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Nota di contenuto	Part 1. Multipactor in a planar gap -- Chapter 1. Existence zones for multipactor discharge -- Chapter 2. Generalized phase stability in multipacting -- Chapter 3. Ping-pong modes -- Chapter 4. Numerical simulations of multipactor -- Part 2.. Multipactor in crossed RF fields -- Chapter 5. Introduction of accelerating RF cavities -- Chapter 6. Effect of RF cavity magnetic field on multipactor in a gap -- Chapter 7. Multipactor near the cavity equator -- Chapter 8. One-point multipactor in crossed fields of RF cavities -- Part 3. Multipacting-free cavities and transitions between cavities and beam pipes -- Chapter 9. Optimized shape cavities free of multipacting -- Chapter 10. Multipacting-free transitions between cavities and beam pipes. Theorem of minimal electric field.

Sommario/riassunto

This book is written by two world-recognized experts in radio frequency (RF) systems for particle accelerators and is based on many years of experience in dealing with the multipactor phenomenon. The authors introduce and review multipactor in RF cavities for scientists and engineers working in the field of accelerator physics and technology. The multipactor phenomenon of unintended electron avalanches occurs in the RF cavities commonly and quite often is a performance-limiting factor. The book starts with an Introductory Overview which contains historical observations and brief description of most common aspects of the phenomenon. Part I deals with the multipactor in a flat gap. It starts with description of the dynamics of electrons, derivation of the stability condition and analyzing influence of several factors on the multipactor. Then, the initial considerations are extended to derive a generalized phase stability and finally a particular case, called ping-pong multipacting, is considered. The part one is concluded with a brief review of computer codes used in multipactor simulations. Part II is dedicated to the multipactor in crossed RF fields, the typical situation in accelerating cavities. Two cases of MP are considered: a two-point multipactor near the cavity equator in elliptical cavities and a one-point multipactor. Part III describes optimization of the cavity shapes geared toward designing multipactor-free structures. The book will serve as an importance reference on multipactor for those involved in developing and operating radio frequency cavities for particle accelerators.