

## Testing of Real-Size Prototype GEM detectors for CBM-MUCH with Pb+Pb Collisions at SPS CERN

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The Compressed Baryonic Matter (CBM) experiment is one of the core experiments of the upcoming FAIR facility in Darmstadt, Germany. This fixed target heavy ion experiment, is designed to explore the phase diagram of strongly interacting matter at high net baryonic density. CBM has been designed to handle unprecedented interaction rates (10 MHz) of Au+Au collisions in an energy range of up to 11 AGeV. The Muon Chamber (MUCH) system being developed at VECC, consists of layers of instrumented muon absorbers with detector stations sandwiched between them. A trapezoidal shaped, large size, Gas Electron Multiplier (GEM) detectors would be employed to perform the job of high rate tracking in the first few stations. In this regard, we have tested real-size prototypes of MUCH chambers in Pb+Pb collisions at CERN SPS. For the first time, almost full module acceptance was populated with realistic self-triggered electronics. The entire active area consisting of about 1900 readout pads having progressively increasing sizes was exposed to spray of particles arising out of the collisions of Pb beam with a 1 mm thick Pb target. The effect of absorber in front of the GEM chamber was also studied using a 20 cm thick small iron plate. The data acquired using new CBM DAQ chain involving several AFCK (AMC FMC Carrier Kintex) boards with time synchronisation between them in a free streaming readout. The test results such as the hit spill structure, time correlation between hits in different detector planes etc. will be discussed in detail.

**Presenter:** KUMAR, Ajit (Department of Atomic Energy (IN))