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# Coil Designing

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***Abstract: In this paper, we have presented the concept of wireless transmission i.e. power transmission without using any type of the electrical conductor and/or wires.***
***We have presented an idea that is discussed here about how electrical energy can be transmitted as microwaves so that to reduce the transmission, allocation and other types of losses.***
***Such technique is known as Microwave Power Transmission (MPT). We have also presented and correlated several aspects with the currently available Power transmission systems to the related history of wireless power transmission systems and also the related developmental changes. The basic design, merits and demerits, applications of Wireless Power Transmission are also discussed.***
***Keywords: Microwave power transmission (mpt), wireless power transmission (wpt), wireless, power transmission.***

## I. INTRODUCTION

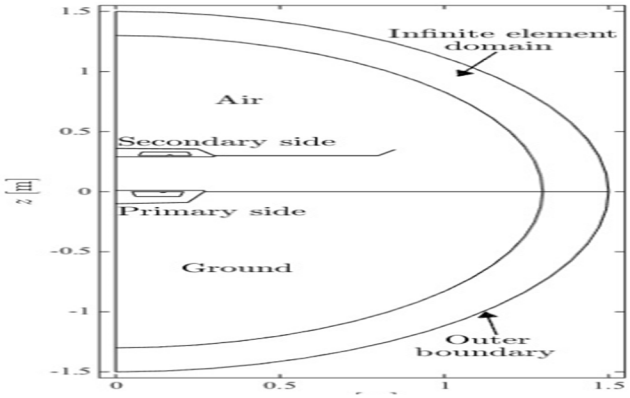
Wireless communication would be the transmission in the energy spanning a distance without the usage of wires or cables, where distance can be short or long. Wireless operations permits services, for example long-range communications, which are merely unfeasible using wires.
Wireless energy transfer or wireless power transmission may be the transmittance of electric power from your power source for an electrical load without interconnecting wires. Wireless transmission is advantageous in instances where interconnecting wires are inconvenient, hazardous, or impossible.
The situation of wireless power transmission is different from that of wireless telecommunications, like radio. In the latter, the proportion of one's received becomes critical on condition that it can be too low for that signal being distinguished on the ground noise.
With wireless power, efficiency is the more significant parameter. A big perhaps the energy sent out by the generating plant must arrive at the receiver or receivers for making the system economical. The most common form of wireless power transmission is completed using direct induction and then resonant magnetic induction. Other methods under consideration include radio waves such as microwaves or beam of light technology. Wireless communication is mostly regarded as a branch of telecommunications. Wireless operations permits services, for example longrange communications, which can be impossible and impractical in conventional methods.

## II. COIL DESIGN

Coil design The coil design study is divided into two parts. First, the effects on the coil characteristics in free space due to the geometry of the coils are analyzed.
Next, we introduce conducting and magnetic materials in the geometry and study their impact. The free-space models are based on the analytical expression given in Section 2.1.2.1, while the more complicated cases in the second part are studied by means of the FEM. The coil windings are placed in a grid pattern with Nr = NrNz.
Free-space coil models The effects of the geometry of the coils are studied in free space using the expressions for the self- and mutual inductance for spatially distributed coil and respectively. In free space, the resistance of the coils only depends on the wire resistance, which is calculated .
These calculations are simple and fast and the study is done by means of parametric sweeps. The coils are described by their geometry, material and type of wire, i.e. solid or litz wire.
The geometrical parameters are the coil radius, the wire radius, the distance between wire windings, the number of windings and the location of the coils. and Eq. (2.14), it is clear that both the self- and mutual inductance increase with larger coil radius and number of coil windings. Similarly, the total length of the wire, and thus the wire resistance, is directly proportional to the radius and number of windings. The wire radius influences mainly the self-inductance and resistance. For the frequencies of interest, it is clear that the resistance of a litz wire is lower than that of a solid wire, where it is assumed that the radius of the wire strands constituting

the litz wire is small enough

## III. CIRCUIT & TABLE




Table

| | Free space |
|---|---|
| $R_1$, $R_2$ | 10.8 mΩ |
| $R_{12}$ | 0 |
| $L_1$, $L_2$ | 81.5 $\mu$H |
| $M$ | 7.93 $\mu$H |
| $k$ | 0.0973 |

## IV. APPLICATIONS OF WIRELESS POWER TRANSMISSION

*A.* Moving targets for example fuel free airplanes, fuel free electric vehicles, moving robots and fuel free rockets. Another applying WPT are wireless power source, wireless sensors and RF power adaptive rectifying circuits (PARC). 2. Mobility - user device might be moved easily in the wireless range.

