

Wireless Electricity (Witricity) Based on Magnetic Resonance Coupling

By

Fawad Noor (091420008)

Muhammad Umair Khan (091420219)

Muhammad Umair Khan (091420169)

Advisor: Muhammad Sohaib

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SCHOOL OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

Abstract

Wireless electricity technology is major breakthrough in history of mankind which promises cutting the cord and allowing users to recharge mobile & medical devices as easily as data is received through air. We practically applied such a non-radiative scheme which leads to strong coupling between two coils at a medium range distance for efficient wireless electricity.

Our project works on the principle of coupled resonant objects. Using this technique, we will be able to transmit power without using any wires. This concept was made possible because of resonance. An object vibrates at a certain frequency is resonance. At first, MIT researchers made a successful experiment and were able to transmit wireless power of 60W at seven feet distance. That consists of two main coils. Those coils were designed having diameter of twenty inches and keep them in range of MHz. One of those coils connected to power source and receiving coil is connected to a bulb.

Our project setup is Omni directional. So we can avoid wires and it would be easy to get power on remote objects. Using this technology, we can avoid mess of wires. So this is easy way to charge our electronics devices like laptop, mobiles, robots etc. we are using magnetic coupled resonance, that's why it has no interaction with surrounding materials. Because of magnetic coupled resonance it is safe and more efficient.

This technology is not available for commercial use. It is the dream of scientists and researchers to see this technology to this point. It is possible that electricity is in air like Wi-Fi signals or FM radio signals.

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Project Motivation

In last few years, our society experienced a silent, but quite dramatic, revolution in terms of the number of autonomous electronic devices (e.g. laptops, palm pilots, digital cameras, household robots, etc.) that we use in our everyday lives. Currently, most of these devices are powered by batteries, which need to be recharged very often.

This fact motivated us to think whether there exist physical principles that could enable wireless powering of these and similar devices.

Results of our research on the feasibility of using resonant objects, strongly coupled through the tails of their non-radiative modes, for mid-range (i.e. a few meters: e.g. within a room, or a factory pavilion) wireless power transfer applications seem to be quite encouraging.