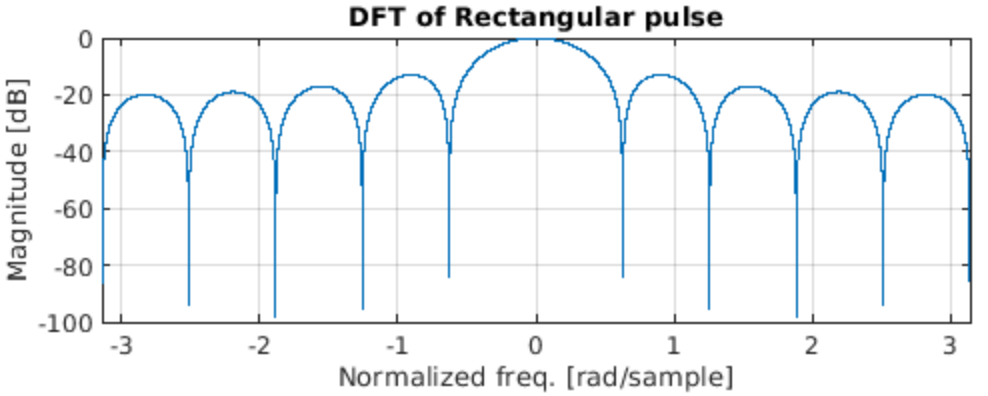
Parameters

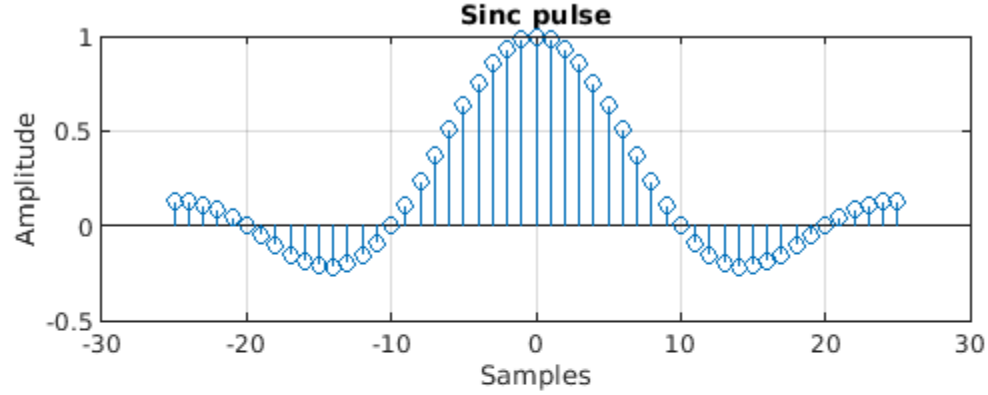
```
nTaps = 50;          % Taps for FIR filters
L = 10;              % Oversampling factor
alpha = 0.5;         % Alpha constant for raised cosine (0 < alpha < 1)
beta = 0.5;          % Beta constant for srrc (0 < beta < 1)
```

