1. Record Nr. UNINA9910300545903321

Titolo	Fano Resonances in Optics and Microwaves : Physics and Applications / / edited by Eugene Kamenetskii, Almas Sadreev, Andrey Miroshnichenko
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2018
ISBN	3-319-99731-9
Edizione	[1st ed. 2018.]
Descrizione fisica	1 online resource (XXIII, 582 p. 259 illus., 206 illus. in color.)
Collana	Springer Series in Optical Sciences, , 0342-4111 ; ; 219
Disciplina	539.758
Soggetti	Atomic structure Molecular structure Microwaves Optical engineering Spectrum analysis Microscopy Semiconductors Physical measurements Measurement Optics Electrodynamics Atomic/Molecular Structure and Spectra Microwaves, RF and Optical Engineering Spectroscopy and Microscopy Measurement Science and Instrumentation Classical Electrodynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Theory of Fano Resonances -- Bound States in a Continuum -- Fano Resonances and Field-Matter Chirality -- Fano Resonances in Plasmonic Structures and Metamaterials -- Fano Resonances in Microwave Structures -- Fano Resonances for Biosensing.

Sommario/riassunto

This book discusses the development of Fano-based techniques and reveals the characteristic properties of various wave processes by studying interference phenomena. It explains that the interaction of discrete (localized) states with a continuum of propagation modes leads to Fano interference effects in transmission, and explores novel coherent effects such as bound states in the continuum accompanied by collapse of Fano resonance. Originating in atomic physics, Fano resonances have become one of the most appealing phenomena of wave scattering in optics, microwaves, and terahertz techniques. The generation of extremely strong and confined fields at a deep subwavelength scale, far beyond the diffraction limit, plays a central role in modern plasmonics, magnonics, and in photonic and metamaterial structures. Fano resonance effects take advantage of the coupling of these bound states with a continuum of radiative electromagnetic waves. With their unique physical properties and unusual combination of classical and quantum structures, Fano resonances have an application potential in a wide range of fields, from telecommunication to ultrasensitive biosensing, medical instrumentation and data storage. Including contributions by international experts and covering the essential aspects of Fano-resonance effects, including theory, modeling and design, proven and potential applications in practical devices, fabrication, characterization and measurement, this book enables readers to acquire the multifaceted understanding required for these multidisciplinary challenges.