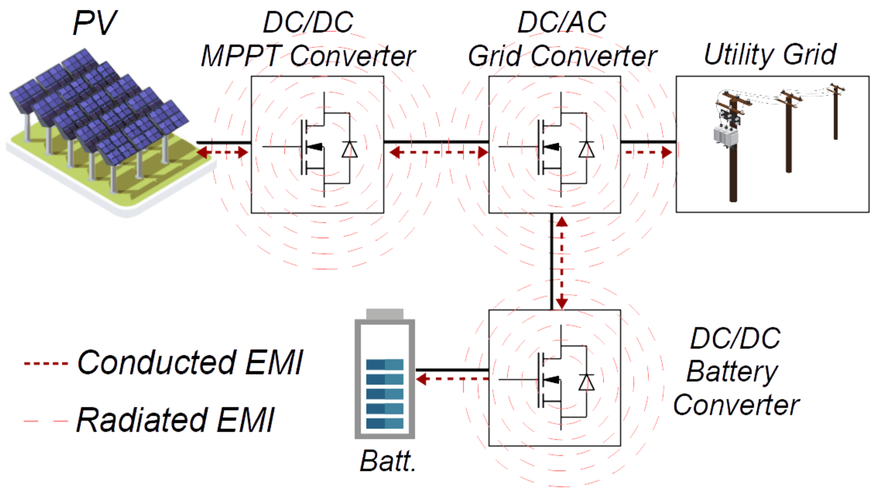
May 8th, 11:00 AM - 1:00 PM

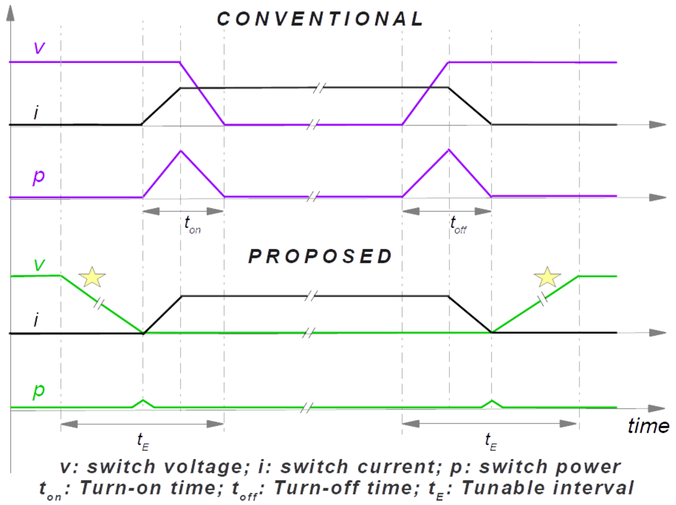
Reducing Switching Noise and Losses in Two-Stage Electric Power Converters

Abhijeet Prem
Portland State University

Our control strategy for Power Electronic Converters can reduce energy loss and noise at the source!

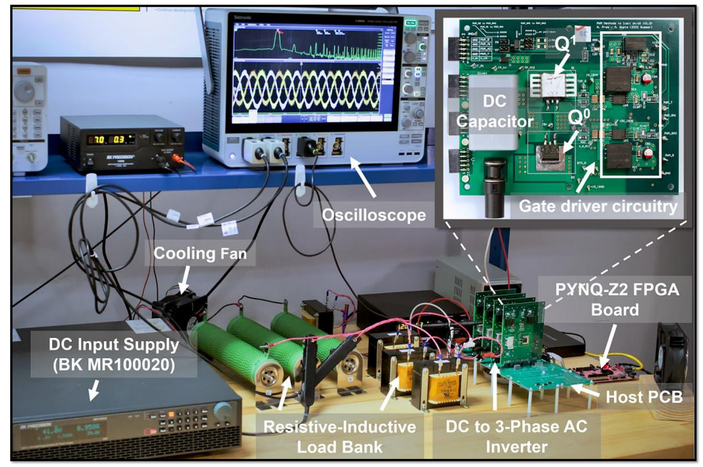


Methodology

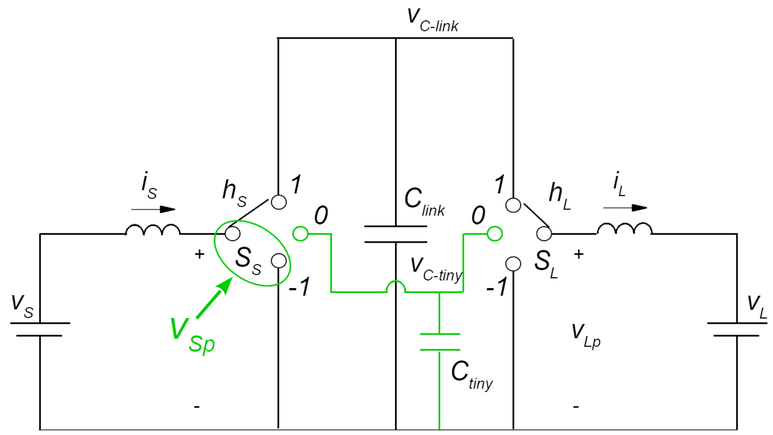


v: switch voltage; i: switch current; p: switch power
t_{on}: Turn-on time; t_{off}: Turn-off time; t_E: Tunable interval

