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Development of Die Hard GEM using PTFE Insulator Substrate

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We have developed the GEM foils with polytetrafluoroethylene (PTFE) film as an insulator layer for the first time. Since the PTFE film is hard to be carbonized by arc discharge, the PTFE-GEM is expected to be strong against break down. We have experimentally confirmed that the PTFE-GEM was really robust against discharge. The gain we achieved was larger than 2.6×10^4 for 50 micron-thick PTFE-GEM in Ar/CO₂=70%/30% gas mixture at the voltage between GEM electrodes $V_{gem}=730$ V. The PTFE-GEM foil was NEVER broken even when it suffered more than 40 thousand discharges during the experiment. We think that PTFE is one of the excellent insulator material for GEM productions. At the conference, we will present the production procedure and the detail of our experiment for valuating the PTFE-GEM.

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