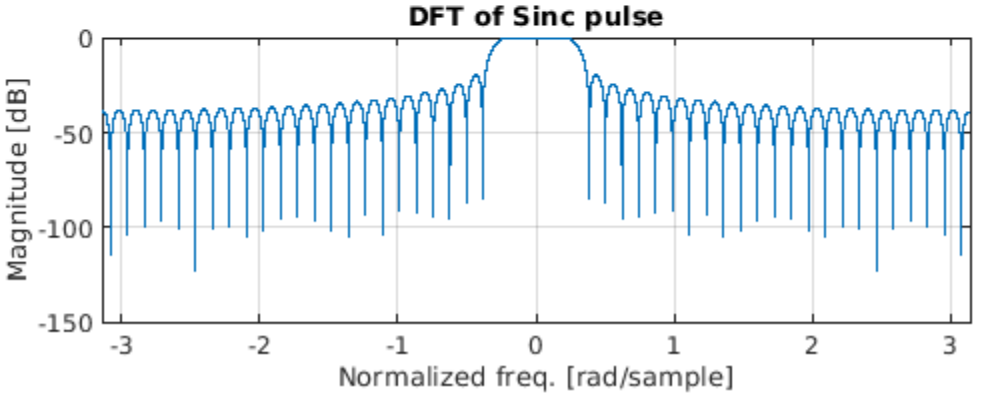
FIR filters

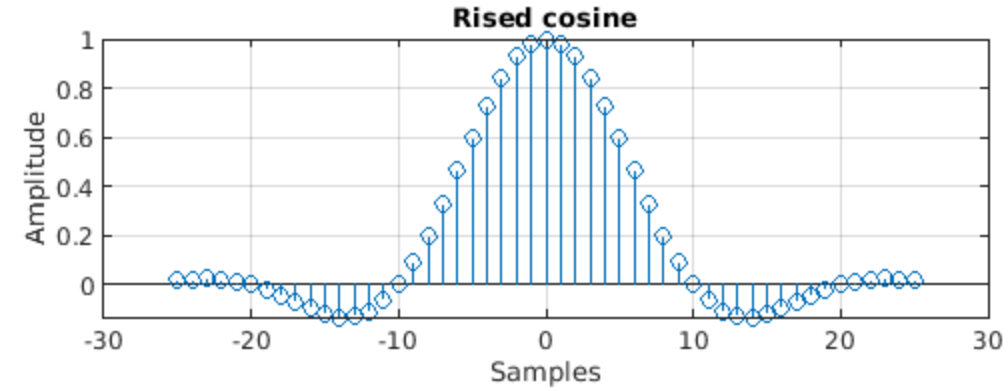
```
rect = Modulator.rect_pulse(L, nTaps);
sinc_p = Modulator.sinc_pulse(L, nTaps);
rc = Modulator.rc_pulse(alpha, L, nTaps);

srrc = Modulator.srrc_pulse(beta, L, nTaps);
%srrc = conv(srrc, srrc, "same"); % Apply two filters, Rx and Tx.

Scope.plot_fir_filter(rect, Title="Rectangular pulse");
Scope.plot_fir_filter(sinc_p, Title="Sinc pulse");
Scope.plot_fir_filter(rc, Title="Rised cosine");
Scope.plot_fir_filter(srrc, Title="Square root rised cosine");
```

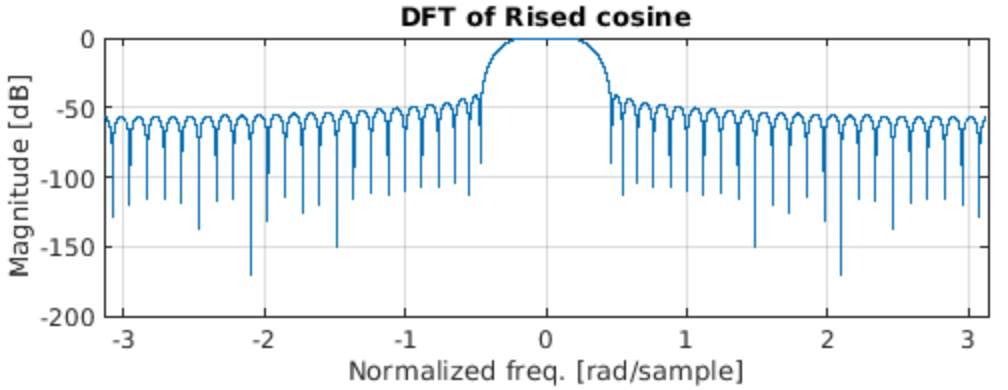

Rectangular pulse
Amplitude
Samples

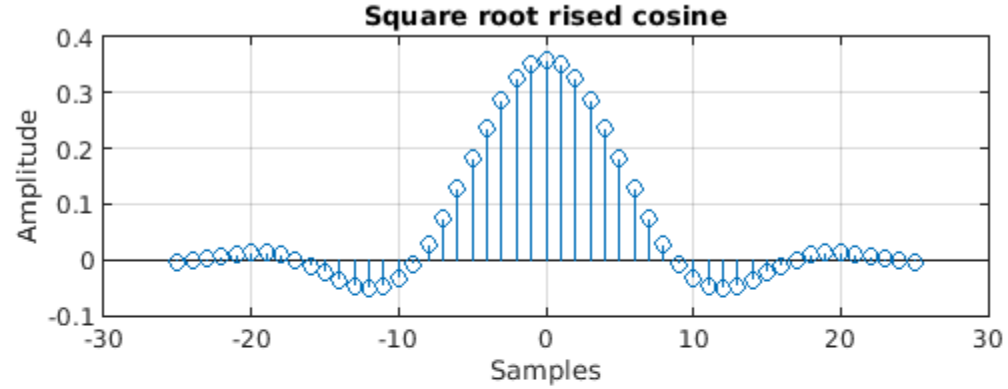

DFT of Rectangular pulse
Magnitude [dB]
Normalized freq. [rad/sample]

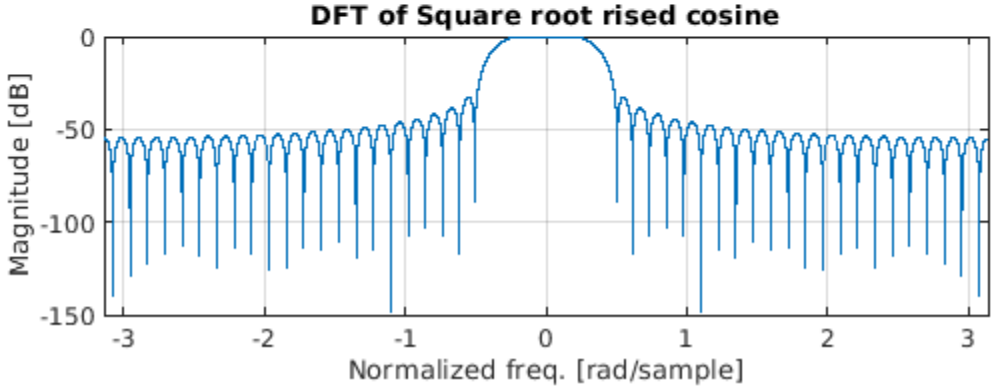

Sinc pulse
Amplitude
Samples


DFT of Sinc pulse
Magnitude [dB]
Normalized freq. [rad/sample]


Rised cosine
Amplitude
Samples


DFT of Rised cosine
Magnitude [dB]
Normalized freq. [rad/sample]


Square root rised cosine
Amplitude
Samples


DFT of Square root rised cosine
Magnitude [dB]
Normalized freq. [rad/sample]

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