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Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (276 pages)
Collana	Graduate texts in physics
Disciplina	539.73
Soggetti	Particle accelerators Particle beams
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Electromagnetism and Special Relativity for Accelerators -- Historical development and classification of accelerators -- Radiofrequency accelerating structures -- Single particle dynamics in high energy accelerators -- Hamiltonian formalism -- Perturbations to linear motion -- Synchrotron radiation and light sources -- Equilibrium distribution -- Light Sources -- Colliders.
Sommario/riassunto	This book offers a concise and coherent introduction to accelerator physics and technology at the fundamental level but still in connection to advanced applications ranging from high-energy colliders to most advanced light sources, i.e., Compton sources, storage rings and free-electron lasers. The book is targeted at accelerator physics students at both undergraduate and graduate levels, but also of interest also to Ph. D. students and senior scientists not specialized in beam physics and accelerator design, or at the beginning of their career in particle accelerators. The book introduces readers to particle accelerators in a logical and sequential manner, with paragraphs devoted to highlight the physical meaning of the presented topics, providing a solid link to experimental results, with a simple but rigorous mathematical approach. In particular, the book will turn out to be self-consistent, including for example basics of Special Relativity and Statistical Mechanics for accelerators. Mathematical derivations of the most

important expressions and theorems are given in a rigorous manner, but with simple and immediate demonstration where possible. The understanding gained by a systematic study of the book will offer students the possibility to further specialize their knowledge through the wide and up-to-date bibliography reported. Both theoretical and experimental items are presented with reference to the most recent achievements in colliders and light sources. The author draws on his almost 20-years long experience in the design, commissioning and operation of accelerator facilities as well as on his 10-years long teaching experience about particle accelerators at the University of Trieste, Department of Engineering and of Physics, as well as at international schools on accelerator physics.

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