

Plenary Talk

PV V Tue 9:45 RW 1

Precision measurements of fundamental properties of atomic particles in Penning traps — •KLAUS BLAUM — Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg, Deutschland

This plenary talk will provide an overview on recent applications of precision measurements with cooled and stored ions in Penning traps. On the one hand, precision Penning-trap mass measurements provide indispensable information for atomic, nuclear and neutrino physics as well as for testing fundamental symmetries. On the other hand, in-trap measurements of the bound-electron g -factor in highly charged

hydrogen-like ions allow for better determination of fundamental constants and for constraining Quantum Electrodynamics. Furthermore, ongoing preparations for the experimental comparison of the proton and antiproton g -factors will allow us to achieve a crucial test of the Charge-Parity-Time reversal (CPT) symmetry. Among others, a 13-fold improvement of the atomic mass of the electron by combining a very accurate measurement of the magnetic moment of a single electron bound to a carbon nucleus with a state-of-the-art calculation in the framework of bound-state Quantum Electrodynamics as well as the most stringent test of CPT symmetry on the baryonic sector by a charge-to-mass ratio comparison of the proton and antiproton will be presented.