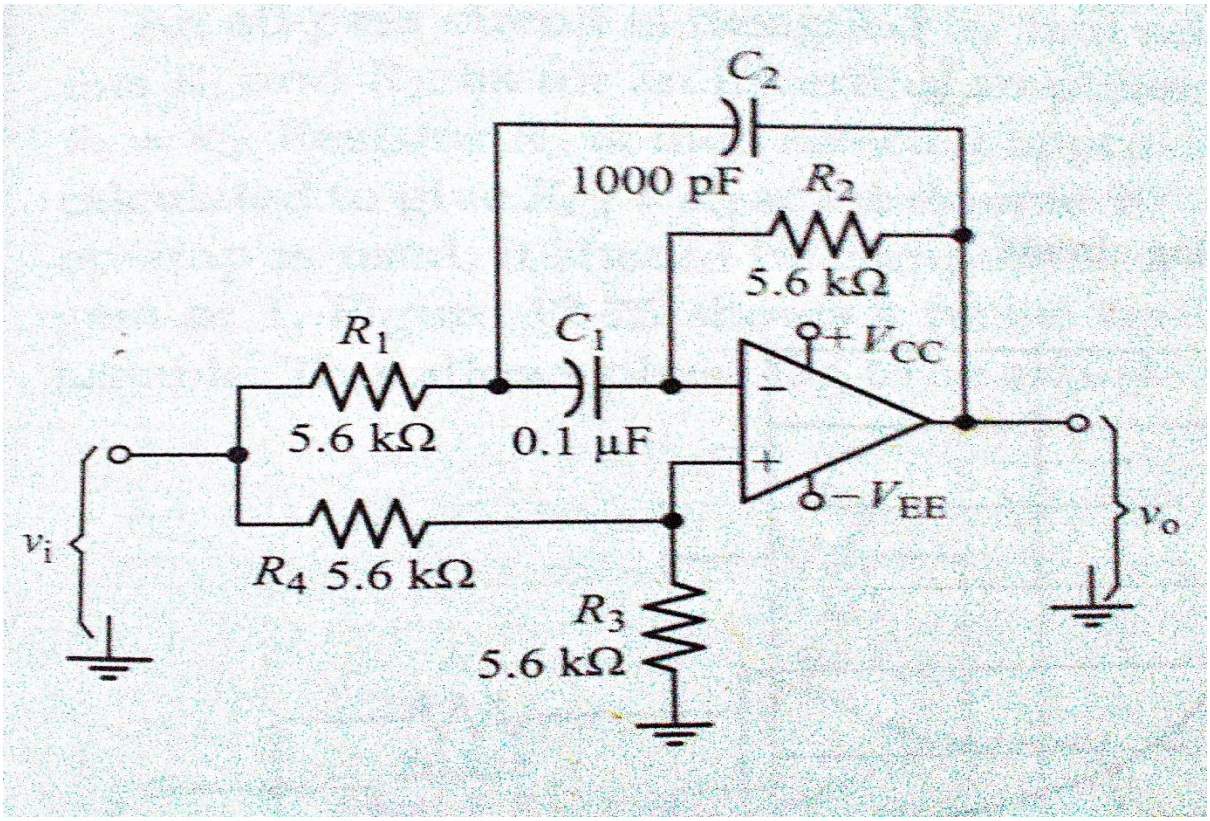
Title of the experiment:

Analysis of the frequency response of Notch filter

Theory:

A Notch filter is used to block a band of signal frequencies. It is simply inverse of band pass filter. One of the method of creating notch filter is to sum the output of a band pass filter with its own input signal. In this case the band pass filter must have the voltage gain of 1, and it must invert the input signal or else an inverting amplifier must be included. During the pass band of the band-pass circuit, its output equals $-v_i$, and so the two inputs to the summing circuit cancel, giving zero output voltage. Thus the combination has a notch frequency response.



