Subject: Re: How to perform the 1-D signal filter?
Posted by jdu on Sat, 02 Feb 2008 19:27:47 GMT
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There is another question about the filter example.
The code of example is below:

```
; Time domain
freq1=2.
freq2=3.
freq3=4.
dtime=0.1
ntime=1000

time=dtime*findgen(ntime)
signal=sin(2*!pi*freq1*time)+sin(2*!pi*freq2*time)+sin(2*!
pi*freq3*time)

; Time domain Filter
f_low = 0
f_high = 2.5
timefilter = DIGITAL_FILTER(f_low*2*dtime, f_high*2*dtime, 50.,40)
signal_1=convol(signal,timefilter)
fsignal_1=fft(signal_1)


; Frequency domain
nfreq=ntime/2+1

freq=findgen(nfreq)/(dtime*ntime)
fsignal=fft(signal)

; Frequency domain filter (instead of time domain filter)
steep=100.d
y=1./(1.+(freq/f_high)^steep)
freqfilter=[y[0:nfreq-2],reverse(y[0:nfreq-2])]
fsignal_2=fsignal*freqfilter
signal_2=fft(fsignal_2,1)

window,/free
plot,freq,abs(fsignal[0:nfreq-1])^2,title='Orignal
Data',xtitle='frequency',ytitle='spectrum'
window,/free
plot,freq,abs(fsignal_1[0:nfreq-1])^2,title='Filter in Time
domain',xtitle='frequency',ytitle='spectrum'
window,/free
plot,freq,abs(fsignal_2[0:nfreq-1])^2,title='Filter in Frequency
domain',xtitle='frequency',ytitle='spectrum'
```

I found that the the value of the peak in the second figure is lower than those in first and third figure. Why does it happen?
And the filtered signal_1 is not equal to the real part of signal_2. Does it mean that the filter in time domain is not exactly equal to it in frequency domain?

Du
