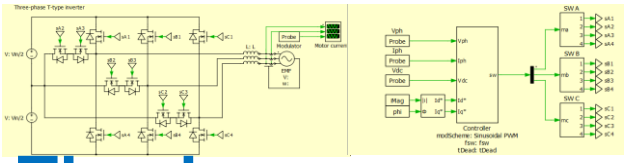
Graz University of Technology
Electric Drives and Machines Institute



Bachelor's / Master's Thesis

Next Generation of Drives:

Sustainable and Low-Loss Servo Drives for Fully Electric Injection Molding Machines Utilizing 3-Level Inverter Design

Motivation

Multilevel topologies in inverters in combination with wide band gap (SiC, GaN) materials and sinusoidal output filters are a promising technology to reduce EMC and increase the efficiency of motor inverters. Three-level topologies yield to lower voltage levels and higher switching frequencies of the power stage in comparison with 2-level inverters can be implemented. This allows a significant improvement in efficiency, reduction of the filter components which could enable the integration of sine motor filter into the drive stage.

Topics on Three-Level Inverter

- Modulation and balancing of three-level inverters under different load conditions.
- Optimal paralleling of three-level inverter stages to increase power range.
- Design and optimization of three-level inverter with integrated sinus motor filter.

Tasks

- Literature study of possible solutions.
- Derivation of convenient PLECs simulation models for the corresponding topic.
- Development of new approaches, structures and detailed analysis on the developed approaches.
- Optimization of the approaches based on (semi-) analytical models.

Further Information

- Start: asap (according to agreement)
- Workplace: EAM Institute TU Graz (Workplace directly at B&R automation possible)
- Compensation or bonus possible

Contact

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