The New Proton Radius Experiment (PRad) at Jefferson Lab

Abstract

The proton charge radius (Rp) is one of the most fundamental quantities in physics. Precise knowledge of its value is critically important for both nuclear and atomic physics – especially for the spectroscopy of atomic hydrogen. Recent high precision measurements of Rp using the muonic hydrogen atom demonstrated up to eight standard deviation smaller value than the accepted average from all previous experiments performed with different methods. This fact triggered the well known "*proton charge radius puzzle*" in hadronic physics. The PRad collaboration at Jefferson Lab for the last four years developed a novel magnetic-spectrometer-free e-p scattering experiment to address this puzzle. The PRad experiment successfully performed in May and June of this year at Jefferson Lab collecting a large statistical and high quality experimental data set. The specifics of the method, the experimental characteristics of the setup together with the first preliminary results from the current data analysis process will be presented in this talk.

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