

Advancements of THGEM in IHEP, China

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Thick Gaseous Electron Multiplier (THGEM) is one of the promising Micro-pattern Gaseous Detectors. It can be applied to Digital Hadron Calorimeter (DHCAL), TPC tracker readout, Muon detector, single photon detector, neutron imaging and so on. The attractive advantages of THGEM are high gain, robust and low cost. The moderate spacial resolution limits its applications but it is acceptable in many cases as listed above. In recent years, we have made continuous effort to improve THGEM performances, develop new types of THGEMs and . The hole pitch and hole diameter can be reached 400 μm and 150 μm by mechanical drilling and 300 μm and 100 μm by laser sputtering respectively. The sensitive area of a single film can be reached $1.0 \times 0.5 \text{m}^2$. The laser sputtering is hopeful to overcome the mass production difficulty of THGEM. Our test results indicated that better substrate, better performance. The specified FR4 substrate for high performance THGEM was made according to more than 10 types of FR4s. Besides FR4 THGEM, the PTFE, Ceramic and Kapton (PI) THGEMs were also developed for low background experiments and neutron imaging. Another attractive direction is the new structure THGEMs, such as Multi-layer THGEM (M-THGEM), Well-THGEM and so on. M-THGEM shows excellent gain performance within a single thin film. The newly progresses will be also presented.

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