Module 8.4 Discrete-Time Comb Filter to Eliminate Periodic Signal from Sinusoid This module generates a periodic signal with a fundamental frequency and up to 3 harmonics. It then uses a comb filter to eliminate the periodic signal, while retaining the sinusoid.

Original signal (time domain)

Value / time (s)

Original signal (freq domain)

Value / Frequency (Hz)

signal   filter

unit circle

zeros

Pole-Zero Plot

poles

Filtered signal (time domain)

Value / time (s)

Filtered (freq domain)

Value / Frequency (Hz)

Im{z} / Re{z}

# of interference harmonics

1   2   3

stop

STOP

f = 30 Hz

interference frequency

40   50   60   70   80

pole radius

0.5 0.6   0.8   0.99