

Therefore the main points that influence the efficiency of a wireless energy transmission system are frequency, load and distance.

Although the results of this technology show significant losses with the distance, there are other technologies in development that promise a satisfactory efficiency. A team of researchers at ITMO University in Russia, proposed a new Wireless Power system. According to numerical simulations, the proposed system can maintain a transfer efficiency of 80% over a distance of 20 cm, while suffering only a very small decrease in efficiency as the distance increases. The paper was recently published in 2016 in a recent issue of Applied Physics Letters [7].

Figure 13 illustrates the comparison between the systems proposed to date, with the blue line being the proposed MIT system, red the magnetic dipole system and the green the new quadrupole system using ceramic resonators.

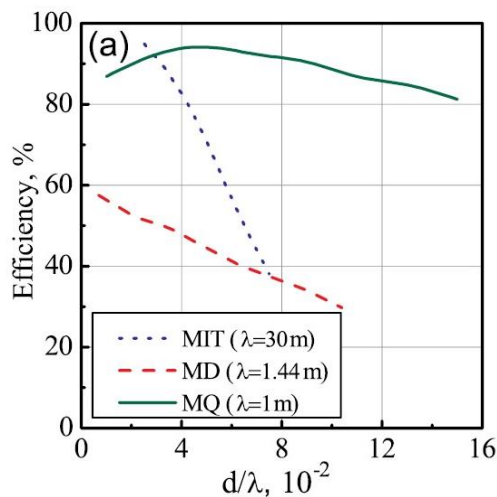


Fig. 13. – Comparison between proposed Witricity systems [7]

6. Conclusion

This paper presented a study on wireless power transfer. It was shown the main parameters that influence the behavior of energy transmission, such as: resonance frequency, coupling factor and quality factor. It was also shown the relationship between coupling factor and distance, the variation of transmission efficiency with respect to distance, the relationship between mutual inductance and distance and finally, the variation of transmission efficiency in relation to frequency. The great barrier to this leverage technology is the low efficiency that the system draws from the distance. In the case of the charging of the electric car that distance is necessary and to maintaining a high efficiency it is necessary to keep the coupling factor high, something that in the ITP system is not easy to do. As research in this area is progressing very fast, it is possible that researchers will be able to use new transfer methods to use other types of systems, but ITP still remains the cheapest and most widely used system in the market today.

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