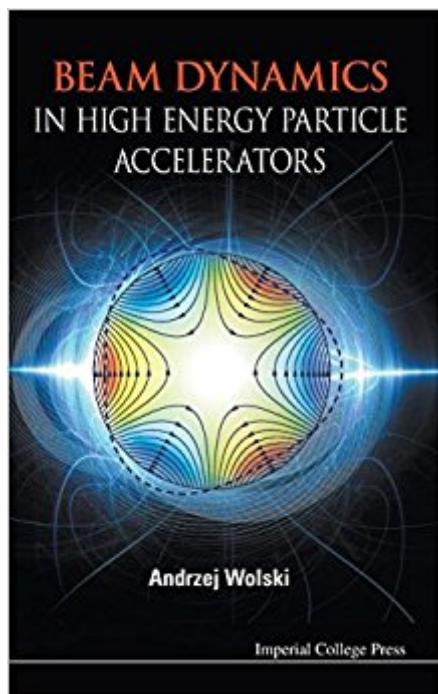


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# Beam Dynamics In High Energy Particle Accelerators



## **Synopsis**

Particle accelerators are essential tools for scientific research in fields as diverse as high energy physics, materials science and structural biology. They are also widely used in industry and medicine. Producing the optimum design and achieving the best performance for an accelerator depends on a detailed understanding of many (often complex and sometimes subtle) effects that determine the properties and behavior of the particle beam. *Beam Dynamics in High Energy Particle Accelerators* provides an introduction to the concepts underlying accelerator beam line design and analysis, taking an approach that emphasizes the elegance of the subject and leads into the development of a range of powerful techniques for understanding and modeling charged particle beams. Readership: Undergraduate students who are looking for an introduction to beam dynamics, and graduate students and researchers in the field.

## **Book Information**

Hardcover: 608 pages

Publisher: Imperial College Press (March 31, 2014)

Language: English

ISBN-10: 178326277X

ISBN-13: 978-1783262779

Product Dimensions: 6 x 1.3 x 9 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

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Particle accelerators are essential tools for scientific research in fields as diverse as high energy physics, materials science and structural biology. They are also widely used in industry and medicine. Producing the optimum design and achieving the best performance for an accelerator depends on a detailed understanding of many (often complex and sometimes subtle) effects that determine the properties and behavior of the particle beam. *Beam Dynamics in High Energy Particle Accelerators* provides an accessible introduction to the concepts underlying accelerator beam line design and analysis, taking an approach that emphasizes the elegance of the subject and

leads into the development of a range of powerful techniques for understanding and modeling charged particle beams. Basic ideas are introduced from the start using an approach that leads logically into the development of more advanced concepts and techniques. In particular, linear dynamics is treated consistently using a Hamiltonian formalism, which provides a suitable foundation for not only perturbation theory, but also for more modern techniques based on Lie operators.

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