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ISBN	9783031500206 3031500202
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Descrizione fisica	1 online resource (502 pages)
Collana	Power Electronics and Power Systems, , 2196-3193
Disciplina	621.31
Soggetti	Power electronics Electric power distribution Electric power production Electric machinery Electric power-plants Power Electronics Energy Grids and Networks Electrical Power Engineering Electrical Machines Power Stations
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	I: Theory of Dynamic Phasors -- Background -- Dynamic Fourier Phasors -- Efficient Estimation of Dynamic Phasors -- Beyond Phasors: Constant-bandwidth Transforms -- Beyond Phasors: Variable-bandwidth Transforms -- II: Modeling and Control Applications of Dynamic Phasors -- Power Electronic Converters -- Electric Machines and Power Systems -- III: Applications to Power Flow in Electric Energy Processing Systems -- Power Quality in Steady-state -- Power Flow in the Presence of Transients -- Appendices -- Linear System With Periodic Excitation -- Duration & Bandwidth of Window Functions -- Lagrange Identity -- Variance Components for Grouped Data -- Orthogonal Decomposition of Periodic Polyphase Current Waveforms -- Geometric Algebra -- a Least-squares Approach to Dynamic Phasor

Estimation -- Cycle-averaging of Instantaneous Metrics -- Tellegen's Theorem and Network-conservative Power Metrics -- Fundamentals of Euclidean and Hilbert Spaces -- State-space Model for Symmetrical Sequence Components -- Example Scenarios.

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## Sommario/riassunto

This advanced textbook explores representations of signals in electric energy systems (EES) and their applications in tasks such as protection, monitoring, estimation, and control. EES plays a crucial role in energy conversion at levels ranging from personal devices and vehicles, such as cars, airplanes, and ships, to regions and even whole continents. The text provides a unified modeling framework for consistent EES analysis, design, and integration with physical and cyber environments. It includes tools that enable frequency-selective modeling, simulation, and control. In modern EES, the switching mode of operation introduces multiple frequency components in signals, and the book's modeling concepts help quantify the dynamics of harmonics in power networks. Coverage includes power electronic converters, electric machines and drives, and other power system components. One of the book's main focuses is characterizing EES transients, which is of significant engineering interest, especially for emerging control and protection strategies that utilize signal processing and microcontrollers. Dynamics Phasors in Energy Processing Systems is appropriate for graduate and advanced undergraduate courses in electric energy engineering and is a valuable professional resource for researchers and practitioners in industry, academia, and national laboratories. Includes background material, technical details, and data for test scenarios; Offers a unified framework for modelling, simulation, estimation, and control; Provides a precise definition of dynamic phasors.

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