Contribution ID: **115** Type: **Oral Presentation**

Performance of the PANDA GEM-TPC prototype

Friday, 9 September 2011 12:10 (20 minutes)

To face the challenges of the physics program in PANDA1, the cylindrical central tracker of the Target Spectrometer has to fulll the following requirements: A high vertex resolution (sigma~ 150 m; z 1 mm), high momentum resolution (1 %), minimal material budget (1% of radiation length), high rate capability, resistance against aging, etc. Due to the beam characteristics (L=*2 10^32 cm^-2 s^-1, 2*10^ 7 pbar p annihilations s^-1), the TPC has to work in a continuous mode, i.e. without gating, which is another big challenge from the technical point of view. Due to the rather long electron drift time, tracks from up to 1000 events are superimposed inside the TPC at any given time. A Time Projection Chamber with Gas Electron Multiplier readout not only fullls all the requirements above, but furthermore provides very good dE/dx measurement also in the region of low momenta, which is necessary for particle identication. In addition, the successful long-term operation of GEM-Detectors for example at the COMPASS2 experiment shows that this kind of detector has excellent properties concerning high rate capability. Due to asymmetric eld conguration the GEM detectors have a high intrinsic suppression of ion back ow. Such properties enables a GEM-based TPC to operate in an ungated mode. A prototype GEM-TPC with a drift length of 72.78 cm and an outer diameter of 30 cm was designed and built by a collaboration of groups from GSI Darmstadt, HISKP Bonn, SMI Vienna, and TU Munchen. This prototype was made to t into the FOPI spectrometer at GSI were it is very useful to increase primary and secondary vertex resolutions. The progress and test results of a measurement campaign with the GEM-TPC prototype inside FOPI will be shown in this contribution.

Primary author: BERGER, Martin (TU-Muenchen)

Presenter: BERGER, Martin (TU-Muenchen)

Session Classification: Facilities and Experiments II

Track Classification: Instrumentation