



**DEPARTMENT OF PHYSICS AND PHYSICAL
OCEANOGRAPHY COLLOQUIUM**

**“Analysis results for the 6x6 PbWO₄
Crystal Prototype Detector beam test”**

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The PRIMEX experiment at Thomas Jefferson National Lab is to measure the lifetime of the π^0 particle with high precision. This experiment is a very important test of Quantum Chromodynamics (the theory to describe the strong interaction). The decay photons from the π^0 's were detected by a high resolution electromagnetic calorimeter (HYCAL) which consists of approximately 2000 channels of PbWO₄ crystal detectors. One of the big experimental challenges was to understand the properties of this calorimeter. I was lucky enough to have an internship with my professor Dr. Gan in the summers of 2008 and 2009. My project was to study the calorimeter through analyzing the data of a 6x6 PbWO₄ Crystal Prototype Detector beam test. I used this data to perform an energy calibration on the prototype and determine crucial properties of the PbWO₄ crystals. The shower profile could then be obtained. I then determined the position resolution of the prototype. Therefore, I had completely calibrated the detector by the end of my second internship. This presentation will be a collaboration of my work at Jefferson Lab.

**November 6, 2009
2:30 PM
DeLoach Hall, Room 212**

Refreshments will be served at 1:45 PM

