Contribution ID: **85** Type: **Poster presentation**

Design, Construction and Test of a precursor GEM-TPC for PANDA

Monday 4 July 2011 16:02 (1 minute)

High-precision spectroscopy of hadrons in the strange and charm sector, as envisaged in the PANDA experiment requires an excellent charged particle tracking system with multiple track identification (up to 4000 tracks superimposed inside the TPC all the time), high spatial resolution (σrϕ˜150 μm,σz˜1mm),high momentum resolution
(˜1%),minimal material budget (˜1% of radiation length),high rate capability, resistance against aging, etc. Therefore, a cylindrical Time Projection Chamber(TPC)was proposed as the central tracking detector for PANDA.In addition to its excellent tracking properties, a TPC would strongly improve particle identification (PID) in the sub-GeV region, which is very important for most of the interesting physics channels and for rejection of low momentum pions from ppbar annihilation. Owing to the beam properties at the High Energy Storage Ring (HESR), the TPC has to operate at high particle rates and in a continuous mode, i.e. without gating. The use of GEM foils as amplification stage instead of conventional MWPC's allows us to bypass the necessity of a gating structure, as the back drift of ions into the drift volume has been shown to be intrinsically suppressed due to the asymmetric internal field configuration in a GEM-based gas amplification system. A large prototype detector has been designed, built and tested. The prototype has been commissioned with cosmic rays before it was installed in the FOPI experiment at GSI at the end of 2010. The application of the prototype in a running physics experiment constitutes a very useful test and provides valuable data on the tracking performance of an ungated GEM-TPC in PANDA. For FOPI, in turn, the TPC will provide a significant improvement for the detection of Λ-vertices. Here the design of the prototype, the front-end and readout electronics employed, and present first results obtained during the beam test in FOPI will be presented.

Primary author: Mr ARORA, Rahul (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Presenter: Mr ARORA, Rahul (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Session Classification: Poster Mini Talks II

Track Classification: High Energy Physics & Astronomy