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Precise determination of proton magnetic radius from electron scattering data JOSE MANUEL ALARCON, Universidad Complutense de Madrid and IPARCOS, Madrid, Spain, DOUGLAS HIGINBOTHAM, CHRISTIAN WEISS, Jefferson Lab — We report about a novel extraction of the proton magnetic radius from the high-precision electron-proton elastic scattering cross section data. Our theoretical framework combines dispersion analysis and chiral effective field theory and implements the dynamics governing the shape of the low-Q^2 form factors. It allows us to use data up to $Q^2 \sim 0.5$ GeV^2 for constraining the radii and overcomes the difficulties of empirical fits and $Q^2 \to 0$ extrapolation. We obtain a magnetic radius $r_M^p = 0.850$ ± 0.001 (fit 68%) ± 0.010 (theory full range) fm, significantly different from earlier results obtained from the same data, and close to the extracted electric radius $r_E^p = 0.842$ ± 0.002 (fit 68%) ± 0.010 (theory full range) fm. [Ref: Alarcon, Higinbotham, Weiss, arXiv:2002.05167]

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