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Study of gain variation as a function of physical parameters of GEM foil using Garfield++

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Electron multiplication in Gas Electron Multipliers (GEM) occurs when primary electrons pass through the small holes where the electric field is very high. However the shape of the electric field distribution through the holes depends on the shape and size of the holes as well as the thickness of the polyimide foil. In consequence the local variation of these parameters results in the variation of gain over the whole area of the foil. Due to complications in the fabrication of the GEM foils, deviations from the design parameters over the entire area of the foil are not rare specially when large area foils are required to be fabricated. So an independent evaluation of the variation of gain as a function of the physical parameters is necessary for better operation of the detector. In this work we used Garfield++ simulation package to evaluate the gain for a GEM based detector and study the variation in it by changing the physical parameters around the standard values. Results from this study with single mask as well as double mask GEM foils will be presented.

Collaboration

ALICE Collaboration

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