

Abstract Submitted
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The ALPHA Experiment: Testing CPT and Gravity with Trapped Antihydrogen MAKOTO FUJIWARA, TRIUMF, ALPHA COLLABORATION — Over the past decade, the ALPHA (Antihydrogen Laser Physics Apparatus) Collaboration at CERN has been working towards precision tests of fundamental symmetries between matter and antimatter [1-4]. Recently, we have succeeded in observing, for the first time, the 1s-2s transition in trapped antihydrogen [5]. The initial measurement had a sensitivity of 2×10^{-10} , and we expect a significant improvement in the near future. In the meantime, we are constructing a new apparatus, ALPHA-g, in order to measure the gravitational force on antimatter by dropping antihydrogen atoms. In this talk, I will give an overview and prospects of the ALPHA experiment. REFERENCES: [1] Andresen, G. B. et al. Trapped antihydrogen, *Nature* 468, 673676 (2010). [2] Andresen, G. B. et al. Confinement of antihydrogen for 1,000 seconds, *Nature Physics* 7, 558564 (2011). [3] Amole, C. et al. Resonant quantum transitions in trapped antihydrogen atoms, *Nature* 483, 439443 (2012). [4] Ahmadi, M. et al. An improved limit on the charge of antihydrogen from stochastic acceleration, *Nature* 529, 373376 (2016). [5] Ahmadi, M. et al., Observation of the 1S-2S transition in trapped antihydrogen, *Nature* 541, 506-510 (2017).

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