



CALL FOR PAPERS



IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS

Special Issue “Magnetically Levitated Motor Systems”

[See updated timeline due to coronavirus pandemic] Magnetically levitated motor systems based around bearingless motors and generators and magnetic bearings offer a potential step change improvement in motor system lifetime and efficiency, solve critical challenges related to oil-lubricated contact bearings, and feature prognostic capabilities for condition-based maintenance. Acceptance of this technology has been historically limited by challenges related to cost, design and control complexity, manufacturing issues, and low force density. However, recent advances in supporting technologies enable new approaches to address these challenges. These advancements include the commercialization of wide bandgap semiconductor devices, high performance and low-cost embedded systems, additive manufacturing of metals, advanced iron alloys, and a new generation of simulation and design software. By leveraging these advancements, fundamentally new magnetically levitated motor system concepts are now possible, as well as significant improvement to existing levitation technology. High impact applications span the entire range of motor and generator technology, including compressor systems, high speed alternators, flywheel energy storage equipment, and low speed direct-drive motor systems. This special section is intended to attract papers which address important and timely topics related to the design, development, analysis, and operation of magnetically levitated motor technology. Contributions which report on recent advancements in enabling and supporting technologies to increase the overall system performance in terms of efficiency, power density, reliability, lifetime and production costs are particularly encouraged.

The guest editorial team solicits original research papers with novel contributions in all aspects of magnetically levitated motor systems. Topics of interest include, but are not limited to:

- Optimal and/or multiphysics design and modelling of bearingless motors/generators and magnetic bearings
- Advanced magnetic suspension drive topologies for high speed motor/generator systems
- Basic research on bearingless motors/generators and magnetic bearings
- Innovations that increase the power density and efficiency of bearingless motor/generator technology
- Medium/high power bearingless motor/generator technology for industrial applications
- Topologies that rely on partial passive stabilization, including bearingless slice motors and single drive bearingless motors
- Passive magnetic levitation systems based on either electrodynamic principles or superconducting diamagnetic principles
- Combined motor windings capable of producing both magnetic suspension forces and torque
- Self-sensing and low-cost sensing for magnetic levitation technology
- Advanced and intelligent control methods for magnetic levitation technology
- Techniques for magnetically-levitated motor/generator system condition monitoring and predictive maintenance
- Applications, such as flywheel energy storage, that are either only possible or significantly improved by use of magnetically levitated motors and generators

Submission Guidelines

Authors who wish to submit a paper for consideration must submit an extended abstract (free format, PDF version, recommended length of 2 pages). The extended abstract should state the significance of the contribution of their paper, including the following information:

1. Corresponding author's first name and last name;
2. Corresponding author's email address (used for manuscript central account) and Affiliation
3. Title of manuscript

The extended abstract should be sent to Professor Eric L. Severson at the University of Wisconsin-Madison, USA via email to eric.severson@wisc.edu.

Authors who submit an accepted abstract will receive a formal invitation with detailed instructions for submission of the complete manuscript to the IAS ScholarOne Manuscripts site. Refer to <http://www.ias.org> for general information about electronic submission through ScholarOne Manuscripts. Manuscripts submitted for this Special Issue will be reviewed separately and will be handled by a Guest Editorial Board.

Important Dates (Revised)

Due to the coronavirus pandemic, the special issue timeline is modified as indicated below. Decisions on whether extended abstracts are of interest to the special issue will be made on a rolling basis, within four weeks of abstract submission. An invitation to submit a full paper will be issued at the time of abstract acceptance. Papers that complete the review process ahead of schedule will be available in IEEE Xplore as Early Access articles.

January 1, 2020: Call for papers issued

June 1, 2020: Editorial board will begin accepting extended abstracts

September 21, 2020: Final deadline for submitting an extended abstract

November 10, 2020: Deadline for submitting initial manuscript of full paper

May 8, 2021: Notification of final decisions

June 5, 2021: Deadline for submission of final files, early access preprint in IEEE Xplore

Publication scheduled for November/December 2021 Issue

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