

## Master Thesis

# Advanced Control of Dual-Active-Bridge (DAB) Converter and Comparison

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## Description

The ever-increasing demand for efficient and reliable power conversion in modern electrical systems has brought significant attention to Dual-Active-Bridge (DAB) converters. These converters are pivotal in applications ranging from renewable energy systems and electric vehicles to smart grids and industrial automation. The traditional control methods, while effective to an extent, often fall short in maximizing the performance and efficiency of DAB converters under varying operational conditions. The research of the advanced control is to extend the Zero-Voltage-Switching (ZVS) range with less effort.



## Tasks

- Conduct an extensive review of current Trip-Phase-Shift (TPS) DAB control methods;
- Simulate and build the operation pattern of current TPS control and the proposed control;
- Model the losses and volume for the entire system and evaluate two control based on efficiency and power density;
- (if possible) Validate the proposed control methods through experimental setups;

## Prerequisites

- Great interest in power electronics;
- Strong background in control systems and power electronics;
- Proficiency in MATLAB, PLECS, and LTspice;
- Knowledge about magnets.

## Contact and further information

- Please attach your CV and the latest study transcript to the application

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