# ABSTRACT

The method of coupling coil by placing it at a remote distance from a target source coil and a receiving coil on a load is a primary concern in wireless power transfer (WPT) applications. The inverse proportionality relationship between the coupling coils in WPT minimizes the system performance. Accordingly, this research optimizes the parameters of distance and resonance frequency.

To optimize distance and resonance frequency, this thesis deploys the principles of resonant circuits, electrical induction, and WPT through the application of the resonance circuit at both ends of a transformer. The circuit is analyzed by using the resonance transformer and the Buck-Boost operation mode in the load section.

This technique ensures a stable thermal characteristic during the charging operation and supports a fast response charging related to the Buck-Boost operation. The wireless power transfer coils are used to implement a 180W prototype, and the experimental results are provided to verify the theoretical analysis and method.

**Keywords:** Resonance coupling, Resonance frequency, Buck-Boost operation, Wireless Power Transfer (WPT).