

## CALL FOR ARTICLES

### “APPLICATIONS OF POWER ELECTRONICS IN ELECTRIC MOBILITY”

**Subject:** *This special issue targets the main challenges and advances in power electronics comprising several research fields with respect to the improvement and modernization of electric mobility. Undoubtedly, the new limits for CO<sub>2</sub> emissions that will make the commercialization of traditional internal combustion engine vehicles unfeasible in the near future are expected to speed up the development of hybrid electric vehicles (HEVs). On the other hand, the improvement of lithium-ion battery technologies associated with a large-scale production has made pure electric vehicles (EVs) more cost competitive. In the context of EV technology, the use of power electronic converters is essential not only for driving the electric motors but also charging the onboard battery banks, or even driving other secondary systems. It is also observed that the use of bidirectional onboard chargers provides several additional design tradeoffs with respect to interacting the vehicle with the power system. Since the chargers are embedded systems, characteristics such as high power density, high performance, low cost, and high reliability are essential for this specific application, thus representing a prominent research field in the context of power electronics. Still regarding EVs, the need for ultra-fast offboard chargers that meet different models and vehicle manufacturers bring quite challenging specifications. The main standards for these chargers (CCS and CHAdeMO) have classes that require a variation in the output voltage between 200 V and 920 V, as well as power levels rated between 350kW and 400kW. To mitigate the demand peaks associated with power systems, some charging stations also include local storage elements and the installation of photovoltaic systems. Such specifications open the possibility for the development of power electronics converters used not only in the dc-dc stage but also in a broader scenario comprising the whole charging station. It is also worth mentioning that electric mobility includes the development of electric or hybrid buses, bicycles, or electric scooters. The well-known traditional electric trains require the existing catenary voltage level typically rated at 25 kV/50 Hz to power the electric motors embedded in the locomotives. In this sense, in addition to power density, high performance and reliability, as well as the peaks that occur during acceleration and deceleration represent interesting challenges for the design of such systems, making the use of solid-state transformers (SSTs) possible. Other related topics such as industrial applications (electric forklifts, autonomous mobile robots, among others), electrification of ships and aircraft, agricultural machinery are also welcome in this special issue.*

#### Interests:

- Power converters topologies, control, and modulation for driving electric machines.
- Unidirectional or bidirectional isolated ac/dc converters for onboard chargers.
- Unidirectional or bidirectional isolated ac/dc and dc/dc converters for offboard chargers.
- Power converters for supplying and driving secondary systems.
- Converter architectures composed of integrated stages.
- Ac or dc power systems for charging stations.
- Motor technologies for electric traction.
- Solid-state transformers for charging stations.
- Solid-state transformers for electric trains.
- Modeling and advanced control of converters.
- Other related topics.

#### Preparation and Submission of Manuscripts

All manuscripts must be submitted through Manuscript Central at <https://mc04.manuscriptcentral.com/revistaep>. Further information can be found at <https://sobraep.org.br/revista-submissao/>.

**Guest Editors:** Prof. Dr. Fernando Lessa Tofoli (UFSJ) and Prof. Sérgio Vidal Garcia Oliveira (UDESC-FURB)

#### Proposed Timelines

Submission deadline:	<b>August 31, 2021</b>
First review results:	<b>September 30, 2021</b>
Final acceptance notification:	<b>October 20, 2021</b>
Estimated publication:	<b>November 01, 2021</b>