Electromagnetic Oscillating Circuit

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# Abstract:

This experiment demonstrates the principles of LC oscillation under different values of Inductance, Capacitance, and Resistance. This is analogous to mass-spring system with inductor and capacitor acting like mass and spring respectively. The simulation can be used to understand the interplay of energy between these components and the effect of a resistor as a damping mechanism. The following concepts we will explore in this app:

1. Finding the frequency of the oscillation
2. V-I plot and phase difference
3. Conservation of energy in LC oscillation

We can understand the EM Oscillating Circuits by writing the second order linear homogeneous differential equation for charge:

Where:

* L is the inductance of the inductor (in henries).
* R is the resistance of the resistor (in ohms).
* C is the capacitance of the capacitor (in farads).
* q is the charge on the capacitor (in coulombs).

In ideal circuit R= 0 thus there is no dissipation of energy and the oscillation goes on forever with the frequency

# Keywords:

Electromagnetic Oscillating Circuit, resonance frequency, resistance, inductance, capacitance, charge, dissipation, differential equation.