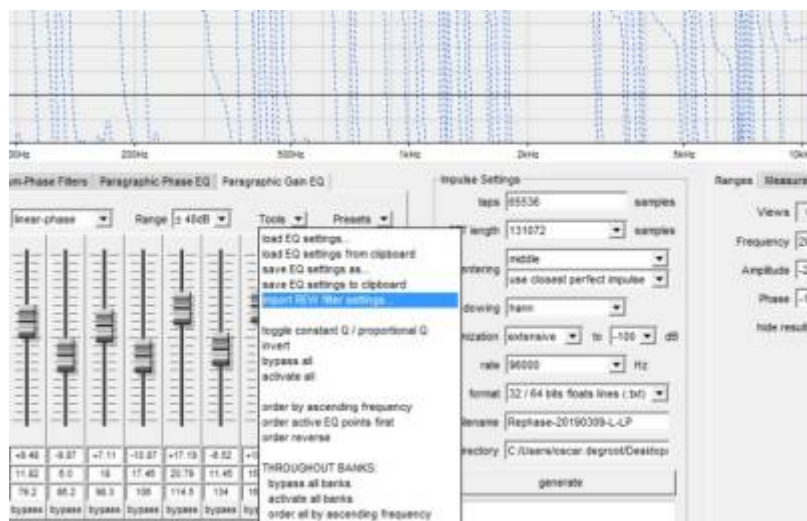


Rephase FIR Tuning

At this last stage we will create convolution files for each speaker to be used in our media player. For each individual stereo channel do the following steps:

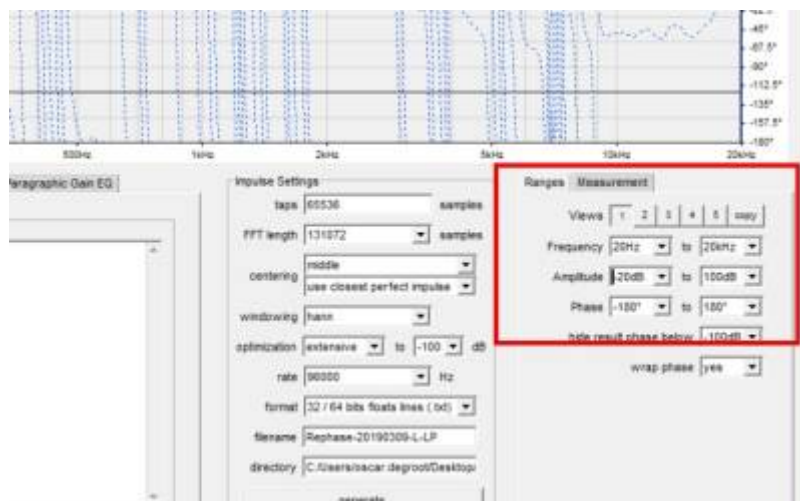
Import the REW filter settings

The EQ filter settings generated by REW can be loaded into Rephase by: Under the “Paraphrastic Gain EQ” tab choose “import REW filter settings ...” in the “tools” list. After loading, Rephase displays the effects on the EQ settings on the frequently displayed curve. The parametric EQ filters can be changed and optimized manually.



