

## Prospects of CPT tests using antiprotonic helium and antihydrogen

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My talk is based on the ASACUSA proposal recently presented to the CERN program committee.

1) Laser spectroscopy of antiprotonic helium atoms, with which we achieved the best baryonic CPT test of  $|m_p - m_{\bar{p}}|/m_p < 10^{-8}$  in 2003, will be further pursued to the sub-ppb ( $< 10^{-9}$ ) range. This requires frequency-comb-stabilized lasers, Doppler-width cancellation with the counter-propagating two-photon method, and an order of magnitude improvement in the precision of theoretical calculations.

2) The ground-state hyperfine splitting spectroscopy of antihydrogen is important, because even a modest precision of  $10^{-4}$  can be competitive to the best CPT test available ( $K^0 - \bar{K}^0$  relative mass difference of  $10^{-18}$ ). After a brief introduction to the theoretical background, requirements for the antihydrogen source, achievable precision, and a possible setup will be discussed.