

## **Systematic Study on a Six Gap Bakelite MRPC in Streamer Mode**

Multi-Gap Resistive Plate Chambers (MRPC) are gas detectors specially used as time of flight (TOF) detector for their excellent time resolution. Mostly, glass based MRPCs have been developed all over the world. To explore parallel possibilities, we have made an effort to build a six-gap MRPC using bakelite electrodes. The MRPC has dimension 15 cm x 15 cm x 1.0 cm. Each gas-gap thickness is  $\sim 250 \mu\text{m}$ . Melamine based high pressure laminated (HPL) resistive plates of 3 mm and 500  $\mu\text{m}$  thickness have been used as outer and internal floating electrodes respectively. The detector has shown efficient performance when operated with Freon (R134a) based gas mixtures in avalanche mode. As Bakelite is well known for its good performance in streamer mode, we have also studied the MRPC in Ar-based streamer mode gas mixture at the cosmic ray setup at VECC. Measurements of efficiency, charge distribution, noise rate, time resolution etc have been performed. Moreover, to develop a detailed understanding of the detector parameters for Multi-Gap bakelite RPCs, we have also started numerical study. The details of the fabrication process of the detector, its performance in streamer mode, the results of numerical study and the future possibilities will be discussed.

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