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Online physics experiment creation on resonance in the LC circuit with simple metal detector circuit

Online learning is necessary and challenging to develop effective teaching strategies to support student learning during the COVID-19 period. This course has seven students. Some essential equipment is sent to students by post. We demonstrate a simple experiment on the resonance frequency in the LC circuit with a simple metal detector circuit based on a 2N2222 transistor. In principle, Metal objects within the magnetic field of inductance affect the resonance frequency resulting in oscillator frequency changes. So, we could study the resonance frequency of the LC circuit from frequency changes by changing the inductance of the inductor. The sound frequency has been generated from the metal detector circuit and is altered depending on the coil's inductance. The frequency change is measured by a sound detector application on the smartphone. From the results, we discuss the equation of the resonance frequency and the oscillator frequency changes and calculate the relationship between the frequency of sound and the inductance value of the coil. As a result, it is possible to adapt the simple metal detector to use the study of the resonance formula and calculate the inductance of any coil with accuracy.

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