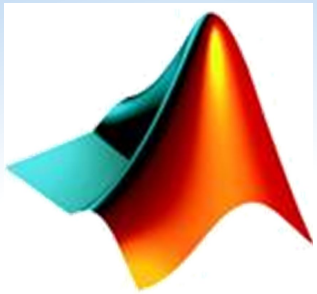


Cihan university - Erbil

COMMUNICATION AND COMPUTER ENGINEERING DEPARTMENT

SPTOOL IN MATLAB PROGRAM

interactive digital signal processing tool in matlab.

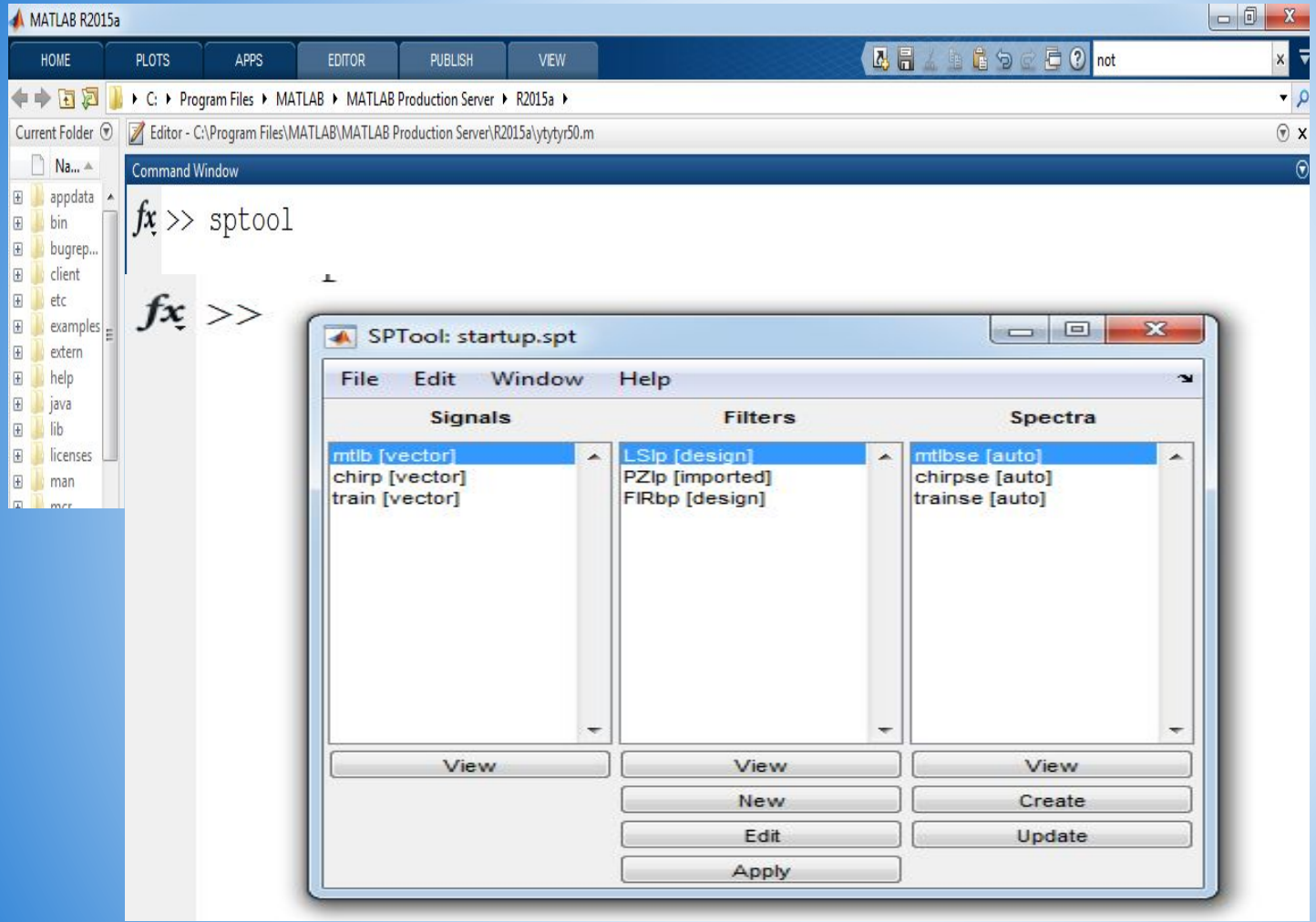
by

asst. lecture

Adil Hussein Mohammed

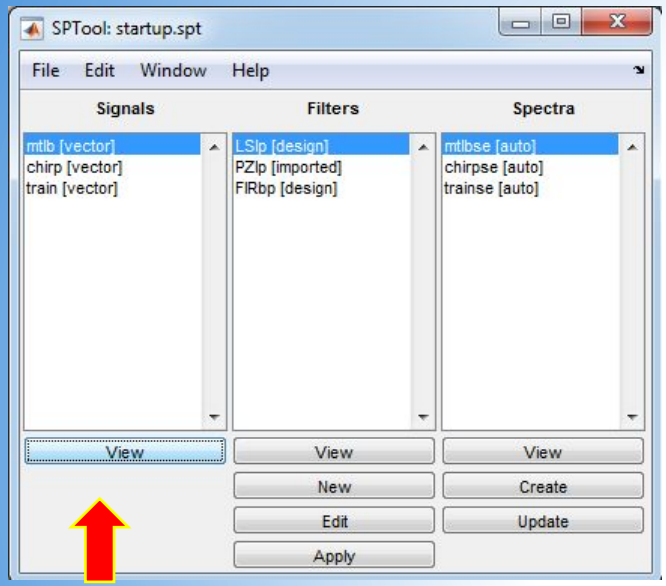
20/2/2020

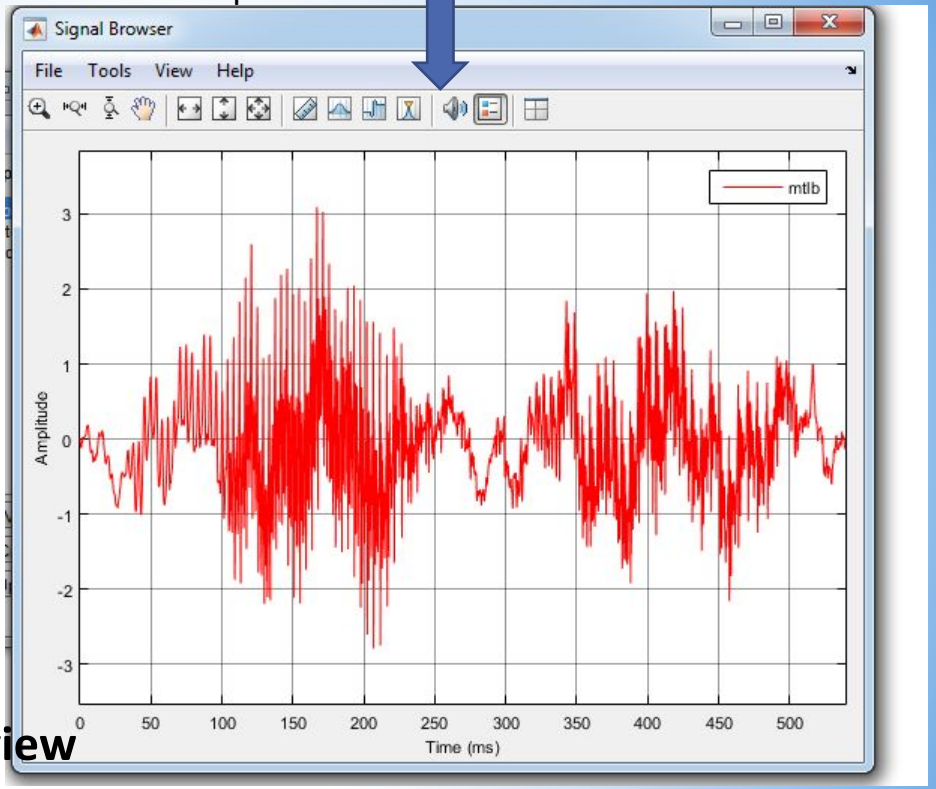
The command, sptool, opens SPTool, a suite of four tools: Signal Browser, Filter Design and Analysis Tool, FV
Tool, and Spectrum Viewer.
These tools provide access to many of the signal, filter, and spectral analysis functions in the toolbox.
When you type sptool at the command line, the SPTool suite opens.


MATLAB R2015a
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
not
C: ▸ Program Files ▸ MATLAB ▸ MATLAB Production Server ▸ R2015a ▸
Current Folder
Editor - C:\Program Files\MATLAB\MATLAB Production Server\R2015a\ytytyr50.m
Command Window
>> sptool
>>
SPTool: startup.spt
File Edit Window Help
Signals
Filters
Spectra
mtlb [vector]
chirp [vector]
train [vector]
LSIp [design]
PZIp [imported]
FIRbp [design]
mtlbse [auto]
chirpse [auto]
trainse [auto]
View
View
New
Edit
Apply
View
Create
Update

