Title of the Experiment:

COMMON EMITTER BJT AMPLIFIER CIRCUIT

By: SHUBHI SAXENA

University Institute of Technology, RGPV, Bhopal

THEORY

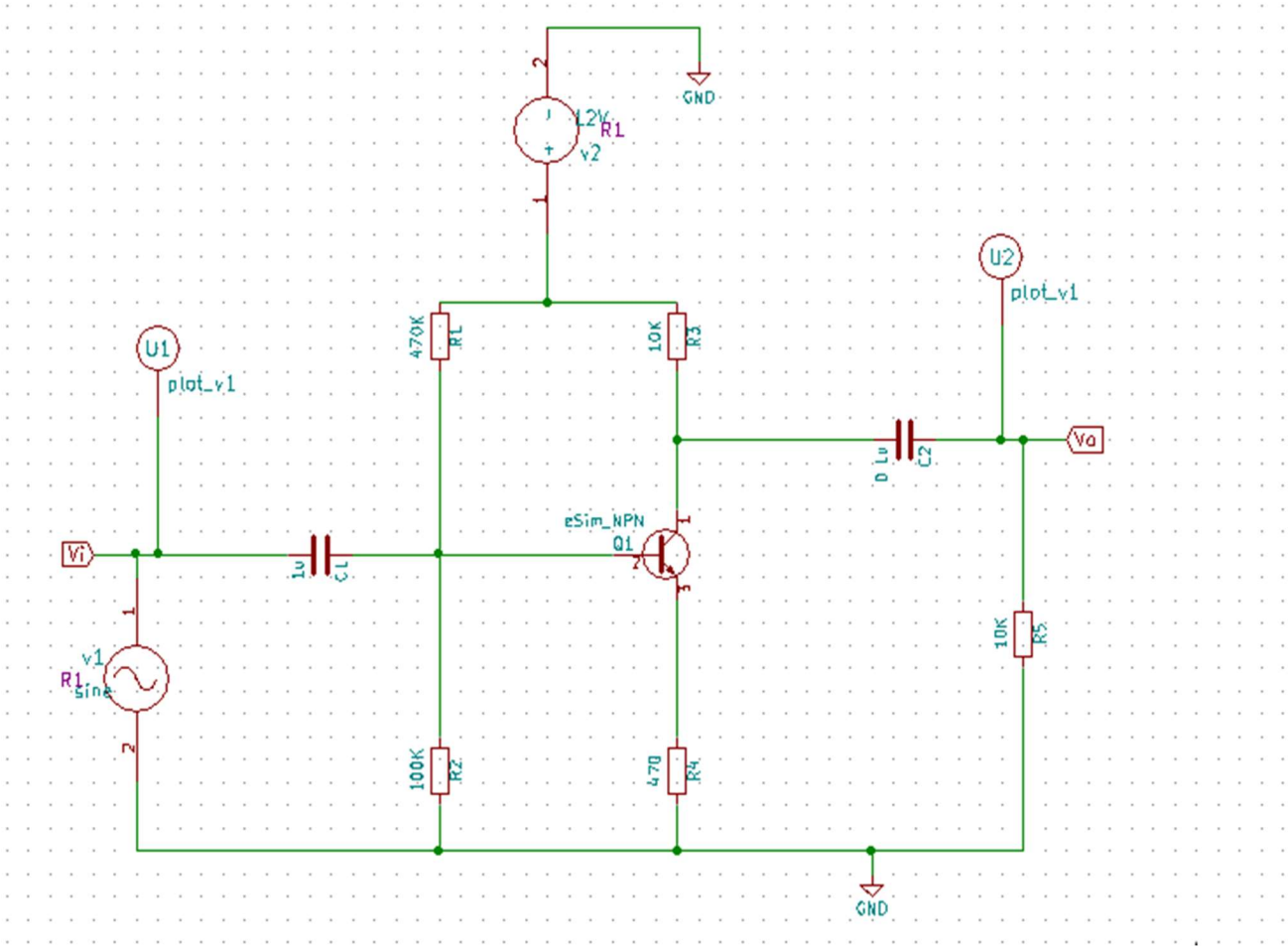
The common emitter amplifier is a three basic single-stage bipolar junction transistor and is used as a voltage amplifier. The input of this amplifier is taken from the base terminal, the output is collected from the collector terminal and the emitter terminal is common for both the terminals.

