Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Construction and Operation of Multi-Wire Proportional Chambers MICHAEL REYNOLDS, Kennesaw State Univ — The Society of Physics Students (SPS) at Kennesaw State University is building a series of Multi-Wire Proportional Chambers as a tool to detect cosmic ray muons, measure muon flux, and do muon tomography. Chamber construction is simple and efficient, consisting of a wire array between two cathode planes. The wire array is under high voltage while the cathodes are grounded to create a potential gap inside the chamber. The array has alternating field-shaping and anode wires serving to further isolate the anode wires from each other for better resolution. To operate the chamber it is filled with an ionizing gas. We have chosen to use an Ar/CO2 mix in an 80:20 ratio. High energy muons that pass through strip electrons from gas molecules, which then avalanche towards the anode wire in a cascade of secondary ionization. This avalanche induces a current in the anode which we will detect with amplifier electronics. The electronics will be described in detail at another talk. Further, we will stack four chambers perpendicular to each other allowing us to calculate muon trajectory for the purposes of muography, which is our intended final goal.

Michael Reynolds
Kennesaw State Univ

Date submitted: 10 Jan 2018 Electronic form version 1.4