What we have in signals field

You can listen to the voice chirp

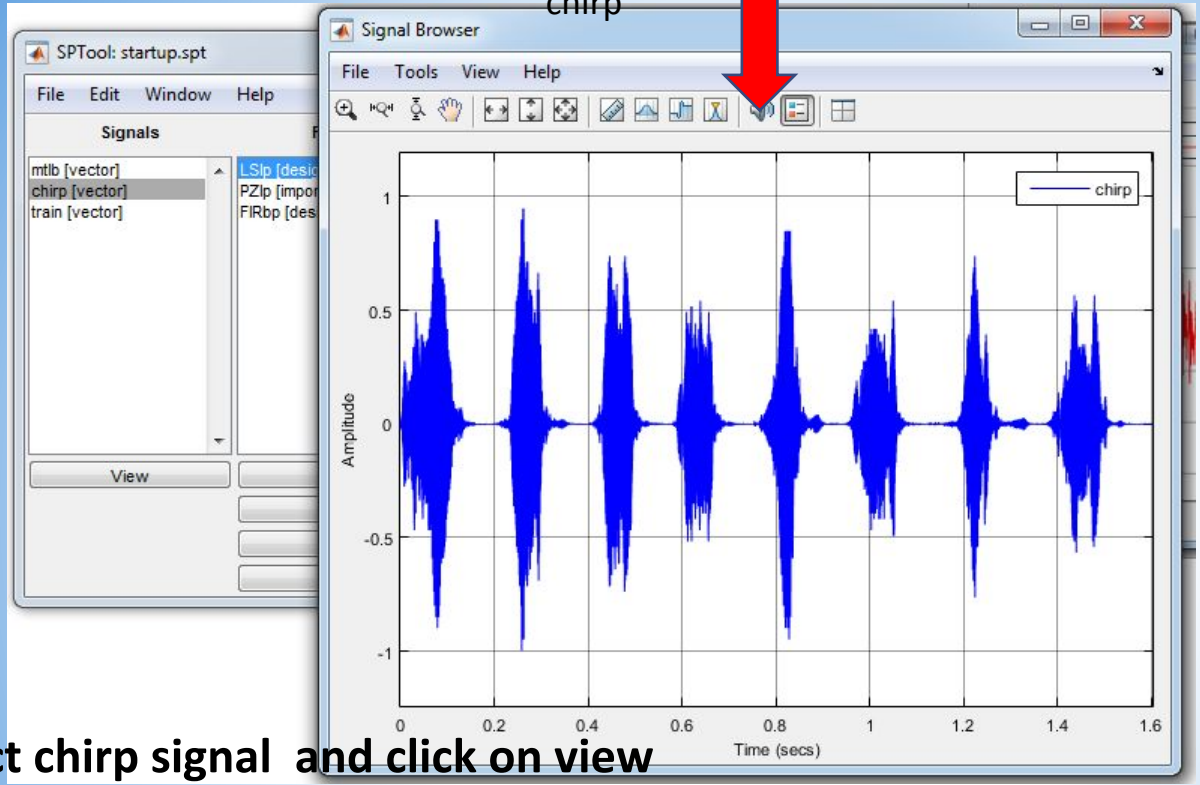




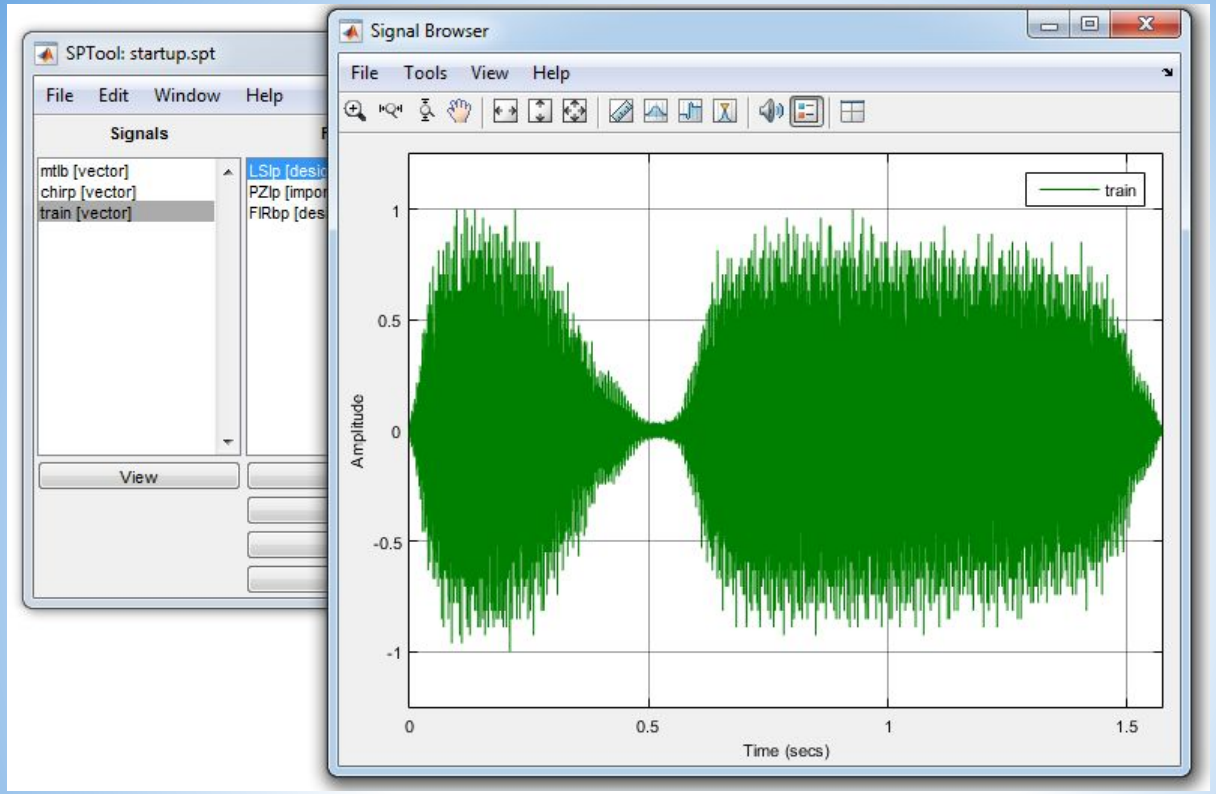
Select matlab signal and click on view

Time domain analysis

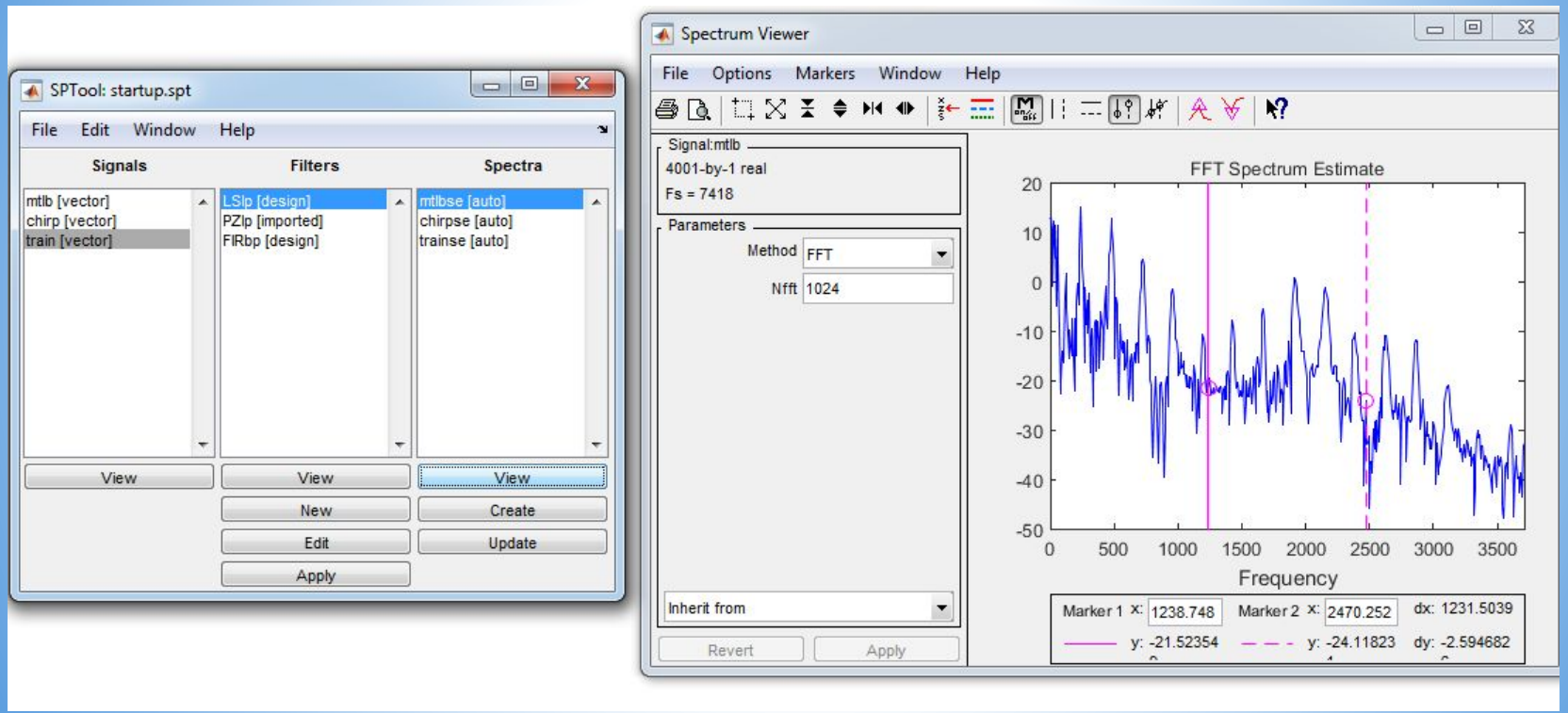
You can listen to the voice chirp



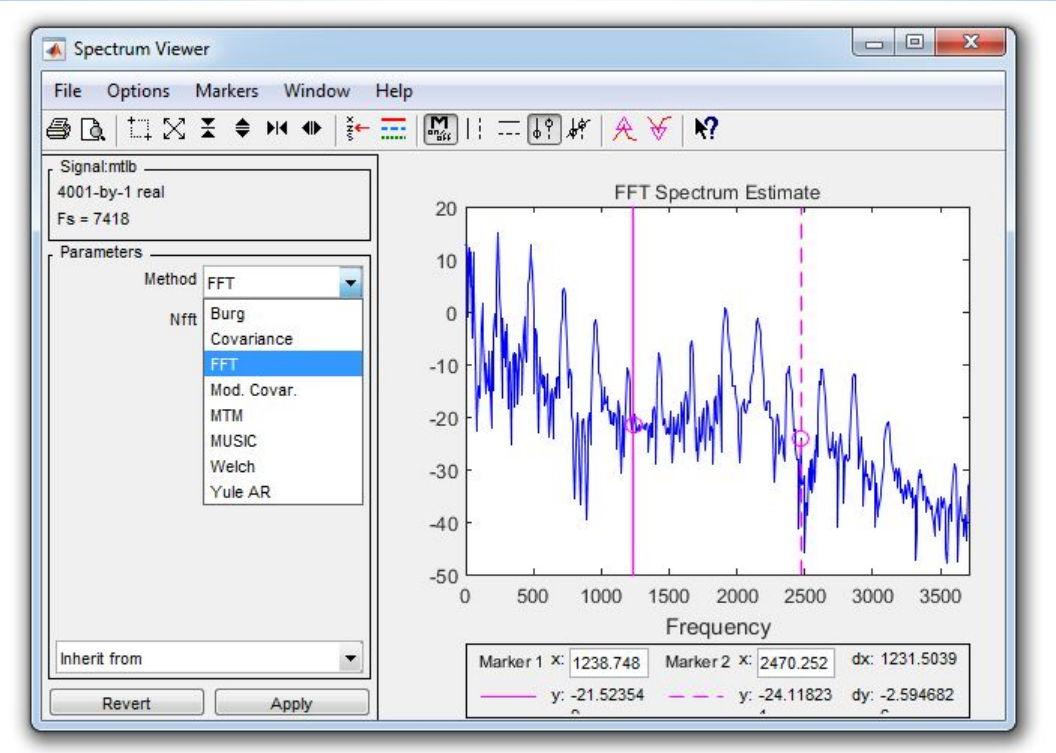
Select chirp signal and click on view


SPTool: startup.spt
File Edit Window Help
Signals
mtlb [vector]
chirp [vector]
train [vector]
LSlp [desi
PZlp [impor
FIRbp [des
View
Signal Browser
File Tools View Help
train
Amplitude
Time (secs)
1
0.5
0
-0.5
-1
0
0.5
1
1.5

