Special Issue

Symmetry with Power Systems: Control and Optimization

Message from the Guest Editors

With the rapid integration of flexible resources—such as distributed solar photovoltaics and electric vehicle charging stations—into distribution power grids, conventional centralized control architectures are increasingly challenged by issues including high communication and computational demands, limited flexibility, and constrained scalability. Given the spatiotemporal asymmetry in the deployment of distributed flexible resources within the grid, decentralized and distributed control strategies are gaining attention due to their advantages in edge computing, plug-and-play operation, and seamless expandability. In such frameworks, resources with strong similarities are managed by dedicated aggregators or agents equipped with tailored bargaining strategies and information. To enable coordination among multiple aggregators, both symmetric and asymmetric game-theoretic approaches have been widely employed. This Special Issue invites original research papers and review articles focusing on control and optimization techniques for flexible resources in modern distribution grids, especially those addressing theoretical or practical aspects of symmetry.

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About the Journal

Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

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