Adjust the visual ranges

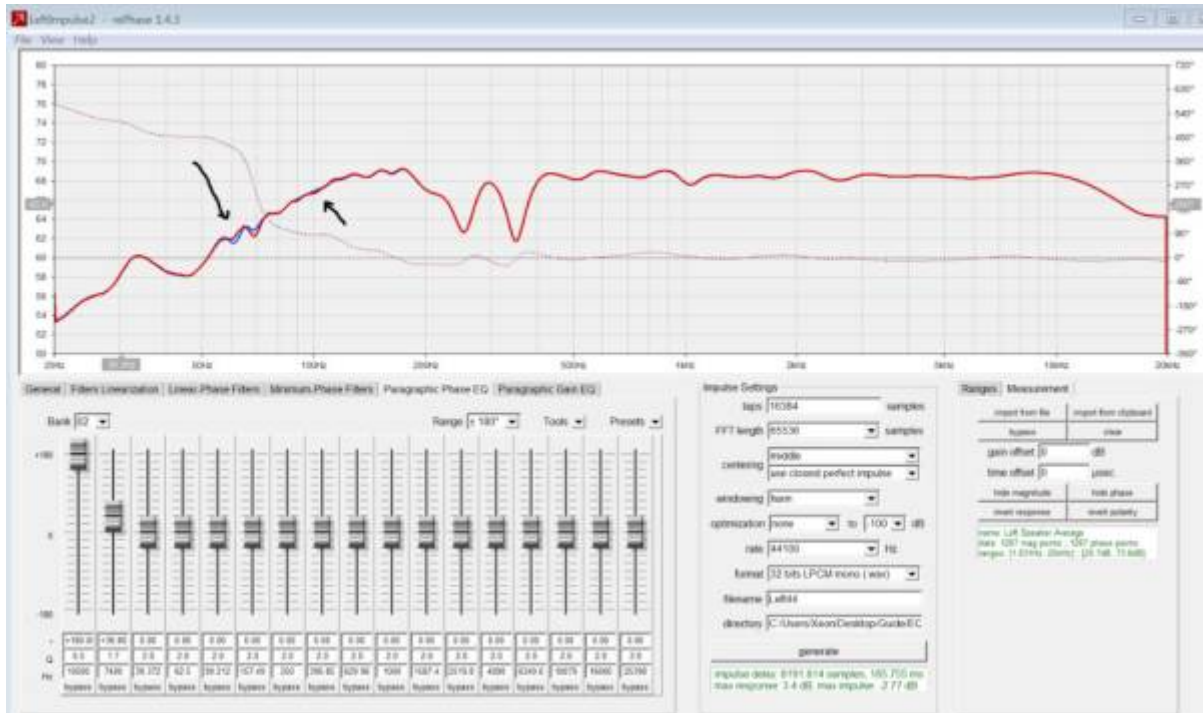
Sometimes the measurement graph from REW is not directly visible, because it falls outside the default visual range of Rephase window. Choose Ranges and adjust Frequency (20Hz - 20kHz) and Amplitude (-20 dB to 100 dB).



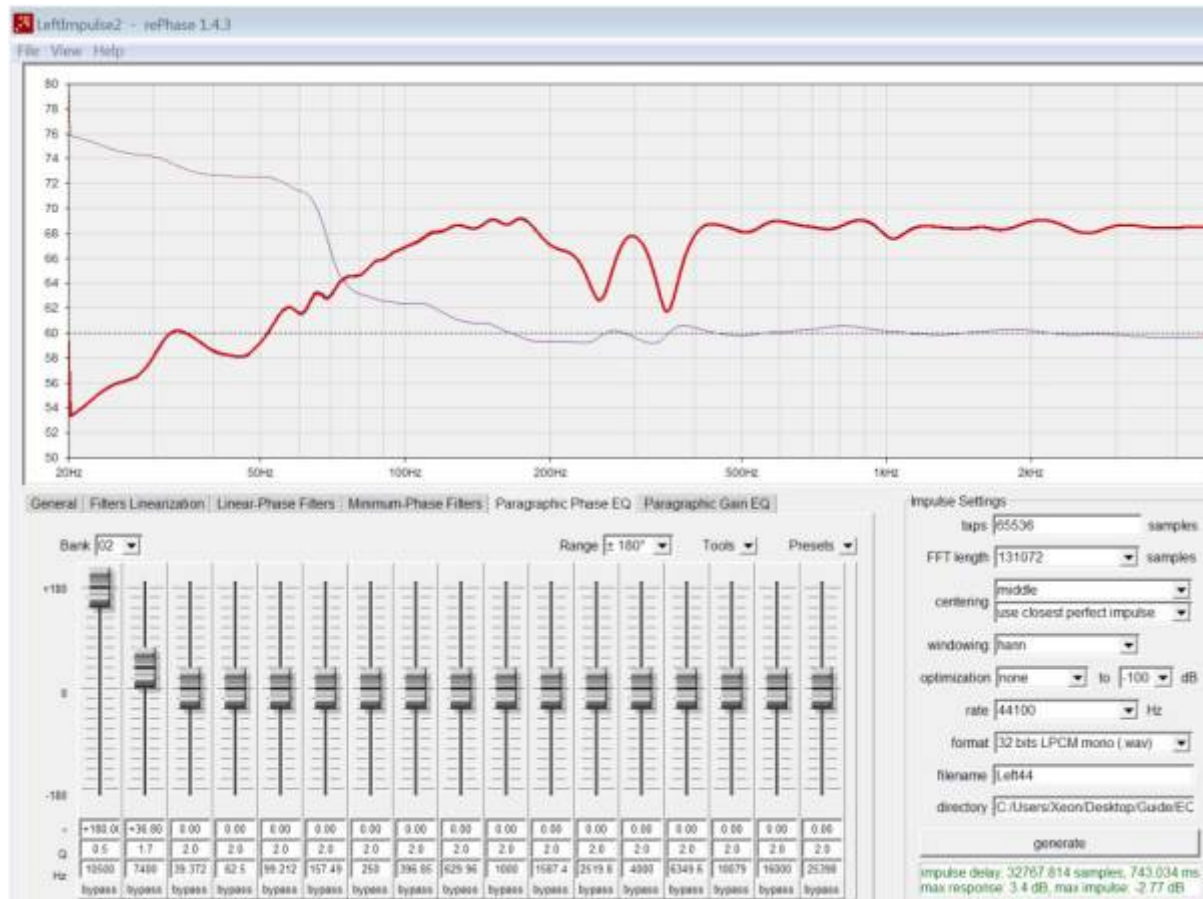
Configure parameters and generate filter

