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Characterization of Gas Amplification in Varied Gas Mixtures for Stacked Gas Electron Multiplier and Micromegas Detectors RAYMOND EHLERS, Physics Department, Yale University — Micropattern Gas Detectors (MPGDs) represent a promising group of gas amplification technologies. Utilizing large electric fields over geometries on the order of tens of micrometers, these elements can achieve large gas amplification while minimizing field distortions by minimizing the number of ions escaping from the amplification stage. Such properties are extremely useful for readout in gaseous detectors such as Time Projection Chambers. Two types of MPGDs are of particular interest, Gas Electron Multipliers (GEMs) and Micro-mesh Gaseous Structure (Micromegas) detectors. These elements may be stacked, which allows for the utilization of the best properties of both, further improving the amplification performance. We report here on the characterization of 2 GEMs stacked on top of a Micromegas. In particular, I will present the dependence of gas amplification on Micromegas voltage in various gas mixtures, as well as an investigation into stability of the elements against sparking.

Raymond Ehlers
Physics Department, Yale University

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