



Physics Division Seminar

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The Proton Charge Radius Experiment (PRad) at JLab

Host: Zein-Eddine Meziani

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NOTE: SPECIAL TIME - 12:30 PM

In order to investigate the proton charge radius puzzle, the PRad experiment (E12-11-106) was performed in 2016 in Hall B at Jefferson Lab, with both 1.1 and 2.2 GeV unpolarized electron beams. The experiment aims to measure the e - p elastic scattering cross section in an unprecedented low values of momentum transfer squared region ($Q^2 = 2 \times 10^{-4}$ to 0.06 (GeV/ c)²), with a sub-percent precision. The PRad experiment utilizes a calorimetric method that is magnetic spectrometer free. Its detector setup includes a large acceptance and high resolution calorimeter (HyCal), and two large area, high spatial resolution Gas Electron Multiplier (GEM) detectors. To have a better control over the systematic uncertainties, the absolute e - p elastic scattering cross section is normalized to that of the well-known Møller scattering process, which was measured simultaneously within similar kinematics and detector acceptances. The windowless H₂-gas-flow target utilized in the experiment largely removes a typical background source, the target cell windows. In this talk, we will discuss details of the data analysis and present the proton charge radius result.