

Call for Papers for the Special Session on

Design, Control, and Fault Detection of Power Converters for Energy Storage and EV Charging Systems

Organizers and Co-chairs

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Technical Outline of the Session and Topics

Electric storage devices, like batteries, supercapacitors, and electric vehicles, are usually connected to the grid for cogeneration or energy conservation for future use. This connection is made through power electronics interfaces that should guarantee high stability, voltage regulation, power flow control, and low electromagnetic emission, along with high power density, low cost, and high reliability. To increase the power density, passive devices that are considered the bulkiest components in these systems should be reduced or avoided. This can be achieved by considering multilevel topologies that would comply with power quality requirements without the need for passive filters.

This session is dedicated to the various solutions adopted for high-quality energy management at the storage or EV charging levels. More specifically, it will present advanced power electronics topologies used for power quality enhancement in such applications. Model-based or intelligent control algorithms ensuring compliance with grid requirements, especially regarding power quality, V2G connectivity, and EV-related standards, are also considered as major topics in this session. In addition, fault detection techniques dedicated to diagnosing power converters for electric vehicles and energy storage devices are also covered.

Topics of this Special Session Include but are not limited to

- Multilevel converters in grid-connected storage devices.
- Fuel cells for EV drives.
- Battery charging systems and PV-assisted charging systems.
- Power quality and energy management in V2G systems.
- Model-based control design.
- Artificial-intelligence-based control.
- Open-winding motor drives.
- Current and voltage signature-based fault diagnosis methods for chargers.
- AI-based fault detection techniques for EV and battery charging systems.

Timeline for Author

Deadline for submission of special session papers March 15, 2025

Notification of acceptance March 31, 2025

Deadline for submission of final manuscripts April 15, 2025

All the instructions for paper submission are available on the conference website.

