

A simulation study for designed triple GEM detector at IOP

Thursday, 16 February 2017 18:05 (5 minutes)

The GEM is one of the Micro Pattern Gas Detector (MPGD) proposed to be used as a readout for ALICE TPC upgrade in LHC experiment, at CERN [1]. The existing Multiple Wire Proportional Chamber (MWPC) will be replaced by GEM based readout which provides intrinsic ion blocking capability without any gating grid system [2]. For R&D purpose we have assembled a 10cm × 10cm triple GEM detector in IOP High Energy Detector (HED) laboratory. In this study we have performed a simulation for triple GEM detector using Garfield++ package [3]. ANSYS script is used to solve the electric fields inside the detector as well as for the graphical visualization of potentials [4]. A systematic calculation is done for gain, transparency, collection and extraction efficiency and signal distribution both for electrons and ions for this particular detector setup. Here we will present a comparison of experimental data with simulation results.

References

- [1] F. Sauli, et al., Nuclear Instruments and Methods 805 (2016) 224 [2] G. Charpak, et al., Nuclear Instruments and Methods 62 (1968) 262 [3] <https://garfieldpp.web.cern.ch/garfieldpp/>
[4] <http://www.ansys.com/>

Presentation type

Oral

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Session Classification: Poster session