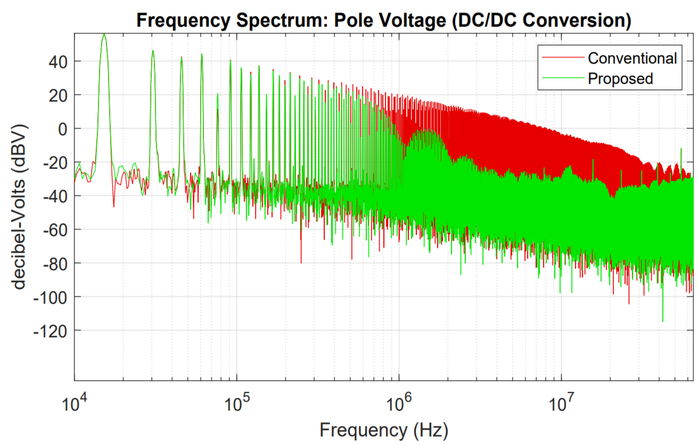
Experimental Test Setup



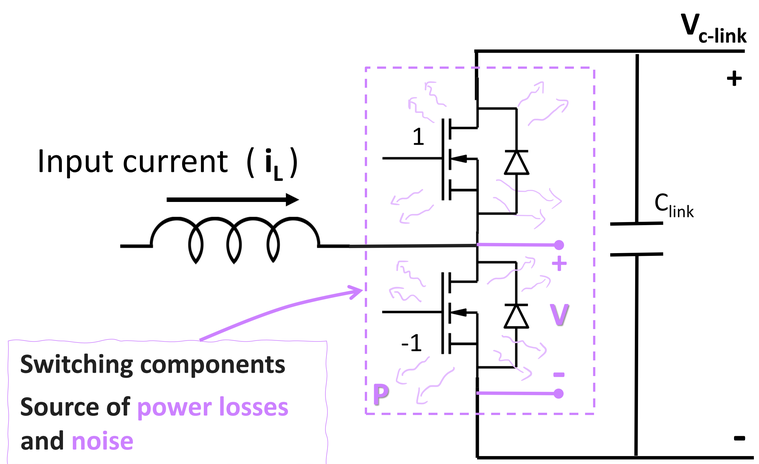
DC/DC Proposed Topology



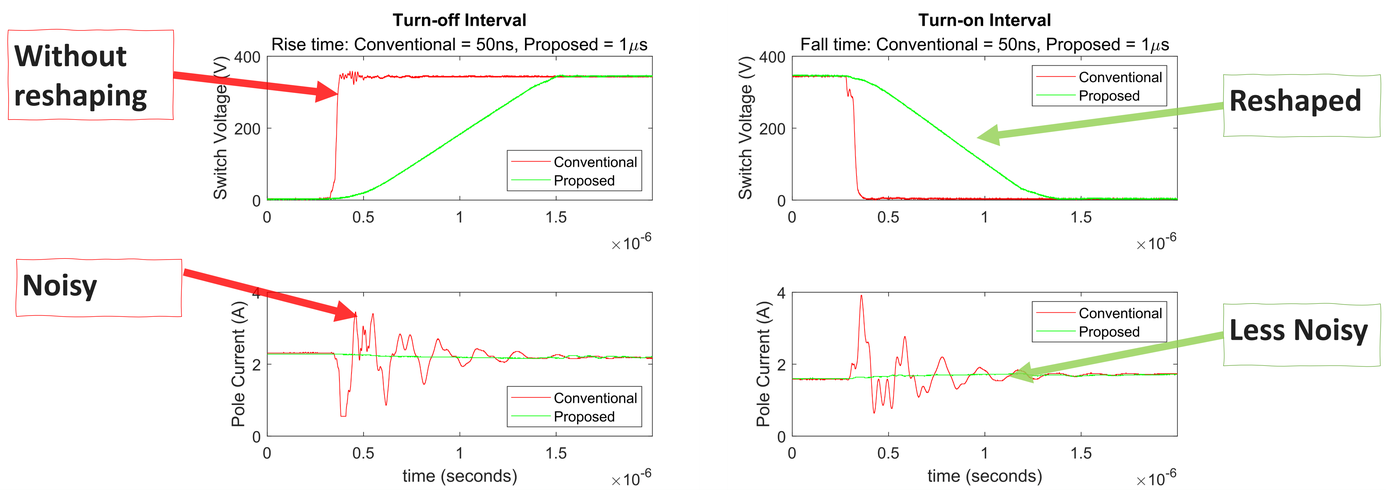
Pole Voltage Frequency Spectrum



A Simple Power Electronic Converter



Time Domain Results From The DC/DC Converter Setup



- **8% to 12%** efficiency improvement in setup with **Silicon switches**, operating at **400W**
- **2%** efficiency improvement in setup with **Silicon Carbide switches**, operating at **750W**
- **20dB to 30dB** reduction in electromagnetic noise at **frequencies > 1MHz**

Abhijeet Prem, Mahima Gupta
Department of Electrical and Computer Engineering
Portland State UNIVERSITY
Maseeh College of Engineering and Computer Science