



## Call for Papers

# IEEE Transactions on Power Electronics (TPEL)

## Special Section on Advanced MV Power Electronics for Grid Interactive Applications

**Scheduled Publication Time: October 2024**

Medium voltage (MV) power electronics plays a crucial role in smart grid applications, acting as the link between MV and low voltage (LV) systems. They enable various functions such as voltage conversion, power regulation, electrical isolation, coordination among AC and DC ports, power quality enhancement, and communication with intelligent devices. This integration of physical power processing units with cyber components forms a cyber-physical system, which is essential for long-term sustainability, development, and environmental preservation.

The field of MV power architectures has witnessed significant advancements, encompassing multiport, multilevel, and multiphase converters for AC/DC, DC/DC, AC/AC, and DC/AC power conversion. To ensure their successful operation, key techniques such as advanced modeling, control, and modulation have become crucial. The integration of cyber-physical systems and methods of power transfer, along with simultaneous power and information techniques, are pivotal in enhancing system efficiency and reliability. Moreover, careful selection of semiconductor devices, gate driving, and magnetics design are imperative to meet the demands of high-frequency MV power conversion.

The objective of this special issue is to engage the scholarly community in exploring multi-timescale modeling, control, and modulation for a wide range of power converters. It focuses on MV power electronics and its integration into cyber-physical systems. By delving into these innovative solutions, we aim to advance intelligent and resilient power converter technologies, ultimately propelling the development of MV power electronics and enabling efficient smart grid operations. The topics covered in this special issue encompass various aspects, including but not limited to the following:

- Reconfigurable multiport / multilevel / multiphase AC/DC, DC/DC, AC/AC, and DC/AC power conversion design for smart grid applications
- Advanced modeling, control, and modulation techniques for multiport / multilevel / multiphase AC/DC, DC/DC, AC/AC, and DC/AC power converters
- Reliability and stability of MV power electronics - fault diagnosis, condition monitoring, fault-tolerant of passive components, power devices, and power converters
- Gate drive design and new semiconductor devices for MV/LV power devices
- Materials, magnetic integration, multi-physical design, and multi-objective optimization of transformer design
- High-efficiency coupling, information integration, encryption, and identity recognition for smart grid applications
- Attack detection, mitigation, and cyber security risk estimation methods for cyber-physical systems
- Advanced analysis and distributed control techniques of multiple MV power electronics systems with practical communication architecture
- Real-time hardware in the loop (HIL) simulation and digital-twin techniques for MV power electronics systems
- Applications of state-of-the-art mathematical or machine learning techniques

All manuscripts must be submitted through ScholarOne at <https://mc.manuscriptcentral.com/tpel-ieee>. Submissions must be clearly marked "Special Section on Advanced MV Power Electronics for Grid Interactive Applications" on the cover page. **Hardware based experimental results are desired to support proposed ideas.** When uploading your paper, please select your manuscript type "Special Section." Refer to <https://www.ieee-pels.org/> for general information about electronic submission through ScholarOne. Manuscripts submitted for the special section will be reviewed separately and will be handled by the guest editorial board noted below.

### Deadline for Submission of Manuscript: March 31, 2024

<b>Guest Editors</b>	Wu Chen	Southeast University, China
	Henry Shu Hung Chung	City University of Hong Kong, China
	Sonny Xue	Oak Ridge National Laboratory, USA

### Timeline

- March 31<sup>st</sup>, 2024 Manuscripts Submission Deadline
- May 15<sup>th</sup>, 2024 Revised Manuscripts Submission Deadline
- June 30<sup>th</sup>, 2024 Final Acceptance Notification
- July 31<sup>st</sup>, 2024 Manuscripts Forwarded to IEEE for Publication
- October, 2024 Special Section Appears in IEEE TPEL

## Guest Associate Editors

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