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Titolo	Response Feature Technology for High-Frequency Electronics. Optimization, Modeling, and Design Automation [[electronic resource] /] / by Anna Pietrenko-Dabrowska, Slawomir Koziel
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Descrizione fisica	1 online resource (604 pages)
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Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Simulation-driven design of high-frequency structures -- Basics of response feature technology -- Response features for local optimization -- Expedited feature-based optimization -- Response features for global and multi-objective design -- Feature-based surrogate modeling -- Performance-driven modeling with response features -- Response features for uncertainty quantification -- Feature-based warm start optimization and database design acquisition -- Response features for reliability improvement -- Generalized features -- Summary and conclusion.
Sommario/riassunto	This book discusses response feature technology and its applications to modeling, optimization, and computer-aided design of high-frequency structures including antenna and microwave components. By exploring the specific structure of the system outputs, feature-based approaches facilitate simulation-driven design procedures, both in terms of improving their computational efficiency and reliability. These benefits are associated with the weakly nonlinear relationship between

feature point coordinates and design variables, which—in the context of optimization—leads to inherent regularization of the objective functions. The book provides an overview of the subject, a definition and extraction of characteristic points, and feature-based design problem reformulation. It also outlines a number of numerical algorithms developed to handle local, global, and multi-criterial design, surrogate modeling, as well as uncertainty quantification. The discussed frameworks are extensively illustrated using examples of real microwave and antenna structures, along with numerous design cases. Introductory material on simulation-driven design, numerical optimization, as well as behavioral and physics-based surrogate modeling is also included. The book will be useful for readers working in the area of high-frequency electronics, including microwave engineering, antenna design, microwave photonics, magnetism and especially those who utilize electromagnetic (EM) simulation models in their daily routines. Describes fundamentals of simulation-based high-frequency design, including optimization and surrogate modelling Introduces the concept, formulation, and implementation of response feature technology for high-frequency design Provides balanced coverage of theoretical foundations and engineering-oriented methods Discusses design applications of response feature methodologies, including single- and multi-objective optimization, global optimization, behavioural and physics-based modelling, and uncertainty quantification.