RC Circuit

1 Theory

An RC circuit is formed by appling a dc voltage source to a capacitor which is connected to a resistor serially. Initially the voltage drop across the circuit will be zero, but it increases exponentially to maximum value. The current which will be at the maximum in the beginning, gradually decresaes to zero as the voltage across capacitor reaches maximum. Thus the capacitor acts as a short in the beginning and towards end it becomes an open circuit.

The voltage drop across the capacitor is

$$V_t = V (1 \ e^{t=RC}) \quad (1)$$

The voltage drop during discharge is

$$V_t = V (e^{t=RC}) \quad (2)$$

2 Schematic Diagram

The schematic diagram of RC circuit in eSim is shown below

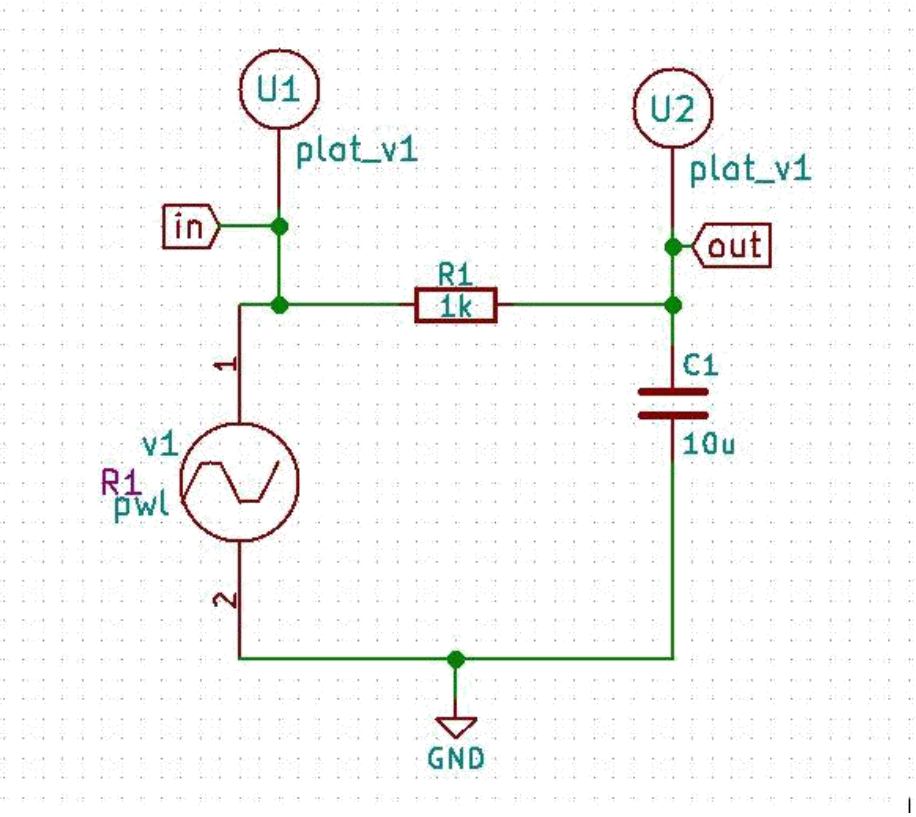


Figure 1: schematic diagram of RC circuit

3 Simulation Results:

1. Python plots:

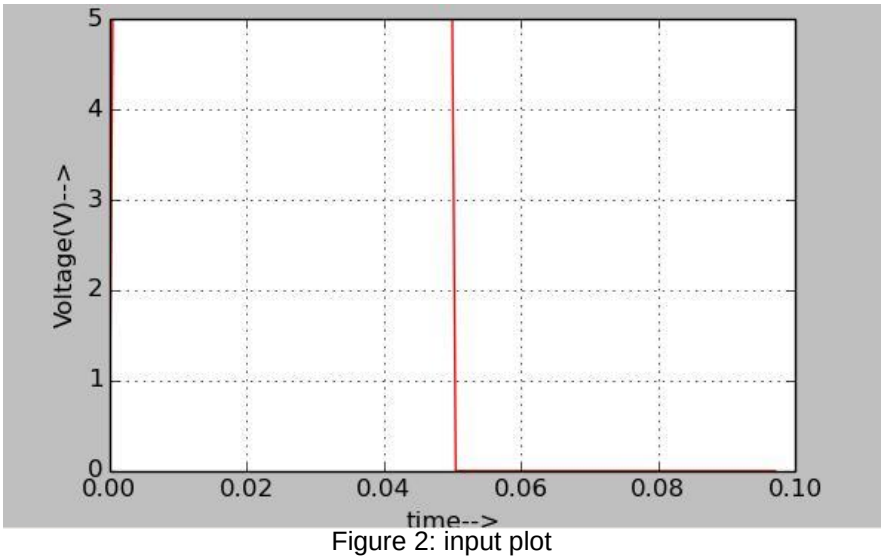


Figure 2: input plot

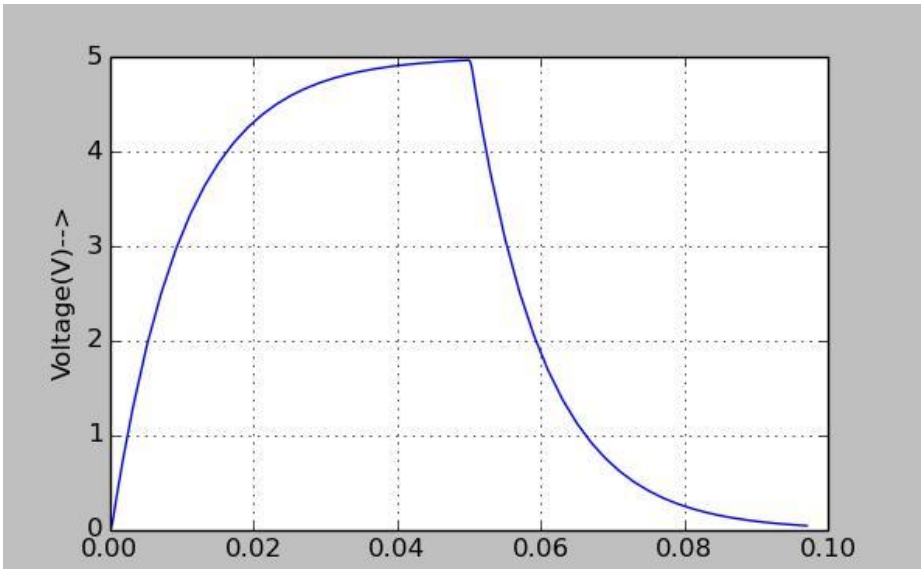
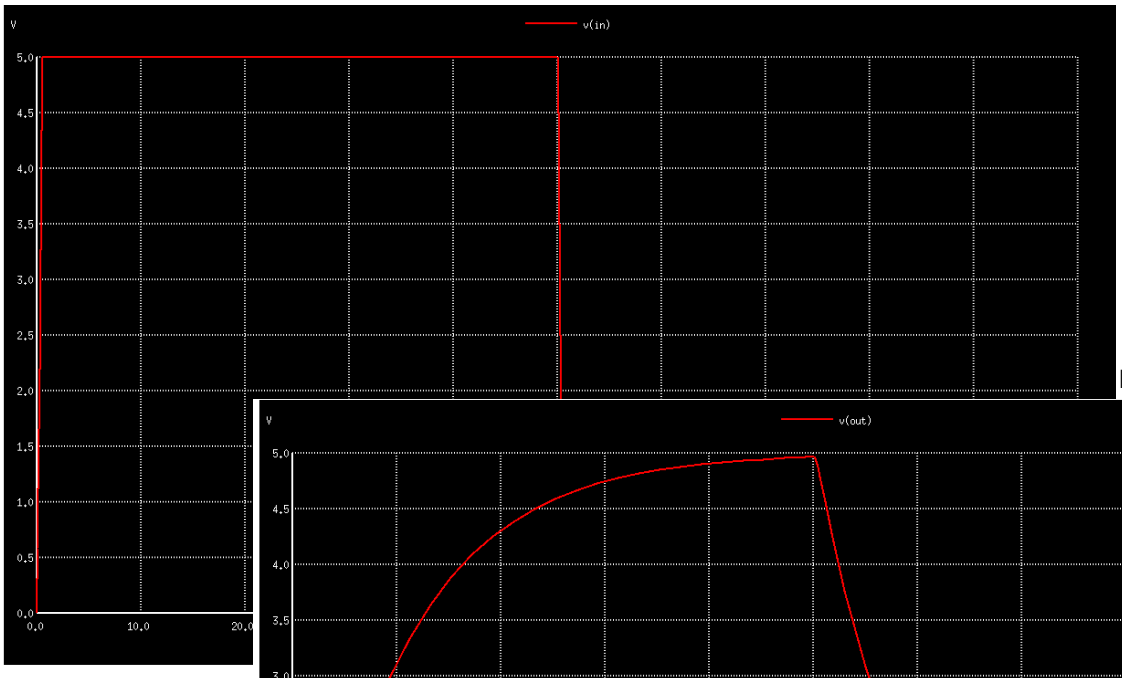


