ICEM 2024, Torino, September 1-4 2024

Special Session on

Switched Reluctance Machines and Drives

Organized and co-chaired by

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Call for Papers

Switched reluctance machines and drives have been attracting increasing attention thanks to their simple and magnet-free structure, robust rotor, wide speed range, easy thermal management, as well as strong fault tolerance, which are widely used in industrial drive, aerospace, household appliance, and etc. However, there are several technical challenges restricting the further spreads of reluctance machines and drives. Due to the highly nonlinear electromagnetic characteristics and the dependence on reluctance torques, the analytical modelling and high-performance control of reluctance machines are difficult. More importantly, the reluctance machine-based drive systems usually suffer the significant torque/current ripple, acoustic noise, and vibrations. In addition, their torque density and power factor are generally inferior to the brushless permanent magnet machines. This special session is aimed to collect the latest theoretical and technological developments of reluctance machines and drives. The innovative topologies and structures of switched and synchronous reluctance machines are expected to improve the torque density and efficiency, as well as alleviate the parasitic effects. The generic and high-reliably analytical modelling and optimization method can be provided for the effective and efficient analyses and designs of reluctance machines. Moreover, the advanced control strategies are essential, with particular reference to the sensorless algorithm, torque ripple mitigation, efficiency and power factor improvement, and fault-tolerance. In addition, the innovations on power circuit topologies are expected to better match the operations of reluctance machines, whilst the multifunction exploration and the integration with power electronic device are of value. The condition monitoring and fault diagnosis of drive systems help to enhance the reliability. Last but not least, the discussions about the novel industrial applications of reluctance machines and drives are warmly welcomed.

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Topics of interest include, but are not limited to:

- Innovative topologies of switched reluctance machines.
- New analytical, modelling, and optimization methods for switched reluctance machines.
- Advanced control strategies of switched reluctance machine drive systems.
- Novel converter topologies for switched reluctance machines and their integrations with power electronics.
- Industrial applications of switched reluctance machines and drives.

Submission of papers: paper submission follows the rules of regular papers. All the instructions for paper submission are included in the conference website https://icem.cc/2024