Try with minimal number of tabs and optimization. Configure following rePhase parameters, set:

- Taps : 16384
- FFT length : 65635
- Optimization : none



At the regions the black arrows point above, the number of taps of the filter were not enough to efficiently imitate the response curve so I will need to increase the number of taps. Number of taps should be multiples of 16384 and FFT length will increase automatically. I tried 32768 which gave a better result however only at 65536 it was satisfactory:

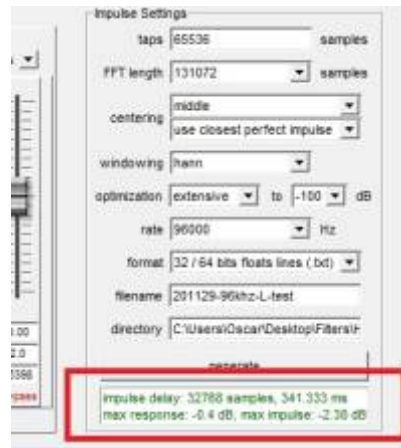


The more we increase the resolution, the longer the delay we will introduce in the final filters (743 ms in my case which you can see under “Impulse Settings” window written in green.

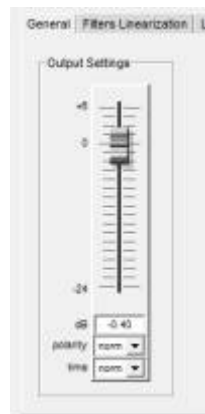
You could generate one such filter file for every sampling frequency you want to filter while listening to your library. 44.1 kHz will be enough for most CD rips however you should generate separate filters for each speaker for 48 kHz, 96 kHz and even 192 kHz if you are playing such high-resolution files. It is also possible to up-sample everything you play to a certain high resolution and generate just one filter for each speaker for this highest resolution.

Maximum Response Peak Output

Make sure that the target curve is completely below 0 dB. After clicking on the generate button the maximum gain value is shown. See the “max response: -0.4 dB” in the example below. This value we be above 0dB if there is an EQ settings with positive gain in one of the banks. If this value is greater than 0 dB, you will risk distortion. A good setting is between -0.5 dB and -1.0 dB.



This can be corrected by adjusting the potentiometer located under the first Rephase tab. Why is it absolutely necessary to mitigate? Imagine a power surge at both 100, 1000 and 10000 Hz, exactly at the same time when recording. With the absence of phasing, the three power peaks arrive shifted in time: We can easily have 300° of phase rotation between 100 and 10,000 Hz. With phasing, power peaks are added. The digital part will be more in demand, hence the absolute need to attenuate. The dynamics will be greater since the strong signal will be stronger, the weak signal will be weaker.



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