

Antihydrogen Studies in ALPHA

The ALPHA antihydrogen experiment studies antihydrogen as a means to investigate the symmetry of matter and antimatter. Spectroscopic studies of antihydrogen holds the promise of the most precise direct comparisons of matter and antimatter possible. The ALPHA experiment was the first to trap antihydrogen in a magnetic trap, allowing the first ever detection of atomic transitions in an anti-atom. More recently, through stochastic heating, we have also been able to put a new limit on the neutrality of antihydrogen. ALPHA is currently preparing to perform the first laser-spectroscopy of antihydrogen, hoping to exit the the 2s state using a two-photon transition from the 1s state.

We will discuss the recent results as well as the key developments that led to these successes and discuss how we are preparing to perform the first laser-spectroscopy. We will also discuss plans to use our novel technique for gravitational tests on antihydrogen for a direct measurement of the sign of the gravitational force on antihydrogen.

Summary

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