

4. CONCLUSION

In this paper, modelling and analysis of mid-range and mid-power four-resonator coil WPT system have been presented. In the proposed work, we have analysed the efficiency and transferred power for different coil structures and topologies. For this purpose, the proposed system was simulated in Keysight ADS tool. The efficiency and the transferred power with the proposed four-resonator coil system are 74.670 % and 3.8 W for circular structure, 81.47 % and 4.7 W for rectangular structure at 13 cm gap respectively. The proposed system was compared with three-coil and two-coil systems using both rectangular and circular structures. The two-coil system has shown to yield very low efficiency and transferred power as compared to both three-coil and four-coil systems. While the three-coil system has lower performance than the four-coil system, both in transferred power and also PTE. It is observed in all topologies that the rectangular structure has better performance. In four coil WPT system, the resonance frequency fluctuates due to the strong coupling between the resonators. In order to mitigate this problem, frequency tracking system at the receiver side is desirable.

In the future work, a hardware prototype will be designed for both geometries to measure both PTE and transferred power, and then compare with simulation results for validation purpose.

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