

The ALPHA experiment: Status and Outlook

Wednesday, September 17, 2014 9:00 AM (30 minutes)

Since the first trapped antihydrogen in 2010 [1] and observing its long lifetime in the 0.5 K deep neutral atom trap [2], experiments have been performed on the anti-atom resulting in the observation of resonant transitions between the hyperfine states of the ground state [3], experimental limits on the ratio of the gravitational mass to the inertial mass of antimatter and an experimental limit on the charge of antihydrogen [5].

We will give an overview of the ALPHA experiment [6] and present some the results originating from recent experiments on trapped antihydrogen. Furthermore, a outline of a newly proposed antimatter gravity experiment will be given [7].

References

- [1] G. B. Andresen et al. (ALPHA collaboration), *Nature* 468, 673 (2010).
- [2] G. B. Andresen et al. (ALPHA collaboration), *Nature Phys.* 7, 558 (2011).
- [3] C. Amole et al. (ALPHA collaboration), *Nature* 483, 439 (2012).
- [4] C. Amole et al. (ALPHA collaboration), *Nature Communications* 4, 1785 (2013).
- [5] C. Amole et al. (ALPHA collaboration), *Nature Communications* 5, 3955 (2014).
- [6] C. Amole et al. (ALPHA collaboration), *Nucl. Instr. and Meth. in Phys. Res. A* 735 (2014) 319
- [7] P. Hamilton et al., *Phys. Rev. Lett.* 112, 121102 (2014).

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