Circuit Simulation Project

POSITIVE CLAMPER CIRCUIT USING LM741

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Title of the circuit: Positive Clamper circuit using LM741

Theory/Description:

A clamper is an electronic circuit that fixes either the positive or the negative peak excursions of a signal to a defined value by shifting its DC value.

The clamper does not restrict the peak-to-peak excursion of the signal; it moves the whole signal up or down so as to place the peaks at the reference level.

In clamper circuits a predetermined dc level is added to the output voltage. (or) The output is clamped to a desired dc level.

- If the clamped dc level is +ve, the clamper is **positive clamper.**
- If the clamped dc level is –ve, the clamper is **negative clamper.**

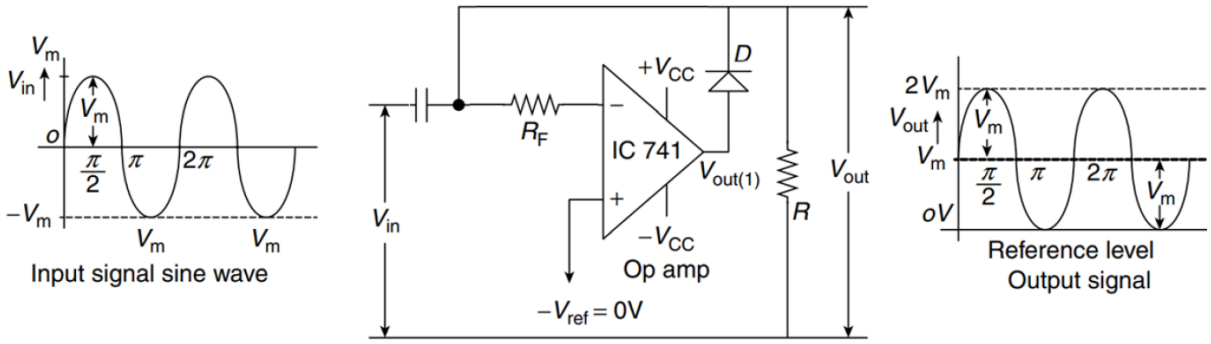
Working:

A sinusoidal voltage signal, is applied to the inverting terminal of op-amp through a network that consists of a capacitor and a resistor. That means, AC voltage signal is applied to the inverting terminal of the op-amp.

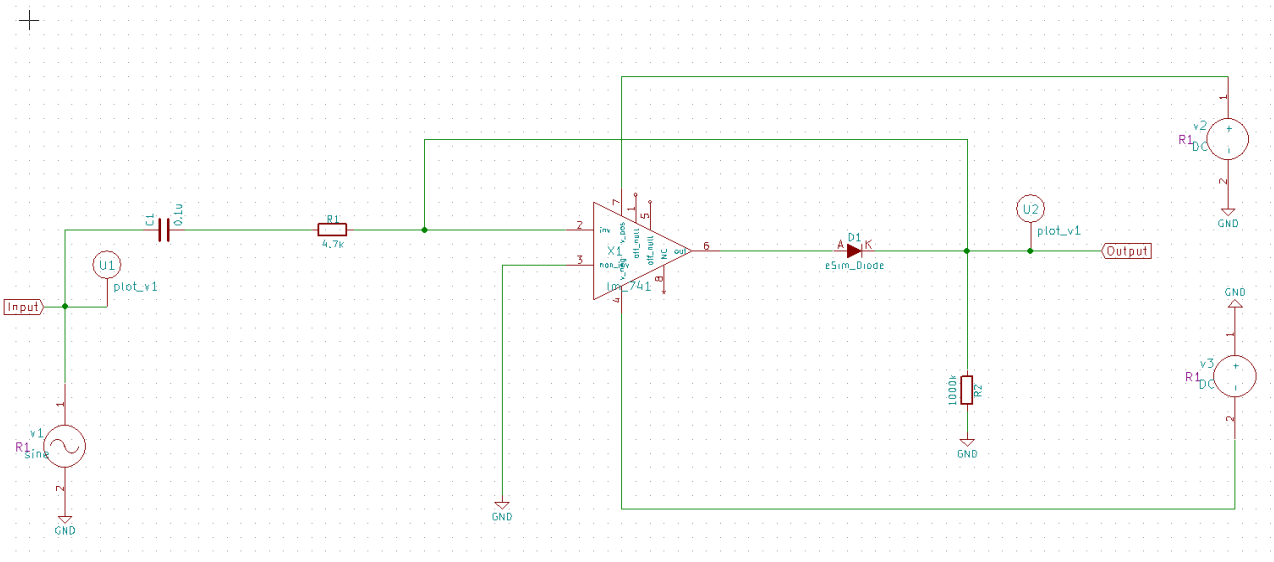
The DC reference voltage Vref is applied to the non-inverting terminal of the op-amp. The value of reference voltage Vref can be chosen by varying the resistor. In this case, we will get a reference voltage Vref of a positive value.