Schematic Diagram:

The circuit schematic of notch filter in eSim is as shown below

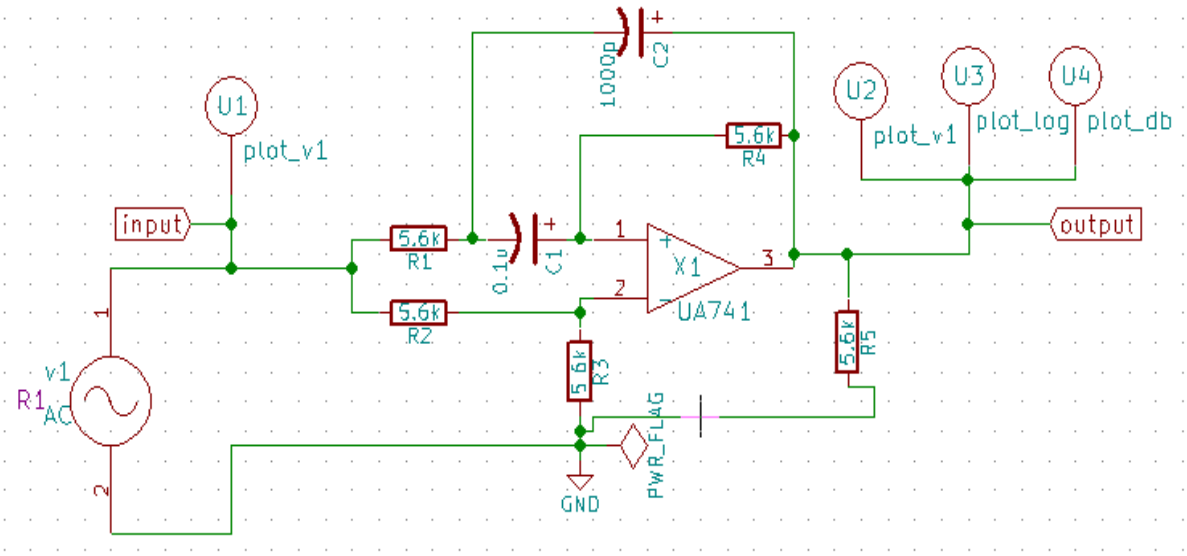


Figure 1: Notch filter

Simulation results:

