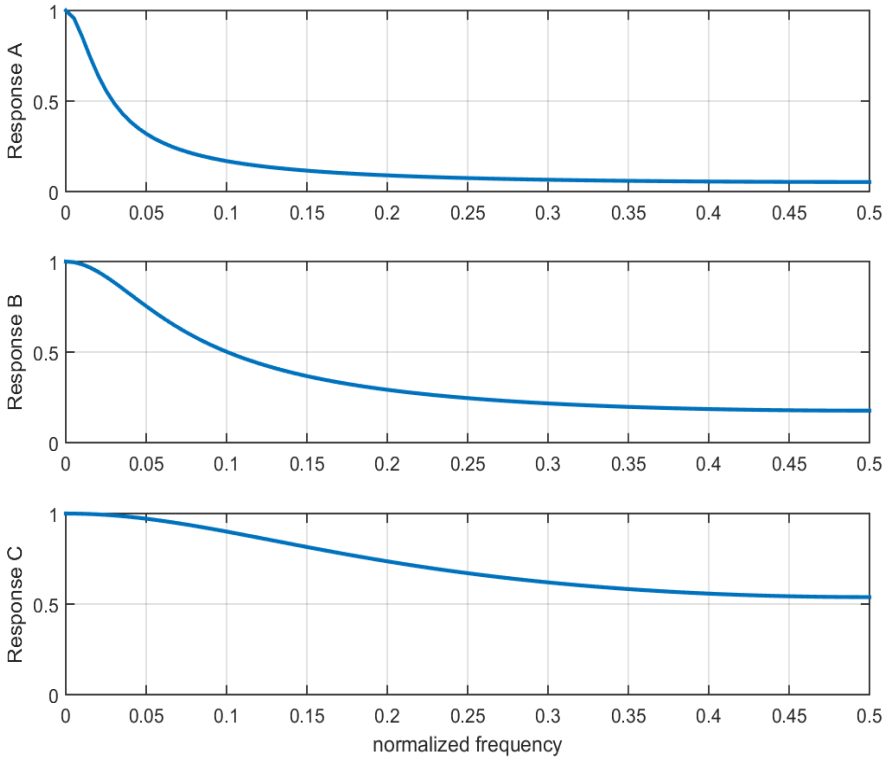
Consider three linear time invariant channels with step responses given by

$$s(n) = (1 - a^{n+1})u(n)$$

where $a = \begin{cases} 0.9 & \text{for channel 1} \\ 0.3 & \text{for channel 2} \\ 0.7 & \text{for channel 3} \end{cases}$

The frequency responses of these three channels are shown in random order below.



5.4 QUIZ QUESTION 1 (1/1 point)

Which frequency response corresponds to channel 3?

- frequency response A

5.5 Lab 3 - Frequency Response
Lab due Nov 16, 2015 at 15:30 UTC

- Topic 6: The Discrete Fourier Transform
- MATLAB download and tutorials
- MATLAB Sandbox

- frequency response B ✔
- frequency response C

EXPLANATION

This channel has a low pass characteristic, where the cutoff frequency varies monotonically with a. The channel 3 has an intermediate value of a between that of channels 1 and 2. Thus, the cutoff frequency should achieve an intermediate value. This corresponds to Response B.

You have used 1 of 2 submissions

5.4 QUIZ QUESTION 2 (1/1 point)

Which frequency response corresponds to channel 1?

- frequency response A ✔
- frequency response B
- frequency response C

EXPLANATION

This channel has a low pass characteristic, where the cutoff frequency varies monotonically with a. The channel 1 has a large a, meaning that the step response changes very slowly. This tends to strongly block high frequencies. If we examine the frequency response for large frequencies, Response A has the smallest values.

You have used 1 of 1 submissions