

Institutsseminar

Probing antimatter gravity and CPT symmetry with trapped antihydrogen

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According to Einstein's Weak Equivalence Principle, an object should behave identically in a gravitational field, regardless of its composition. This has been precisely verified for matter. However, the influence of gravity on antimatter has not yet been observed. I will report the results of the first measurement of this kind, which we have conducted using magnetically trapped antihydrogen atoms in the ALPHA-g experiment at CERN. Furthermore, I will discuss the latest results and status of antihydrogen laser spectroscopy, with the aim of testing CPT symmetry by comparing the energy spectrum to conventional hydrogen. Recent advances in antihydrogen trapping and laser cooling have led to routine production of large and cold antihydrogen samples. Finally, I will show how the implementation of a Cs fountain clock and active hydrogen maser enables reaching unprecedented precision of 15 digits and beyond.

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