Frequency domain analysis



Types of analysis



Spectrum Viewer

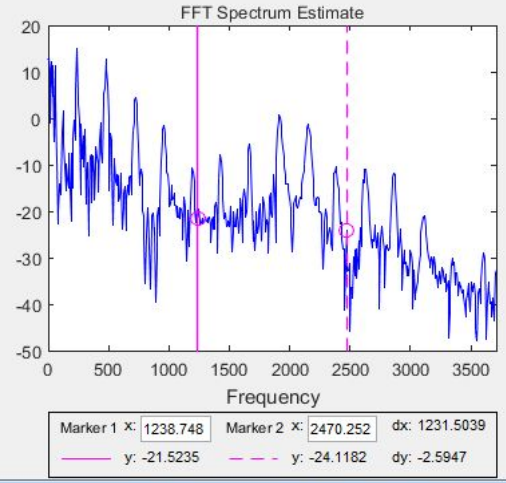
File Options Markers Window Help

Signal:mtlb
4001-by-1 real
Fs = 7418

Parameters
Method FFT
Nfft 1024

Inherit from

Revert Apply



Marker 1 x: 1238.748 Marker 2 x: 2470.252 dx: 1231.5039
y: -21.5235 y: -24.1182 dy: -2.5947

Spectrum Viewer

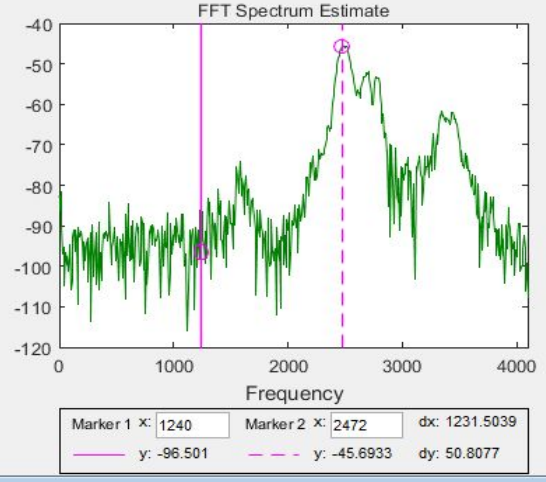
File Options Markers Window Help

Signal:chirp
13129-by-1 real
Fs = 8192

Parameters
Method FFT
Nfft 1024

Inherit from

Revert Apply



Marker 1 x: 1240 Marker 2 x: 2472 dx: 1231.5039
y: -96.501 y: -45.6933 dy: 50.8077