When a signal is applied across the emitter-base junction, the forward bias across this junction increases during the upper half cycle. This leads to an increase in the flow of electrons from the emitter to a collector through the base, hence increases the collector current. The increasing collector current makes more voltage drops across the collector load resistor RC. The negative half cycle decreases the forward bias voltage across the emitter-base junction. The decreasing collector-base voltage decreases the collector current in the whole collector resistor RC. Thus, the amplified load resistor appears across the collector resistor.

The common emitter transistor amplifier has a common configuration and it is a standard format of transistor circuit whereas voltage gain is desired. The common emitter amplifier is also converted as an inverting amplifier.

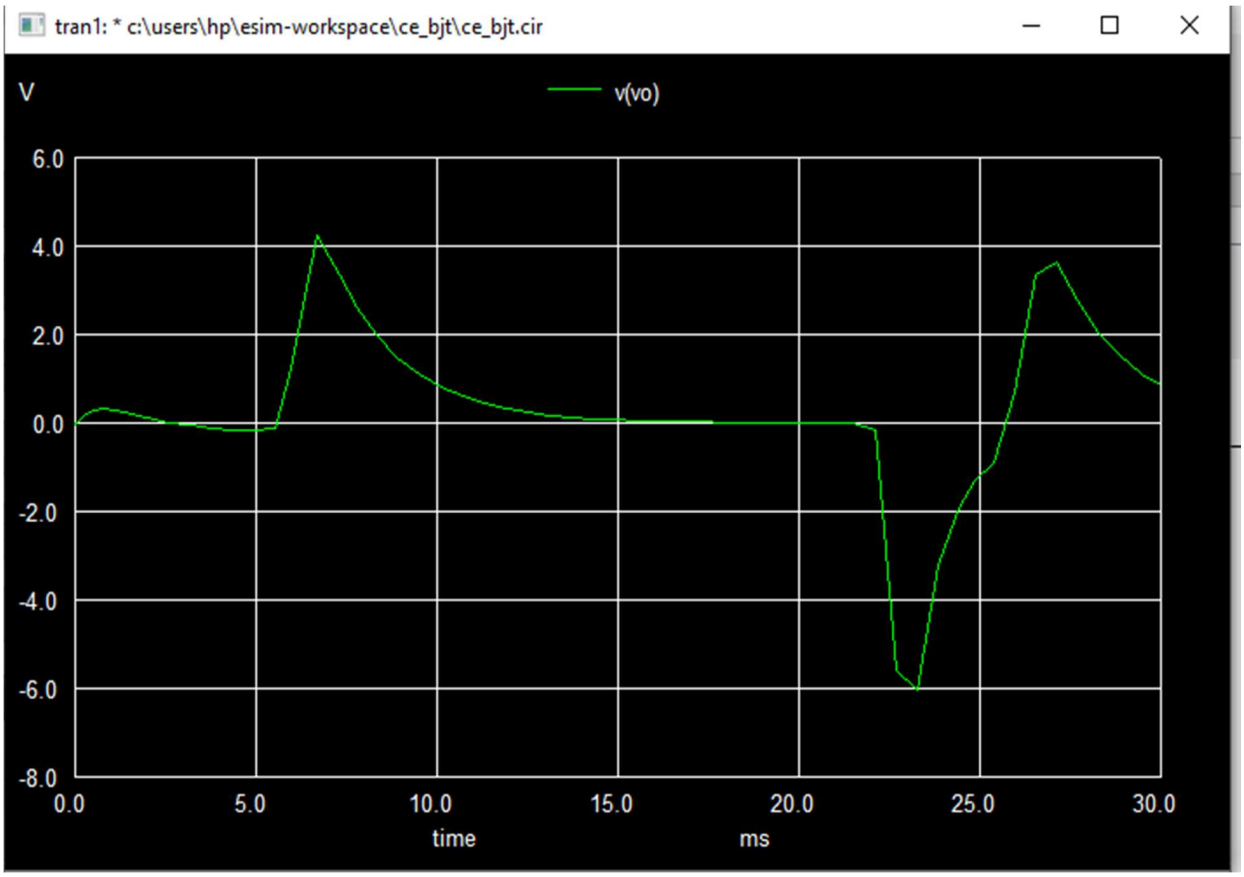
SCHEMATIC DIAGRAM

The circuit schematic of the CE BJT amplifier in eSim is as shown below:

