

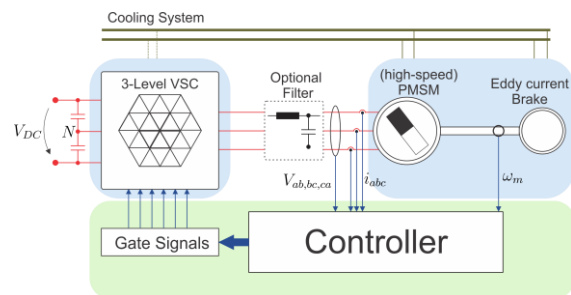
# Controller and Observer modelling and implementation for high speed PMSM

**Bachelor's/Master's Thesis**

Contact: Karthik Debbadi  
 Email: kde@tf.uni-kiel.de

Prof. Dr.-Ing. M. Liserre

**Abstract**—The position of the rotor is important to have good control of the speed and torque of the permanent magnet synchronous machine ( PMSM ). For high speeds, it is difficult to sense the position with high accuracy. An observer needs to be designed to estimate the position of the rotor with high accuracy. dSpace hardware is used for hardware implementation of the controller and observer.



**Background**—The plant with the motor and the power electronics inverter are simulated in plects and the controller and the observer are simulated in matlab Simulink. The analysis is validated and then programmed onto the dSpace microlabbox hardware. The focus of the thesis will be on the design and implementation of the controller and observer for the high speed PMSM in the lab. Then designed controller will be tested with real experimental operation. The observer is validated with the already available position sensor on the PMSM for accuracy.

**Objectives:**

- Create the model of the PMSM, control and observer in plects and Simulink in Matlab
- Program the dSpace with the controller and the observer
- Compare simulation results with experimental results

**Type of the Work:**

- Simulations
- Laboratory

**Language of the Thesis:**

- German/English

**Connected Project:**

Title of the project