The circuit produces an output, which is the combination (resultant sum) of the sinusoidal voltage signal Vin and the reference voltage Vref. That means, the clamper circuit produces an output in such a way that the sinusoidal voltage signal Vin gets shifted vertically upwards by the value of reference voltage Vref.

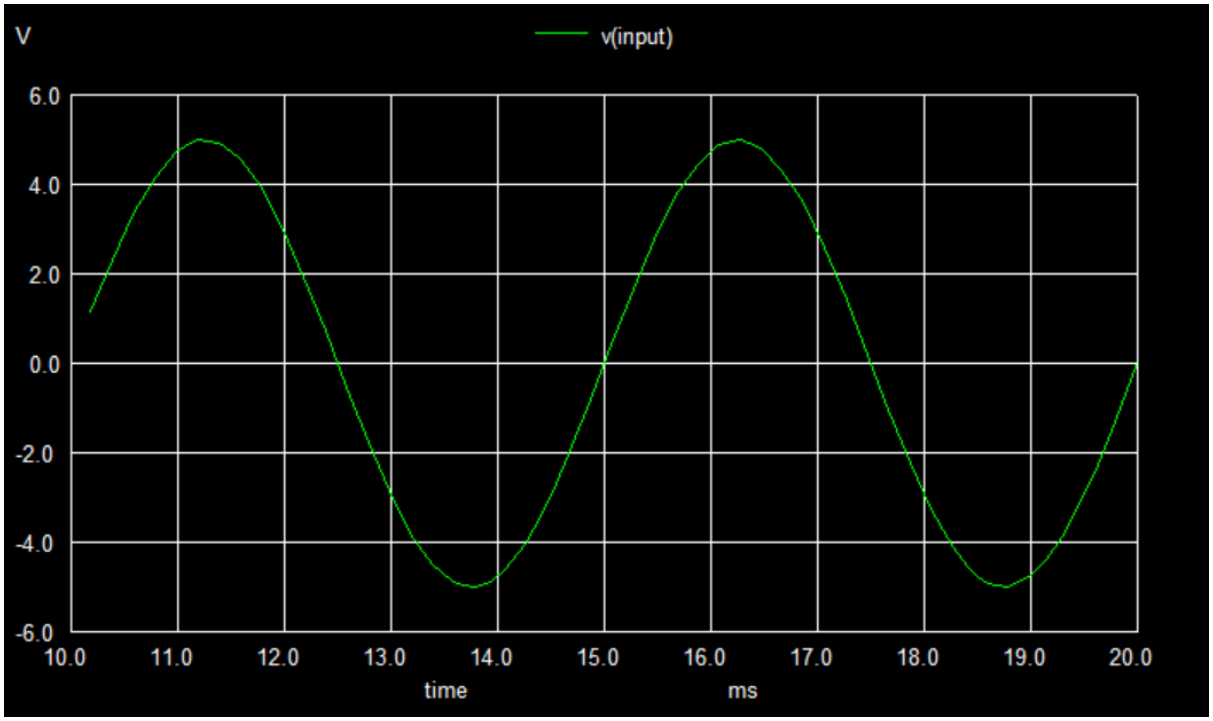
Positive Clamper circuit with zero reference voltage



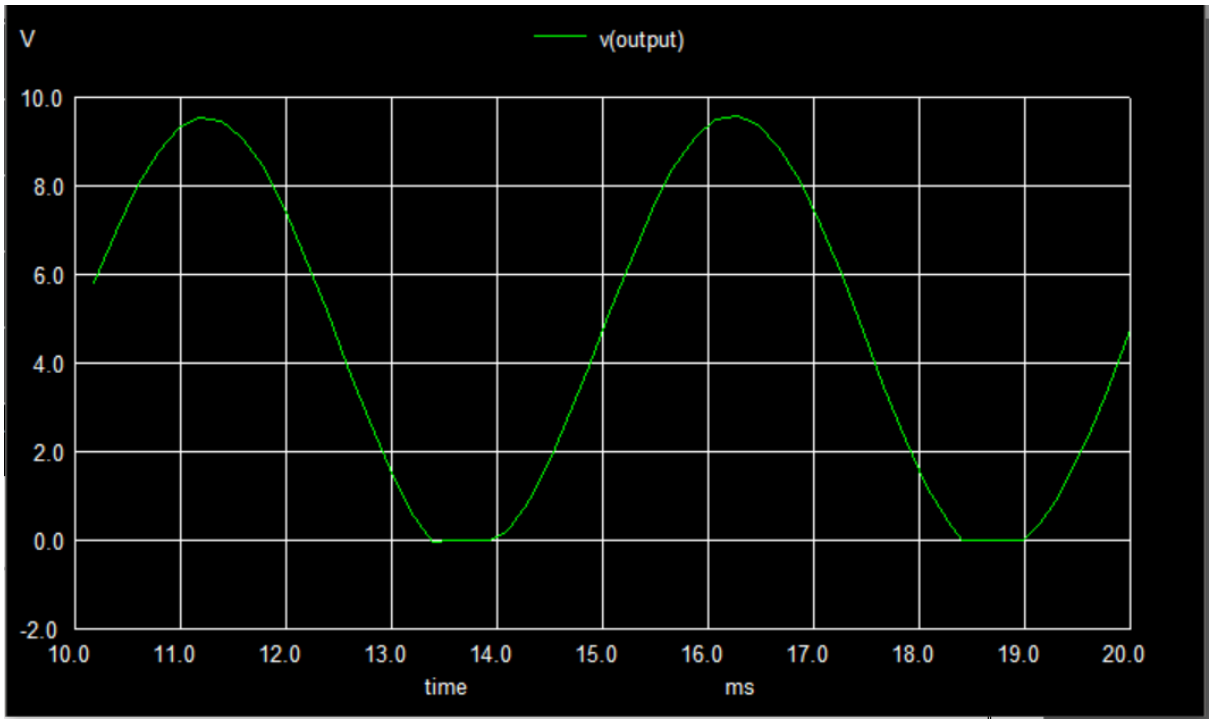
Circuit Diagram:



