

Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Calculating Electron Drift Velocity and Development of the ND Cube Detector¹ LAUREN DELGADO, Vassar Coll — Active-target detectors are crucial for reactions with radioactive beams because of their high efficiency and good energy resolution. Their significant amount of target material enhances the ability to perform experiments at lower beam rates. At University of Notre Dame, we are developing an active-target time-projection chamber called the ND Cube that will image charged-particle tracks. To understand properties of the detector such as electron drift velocity and straggling in the detector gas, calculations were obtained for a He-CO₂ mixture as a function of electric field and pressure. Higher electric field strengths and lower pressures produced higher drift velocities. Increased pressures minimized both longitudinal and transverse straggling whereas electric field strength had no direct effect on straggling in either direction. Additionally, the field cage of the detector was completed and electrical feedthroughs were designed and constructed. The completion of the field cage included the assembly and testing of its resistor chain. The cage will be tested in experimental conditions and used in future measurements of drift velocity and straggling. Experimental data will be compared with our calculated results and aid our understanding of the detector design.

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Date submitted: 02 Aug 2017

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