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## Development of GEM for the CBM MUCH Detector

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In the GSI detector laboratory a test setup has been installed for the study of the characteristics of the Gas Electron Multiplier (GEM). GEMs will be used as trackers in the Muon Chamber in the future Compressed Baryonic Matter (CBM) experiment. The characteristics of triple GEM detectors have been studied systematically by using cosmic ray muons. The minimum ionizing particle (MIP) spectra has been taken for different GEM voltage setting. An efficiency plateau at 95% has been achieved for cosmic ray. At high rate operation of GEMs the value of the protection resistor influences the gain and the stability. We have investigated this feature varying both the rate and the value of the protection resistor. This measurement has been performed using both X-ray generator and Fe55 sources. The ageing and long-term stability of GEM based detectors has been studied employing both X-ray and Fe55 sources [1]. The ageing study of one GEM module is performed by using an 8 keV Cu X-ray generator to verify the stability and integrity of the GEM detectors over a longer period of time. The accumulated charge on the detector is calculated from the rate of the X-ray and the average gain of the detector. No sign of ageing is observed after accumulation of more than 0.04 mC/mm<sup>2</sup>. The details of the measurement and results will be presented. REFERENCES 1. S.Biswas et al., Nuclear Instruments and Methods in Physics Research A (In Press). DOI: 10.1016/ j.nima.2012.08.044.

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