1. Record Nr. UNINA9910977980903321

Autore	Li Er-Ping
Titolo	New Advances in Maxwell’s Equations and Applications / / by Er-Ping Li, Zhong Lin Wang
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	9783031757860 3031757866
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (366 pages)
Collana	NanoScience and Technology, , 2197-7127
Altri autori (Persone)	WangZhong Lin
Disciplina	620.5
Soggetti	Nanoelectromechanical systems Electrodynamics Semiconductors Special relativity (Physics) Materials Photonics Mathematical physics Nanoscale Devices Classical Electrodynamics Special Relativity Photonic Devices Theoretical, Mathematical and Computational Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Classical Maxwell’s Equations -- Quantum Effects on Maxwell’s Equations -- Size-scale Effects on Maxwell’s Equations -- Maxwell's Equations for Advanced Electronic/Optoelectronic Devices -- Maxwell's Equations for Nanosize Devices with Quantum Effects -- Electromagnetism of Moving Observers in Free-space -- Maxwell’s Equations for a Mechano-driven Moving Objects System.
Sommario/riassunto	This book offers a comprehensive examination of ongoing advancements in theoretical and experimental approaches to Maxwell's equations. It focuses on three key aspects: quantum effects, scale effects, and kinetic effects, which exert subtle influences at microscopic

levels. Addressing pressing challenges for future progress, the text explores the interplay of these phenomena within classical electromagnetism. The evolution of data communication and information technology has led to a demand for high-density, minimization, ultra-compact nano-photo-electronic integration. As electronic devices scale down to nanometer and sub-nanometer levels, classical Maxwell's equations reveal quantum effects. This book provides insights into these advancements, focusing on potential applications in nano-scale electronic and optic devices. Tailored for physicists, engineering scientists, electronics engineers, and developers, this text serves as a valuable resource. It guides readers from classical Maxwell's equations to their quantum-affected counterparts, providing essential insights for electromagnetic simulation and the design of nano-scale electronic and optic systems. With its blend of theoretical foundations and practical applications, this book equips professionals with the knowledge needed to apply these advancements in real-world scenarios.