1. Ngspice plots

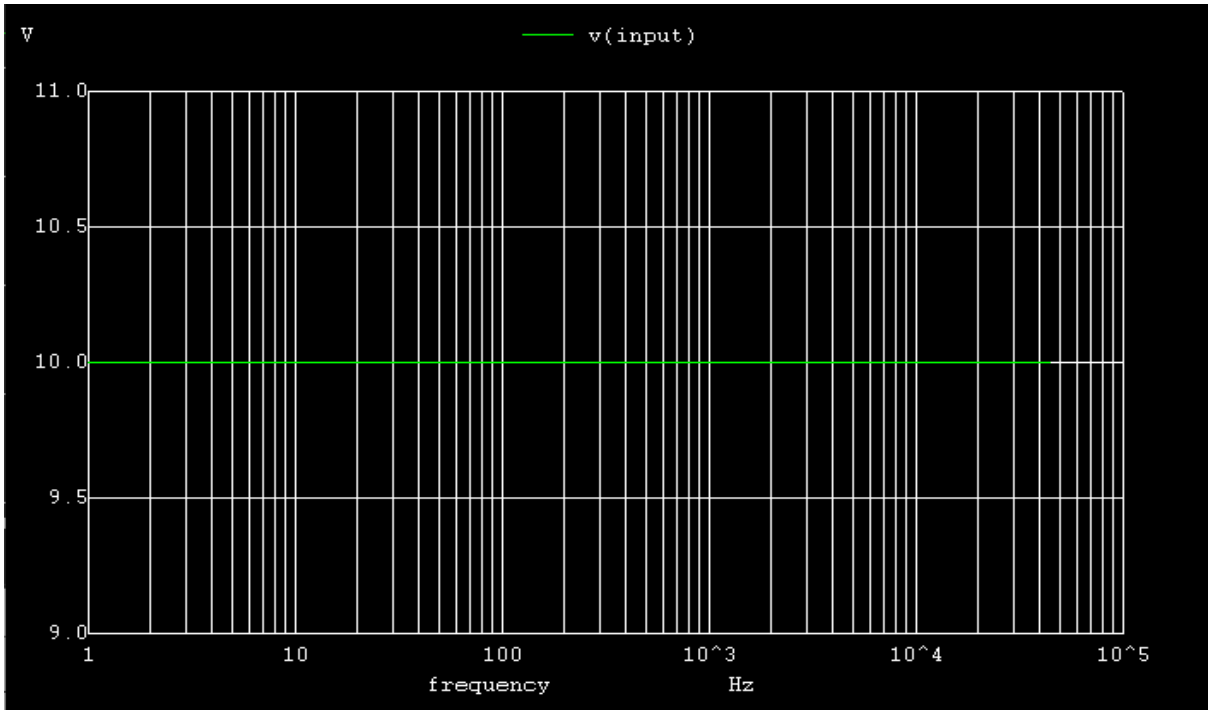


Figure 2: Ngspice input plot

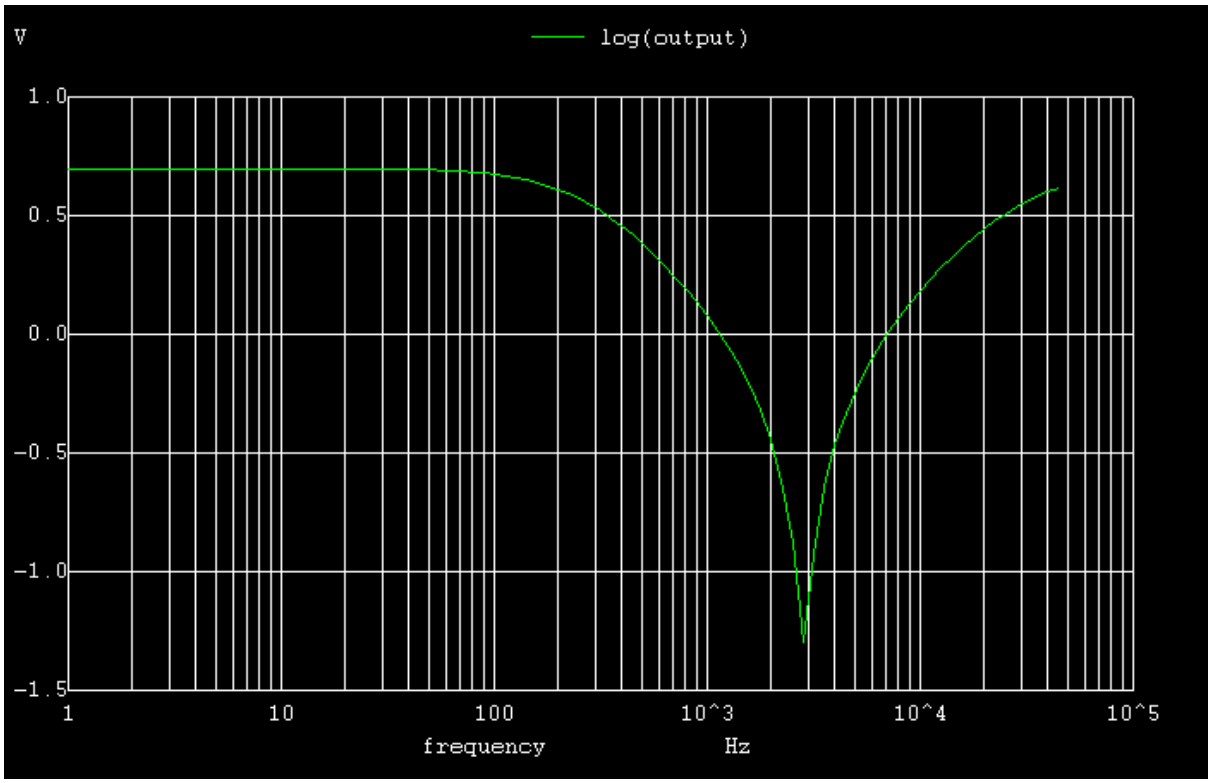


Figure 3: Ngspice output frequency plot

