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Reducing IBF with a novel MPGD structure

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MicroMEGAS (Micro-MEsh-GAseous Structure) and Gas Electron Multiplier (GEM) detectors are commonly used as readout technologies in Time Projection Chambers (TPCs) for particle physics experiments. However, for these two types of detectors, a small fraction of the secondary ions produced in the amplification region returns to the drift volume, i.e. the TPC itself, causing local distortions of electric field. This effect is know as space charge effect. We present a new Micro- Pattern Gaseous Detector (MPGD) structure, that combines a micro-mesh and a set made of a GEM surmounted by a micro-mesh at only a few hundred µm. We report the performance results of 2 prototypes using this new structure, capable of reducing the ion feedback fractions to less than 0.2% for a total gain of around 2000.

Collaboration

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