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Characterization of an amplification read-out gas chamber with stacked GEM and MicromeGas detectors SALVATORE AIOLA, Physics Department, Yale University — Micro-Pattern Gas Detectors (MPGD) are a relatively new class of devices that allow gas amplification of charges. Amplification is achieved by exploiting the high field density generated in gaps or holes of the order of a few tens of microns. If carefully designed, the field lines are such that the ions produced in the amplification process are trapped by the device, thus avoiding the build-up of space charge (ion back flow) in the gas volume. This is a crucial capability, especially when these devices are employed as read-out chambers of large gaseous tracking detectors, such as a Time Projection Chamber (TPC). We report on a series of measurements aimed at characterizing the performance of an amplification read-out chamber consisting of a stack of two Gas Electron Multipliers (GEMs) on top of a MicromeGas. The combination of these two technologies has proven to be particularly useful: the presence of multiple amplification steps allows operation of the MicromeGas at a relatively low gain, thus suppressing the spark rate; in addition this setup further reduces the overall ion back flow, without hindering the energy resolution. Measurements of the energy resolution, the amplification factor and the ion back flow for different electric field configurations will be presented.

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