

IET Electric Power Applications Call for Papers

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Special Issue on: Advances in Electric Machines: Solutions for Electro-mobility with Improved Characteristics

The efforts of mankind, focused on the reduction of global warming and carbon dioxide emissions, achievable through the reduced usage of fossil fuels, strongly influence the development of the entirety of engineering. The means identified to achieve these goals are improved energy efficiency, increased utilisation of renewable energy sources, and a broader introduction of electro-mobility. All of these are challenges that must be properly addressed in the further development of electric machines.

Electro-mobility introduced completely new challenges in the development of electric machines where low mass, high power density, high efficiency and reliability, wide speed range, robustness, and fault tolerant design are some of the main targets. These requirements, combined with different supply voltage levels and specific cycles of operation, lead to solutions based on completely new materials, topologies, cooling methods, supply, and control of electric machines. The power range of electro-mobility road applications from several W to several hundreds of kW is substantially exceeded in railway traction and ship propulsion, where electric machines in the range of several MW are required. Imperative for all electric machines, the conventional ones as well as those used in electro-mobility related applications, is efficiency. Its further improvement can be achieved by the introduction of new materials and improved characterisation methods, new and improved designs and topologies of rotors, stators and windings, improved cooling as well as novelties and further development in the fields of testing procedures, modelling, simulations, and control of electric machines.

This special issue focusses on, but is not limited to, the novelties in the field of electric machine for electro-mobility with improved characteristics, including:

- applications of new materials in electric machines
- destructive and non-destructive testing of electric machines
- measurements, testing, and parameter identification
- design and topology of electric machines including rotors, stators, and windings
- improved cooling methods for electric machines
- modelling, simulations, and optimisation of electric machines
- fault tolerant design of electric machines
- monitoring and fault detection systems
- applications in electric cars, motorcycles, bicycles, trucks, buses and trams
- applications in railway traction and ship propulsion
- electric machines for main and auxiliary drives for electro-mobility
- measures for improving efficiency of electric machines

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