

## **Cost Effective Large Area Gaseous Detectors for Detection of Charged Particles [Online]**

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Detection of charged particles especially cosmic muons is very crucial to study cosmic rays. There are several experiments dedicated to this purpose. Detection of cosmic rays needs detectors covering large areas. The cost of the detectors increases significantly with the increase in the detection area. Gaseous detectors like Resistive Plate Chambers (RPCs) offer a very cost-effective solution for the detection of charged particles, especially muons. These detectors can be fabricated over a large surface area (each of a few m<sup>2</sup>). They have excellent detection efficiency (> 98%) and time resolution (~10 ps). These detectors are used by several High Energy Physics and Neutrino Physics experiments. These detectors are broadly classified into two categories - glass RPCs and bakelite RPCs, based on the nature of their electrodes. Developing bakelite RPC without any kind of oil treatment further reduces the cost significantly. The summary and overview of the development and performance of oil-free large-area bakelite RPCs and MRPCs for the detection of charged particles will be presented and discussed. The detector has been developed from indigenous materials in India. The feasibility of using these detectors to study cosmic ray interactions will also be discussed.

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