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Performance study of a new type of bakelite RPC for future High-Energy Physics Experiments

Single-gap RPC is among the family of gaseous detectors used in high-energy physics experiments. They are known for their fast response time, high efficiency and low fabrication cost per unit area. RPCs are typically constructed using glass or bakelite plates with high bulk resistivity in the range of approximately $10^{9} - 10^{12}$ Ω cm. In the present work, bakelite RPC prototype is built with a new technique of linseed oil coating and has been thoroughly characterized with different gas mixtures and operating in both the avalanche and streamer mode of operation using cosmic rays. The efficiency, noise rate, time resolution, long-term stability, radiation hardness are tested. The effect of ambient parameters on the performance of the chamber are also tested. Performance of the detector is also compared for operation in gas flow mode and fixed gas mode. The details of the detector fabrication procedure and the test results will be presented.

Field of contribution

Experiment

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