

ICEM 2024, Torino, September 1-4 2024

Special Session on Intelligent Model-Based Design & Simulation Technology of Electrical Machines Targeting E-Mobility

Organized and co-chaired by

- Dr. Sarbajit Paul, ABB Corporate Research Center, Germany,
sarbajit.paul@de.abb.com, pol.jit@gmail.com
- Prof. Junghwan Chang, Dong-A University, South Korea, cjhwan@dau.ac.kr

Call for Papers

Over recent years, research in e-mobility has surged in popularity, primarily driven by the quest for efficiency and the imperative to reduce carbon emissions. This rapid advancement calls for electrical machines, power electronics, and storage systems that align seamlessly with the diverse requirements of electric transportation modes.

The Special Issue is dedicated to the forefront of model-based design in electric machines, encompassing traction motors, electromagnetic actuators, and contactless power transfer technologies pivotal for e-mobility. We particularly emphasize innovations related to design of the electric machines considering the whole system consideration rather than treating the electric machine as a component. Our scope extends to a broad spectrum of model-based design methodologies and simulation techniques for electric powertrains, integrating aspects of electrical machine design, power electronics, storage systems, and more. We welcome contributions that not only discuss theoretical advancements but also practical implementations, offering insights into improved design, reduced losses, cost efficiency, and enhanced safety. **We are seeking submissions that explore the system-level design of electric powertrains, encompassing integration aspects of electric machines, drives, and other subsystems, among other relevant topics:**

- **Model-based design strategies** for traction motors tailored to Electric Vehicles, Railways, Aerial Vehicles, and Marine applications.
- Innovative modeling and control approaches for less rare earth or rare earth-free machines in e-mobility that **integrate system level approach**.
- Development of computationally efficient winding loss models, including AC winding losses **considering the effect of powertrain subsystems**.
- Online, computationally efficient, and integrated **system level** electromagnetic-mechanical-thermal modeling of electric machines for e-mobility.
- Utilization of advanced artificial intelligence methods in the **model-based design** of electric machines within e-mobility.
- Automation programs for optimum design of e-mobility powertrain **system combining electric machines, drives and associated mechanisms**.

* **Traditional component level design of electric machines is beyond the scope of this special session.**

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>