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The ALPHA experiment

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The ALPHA experiment aims to perform precision studies of antihydrogen and comparisons with hydrogen as a test of fundamental symmetries. Since 2010 ALPHA routinely traps antihydrogen and has demonstrated the first measurement of the internal structure of an antihydrogen atom by using microwaves to induce a resonant spin flip in the trapped antiatoms. ALPHA has also ventured to estimate its experimental sensitivity to gravitational effects and a putative non-zero charge of the antihydrogen atom.

ALPHA is now preparing for the first laser-spectroscopy of an antiatom and has recently commissioned a new apparatus that allows laser-access as well as a number of other improvements. In this presentation we will present an overview of the ALPHA results to date as well as discuss the upgrade and the first results from commissioning of the new apparatus. We will also discuss steps towards the first laser-spectroscopy of an antiatom and what implications the current state-of-the-art of trapping has on the potential for precision measurements.

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