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Performance studies of GEM detector for future Heavy-Ion experiments

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Gas Electron Multiplier (GEM) is one of the most suitable gaseous detector for tracking devices in high rate Heavy-Ion (HI) experiments for their high rate handling capability and good spatial resolution.

The performance studies including the detector efficiency, time resolution, discharge probability and also the radiation induced effects on the chamber such as charging-up effect, long-term stability study are the most important aspects need to be investigated before using the detector in any experiments.

In this work all of the above mentioned aspects are investigated for triple GEM chamber prototypes operated with premixed Ar/CO₂ gas mixtures in different volume ratios. The cosmic ray muons are used to measure the efficiency of the chamber. The time resolution of the chamber is investigated with a Cs137 gamma source of energy 662 keV. The radiation induced effects on the chamber are investigated using a Fe55 X-ray source of characteristic energy 5.9 keV. The discharge probability of the chamber is measured at the CERN-SPS beam line facility. The details of the experimental setup, method of measurements and experimental results will be presented.

Session

Future Experiments and Detector Development

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