

Special Session on

**“High Power Multilevel Converters: Topologies, Combination of
Converters, Modulation and Control”**

Organized by

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Call for Papers

The continuous increase in the demanded power capacity has made the two-level converter impractical in many applications. In order to increase the power rating, two main approaches are usually adopted: i) the use of multilevel power converters and/or ii) the combination of several converters with simpler structure to achieve higher power levels. These two alternatives, sometimes combined together, open a big scope of challenges to be overcome, mainly related to the inherent dclink capacitor voltage control, the synthesis of multilevel voltage waveforms with relatively low switching frequency techniques or the optimal combination of Power Electronics Building Blocks to achieve higher power levels and improved output voltage and current quality. These approaches are nowadays used in several applications and operating fields, such as StatComs, Energy Distribution/Transportation, Wind Turbines, Pump Storage Plants or Drives among others. Each of these applications has its own peculiarities and can be the target of a research topic in this section. On the top of that, as the number of levels and output power rises, the variety of suitable modulation techniques that can be adopted increases, ranging from adaptations of existing methods to new

developments. Modulation techniques for high-power converters are also targeted in this section.

Topics of the Session:

The main objectives of this special section are to explore, identify and analyze the problematics of increasing the output power capability of the converters by means of multilevel converter topologies and/or their interconnection. Topic of interest for this special session are (but are not limited to):

- New applications for multilevel converters.
- New advances in existing applications: StatComs, HVDC, MVDC links, Wind Turbines, Pump Storage Power Plants, Traction, Variable Speed Drives, etc.
- Power capability increasing techniques and related challenges (for instance the implications related to the use of Medium Voltage).
- New multilevel converter topologies. Hardware structure and DC-link capacitor voltages balancing.
- Advanced modulation techniques to better optimize the switching patterns of the converters.
- Advanced combination of multilevel converters to increase the output power quality.
- Problematics with modulation and appearing voltage and currents.
- Design of hardware-modulation solutions to increase the power quality.