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Disciplina	539.754
Soggetti	Optics Electrodynamics Atoms Physics Lasers Photonics Microwaves Optical engineering Classical Electrodynamics Atoms and Molecules in Strong Fields, Laser Matter Interaction Optics, Lasers, Photonics, Optical Devices Microwaves, RF and Optical Engineering
Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Structure of molecules -- Electrodynamics -- Charge in electromagnetic wave -- Confinement of charge -- Controlling dynamics of a bound charge -- Atom in electromagnetic field -- Very short electromagnetic pulse -- Radiation by charge -- Field reaction -- Dynamics of single charge -- Dynamics of dipoles -- Level shifts.
Sommario/riassunto	This book is devoted to theoretical methods used in the extreme circumstances of very strong electromagnetic fields. The development of high power lasers, ultrafast processes, manipulation of electromagnetic fields and the use of very fast charged particles

interacting with other charges requires an adequate theoretical description. Because of the very strong electromagnetic field, traditional theoretical approaches, which have primarily a perturbative character, have to be replaced by descriptions going beyond them. In the book an extension of the semi-classical radiation theory and classical dynamics for particles is performed to analyze single charged atoms and dipoles submitted to electromagnetic pulses. Special attention is given to the important problem of field reaction and controlling dynamics of charges by an electromagnetic field.