

Abstract Submitted  
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**Probing the Lyman-alpha transition in antihydrogen** ALEXANDER KHRAMOV, ROBERT COLLISTER, TRIUMF, ANDREW EVANS, University of Calgary, MAKOTO FUJIWARA, JOSEPH MCKENNA, TRIUMF, TAKAMASA MOMOSE, UBC, ALPHA COLLABORATION — The 1s-2p transition in antihydrogen is of importance from both a fundamental and technical perspective. Fundamentally, it provides an additional avenue for antihydrogen spectroscopy including a possibility of calculating the fine structure splitting and Lamb shift measurement. From a technical standpoint, the transition may be used for laser cooling of antihydrogen atoms to achieve cold trapped samples which are needed for increased precision tests of CPT symmetry and antimatter gravitational behaviour. The ALPHA collaboration at CERN employs a pulsed laser system consisting of a 365 nm beam followed by triple harmonic generation in a Kr-Ar cell to generate pulses which can access this transition. We report on technical upgrades to the system and discuss ongoing attempts to measure the 1s-2p transition in antihydrogen. We give new results of pulsed spectroscopy experiments in the 1s-2p manifold from the 2017 ALPHA run at CERN.

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