Second call for special session papers

Special Session on

Energy Storage Systems: new power electronics topologies, high-performance control techniques, and hardware emulation

SS5 at ELECTRIMACS 2019

Special session organizers

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Special session theme

There is an ever-increasing need for Energy Storage Systems (ESSs) in mobile and stationary electrical applications such as electric/hybrid vehicles, robots and drones, renewable energy systems, and micro/nanogrids. Depending on the application, ESSs can represent the only available power source, be used as a backup source, or act as a short-term or long-term energy buffer; in the latter case, they also enable the implementation of suitable management techniques aimed at maximizing system efficiency or autonomy, minimizing operating cost, etc.

Besides encompassing the physical storage device, ESSs must include suitably devised AC/DC or DC/DC power electronic converters to process the energy flow. Furthermore, given that ESSs are often an expensive and long-term investment, accurate modelling and simulation play a crucial role for ensuring adequate performance in real-world applications. Finally, model-based ESS hardware emulation is a very useful possibility that lowers the cost and complexity of system tests.

This special session is aimed at presenting the latest advances and developments in ESS technologies of different kind (batteries of various chemistry, supercapacitors, hydrogen storage, flywheels, etc.), with particular reference to advanced modeling, high-performance/high-efficiency power electronic converters, high-performance linear and

nonlinear control systems, high-power dynamic ESS hardware emulation, and advanced ESS management techniques.

Topics of interest

Topics of interests include, but are not limited to:

- power electronic converters for ESSs using novel hardware topologies and wide bandgap devices
- high-performance linear and nonlinear control techniques for ESSs
- advanced electrical and thermal models for ESSs
- parameter identification techniques for ESS models
- real-time ESS hardware emulation
- Battery Management Systems / Energy Management Systems
- hybrid generation and storage systems
- supercapacitor and hybrid supercapacitors modeling
- electrolyzers supply and control, and hydrogen storage technologies
- applications of flywheel ESSs

IMPORTANT DATES (see updates on ELECTRIMACS 2019 website)

The submission system is open!

Deadline for special session papers	see ELECTRIMACS 2019 website
Notification of acceptance	1st March 2019
Final paper submission and registration	1st April 2019

ELECTRIMACS 2019 PUBLICATIONS (see updates on ELECTRIMACS 2019 website)

• a **special issue of MATCOM**–Transactions of IMACS Mathematics and Computers in Simulation (Elsevier journal, SCOPUS and WOS indexed);

• a **Springer book in the series *Lecture Notes in Electrical Engineering***. Each paper, appearing as a book chapter, will be also online available (with DOI). The book will be sent for indexing to the major scientific databases, such as Scopus and WoS.