

# Data Analysis and Preliminary Results of the Proton Charge Radius Experiment (PRad) at JLab

*Saturday, 2 June 2018 17:10 (20 minutes)*

In order to investigate the proton radius puzzle, the PRad experiment (E12-11-106) [1] 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 at unprecedented low values of the momentum transfer squared region ( $Q^2 = 2 \times 10^{-4} - 0.06 \text{ (GeV/c)}^2$ ), with a sub-percent precision. The PRad experiment utilizes a non-magnetic calorimetric method with 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 Moller scattering process, which is measured simultaneously within similar kinematics and geometrical acceptances. The windowless  $\text{H}_2$ -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 preliminary results from both beam energy settings.

[1] Spokespersons: A. Gasparian (contact), H. Gao, M. Khandaker, D. Dutta.

## E-mail

weizhi.xiong@duke.edu

## Collaboration name

PRad Collaboration

## Funding source

Supported in part by the U.S. Department of Energy under Contract No. DE-FG02-03ER41231, NSF MRI award PHY-1229153

**Primary author:** XIONG, Weizhi (Duke University)

**Co-author:** Mr PENG, Chao (Duke University)

**Presenter:** XIONG, Weizhi (Duke University)

**Session Classification:** QCDHS / PPHI

**Track Classification:** PPHI