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Measurements of Stability of Gas Electron Multiplier (GEM)

YORITO YAMAGUCHI, HIDEKI HAMAGAKI, KYOICHIRO OZAWA, SUSUMU ODA, CNS, University of Tokyo, MASAHIDE INUZUKA, National Research Institute for Cultural Properties, Tokyo — Recently, we produce a new type of Gas Electron Multiplier (GEM) foils by a plasma etching method. We investigate the gain stability of the GEM made at CNS, University of Tokyo. The GEM, which has been originally developed at CERN using micro-pattern technology, is expected to have the possibility of high rate operation together with good spatial resolution. The GEM made at CERN (CERN-GEM) is produced by the chemical etching method and has holes with a double-conical shape. It has been reported that the gas gain of CERN-GEM increases (or decreases) as a function of illumination time. One possible reason of the illumination-time dependence is that the Kapton insulator in the GEM charges up. The charging-up is thought to be due to a double-conical shape of holes of the CERN-GEM. We succeeded in producing the GEM (CNS-GEM) which has holes with a cylindrical shape by the plasma etching method. The CNS-GEM is expected to have better gain stability than CERN-GEM since the CNS-GEM has better electron transmission and less probability of charging-up. In this talk, the result of measurements for gain stability of the CNS-GEM compared with that of the CERN-GEM and the current status of development of the CNS-GEM will be reported.

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