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Hyperfine Microwave Spectroscopy of Ground State Antihydrogen

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In March 2012 the ALPHA Collaboration reported data from an experiment in which transitions between hyperfine levels of magnetically-trapped ground state antihydrogen atoms were selectively induced and monitored [1]. Those data comprise the first–albeit crude–direct spectroscopic probe of a pure antimatter atom, and mark the advent of an era in which precision comparisons of hydrogen and antihydrogen are expected to become a reality. I will describe the experiment that was performed by the ALPHA Collaboration, comment on its significance, and discuss prospects for hyperfine microwave spectroscopy in future tests of CPT symmetry with antihydrogen.

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