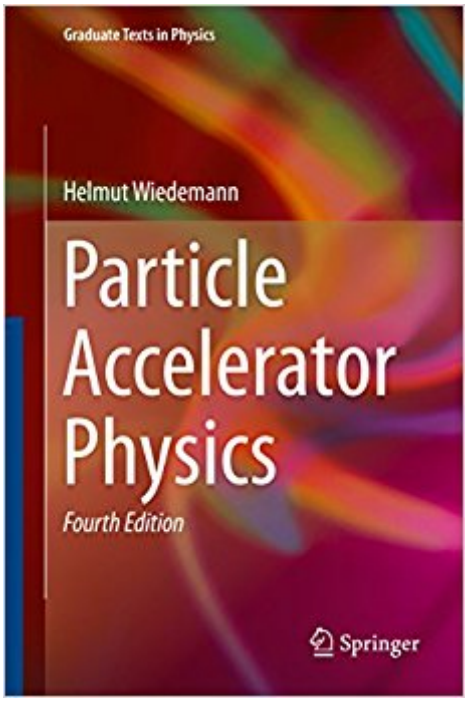
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Synopsis

This book by Helmut Wiedemann is a well-established, classic text, providing an in-depth and comprehensive introduction to the field of high-energy particle acceleration and beam dynamics.The present 4th edition has been significantly revised, updated and expanded. The newly conceived Part I is an elementary introduction to the subject matter for undergraduate students. Part II gathers the basic tools in preparation of a more advanced treatment, summarizing the essentials of electrostatics and electrodynamics as well as of particle dynamics in electromagnetic fields. Part III is an extensive primer in beam dynamics, followed, in Part IV, by an introduction and description of the main beam parameters and including a new chapter on beam emittance and lattice design. Part V is devoted to the treatment of perturbations in beam dynamics. Part VI then discusses the details of charged particle acceleration. Parts VII and VIII introduce the more advanced topics of coupled beam dynamics and describe very intense beams Ã¢â ¬â œ a number of additional beam instabilities are introduced and reviewed in this new edition. Part IX is an exhaustive treatment of radiation from accelerated charges and introduces important sources of coherent radiation such as synchrotrons and free-electron lasers. The appendices at the end of the book gather useful mathematical and physical formulae, parameters and units. Solutions to many end-of-chapter problems are given.This textbook is suitable for an intensive two-semester course starting at the senior undergraduate level.

Book Information

File Size: 11760 KB

Print Length: 1021 pages

Publisher: Springer; 4 edition (July 24, 2015)

Publication Date: July 24, 2015

Sold by:Ã Â Digital Services LLC

Language: English

ASIN: B012I0SBM8

Text-to-Speech: Enabled

X-Ray: Not Enabled

Word Wise: Enabled

Lending: Not Enabled

Enhanced Typesetting: Not Enabled

Best Sellers Rank: #433,833 Paid in Kindle Store (See Top 100 Paid in Kindle Store) #15

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