Spectrum Viewer

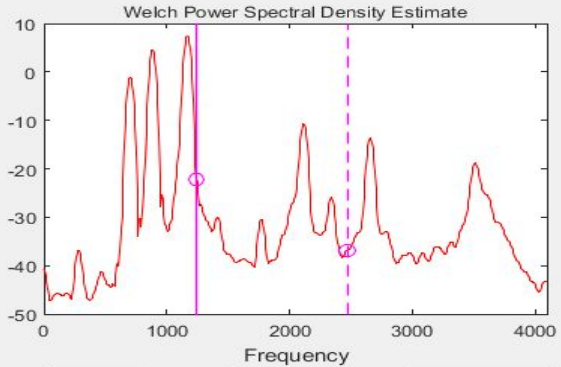
File Options Markers Window Help

Signal:train
12880-by-1 real
Fs = 8192

Parameters
Method FFT
Nfft 1024

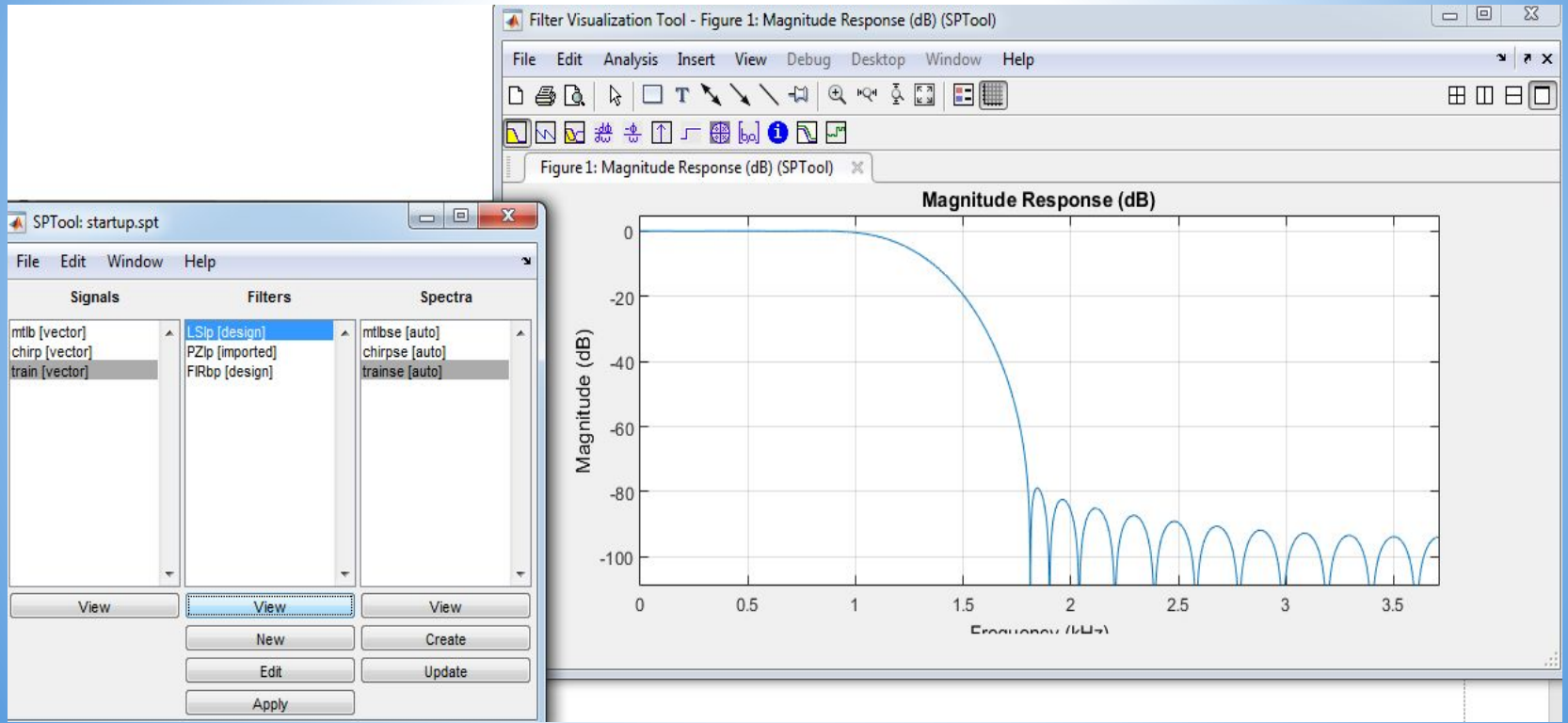
