Abstract Submitted
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A microwave measurement of the n=2 Lamb shift in hydrogen using the FOSOF technique[1] N. BEZGINOV, T. VALDEZ, M. HORBATSCH, A. MARSMAN, York University, A.C. VUTHA, University of Toronto, E.A. HESSELS, York University — We present the details of a recently completed measurement of the n=2 Lamb shift in atomic hydrogen. The measurement uses a fast beam of hydrogen atoms that interact with two separated oscillatory fields. The two fields are slightly offset in frequency to employ the new frequency-offset separated oscillatory field (FOSOF) technique[1]. The uncertainty in our measurement is 3.2 kHz, which allows for a precise determination of the rms charge radius of the proton. This charge radius can be compared to that obtained from the measurements of the Lamb shift of muonic hydrogen[2] and helps to resolve the nine-year-long discrepancy between proton size measurements that use electrons and those that use muons. [1] A Vutha, EA Hessels, PRA 92, 052505 (2015). [2] R Pohl, et al Nature 466, 213 (2010); A Antognini, et al Science 339 417 (2013).

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