

CALL FOR PAPERS

Next generation of grid-connected converters for photovoltaic and wind power systems: Ancillary services, advanced control, and power quality capabilities

Theme

This call for papers targets the main challenges and advances in power electronics comprising several research fields with respect to the improvement and modernization of grid-connected solar photovoltaic and wind turbine conversion systems.

Indeed, the current power systems scenario is characterized by an increasing insertion of renewable energy sources, especially solar photovoltaic and wind turbine systems. This modernization results in a decentralized power system and several concerns regarding the power system control, power quality and stability arise. This change of paradigm can also be observed in the international standards. For example, the reviewed version of IEEE-1547 published in 2018 has defined that the power converters employed in distributed generation systems must remain connected under voltage and frequency disturbances and should support the grid through ancillary services. Among the potential ancillary services, we can cite the voltage regulation (volt-watt and volt-var control), frequency regulation, harmonic compensation, inertial response, resonance damping, etc. Contributions related to the ancillary services provided by energy storage systems to increase the penetration of renewables into the grid are also within the scope of this call.

Finally, the power conversion system is responsible for a significant part of the losses and an important percentage of failures in commercial systems. For these reasons, the development of high-efficiency and reliable power converters is particularly important to reduce the costs and increase the penetration of renewables around the globe. Therefore, contributions for improvement of power conversion system efficiency and reliability are also topic covered by this special issue.

Topics of Interest (Not limited to)

- New topologies of power converters for photovoltaic and wind systems.
- Control techniques for photovoltaic and wind systems focusing on integration of ancillary services.
- New approaches for increasing efficiency and/or reliability for the power stages of photovoltaic and wind systems
- New approaches in designing the power converter stage taking into account the impact of different ancillary services.
- Proposal of new ancillary services and their impact on the electric power systems.
- Proposal of grid code modernization related to renewable energies and their impact on the electric power systems.
- New approaches of integration of energy storage system in photovoltaic and wind systems.
- Control and modulation techniques applied to improving the electrical energy quality.
- Computational models to the development of integration of renewable energy with ancillary service capacity.
- Modeling and advanced control of power converters.
- New Maximum Power Point Tracking techniques.

Preparation and submission of papers

The paper submission is done exclusively through ScholarOne Manuscripts system (<https://mc04.manuscriptcentral.com/revistaep>). More information may be found on <https://sobraep.org.br/revista-submissao/>.

Guest Editors: Prof. Allan Fagner Cupertino (CEFET-MG) e Prof. Tiago Davi Curi Busarello (UFSC)

Important Dates

Deadline for submission:	01/11/2021
Decision on acceptance/rejection	15/12/2021
Deadline for final version:	15/01/2022
Estimated publication data:	01/04/2022