Inherit from

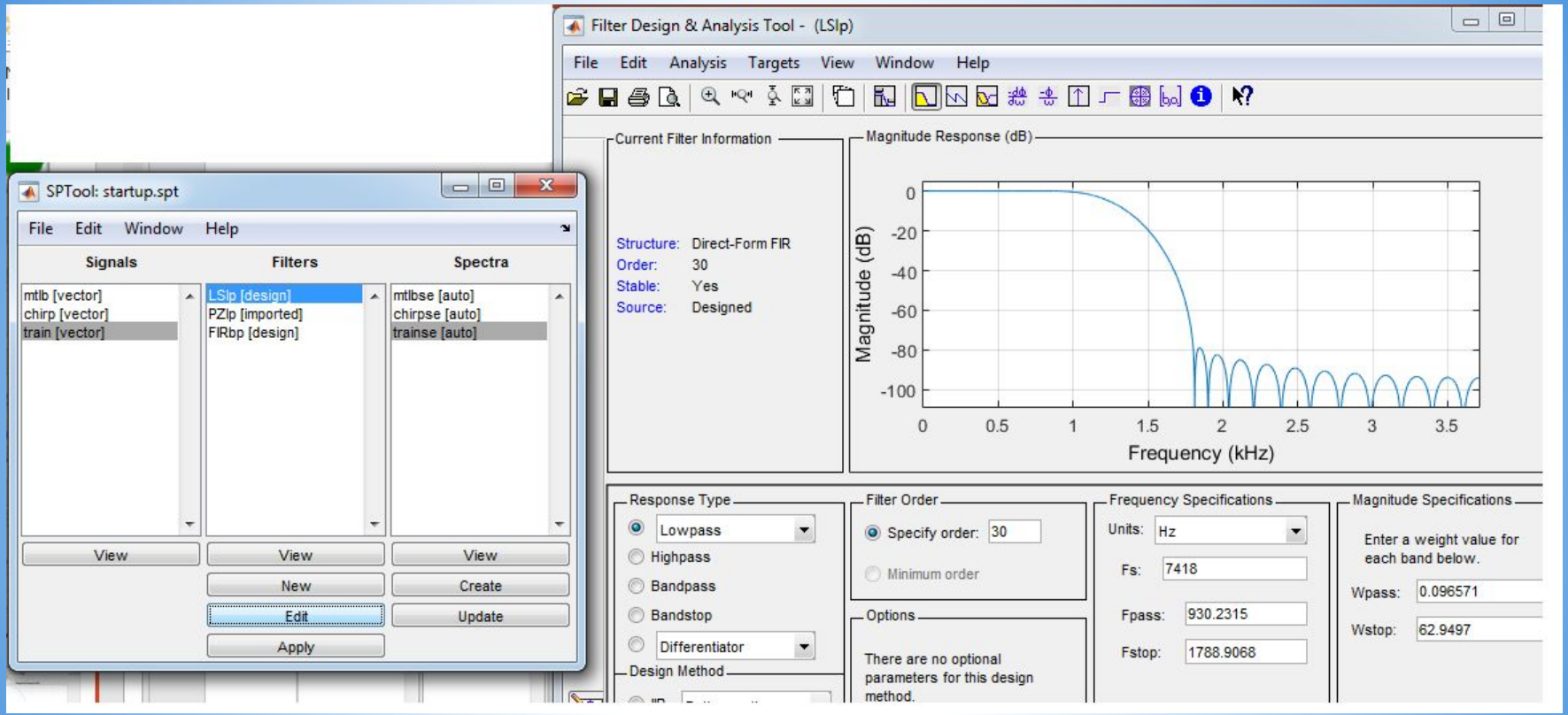
Revert Apply



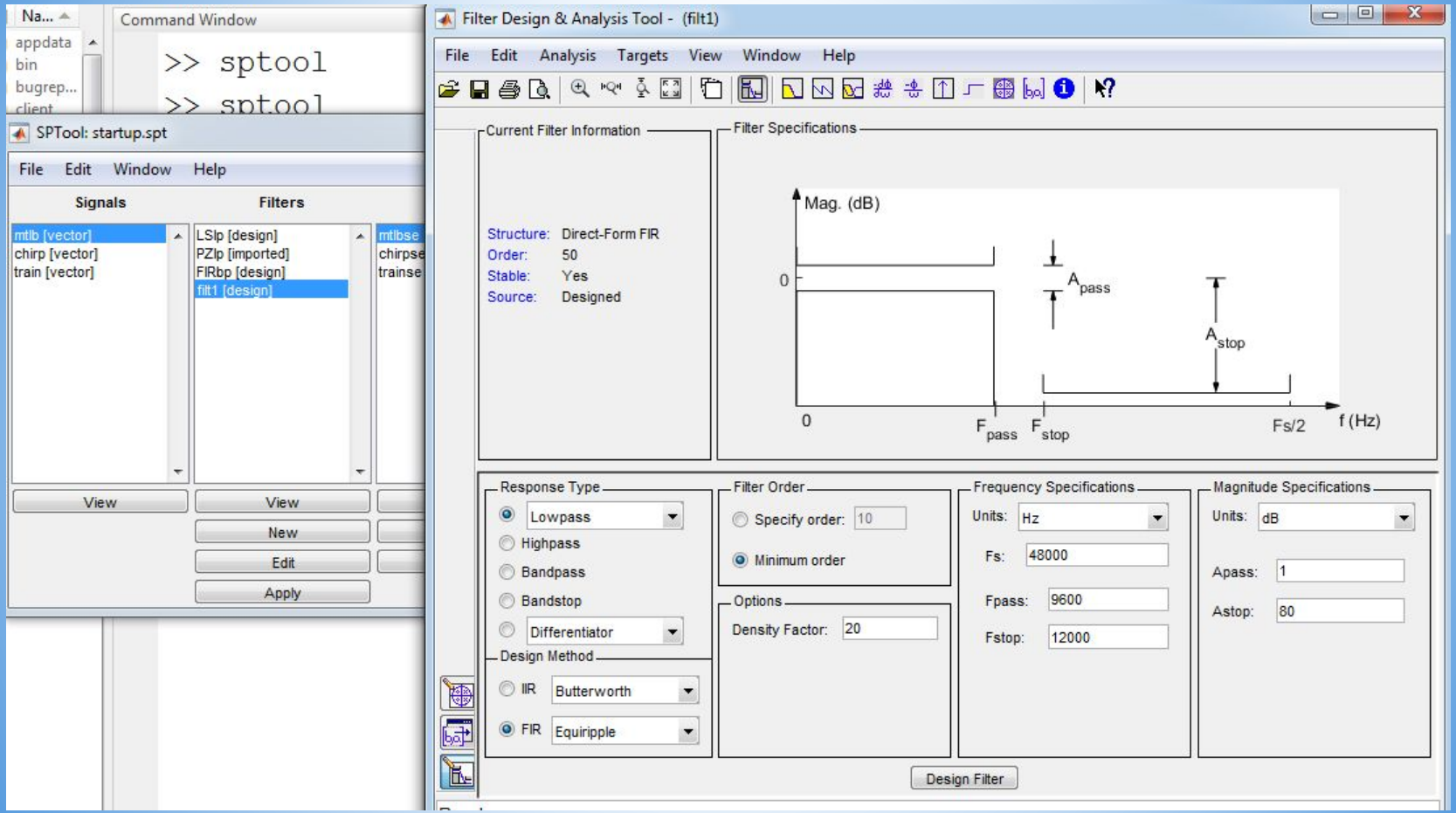
Marker 1 x: 1240 Marker 2 x: 2472 dx: 1231.5039
y: -22.1658 y: -36.8592 dy: -14.6935

