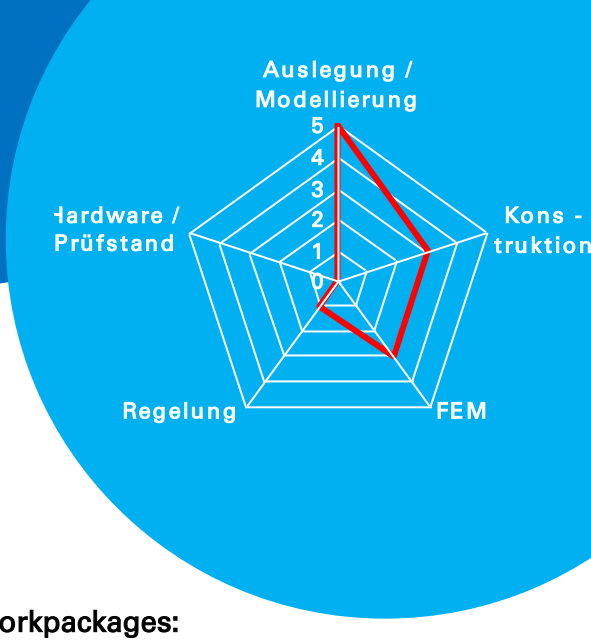
Universität Stuttgart
Institut für Elektrische
Energiewandlung

FA / SA / MA



Comparison of innovative motor topologies for industrial drive applications

In the context of increasing requirements for energy efficiency, space optimization and power density, new motor topologies are becoming increasingly important in industrial applications. Particularly in the field of electric drive trains for machines and production plants, there is potential to achieve significant improvements through alternative electromagnetic concepts. The aim of this thesis is to analyze selected motor topologies in a structured manner and to evaluate their suitability as drives for industrial applications.

Students-Profile:

- Basic knowledge of electrical machines and drive technology
- Interest in innovative machine concepts and system evaluation
- Structured, independent and thorough way of working, intrinsic motivation
- Ability to conduct literature research and structured analysis
- Experience with FEM tools or simulation software is an advantage
- Enrolled at the University of Stuttgart

Possible Workpackages:

- Introduction to common and innovative electromagnetic motor topologies (e.g. PMSM, SRM, ASM, SynRM, axial flux machines, transverse flux machines, ...) and creation of a morphological box
- Definition of suitable comparison categories and criteria (e.g. efficiency, torque density, costs, coolability, complexity of production, controllability, scaling options)
- Structured comparison of the identified topologies, taking into account industrial requirements
- Selection of one or more promising concepts with well-founded justification
- Creation of an evaluation matrix and simple simulation models for illustration purposes

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