Figure 3: output plot

2. Ngspice plots:



Figur

e 4: input plot

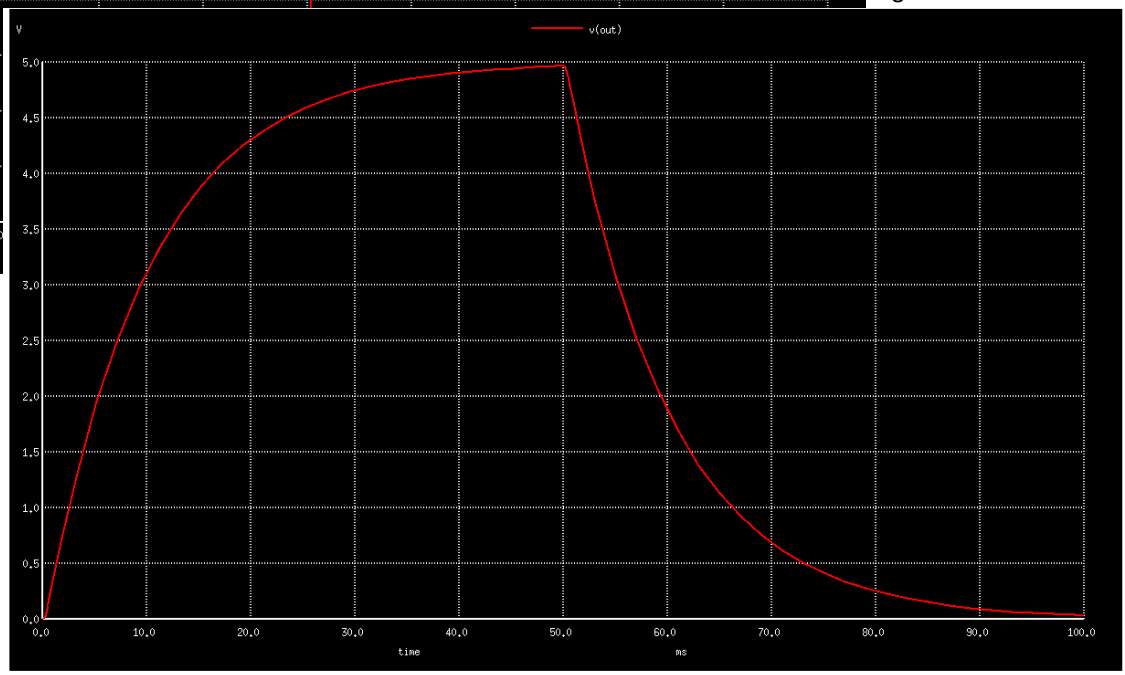


Figure 5: output plot

4 References

[1] http://www.electronics-tutorials.ws/rc/rc_1.html referred on 20/03/2017.