T558

Beam test in a magnetic field of a prototype TPC for the linear collider

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The use of a Time Projection Chamber (TPC) is being considerd as a central tracker for the detector at the International Linear Collider. The multi-wire proportional chamber as a readout endplate has been used in past TPCs. The use of new micro-pattern gas devices (MPGD) for a high performance TPC is an attractive possibility for the gas ampliffication. As the first step, performances of a small prototype TPC (25 cm drift length) with a MWPC readout enfplate which was built by MPI Munich and DESY was tested at KEK PS π-2 beam line with 1T in the JACEE magnet. They are shown in Fig.1 and Fig.2. This magnet is a thin-walled superconducting coil so that the test beam would penetrate the side of the coil into the TPC volume. The test camber has been exposed to e, π and p beams with momenta of 0.5–4.0 GeV/c. The pad response point resolution obtained in this setup is shown in Fig.3. The same prototype TPC will be converted to GEM and then to Micromegas technology and measured in the beam.

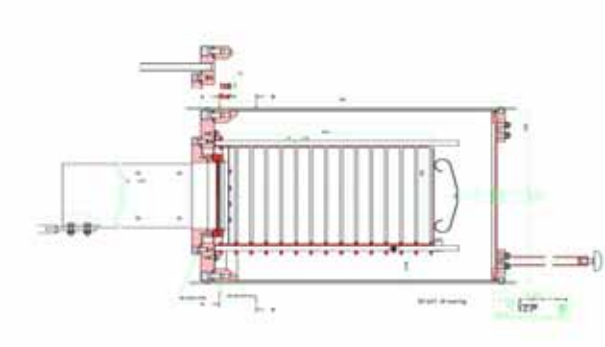

Fig.1. Prototype TPC built by MPI Munich

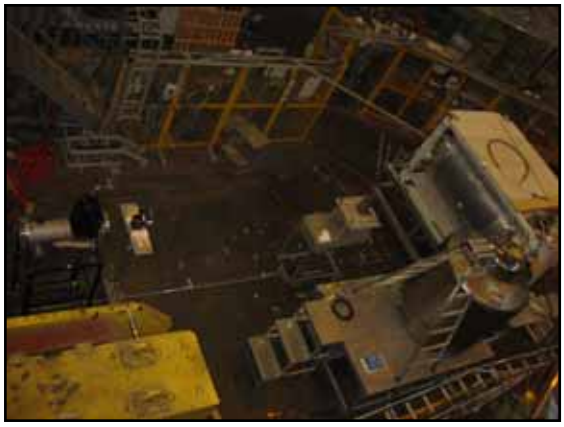

Fig.2. π-2 beam line and JACEE magnet

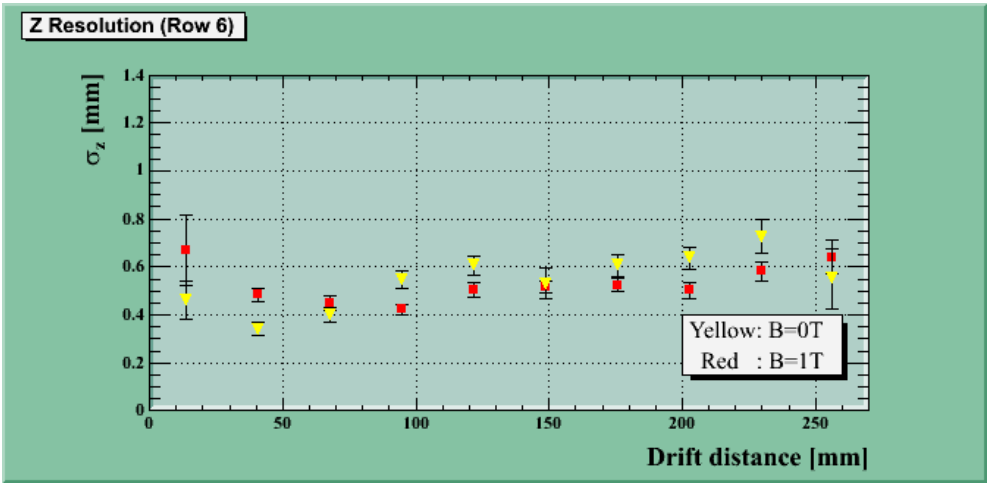

Fig.3. Point resolution measured as a function of drift distance in MWPC-TPC (preliminary)