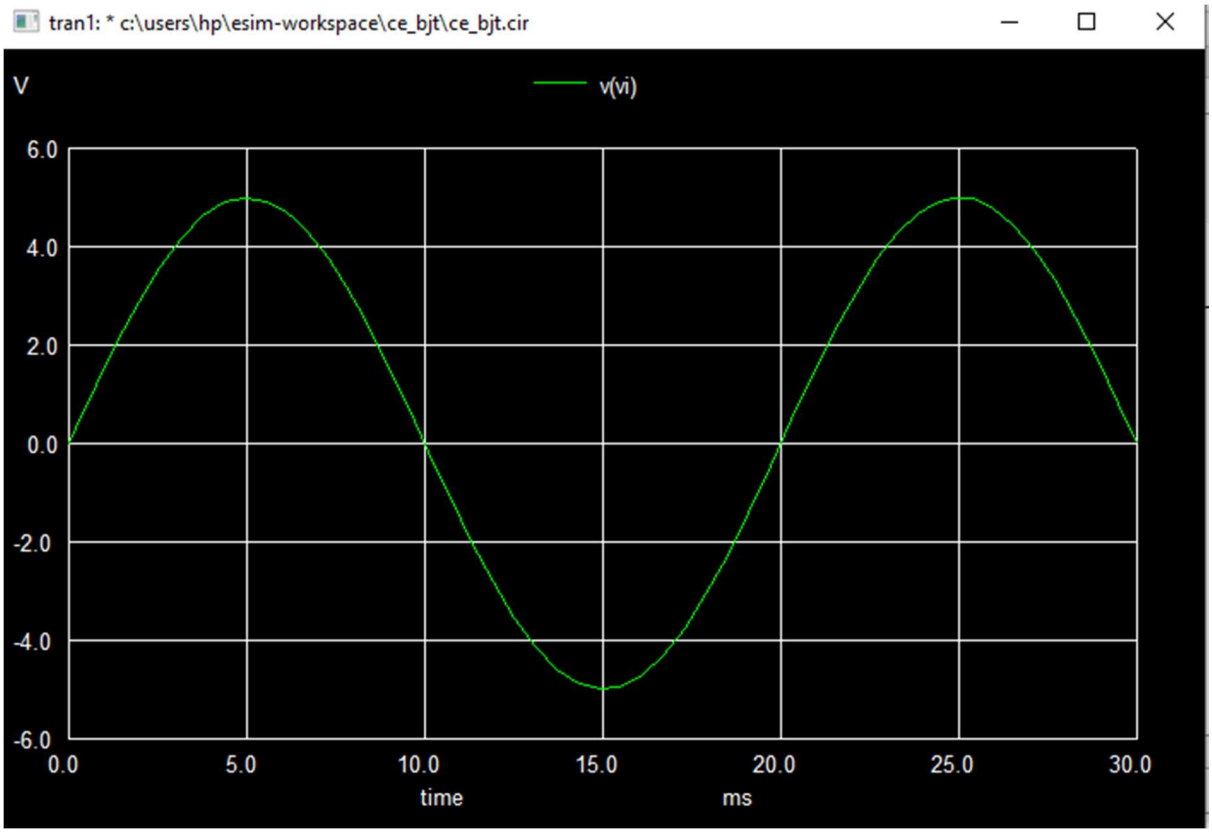


SIMULATION RESULTS

1. Ngspice Plots

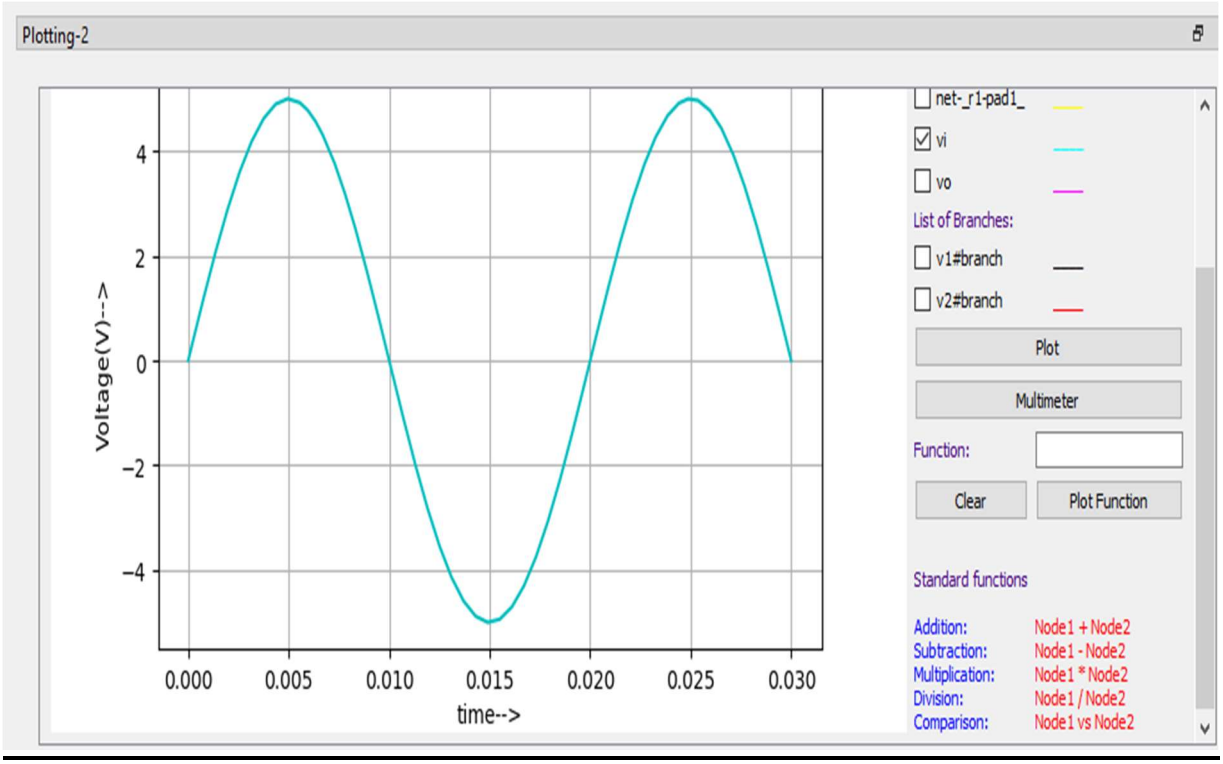

tran1: * c:\users\hp\esim-workspace\ce_bjt\ce_bjt.cir
V
v(vo)
