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Study of a Large Prototype TPC for the ILC using Micro-Pattern Gas Detectors

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In the last decade, R&D of detectors for the future International Linear Collider (ILC) has been performed by the community. The International Large Detector (ILD) is one detector concept at the ILC where calorimetry and tracking systems are combined. The tracking system consists of a Si vertex detector, forward tracking disks and a large volume Time Projection Chamber (TPC).

Within the framework of the LCTPC collaboration, a Large Prototype (LP) TPC has been built as a demonstrator. Its endplate is able to contain up to seven identical modules of Micro-Pattern Gas Detectors (MPGD). Recently, the LP has been equipped with resistive anode Micromegas (MM) or Gas Electron Multiplier (GEM) modules. Both the MM and GEM technologies have been studied with a 5 GeV electron beam in a 1 Tesla magnet.

After introducing the LP, the current status, recent results (drift velocity, field distortions, ion gate and spatial resolution measurements) as well as future plans of the LCTPC R&D with MM and GEM will be presented.

Summary

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