9th International Conference on Clean Electrical Power



Special Session on Advances in Isolated Power Converters for Renewable Grid Integration

The increasing adoption of renewable energy sources has amplified the need for advanced isolated power converters tailored to grid integration applications. Key features for these technologies include galvanic isolation, high power density, and high efficiency, all essential for achieving stable, flexible, and scalable grid connections. The availability of wide-bandgap devices, such as SiC and GaN, enables high switching frequency operations in established isolated topologies, including resonant converters and dual-/multi-active-bridge designs, as well as their integration with modular multilevel converters, such as solid-state transformers based on dual-active-bridge topologies and other emerging configurations.

Despite significant advancements, ongoing research focuses on topological innovations, modulation optimization, and high-performance control algorithms to improve these converters performance and adaptability. This Special Session invites novel contributions in isolated power converters for grid integration, addressing areas such as innovative control strategies, modulation techniques, niche applications, symmetric/asymmetric topologies, power switch optimization, and decoupled power-flow management, all aimed at optimizing renewable energy integration within the power grid.

Topics of interest for publication include, but are not limited to:

- Novel converter topologies for renewable and storage integration;
- Innovative control strategies for power converters integrating distributed generation;
- MV-level renewable and storage integration;
- Multilevel modular power converters;
- Dual-active-bridge power converters;
- Resonant converters;
- Multi-active-bridge power converters;
- Niche applications of isolated converters
- Soft-switching techniques in isolated converters;
- Isolated power converter design and cost optimization;
- Modulation and control strategies for efficient power conversion;
- Multiport isolated power converters;
- Power converters and compensation circuits for wireless power transfer;
- Reliability and redundancy in isolated power converters;
- Modular isolated power converters for smart transformers;
- Conductive/wireless chargers;
- MV-level charging;

This special session is organized by:

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