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
time
ms

Plot-1

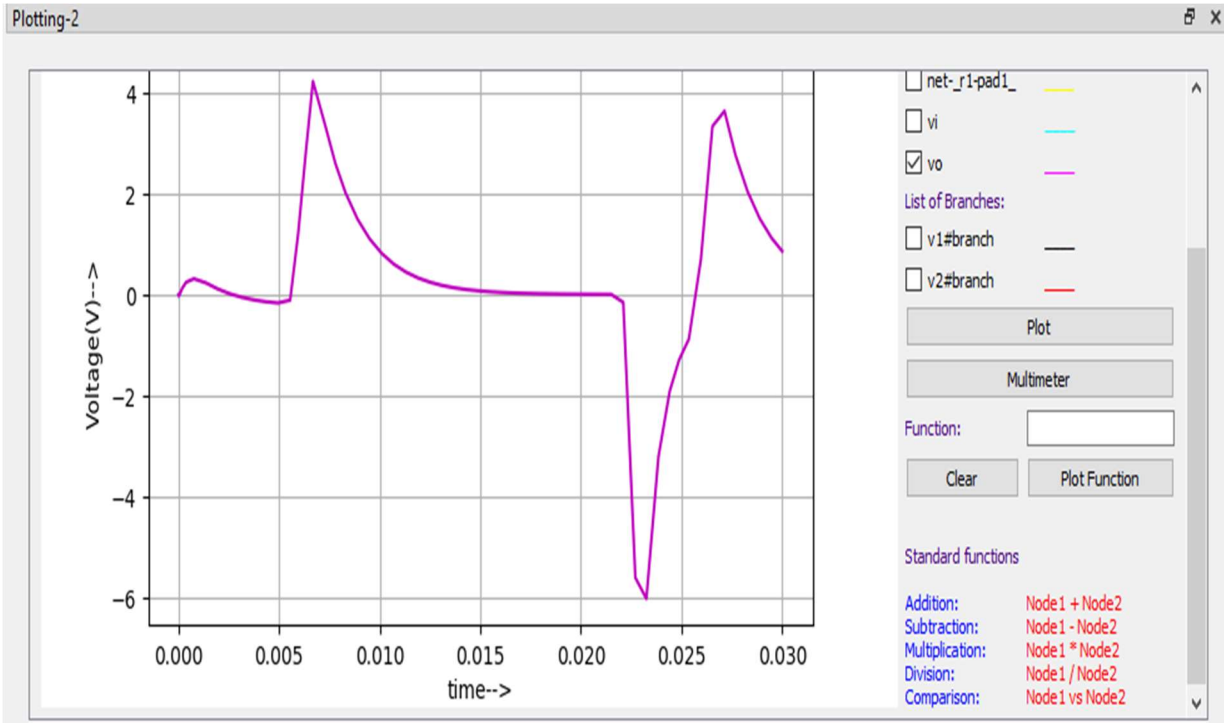

tran1: * c:\users\hp\esim-workspace\ce_bjt\ce_bjt.cir
V
v(vi)
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
time
ms

