

Abstract Submitted
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The Charged Pion Polarizability Experiment at the Thomas Jefferson National Accelerator Facility: Developing Muon Chambers and Experiment Simulation¹ BOBBY JOHNSTON, RORY MISKIMEN, MATTHEW DOWNING, CHRISTIAN HAUGHWOUT, ANDREW SCHICK, Univ of Mass - Amherst, JEFFERSON LAB HALL D COLLABORATION — The Thomas Jefferson National Accelerator Facility has proposed to make a precision measurement of the charged pion polarizability through measurements of $\gamma\gamma \rightarrow \pi^+\pi^-$ cross sections using the new GlueX detector. This experiment will have a large muon background which must be filtered out of the pion signal. For this issue we are developing an array of Multi-Wire Proportional Chambers (MWPCs) that will allow the pions to be identified from the muons, permitting a precise measurement of the polarizability. Small (1:8 scale) and medium (1:5 scale) sized prototypes have been constructed and tested, and a full scale prototype is currently being assembled.

MWPC electronics were developed and tested to amplify the signal from the detection chamber, and were designed to interface with Jefferson Labs existing data acquisition system. In order to construct the detectors, a class 10,000 clean room was assembled specifically for this purpose. Lastly, Geant4 software is being used to run Monte Carlo simulations of the experiment. This allows us to determine the optimal orientation and number of MWPCs needed for proper filtering which will indicate how many more MWPCs must be built before the experiment can be run.

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