Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

Prototyping A Gas Electron Multiplier For Use At TJNAF CHRIS COLVIN — I am currently working on, and studying, prototype GEM detectors at the Thomas Jefferson National Accelerator Facility (TJNAF). The goal of this project is to be able to implement a large scale version of this technology into the halls of the accelerator. A GEM (Gas Electron Multiplier) detector is relatively cutting edge technology, first used at CERN in 1997. The models we use receive a constant flow of mixed gas (75%Argon, 25% Carbon Dioxide). The inner workings of the GEMs contain 3 layers of Kapton foil with microscopic engineered holes. Electrons are multiplied inside the holes as they drift along lines created by an external electric field. This charge is collected on two planes of readout strips which are perpendicular to each other, allowing the measurement of the x and y directions. The z- coordinate comes from stacking 3 of these chambers on top of each other. This data is then sent through a costumized data acquisition system for analysis.

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Date submitted: 28 Jul 2011 Electronic form version 1.4