

**International Conference on
Sustainable Energy Technologies and Computational Intelligence
(SETCOM 2025)
Department of Electrical Engineering, SoET
Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat, India |
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**SETCOM 2025 Special Sessions on
Low power energy converters: State of the art and future challenges**

Aims & Scope of the Session:

Low Voltage power converters have been widely investigated and used in academia and industry for many years, ranging from low power (milliwatt level) to high power (several kilowatt levels) for various applications like portable regulators and voltage converters. It offers several advantages, including eliminating inductor and related magnetic design issues and hence low electromagnetic interference (EMI), better form factors or power density, and improved dynamic response. However, there is still a huge room for performance improvement in low voltage converters by introducing a small resonant inductor and integrating the best capacitive and inductive power conversion features. Such a “hybrid” concept can achieve high efficiency, reliability, and power density simultaneously.

In recent years, capacitor-based multilevel inverters have gained widespread attention due to their simple design, voltage buck/boost capability, and inherent capacitor voltage balancing features. Various switched capacitor (SC) topologies that generate more voltage levels and increased voltage gain while reducing the voltage stress and switch count have been developed in the literature. Despite the tremendous efforts, current spike mitigation with the so-called quasi or full soft charging of SCs is indispensable using novel circuit architecture and their control/modulation techniques.

Topics of interest include, but are not limited to:

- Advanced topologies and architectures, including dual topology, current ripple cancellation topologies, combinations with switched capacitors, and voltage multipliers.
- Design, control, and modulation techniques, including techniques combined with numerical optimization algorithms and artificial intelligence.
- Efficiency improvement and loss modelling.
- Thermal management and packaging.
- Electromagnetic compatibility (EMC) and electromagnetic interference (EMI) issues and solutions, including low common mode current and common mode voltage topologies.
- Application-specific designs, including but not limited to electrolyzers for green hydrogen, fuel cell applications, powertrains for electric vehicles, power systems for photovoltaic (PV) panels, Internet of Things devices, etc.
- Comparative studies among existing non-isolated converters.

Special Session Organizers:

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Vivekanandan S received the B.E. and M.E. degrees in electrical and electronics engineering from Anna University, Chennai, India, in 2011 and 2013, respectively, and the Ph.D. degree from the Electrical and Electronics Engineering Department, National Institute of Technology Karnataka (NITK), Mangalore, India, in 2019. He was awarded University Rank Holder in his M.E degree. He was with NITK, where he was involved in low-power circuit design. Further, He served as an Associate Professor at REVA University, Bengaluru, India. He joined the Electrical Engineering department at NIT Silchar, India, in 2022, where he is currently an Assistant Professor. His current research interests include low-voltage dc–dc converter topology design with particular emphasis on low-power electronics for portable computing and power management IC, power chargers, and low-power inverters. Vivekanandan S received the Best Paper Award at the Asia Flagship Conference TENCON 18. He is a Senior Member of IEEE. He served as an editorial board member on many conference committees. Published his research articles in high-impact journals such as IEEE Transaction, IET, Elsevier, Springer, etc., He served as guest editor for SCOPUS and Web of Science Journals. He organized the Scopus index and IEEE conferences and supported many workshops and training programs conducted by the government organization. Vivekanandan S has provided 1 Ph.D. and a few M. Tech. He is also a technical committee member of many IEEE events. He served as session chair for IEEE-sponsored conferences.



Saahithi S received the B.Tech. from JNTU Hyderabad and M.Tech. Degrees in electrical and electronics engineering from VTU, Karnataka, India, in 2006 and 2014, respectively, and a PhD from the School of Electrical and Electronics Engineering at REVA University, Bengaluru, India, in 2023. She was awarded University Rank Holder and Gold Medalist in her MTech degree. She was with REVA, where she was involved in power electronics converter-based design. She joined the School of Electrical and Electronics Engineering, REVA University, India, in 2014 and is currently an Assistant Professor. Her current research interests include low-voltage dc-dc converter topology design.

Saahithi S is a Member of IEEE. She served as an Editorial board member of many conference committees. He published his research articles in high-impact journals. She organized the Scopus index and IEEE conferences and supported many workshops and training programs conducted by the government organization.