

Abstract Submitted
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Progress towards measuring the $2S_{1/2}$ to $2P_{1/2}$ interval in hydrogen¹ A.C. VUTHA, N. BEZGINOV, I. FERCHICHI, E.A. HESSELS, York University — There is a large discrepancy between the CODATA value for the proton charge radius, and its determinations from muonic hydrogen measurements. This discrepancy is referred to as the *proton radius puzzle*. Improved measurements on atomic hydrogen can elucidate the origins of this discrepancy. We have constructed an experiment to measure the Lamb shift ($n = 2, S_{1/2} \rightarrow P_{1/2}$) in a fast beam of atomic hydrogen. Using a novel separated-oscillatory-fields method and high signal-to-noise ratio detection, we can measure the center of this transition with a statistical uncertainty approaching 10^{-5} of its natural linewidth. We report on our studies of systematic effects, and on our progress towards a new measurement of the proton charge radius.

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