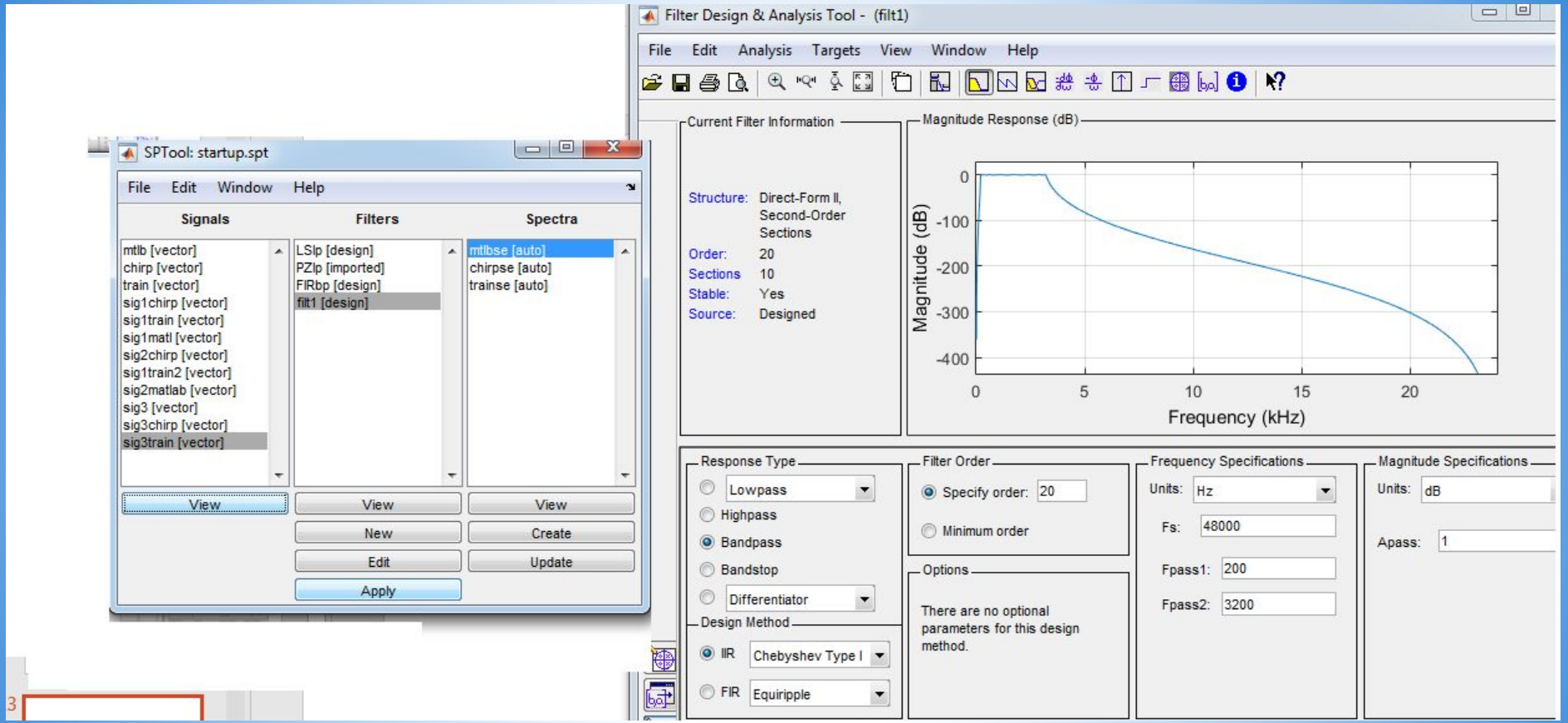
Filter design

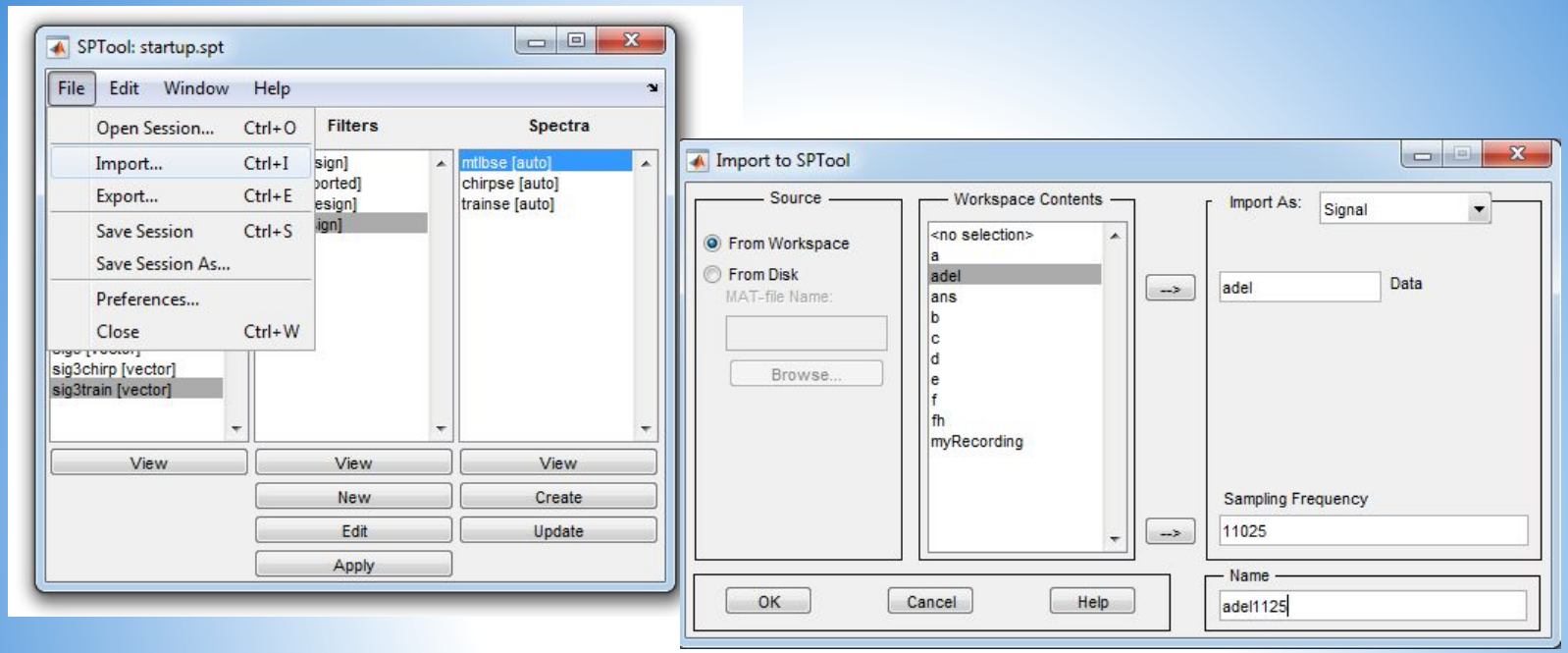


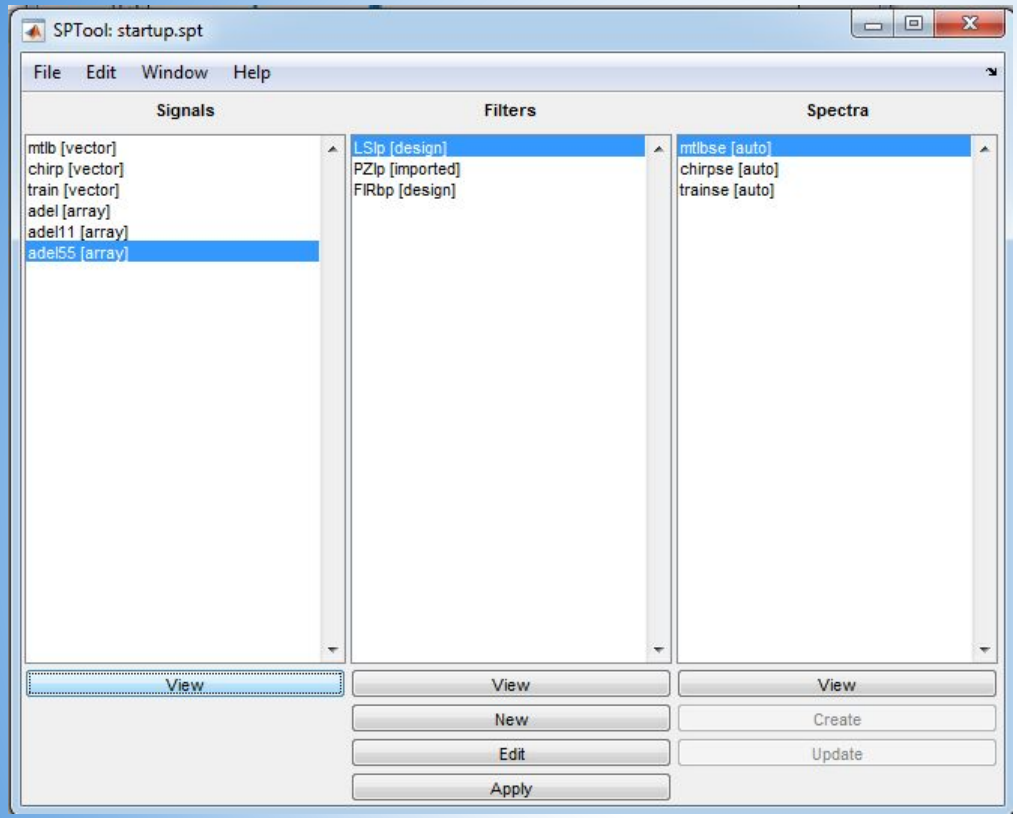

SPTool: startup.spt
File Edit Window Help
Signals
Filters
Spectra
mtlb [vector]
chirp [vector]
train [vector]
LSlp [design]
PZlp [imported]
FIRbp [design]
mtlbse [auto]
chirpse [auto]
trainse [auto]
View
View
View
New
Create
Edit
Update
Apply
Filter Design & Analysis Tool - (LSlp)
File Edit Analysis Targets View Window Help
Current Filter Information
Structure: Direct-Form FIR
Order: 30
Stable: Yes
Source: Designed
Magnitude Response (dB)
Magnitude (dB)
0
-20
-40
-60
-80
-100
0 0.5 1 1.5 2 2.5 3 3.5
Frequency (kHz)
Response Type
Lowpass
Highpass
Bandpass
Bandstop
Differentiator
Design Method
Filter Order
Specify order: 30
Minimum order
Options
There are no optional parameters for this design method.
Frequency Specifications
Units: Hz
Fs: 7418
Fpass: 930.2315
Fstop: 1788.9068
Magnitude Specifications
Enter a weight value for each band below.
Wpass: 0.096571
Wstop: 62.9497

