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Performance and applications of standard and non-standard GEM foils

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Gas Electron Multiplier (GEM) technology is widely used in many applications in nuclear and particle physics. It offers the potential to develop new gaseous detectors with unprecedented spatial resolution, high rate capability, sizable sensitive area, operational stability and radiation hardness.

The aim of research was to study the performance of GEM in two thickness: 50 μm (standard) and 125 μm (non-standard) in a broad range of gas mixture pressures. It was observed that non-standard, thicker, GEMs are particularly suitable for applications in experiments employing low-pressure gas mixtures due to effective gas gain capabilities and efficient suppression of secondary effects (like ion back-flow).

In this contribution, basic concepts, operational mechanisms and performance of the gas amplifier structures based on standard and non-standard GEM foils will be presented.

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