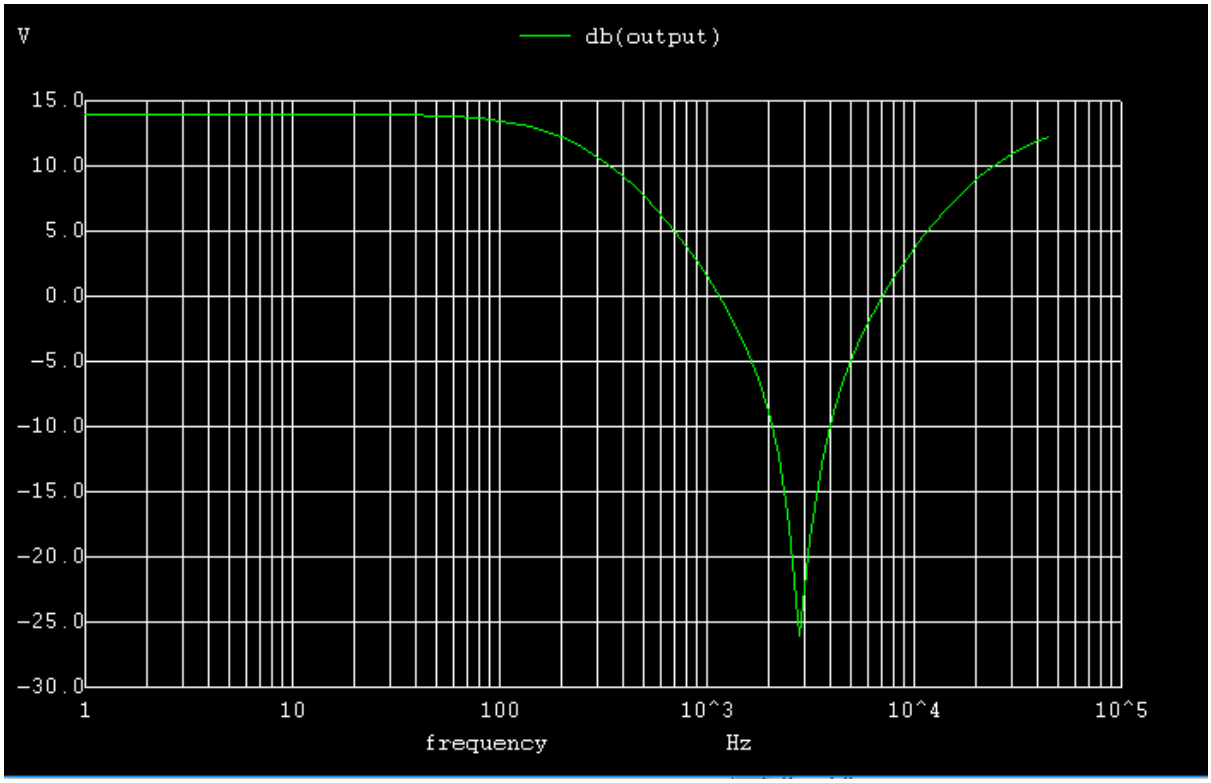


Figure 4: Ngspice db output plot

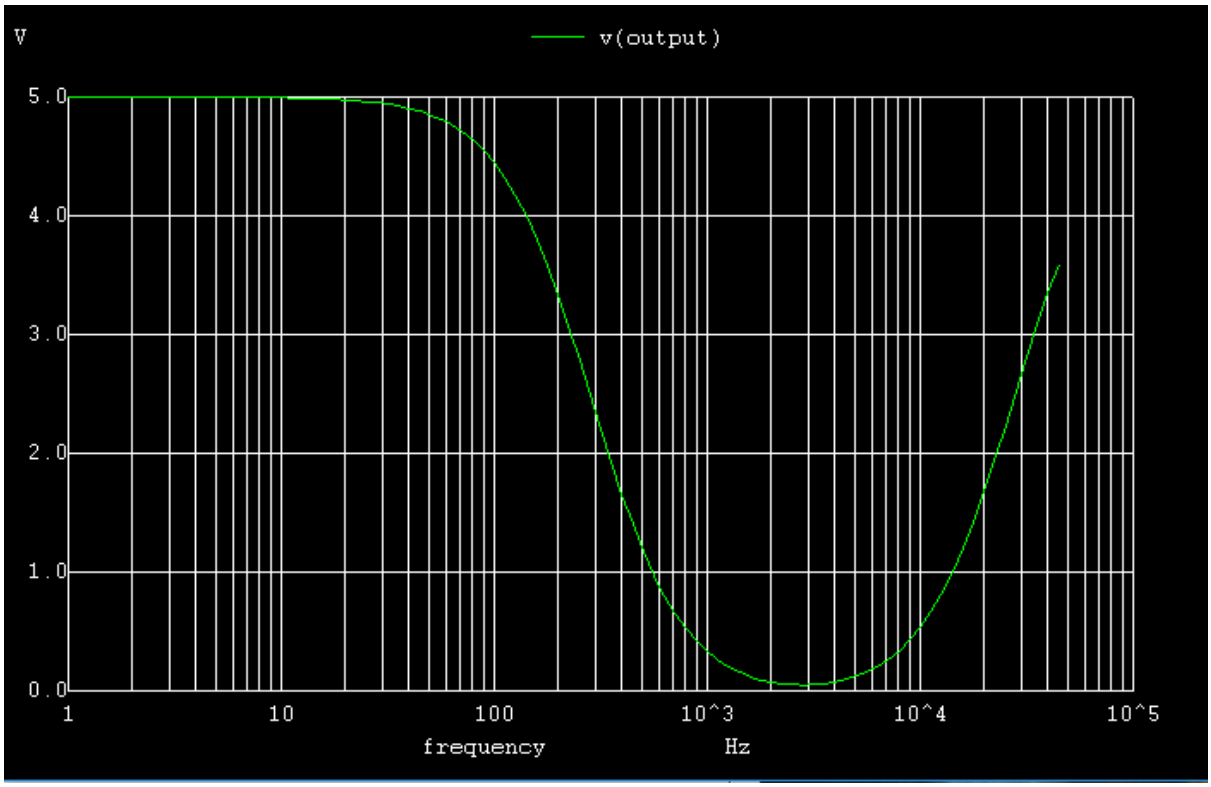


Figure 5: Ngspice output plot

2. Python plots:

