

Comparing Three Methods of Wireless Power Transfer

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Abstract

The purpose of this research is to utilize three modern methodologies of wireless power transfer (WPT) on fixed-wing, unmanned, aerial vehicles (UAVs) and compare their efficiencies. Various considerations will be taken into account which include a cost-benefit analysis, distance and efficiency comparisons, and practical use-case limitations. Analyzed methodologies include inductive power transfer (IPT), microwave power transfer, and infrared wireless optical power transfer. In collaboration with the UNR AIAA Aerospace Club and other WPT research teams on campus, these configurations will be tested physically in controlled experiments. After the results are analyzed, pathways of optimization for future research will be proposed. In short, with modern design methods, the infrared wireless power transfer has the highest efficiency potential, inductive power is simplest and cheapest, but less effective than radiative power, and microwave wireless power transfer is simpler and cheaper than infrared, but has more design parameters and much of the potential of IR.