For power electronics new fast switching modules (SiC, GaN) become more and more important and replace the standard IGBT modules. In this thesis, the undesired effects in the machine which are by operating with the frequency inverter (e. g. bearing and stray current) should be investigated. Bearing currents are still the main cause for electrical machine failures and become even more relevant for fast switching modules in the future.

The high voltage change dv/dt of SiC modules results in reloading of parasitic capacitors within the machine and between machine and inverter/environment. The first part of the thesis should be the adaption of an existing simulation model to model this process. Especially the high dv/dt has to be considered when creating the model. The topology of the inverter should be a standard B6C as well as an 3-level NPC. In a second step measurements on the electrical machine should be conducted in order to validate the model.

This thesis is suitable for students of the following study program:

☒ Electrical Engineering
☒ Industrial Engineering

Earliest start date: Now
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