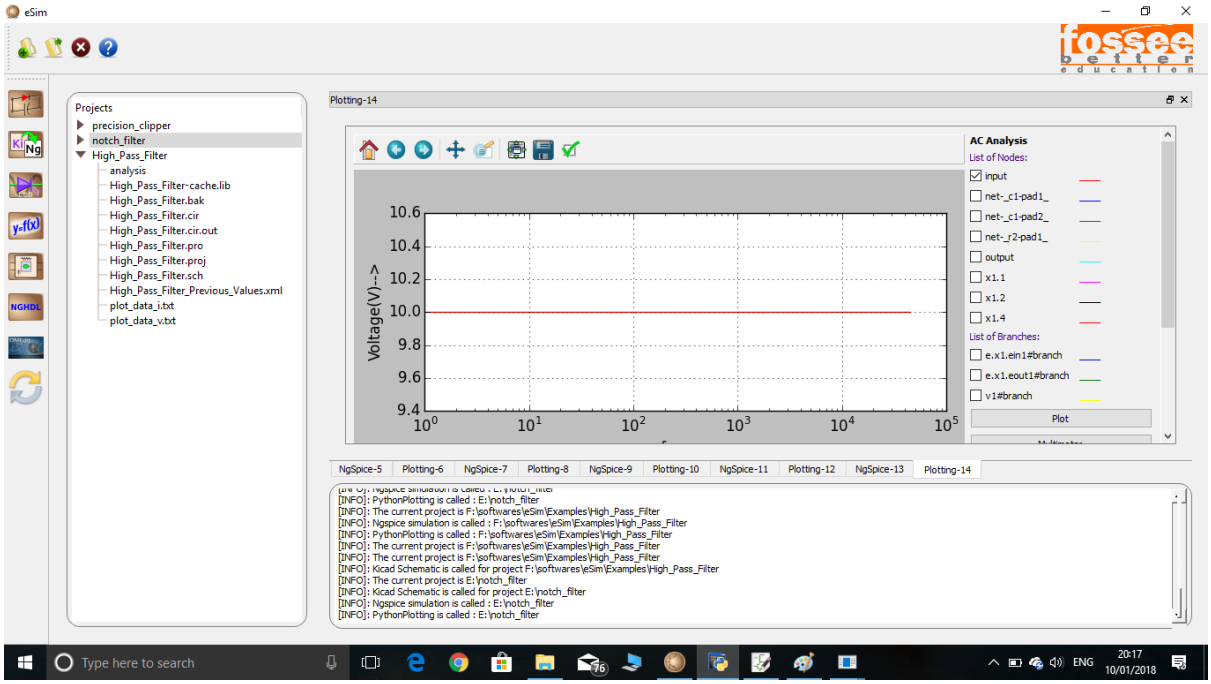


Figure 6: Python plot input

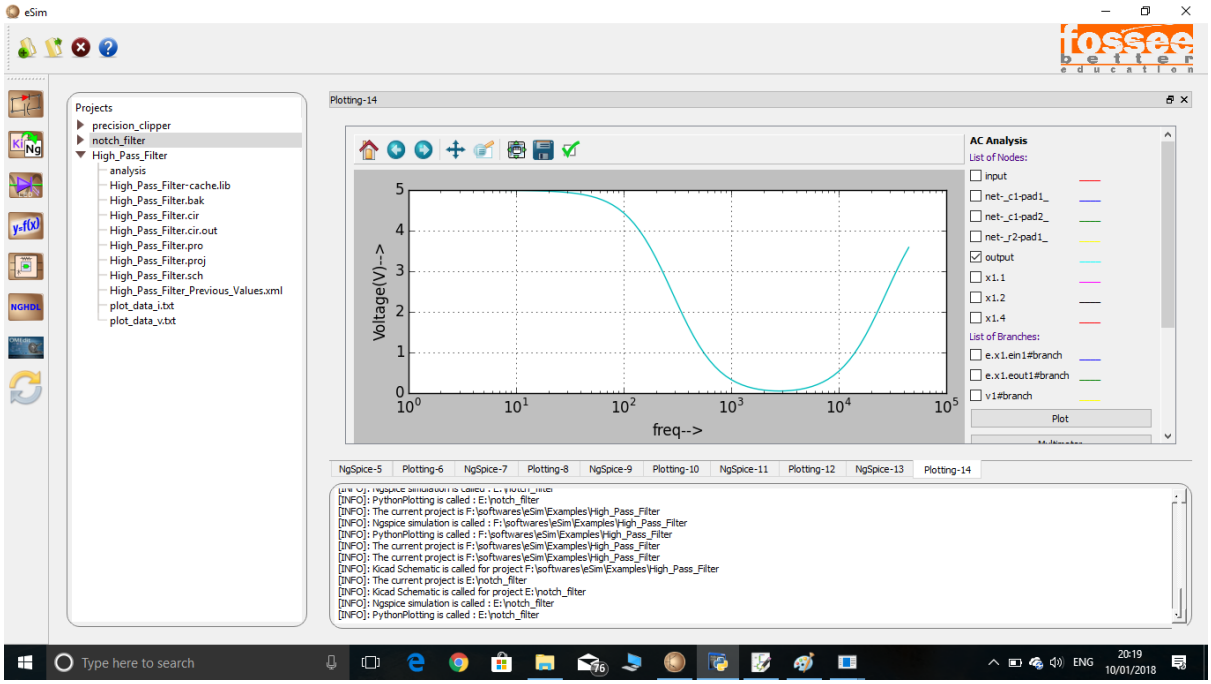


Figure 7: Python plot output

Conclusion:

Thus, we have studied the frequency response of Notch filter using eSim and we get the appropriate waveforms.

References:

Operational Amplifiers and linear ICs THIRD EDITION by DAVID A. BELL