Special Session on

Advanced Switched Reluctance Machines and Drives: a Magnet-Free Alternative for Cost-Sensitive and High-Reliability Applications

Organized and co-chaired by:

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Abstract

Thanks to their peculiar operation principle, switched reluctance machines (SRM) feature a very simple structure making no use of permanent magnets, with an extremely robust rotor and a very reliable stator; moreover, their basic control is pretty simple and do not require bi-directional current supply.

Such characteristics make them potentially interesting for a broad range of applications where low manufacturing cost with limited environmental impact, very high resilience in front of mechanical and thermal stress, fault mitigation capability and simple converter structure and control are valued.

Nevertheless, traditional electrical drives based on SRMs usually exhibit high torque/force ripple, vibrations, noise and low power factor: therefore, such machines are often considered to be useful only for rough applications in hostile environments.

This Special Session aims to explore the potential of both rotary and linear SRM-based electrical drives for any viable application, especially levering on innovative concepts supported by unconventional materials and manufacturing processes as well as by advanced modeling and design techniques and control strategies.

Topics of interest include, but are not limited to:

- Innovative topologies and layout for machine and converter.

- Wise utilization of non-conventional materials and manufacturing processes, also considering sustainability aspects.
- Advanced modeling and optimal design based on analytical and numerical methods, also using multi-physics approach.
- Machine-converter integration and interactions.
- Advanced control techniques, including model-predictive and sensorless.
- Improvement of performances, including torque/force density, ripple, efficiency, operational range, converter requirements etc.
- Fault prediction, detection, management and tolerance capability.
- Mitigation of vibrations and noise, including NHV assessment for vehicular applications.

Important dates

- Full Paper Submission: February 1, 2026
- Full Paper Notification: May 1, 2026
- Final Paper Upload: June 1, 2026

Submission of papers

Paper submission follows the rules of regular papers. All the instructions for paper submission are included in the conference website:
https://icem2026.ubi.pt/submission.html