

Filter User's Guide

Filter designs bandpass, high pass and low pass filters. Key points are:

- No input file is needed. The user enters input parameters pertaining to the individual filter design.
- Options are available to plot, print and/or save each filter graph.
- The output file, consisting of filter weights, is useful in conjunction with the Smooth program.
- Multiple filters may be created per program execution.

File Menu:

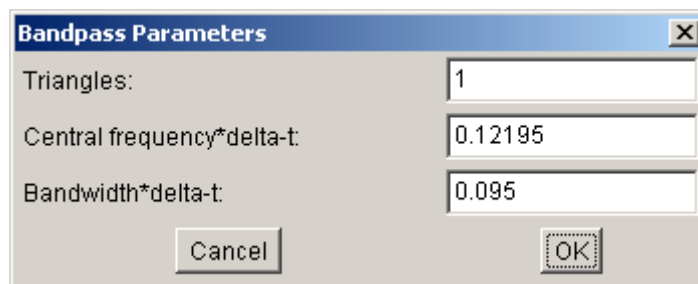
Bandpass Filter... Ctrl+1: Design a bandpass filter. The *Bandpass Parameters* dialog box (below) is displayed.

High Pass Filter... Ctrl+2: For a high pass filter, the *High/Low Pass Parameters* dialog box (below) is displayed.

Low Pass Filter... Ctrl+3: For a low pass filter, the *High/Low Pass Parameters* dialog box (below) is displayed.

Output Filter Data... Ctrl+O: Save the filter weights. A dialog box appears for writing an output file to disk.

Bandpass Parameters dialog box from Bandpass Filter menu item:

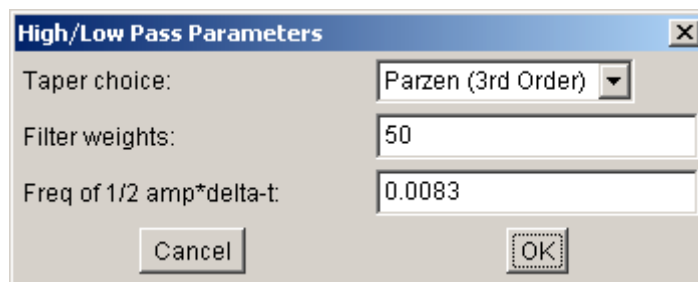
A screenshot of the 'Bandpass Parameters' dialog box. It has a title bar with 'Bandpass Parameters' and a close button. The dialog contains three input fields: 'Triangles:' with the value '1', 'Central frequency*delta-t:' with the value '0.12195', and 'Bandwidth*delta-t:' with the value '0.095'. At the bottom are 'Cancel' and 'OK' buttons.

Triangles: Enter the number of triangles to be used in the bandpass filter.

Central frequency*delta-t: Enter the central frequency of the filter. Multiply this value by Δt . The range is 0.0 to 0.5 since the Nyquist value, $1/(2\Delta t)$, results in the 0.5 maximum when multiplied by Δt .

Bandwidth*delta-t: Enter the bandwidth of the filter. Remember to multiply this value by Δt .

High/Low Pass Parameters dialog box from High or Low Pass Filter menu items:

A screenshot of the 'High/Low Pass Parameters' dialog box. It has a title bar with 'High/Low Pass Parameters' and a close button. The dialog contains three input fields: 'Taper choice:' with a dropdown menu showing 'Parzen (3rd Order)', 'Filter weights:' with the value '50', and 'Freq of 1/2 amp*delta-t:' with the value '0.0083'. At the bottom are 'Cancel' and 'OK' buttons.

Taper choice: Pick a taper choice from this popup menu. The choices are Lanczos (Sine), Lanczos-Squared, Parzen (3rd Order), Triangular and Tukey (Cosine).

Filter weights: Enter the number of filter weights for the high or low pass filter.

Freq of 1/2 amp*delta-t: Enter the frequency of half amplitude. Multiply this value by Δt .

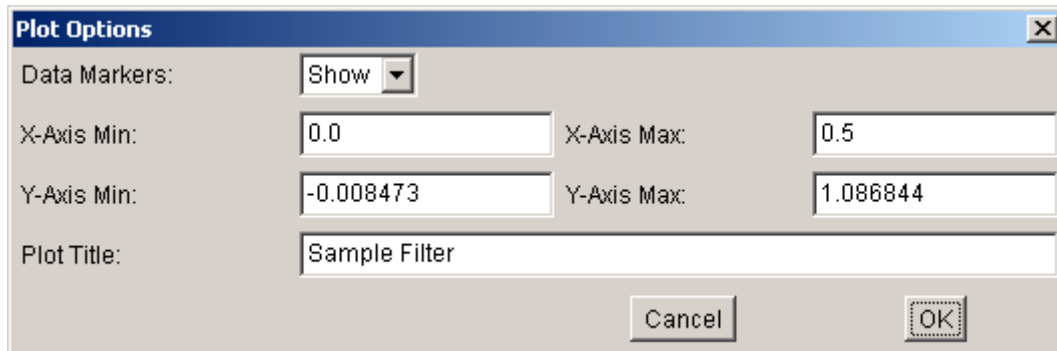
Graphs Menu:

Plot Filter... Ctrl+F: This plots the filter. The *Plot Options* dialog box (explained below) is displayed.

Save Graph/Printer Options... Ctrl+S: This option offers a full print dialog box, giving the user the ability to save the plot as a PDF, switch printers and change other properties. To save the graph as a PDF, choose a PDF writer from the dropdown list in the *Print* dialog box and proceed as if printing. At that point, the next dialog box allows the user to save the PDF to disk. Refer to section 6 in ReadMe.pdf for more information on obtaining a PDF writer.

Print Graph Ctrl+P: This menu item prints the plot, in landscape mode, to the default printer. No print dialog box is displayed. The graph is sent directly to the printer in the background without prompting the user.

Plot Options dialog box from Plot Filter menu item:



Data Markers:

Show: A plus sign (+) marks each data point on the plot.

Hide: No data points are marked. A smooth curve is plotted.

X-Axis and Y-Axis Min and Max: Change the defaults to view different axis ranges.

Plot Title: Enter a title to describe the filter plot.

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Revised: January 2012