Second-Order Active Band-Pass Filter Design

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Problem Statement:

The objective of this project is to design and simulate a second-order active band-pass filter (BPF) with a resonant frequency of 2.5 kHz and a passband bandwidth of 500 Hz. The circuit will be implemented using the LM741 operational amplifier, chosen for its compatibility and simplicity in low-frequency analog designs. This work aims to address the need for efficient signal filtering in communication systems and audio processing applications.

Expected Outcome:

The project will result in a verified, simulated second-order active BPF design, demonstrating its applicability to audio signal processing. The results will include frequency response plots, quality factor analysis, and performance evaluation under varying conditions.

>The paper emphasizes the practical considerations in choosing components for achieving specific resonant frequencies and bandwidths in audio filters. While leveraging the foundational approach described, the proposed project differentiates itself by targeting a different application domain and parameter set (resonant frequency and passband).

Reference Paper:

The work is inspired by the methodology outlined in the paper

1)Design and Implementation of Active Band-Pass Filter for Low Frequency RFID (Radio Frequency Identification) System