

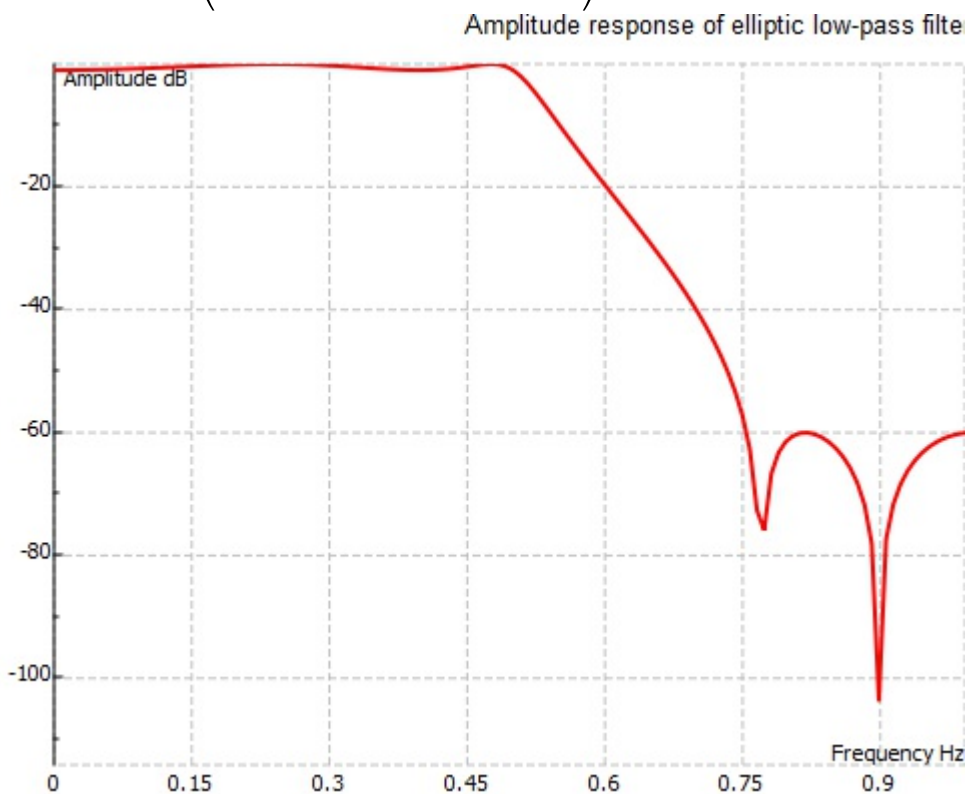
Elliptic filter - lowpass and highpass case

Elliptic filter is a very useful IIR filter. It has a equiripple magnitude response in both passband and stopband. In the following example we show how Elliptic filters can be designed for all four major types of filters. First, we start with a low pass filter of order 4, with passband edge at 0.5Hz, passband ripple at 1dB, stopband attenuation at 60 and sampling frequency at 2Hz.

```

Elliplo := elliplohi(4 , "low" , 0.5 , 1 , 60 , 2)  Design of low-pass filter
A1 := col2vec(Elliplo , 1)  Denominator coefficients
B1 := col2vec(Elliplo , 0)  Numerator coefficients
Flo := iirfreqres(A1 , B1 , 128 , 1)  Frequency response of the filter
fre := ynodes(z , 0 , 1 - 1/128 , 128)  Frequency response

Flog := join mat cols( fre , 20 log10(fabs(Flo)))  Graph of amplitude response of designed filter
    
```



High-pass filter

Next, we design a high pass filter of order 4, with passband edge at 500Hz, passband ripple at 1dB, stopband attenuation at 60 dB and sampling frequency at 2000Hz

```

Elliphi := elliplohi(4 , "high" , 500 , 1 , 60 , 2000)  Filter design
A2 := col2vec(Elliphi , 1)
B2 := col2vec(Elliphi , 0)
Fhi := iirfreqres(A2 , B2 , 128 , 1)

Flhi := join mat cols( fre , 20 log10(fabs(Fhi)))  Amplitude response of high-pass elliptic filter
    
```

Amplitude response of high-pass elliptic filter