New filter design



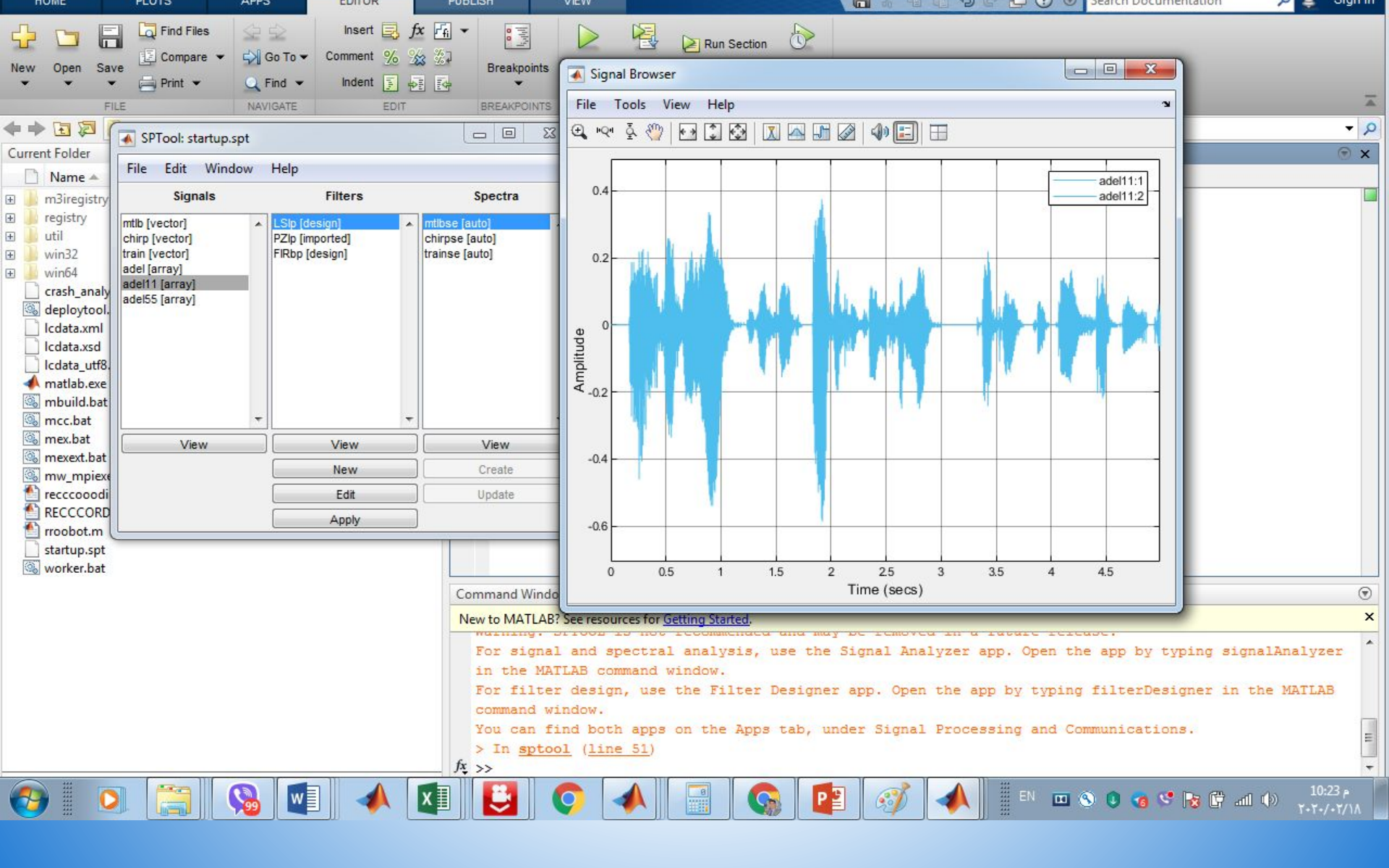

SPTool: startup.spt
File Edit Window Help
Signals
Filters
Spectra
mtlb [vector]
chirp [vector]
train [vector]
sig1chirp [vector]
sig1train [vector]
sig1matl [vector]
sig2chirp [vector]
sig1train2 [vector]
sig2matlab [vector]
sig3 [vector]
sig3chirp [vector]
sig3train [vector]
LSlp [design]
PZlp [imported]
FIRbp [design]
filt1 [design]
mtlbse [auto]
chirpse [auto]
trainse [auto]
View
View
View
New
Create
Edit
Update
Apply
Filter Design & Analysis Tool - (filt1)
File Edit Analysis Targets View Window Help
Current Filter Information
Structure: Direct-Form II, Second-Order Sections
Order: 20
Sections 10
Stable: Yes
Source: Designed
Magnitude Response (dB)
Magnitude (dB)
0
-100
-200
-300
-400
0
5
10
15
20
Frequency (kHz)
Response Type
Lowpass
Highpass
Bandpass
Bandstop
Differentiator
Design Method
IIR
Chebyshev Type I
FIR
Equiripple
Filter Order
Specify order: 20
Minimum order
Options
There are no optional parameters for this design method.
Frequency Specifications
Units: Hz
Fs: 48000
Fpass1: 200
Fpass2: 3200
Magnitude Specifications
Units: dB
Apass: 1


SPTool: startup.spt
File
Edit
Window
Help
Open Session... Ctrl+O
Import... Ctrl+I
Export... Ctrl+E
Save Session Ctrl+S
Save Session As...
Preferences...
Close Ctrl+W
Filters
Spectra
mtlbse [auto]
chirpse [auto]
trainse [auto]
sig3chirp [vector]
sig3train [vector]
View
View
View
New
Create
Edit
Update
Apply
Import to SPTool
Source
From Workspace
From Disk
MAT-file Name:
Browse...
Workspace Contents
<no selection>
a
adel
ans
b
c
d
e
f
fh
myRecording
-->
-->
Import As:
Signal
adel
Data
Sampling Frequency
11025
Name
adel1125
OK
Cancel
Help



Saving file with sampling frequency

Life work with matlab program 2019


Signal Browser
File Tools View Help
adel11:1
adel11:2
Amplitude
Time (secs)
SPTool: startup.spt
File Edit Window Help
Signals
Filters
Spectra
mtlb [vector]
chirp [vector]
train [vector]
adel [array]
adel11 [array]
adel55 [array]
LSlp [design]
PZlp [imported]
FIRbp [design]
mtlbse [auto]
chirpse [auto]
trainse [auto]
View
New
Edit
Apply
Create
Update
Current Folder
Name
Command Window
New to MATLAB? See resources for Getting Started.
For signal and spectral analysis, use the Signal Analyzer app. Open the app by typing signalAnalyzer in the MATLAB command window.
For filter design, use the Filter Designer app. Open the app by typing filterDesigner in the MATLAB command window.
You can find both apps on the Apps tab, under Signal Processing and Communications.
> In sptool (line 51)
>>

Thank you