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Autore	March Raymond E
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2.3.2.1. The Structure of the QIT 2.3.2.2. Electrode Surfaces; 2.3.2.3. Quadrupolar Potential; 2.3.2.4. An Alternative Approach to QIT Theory; 2.3.2.5. Regions of Ion Trajectory Stability; 2.3.3. Secular Frequencies; 2.3.4. Calculations; 2.3.4.1. $q(z)$ and LMCO; 2.3.4.2. $b(z)$; 2.3.4.3. $w(z)$; 2.3.4.4. Mass Range; 2.3.5. The Complete Solution to the Mathieu Equation; 2.3.6. Secular Frequencies; 2.4. Conclusions; Appendix; References; 3 Dynamics of Ion Trapping; 3.1. Introduction; 3.2. The Pseudopotential Well Model; 3.2.1. Specimen Calculation of the Pseudopotential Well Depth $D(z)$ 3.2.2. Some Applications of the Pseudopotential Well Model 3.2.2.1. Estimation of the Effects of Space Charge; 3.2.2.2. Ion Kinetic Energies; 3.3. Higher Order Field Components and Nonlinear Resonances; 3.3.1. Historical Background; 3.3.2. Fundamental Aspects of Nonlinear Resonances; 3.3.2.1. Multipole Fields; 3.3.2.2. Experimental Observations of Effects Arising from Nonlinear Resonances in the Quadrupole Ion Trap Mass Spectrometer; 3.3.2.3. Nonlinear Field Effects in Quadrupole Mass Spectrometers and Linear Ion Traps; 3.3.2.4. Mass Shifts; 3.4. Motion of Trapped Ions 3.4.1. Collision Processes: Collisional Cooling 3.4.2. Collision Processes: Trapping Injected Ions; 3.4.3. Resonant Excitation; 3.4.3.1. Resonant Excitation: Ion Ejection; 3.4.3.2. Resonant Excitation: Collision-Activated Decomposition; 3.4.3.3. Collision Energies; 3.4.4. Boundary-Activated Dissociation (BAD); 3.4.5. Surface-Induced Dissociation; 3.5. Conclusion; References; 4 Simulation of Ion Trajectories in the Quadrupole Ion Trap; 4.1. Introduction; 4.2. Recent Applications of Simulations; 4.3. Theoretical Background; 4.3.1. Numerical Integration of the Mathieu Equation 4.3.2. Calculation of Electrostatic Fields

Sommario/riassunto

A definitive reference, completely updated Published in 1989, the First Edition of this book, originally entitled Quadrupole Storage Mass Spectrometry, quickly became the definitive reference in analytical laboratories worldwide. Revised to reflect scientific and technological advances and new applications in the field, the Second Edition includes new chapters covering:

- * New ion trap instruments of high sensitivity
- * Peptide analysis by liquid chromatography/ion trap tandem mass spectrometry
- * Analytical aspects of ion trap mass spectrometry combined with gas chromatography