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Detecting More Pion

Kylie Holmes

B.S. Astrophysics & Meteorology, Class of 2016



Kylie Holmes worked with [Dr. Julie Roche](#) on a particle physics project at the [Thomas Jefferson National Accelerator Facility](#) (JLab) in Newport News, VA.

“My main project was to stimulate signals produced by photon pairs resulting from pion decay,” Holmes explained. “I wanted to be able to remove this noise from a segmented calorimeter by measuring it separately, which would further benefit the upcoming Deeply Virtual Compton Scattering (DVCS) experiments. I think one of the most challenging parts of my research was the lack of strong programming knowledge. By talking to Dr. Roche and other students that were doing research, I was able to overcome some of these challenges and ended up learning from it.”

The goal of most experiments conducted at this facility, including the one Holmes prepared, is to understand the force that holds the constituents of the proton together, a force that is responsible for 99.9 percent of the mass of the visible matter making up the universe.

Holmes learned the basics of detector simulation and worked on the preparation of the DVCS experiment. She simulated the detector signal produced by pairs of photons resulting from pion decay. Indeed, some of these decay-photons can result in signals comparable to the one of the high energy photon produced during the DVCS process. Her simulation will help define selection criteria to ultimately reject photons from pion decay.







Kylie is holding one of the 208 lead glass blocks that make up the detector at Jefferson Lab.

Kylie Holmes – Intern with Dr. Julie Roche – junior at Ohio University – College of Arts & Sciences – astrophysics and meteorology major

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