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Performance Studies of Large Resistive Micromegas Quadruplets in Test-Beams and High Radiation Environments (12' + 3')

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In recent years, Micromegas detectors become more and more important for large scale tracking systems in particles physics. In this presentation, we report on the construction of two prototype detector quadruplets with an area of 0.5 m² per plane, based on the resistive-strip technology, which can be used for precision tracking in high rate environments. The detectors were built in a modular way. The quadruplets consist of two double-sided readout panels and three support (or drift) panels equipped with the micromesh and the drift electrode. The panels are bolted together such that the detector can be opened and cleaned, if required. Two of the readout planes are equipped with readout strips inclined by 1.5 degree. In this talk, we present the results of detailed performance studies based on X-Ray measurements, cosmic ray- and test-beam measurements at the MAMI accelerator that have been conducted in the past months. In particular, results on reconstruction efficiencies, track resolution and gain homogeneity will be presented. In addition, first performance measurements in high radiation environments taken at the GIF++ facility will be presented.

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