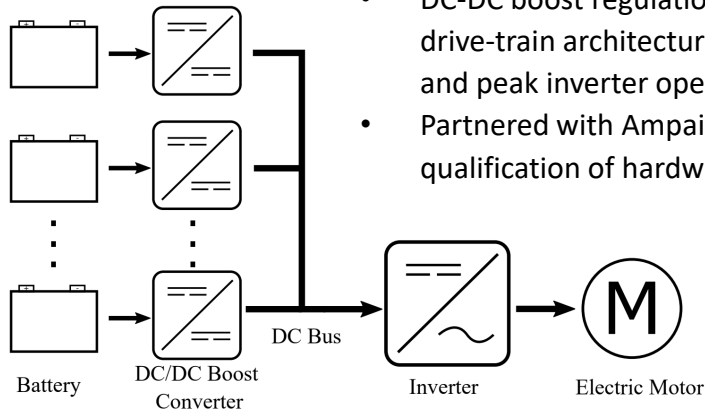


Motivation and Application



Proposed drivetrain architecture.

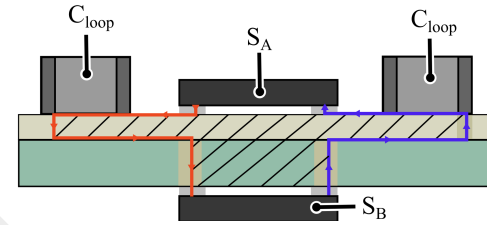
- DC-DC boost regulation stage added to hybrid electric drive-train architecture to allow variable battery voltage and peak inverter operation.
- Partnered with Ampaire and ARPA-E for flight qualification of hardware.



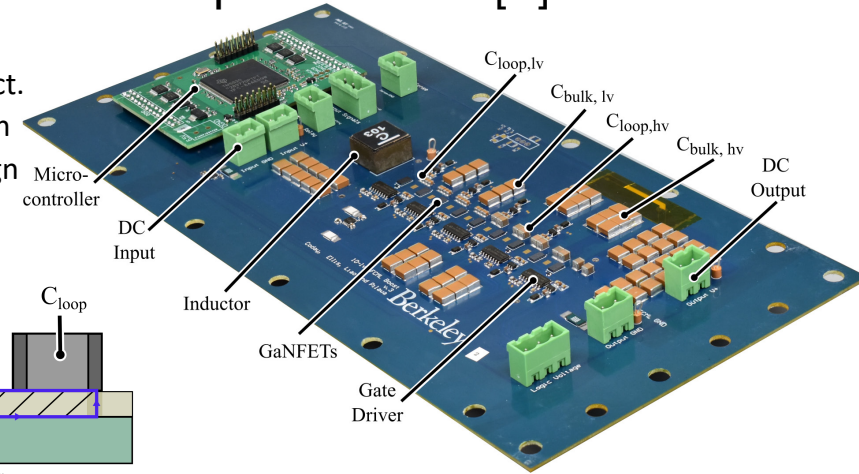
Ampaire EEL flight.

Hardware Implementation [1]

- 10-level FCML design is light-weight and compact.
- Modified electrically thin commutation loop design decreases parasitic inductance.

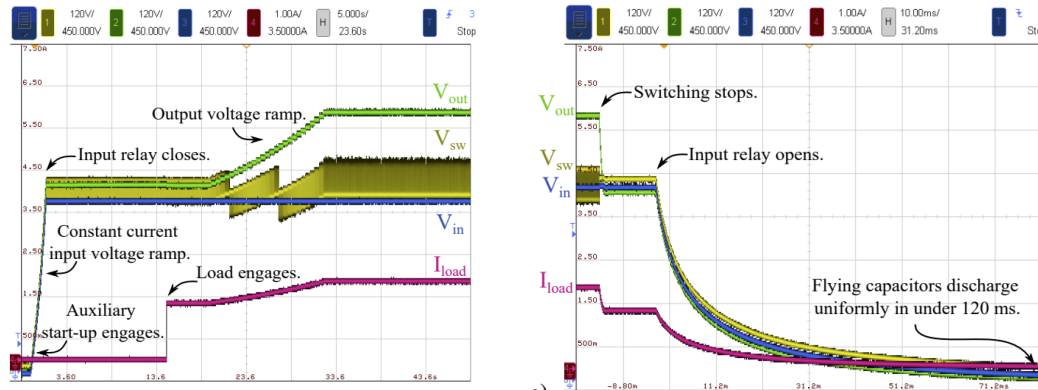


Commutation loop rendering.



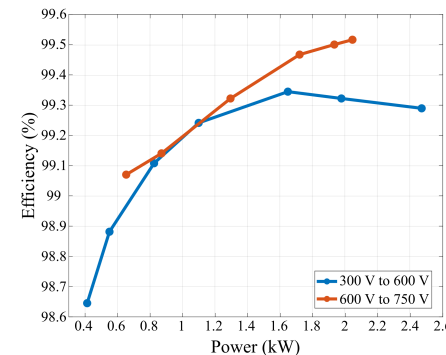
10-level FCML labelled hardware prototype.

Challenges and Solutions [2]

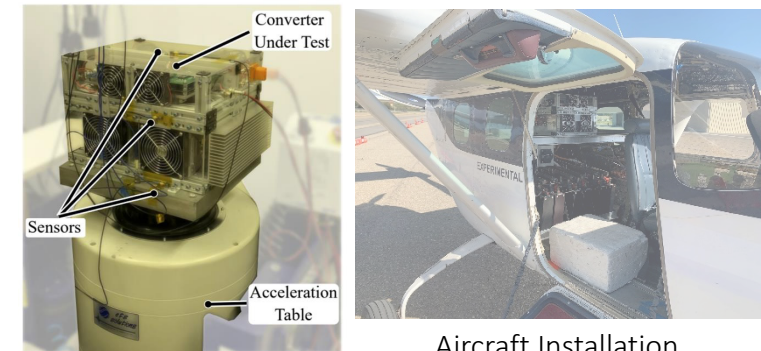


- Start-up auxiliary circuit and control allows for safe start-up at high voltages.
- Careful shutdown control of FCML is demonstrated as to not over stress switches.

Experimental Results [3]



Measured efficiency (including gate drive losses).



Vibration test set-up.

Aircraft Installation