*B.* Neat and easy Installation - since no cable running occasionally, just start-up the wireless device and you're ready to rumble.

*C.* Generating power by placing satellites with giant solar arrays in Geosynchronous Earth Orbit and transmitting the power as microwaves on the earth called Solar Power Satellites (SPS) will be the largest application of WPT.

## V. CONCLUSION

The concepts of wireless power transmission (WPT), its history, technological developments, merits, demerits and applications are discussed in this paper. By this, we are able to know the greater possibilities for transmitting power with negligible losses and simple transmission from a long time. It really is envisaged that wireless energy would be really accomplished using a advantage of easy implementation and less expensive i.e., tariff of transmission and distribution overhead would dwindle and moreover it is crucial the tariff of electrical power on the consumer would even be reduced when compared with existing systems.

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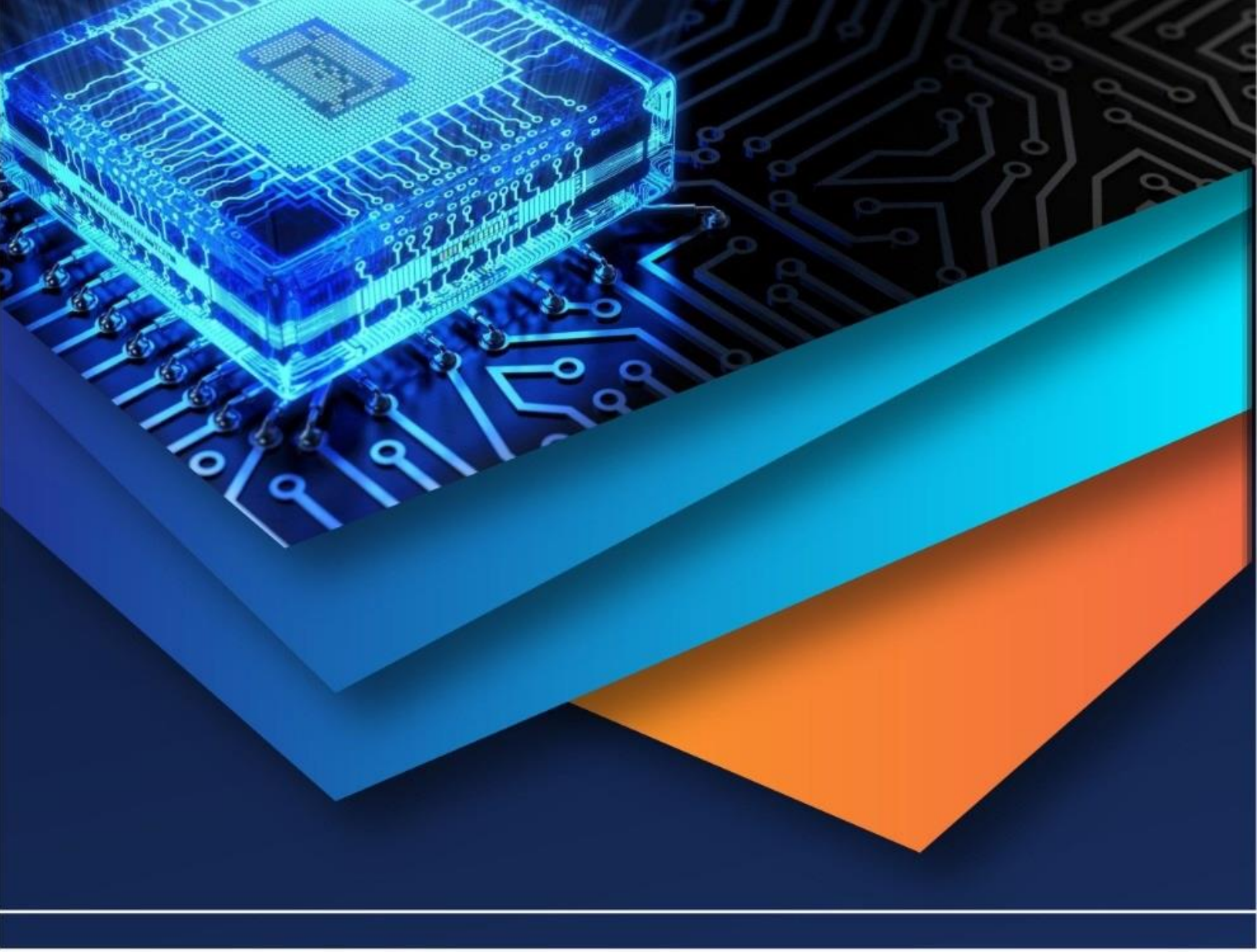

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