



Contribution ID: 93

Type: Poster (Session B)

Status of Triple GEM Muon Chambers for LHCb Experiment

Muon triggering and offline muon identification are fundamental requirements of the LHCb experiment, which will be already taking data at the start-up of the LHC machine. The identification of muon particles with a rough momentum measurement (down to 3 GeV/c) in the near-beam area of the first muon station of about 0.6 m² is achieved by a set of 24 triple-GEM detectors. Due to the very forward peaked b-quark distribution at LHC, GEM detectors will trigger about 20% of muons from B-particle decays. In this paper the results of the quality checks, panel planarity, GEM foil HV test, chamber gas leak and gain uniformity performed on the whole production are presented. In particular, the gas leak of all detectors is less than 2 mbar/day, corresponding to a residual relative humidity in the gas mixture (Ar/CO₂/CF₄=45/15/40) below 100 ppmV. The gain uniformity measured with an X-ray beam moved over the whole chamber is better than 10%. The performance of a station, composed by two detectors logically OR-ed, has been measured in a recent test beam at the SPS, where particle bunches have a time structure of 25 ns similar to LHC running conditions. In this test the final front-end electronics and the final LHCb DAQ have been used. The results demonstrate that the station can achieve the required efficiency of 96% at a detector gain of 4000, instead of 6000 as measured in previous tests, thus ensuring a longer detector lifetime in the harsh LHCb environment.

Primary author: RASPINO, Davide (Cagliari University and INFN)

Co-author: MURTAS, Fabrizio (INFN Frascati)

Presenter: RASPINO, Davide (Cagliari University and INFN)