Circuit Simulation Project

https://esim.fossee.in/circuit-simulation-project

**Name of the participant :** Jovin P John

Title of the circuit : Design and Simulation of a Logarithmic Amplifier using Op-Amp in eSim

Theory/Description : The logarithmic (log) amplifier is an op-amp circuit that generates an output voltage proportional to the logarithm of the input voltage. It uses a diode or transistor in the feedback path to exploit the exponential current–voltage relationship of the device. This circuit compresses wide input ranges into smaller outputs, useful in dB measurement, audio processing, and automatic gain control. The project involves designing and simulating the log amplifier in eSim (KiCad + NgSpice), verifying its logarithmic behavior through DC sweep and transient analysis, and examining practical limits such as temperature dependence and input polarity.

Circuit Diagram(s) :
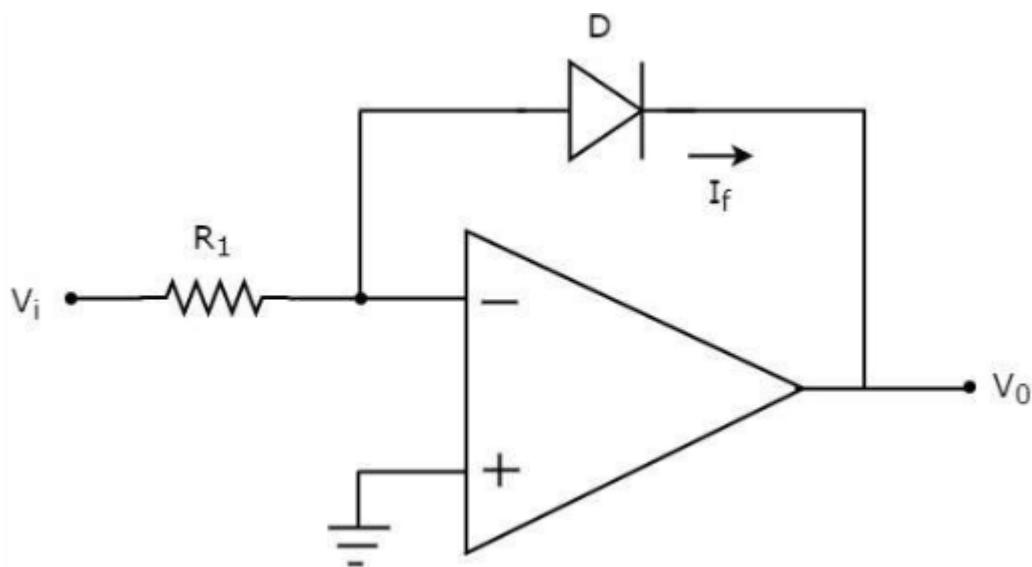
Results (Input, Output waveforms and/or Multimeter readings) :
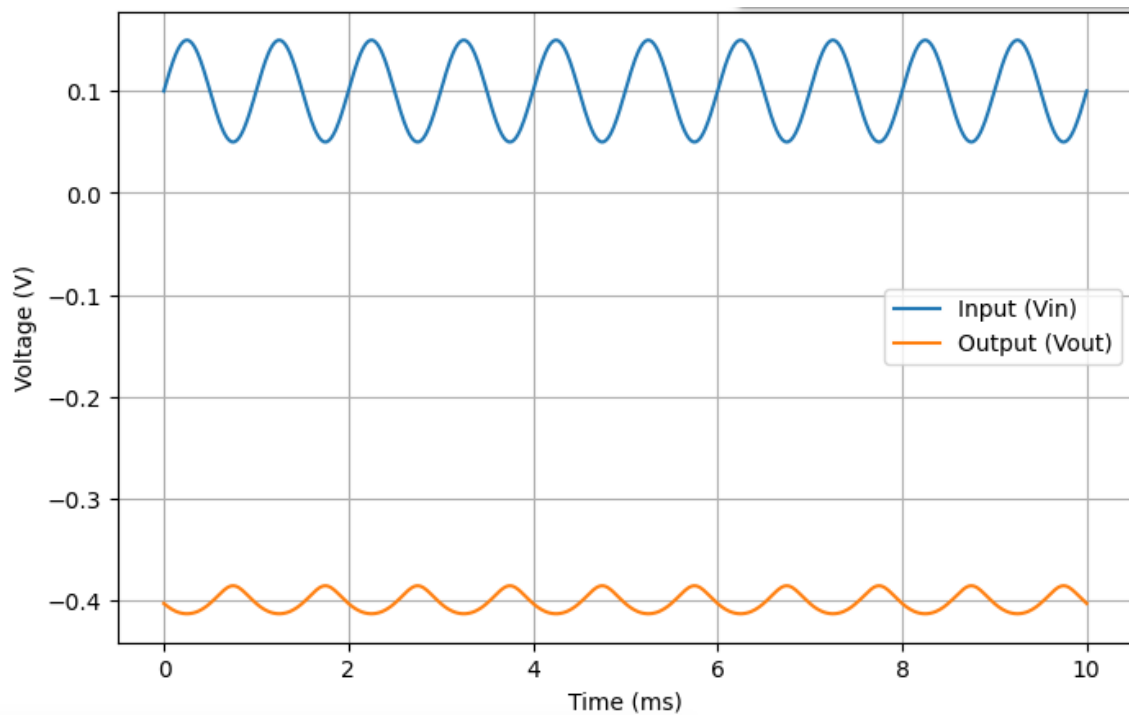
Source/Reference(s) : Logarithmic amplifiers and related circuits