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Studies on Gas Electron Multiplier (GEM) modules of a Large Prototype TPC for the ILC

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The International Large Detector (ILD) is one of two detector concepts at the ILC. It relies on highly granular calorimetry and a high precision tracking system. The tracking system consists of a Silicon vertex detector, forward tracking disks and a large volume Time Projection Chamber (TPC), which will be read out with micro-pattern gas detectors (MPGD).

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 MPGD modules and studied with electron beams (1-6 GeV) in a 1 Tesla magnetic field.

The interest of this talk lies in the studies of Gas Electron Multiplier (GEM) modules.

In particular, after introducing the LP, recent results (drift velocity, field distortions, spatial resolution, alignment measurements) as well as the current status and future plans of the LCTPC R&D will be presented.

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