

Vortragsankündigung

Direct Grid Operation of Permanent Magnet Generators: Concept and Design

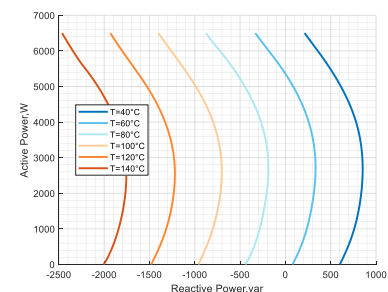
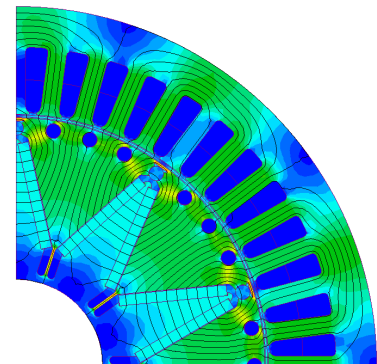
Dr. Ana Hanic, University of Zagreb

Monday, 18th November 2024 9:00 Uhr, Library of IEALS (Inffeldgasse 18, HS01020F)

Small and micro hydropower plants provide a sustainable decentralized energy supply, contribute to power system stability, and play an important role in supporting energy solutions for small and rural communities.

Although many of these systems rely on either cost-effective direct-on-line induction generators or variable-speed generators connected to the network via frequency converters, direct-on-line permanent magnet generators offer a good compromise: they provide a higher power factor and greater efficiency than induction generators while remaining less complex and more cost-effective than variable-speed solutions.

This lecture will present an approach to the design of direct on-grid permanent magnet synchronous generators for small and micro hydropower plants. It will outline the calculation of operational trajectory as a special case of a capability diagram with fixed rotor magnetic excitation. The lecture will also cover the optimization method, including the quality of the operational trajectory, temperature dependence, and considerations for meeting grid connection standards.



Dr. Ana Hanic is a lead researcher at the University of Zagreb, Faculty of Electrical Engineering and Computing, at the Department of Electric Machines, Drives, and Automation. Her research is focused on developing advanced analytical and numerical modeling techniques for electric machine simulation and optimization, as well as designing electric machines for traction and power generation applications. Her current projects include research on harnessing low-energy heat from renewable sources using a high-speed microgenerator and developing a proof-of-concept for a low-speed permanent magnet synchronous machine for direct grid connection.