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Nota di contenuto	Precise Matter and Antimatter Tests of the Standard Model with e-, e+, p, p and H (G. Gabrielse, S. Fogwell Hoogerheide, J. Dorr and E. Novitski) -- Theory of Anomalous Magnetic Dipole Moments of the Electron (M. Hayakawa) -- Magnetic Moment of the Bound Electron (M. Vogel and W. Quint) -- QED Theory of the Bound-Electron Magnetic Moment (D.A. Glazov, A.V. Volotka, V.M. Shabaev, and G. Plunien) --

The Magnetic Moments of the Proton and the Antiproton (S. Ulmer and C. Smorra) -- Fundamental Physics with Antihydrogen (J.S. Hangst) -- High-precision Mass Measurements of Radionuclides with Penning Traps (M. Block) -- Quantum Information Processing with Trapped Ions (C. Roos) -- Optical Transitions in Highly Charged Ions for Detection of Variations in the Fine-Structure Constant (A. Ong, J. C. Berengut and V. V. Flambaum) -- Emission and Laser Spectroscopy of Trapped Highly-Charged Ions in Electron Beam Ion Traps (J. R. Crespo L´opez-Urrutia and Z. Harman) -- Tests of Theory in Rydberg States of One-Electron Ions (J. N. Tan and P. J. Mohr).

Sommario/riassunto

This volume provides detailed insight into the field of precision spectroscopy and fundamental physics with particles confined in traps. It comprises experiments with electrons and positrons, protons and antiprotons, antimatter and highly charged ions, together with corresponding theoretical background. Such investigations represent stringent tests of quantum electrodynamics and the Standard model, antiparticle and antimatter research, test of fundamental symmetries, constants, and their possible variations with time and space. They are key to various aspects within metrology such as mass measurements and time standards, as well as promising to further developments in quantum information processing. The reader obtains a valuable source of information suited for beginners and experts with an interest in fundamental studies using particle traps.