

Abstract Submitted  
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**Determination of the proton charge radius from elastic electron-proton scattering**<sup>1</sup> MARKO HORBATSCH, ERIC A. HESSELS, York University — Precisely measured electron-proton elastic scattering cross sections [Phys. Rev. Lett. 105, 242001 (2010)] are reanalyzed to evaluate their strength for determining the rms charge radius ( $R_E$ ) of the proton. More than half of the cross sections at lowest  $Q^2$  are fit using two single-parameter form-factor models, with the first based on a dipole parametrization, and the second on a linear fit to a conformal-mapping variable. These low- $Q^2$  fits extrapolate the slope of the form factor to  $Q^2 = 0$  and determine  $R_E$  values of approximately 0.84 and 0.89 fm, respectively. Fits spanning all  $Q^2$ , in which the single constants are replaced with cubic splines at larger  $Q^2$ , lead to similar results for  $R_E$ . We conclude that the scattering data are consistent with  $R_E$  ranging from at least 0.84 to 0.89 fm, and therefore is consistent with both of the discrepant determinations of  $R_E$  made using muonic and electronic hydrogen-atom spectroscopy. Phys. Rev. C 93, 015204 (2016)

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