



ICEM2020 – Gothenburg, Sweden, August 23-26, 2020

Special Session on

High-Speed Electrical Machines

Organized and co-chaired by:

Shaopeng Wu, Harbin Institute of Technology, China, wushaopeng@hit.edu.cn
Lassi Aarniovuori, LUT-University, Finland, lassi.aarniovuori@lut.fi

Call for Papers

High-speed motor drives have spurred a renewed interest in motor technology and power electronics, which may require a quite different view to conventional designs. High-speed electrical machines usually have high power density and high efficiency. High-speed electrical machines can be connected to high speed applications and thus they eliminate the traditional mechanical gearboxes that results in reduced system noise. Electric vehicles, energy storage, industrial compressor systems, high-speed machine tools, high-speed generators, distributed power generation systems and military fields have excellent application prospects. There are several technical challenges for high-speed electrical machines. Typically, the mechanical losses are omitted in the low-speed machines but they are a major component in the high-speed machines. Typically, the high-speed machines demands high excitation frequency that causes increased losses in the conductors and in the iron circuit. The thermal management in high speed machines is troublesome and one of the special challenges in the high-speed machine design is the heat removal from rotor. The control difficulty is increased due to higher electric frequency. The induction motors dominated the HS-market, but the PMSMs numbers are rising. The high risk of demagnetization for PMSM increase the fault probability and reduce the reliability of the motor. The high-speed rotating rotor also makes the strength of the rotor more prominent than that of conventional medium and low-speed motors. Structural design, strength analysis, material selection and dynamic characteristics analysis of the rotor are required to ensure that the rotor can operate reliably and safely. The active magnetic bearings have become a common part in the high-speed machines.

Topics of interest include, but are not limited to:

- Topology design of high-speed electrical machines
- Simulation of high-speed electrical machines
- Optimization design of high-speed electrical machines
- Cooling and thermal management of high-speed electrical machines
- Control/Modulation methods of high-speed electrical machines
- Fault diagnosis of high-speed electrical machines
- Reliability analysis of high-speed electrical machines
- AMB –systems for high-speed machines

Submission of papers: deadline follows the deadline for the regular papers.

All the instructions for paper submission are included in the conference website:

<http://www.icem.cc/2020>