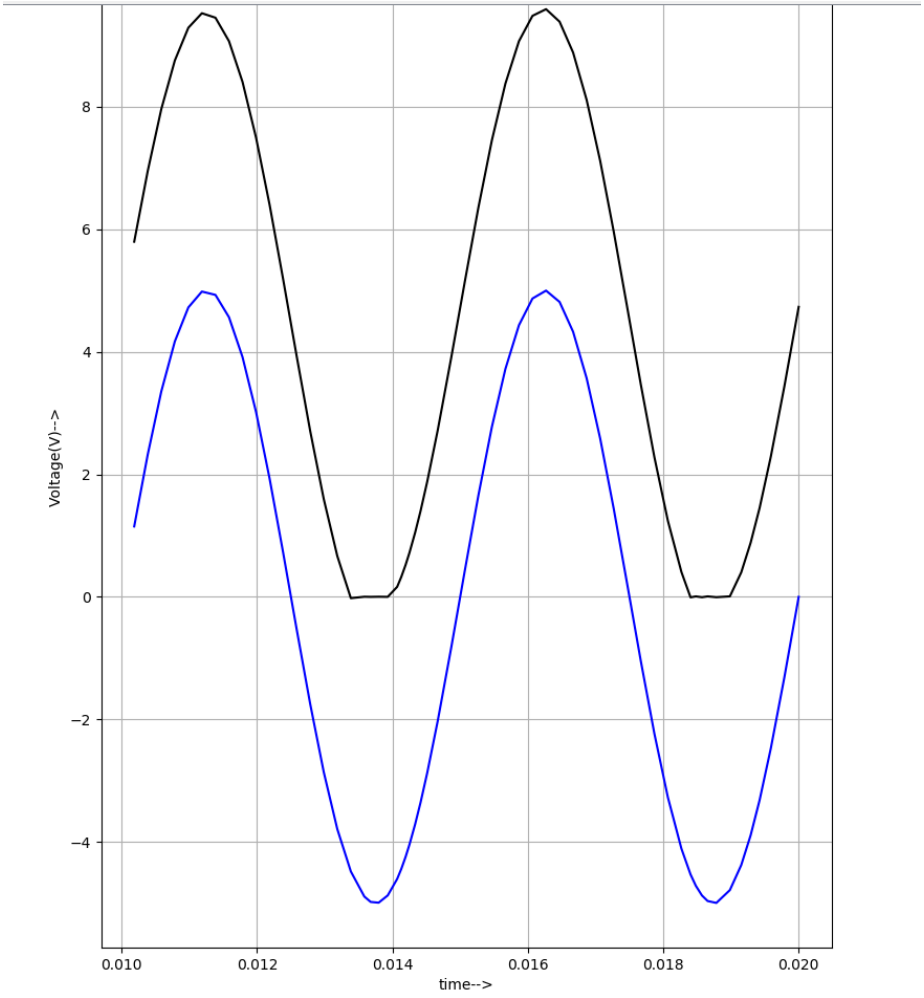
Input Waveform



Output Waveform



Python Plot



---- Input voltage plot

---- Output voltage plot

Conclusion: Hence a positive clamper circuit using LM741 op- amp has been designed and simulated using eSim software.

References:

https://www.wikiwand.com/en/Clamper_(electronics)

https://www.electronicshub.org/ic-741-op-amp-basics/

https://www.electrical4u.com/clamping-circuit/