

Hyperfine spectroscopy in the ALPHA experiment

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Precision hyperfine spectroscopy of antihydrogen is one of the primary goals of the ALPHA experiment. In hydrogen, the zero-field ground-state hyperfine splitting frequency has been measured to better than 1 part in 10^{12} [1]. A measurement of a similar precision on antihydrogen would provide an extremely precise test of CPT symmetry. An initial proof-of-principle experiment was performed in 2012 demonstrating the ability to excite positron spin resonance transitions in ground state antihydrogen [2]. In this talk, I will present the tools we have developed to study antihydrogen's hyperfine structure and the results of ALPHA's latest hyperfine spectroscopy experiments.

[1] IEEE Trans. Instrum. Meas. IM-19, 200 (1970); Nature 229 110 (1970).

[2] Amole et al., Nature 483, 439 (2012).

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