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Potential Ion gating using GEM: Experiment and simulations

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Positive ion feed-back can be problematic in a high precision Time Projection Chamber (TPC) as proposed for the International Linear Collider (ILC). Use of a traditional wire gating device is difficult because of the high magnetic field and the module structure. F. Sauli proposed, in 2006, the use of a Gas Electron Multiplier (GEM) as a gating device. We have measured the electron transparency for a 14 μ m thick GEM in a 1T magnetic field. The transparency does not meet the requirement for a TPC at the ILC. We performed a simulation study using Garfield++ to understand the important parameters. Simulations show that a new GEM structure with wider aperture, for example a hexagonal honeycomb structure, can provide improved the performance as a gate. Results of measurements will be compared to the simulation and predicted performance of the new GEM structure will be des

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