

Abstract Submitted
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Designing an Active Target Test Projection Chamber JAMES KOCI, University of Notre Dame, DR. TAN AHN COLLABORATION¹, NICOLAS DIXNEUF COLLABORATION² — The development of instrumentation in nuclear physics is crucial for advancing our ability to measure the properties of exotic nuclei. One limitation of the use of exotic nuclei in experiment is their very low production intensities. Recently, detectors, called active-target detectors, have been developed to address this issue. Active-target detectors use a gas medium to image charged-particle tracks that are emitted in nuclear reactions. Last semester, I designed a vacuum chamber to be used in developing Micro-Pattern Gas detectors that will upgrade the capabilities of an active-target detector called the Prototype AT-TPC. With the exterior of the chamber complete, I have now been using an electric field modeling program, Garfield, developed by CERN to design a field cage to be placed within the vacuum chamber. The field cage will be a box-like apparatus consisting of two parallel metal plates connected with a resistor chain and attached to wires wrapped between them. The cage will provide a uniform electric field within the chamber to drift electrons from nuclear reactions down to the detector in the bottom of the chamber. These signals are then amplified by a proportional counter, and the data is sent to a computer. For the long term, we would like to incorporate a Micro-Pattern Gas Detectors in the interior of the chamber and eventually use the AT-TPC to examine various nuclei.

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