Plot-2

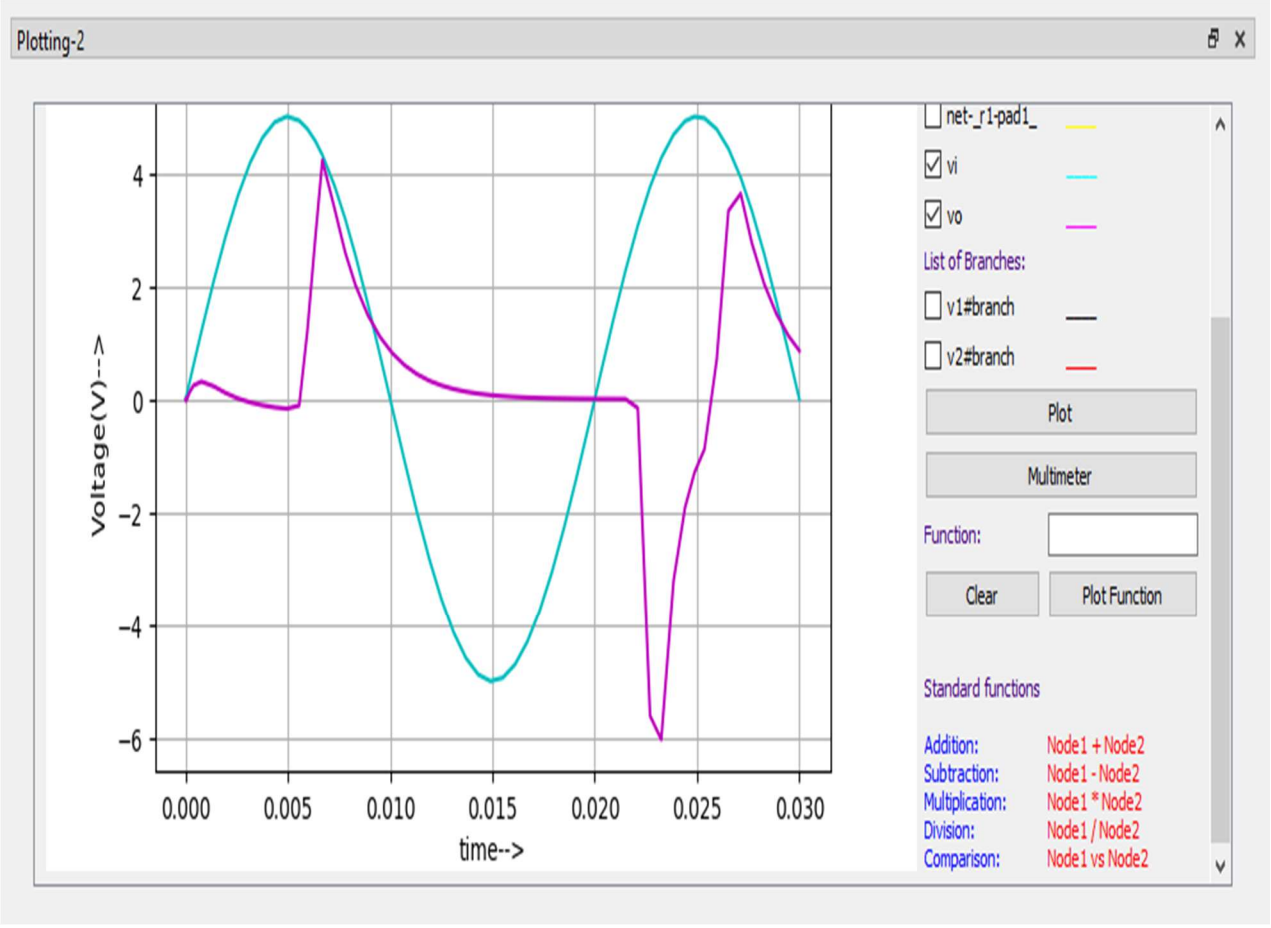
2. Python Plots



Python Plot Input



Python Plot Output



Python Plot for CE BJT amplifier

CONCLUSION

Thus, we have studied the CE BJT Amplifier circuit using eSim and we get the appropriate waveforms.

REFERENCES

https://www.elprocus.com/common-emitter-amplifier-circuit-working/