

Abstract Submitted
for the NWS12 Meeting of
The American Physical Society

Microwave Spectroscopy of Trapped Antihydrogen MOHAMMAD DEHGHANI ASHKEZARI, Simon Fraser University — Theory predicts that, under CPT¹ symmetry, the laws of physics make no distinction between matter and anti-matter. We have every reason to believe that equal amounts of both were produced in the early universe, following the Big Bang. However, our observable universe is overwhelmingly made up of matter. ALPHA is an international project located at CERN and involves ~ 30 physicists from 15 different institutions. The primary goal of the collaboration is to investigate this gaping discrepancy between theoretical expectations and reality by precise comparison of matter and anti-matter, in particular hydrogen and antihydrogen. A critical milestone was reported in November 2010, the first-ever stable and reproducible magnetic confinement of neutral antihydrogen atoms. Shortly after, in June 2011, ALPHA announced the long-time (1000 s) trapping of antihydrogen, opening the door to precision spectroscopy. In March 2012, the first proof-of-principle spectroscopic measurement performed on trapped antihydrogen atoms using microwave radiation². Detailed aspects of this measurement is presented in this talk.

¹Charge conjugation, Parity inversion, and Time reversal.

²C. Amole, et al., (ALPHA collaboration), *Nature* **483**, 439 (2012).

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Date submitted: 11 Sep 2012

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