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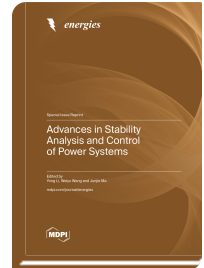
Special Issue Reprint

Advances in Stability Analysis and Control of Power Systems

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Power electronics-interfaced devices have brought significant advantages in terms of flexibility, efficiency, and sustainability to modern power systems. However, PEDs have also profoundly changed the dynamics of power systems and introduced complex challenges, particularly in the areas of stability, control, and fault management. Modern power systems are increasingly characterized by reduced system inertia, weak damping, nonlinear interactions, and multiple time scale dynamics. These factors exacerbate challenges such as transient stability, voltage stability, frequency regulation, and fault detection. Furthermore, the rise in stochastic power generation and consumption introduces uncertainties that complicate the analysis and control of system behavior. Addressing these challenges requires innovative approaches that blend theoretical insights with practical solutions.

This Special Issue presents a collection of cutting-edge research that addresses these challenges from diverse perspectives. From enhancing stability control mechanisms to advancing fault recovery strategies and leveraging data-driven tools, these studies provide a comprehensive overview of state-of-the-art approaches being developed to address the complexities of power systems with high PED penetration. By combining theoretical advancements with practical applications, this collection aims to contribute to the development of resilient, efficient, and sustainable power.



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