

Abstract Submitted
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Advances in Thick GEM-like (THGEM) multipliers AMOS BRESKIN¹, RACHEL CHECHIK, MARCO CORTESI, Weizmann Institute of Science, VOLKER DANGENDORF, PTB Braunschweig, WEIZMANN TEAM, PTB TEAM — The concept and properties of the novel and robust Thick GEM-like (THGEM) hole-multiplier, economically produced by standard printed-circuit techniques, is presented. It has a GEM-like structure and operation mode, with dimensions expanded to the sub-mm to mm scales, and mechanically-drilled holes etched at their rim. Very high electron multiplication, 10^5 and 10^7 in single- and double-THGEM elements were reached; very efficient electron transport into and out of the holes permits efficient multi-element cascading. The fast avalanche buildup leads to ns timing properties and rates exceeding MHz/mm². The THGEM can efficiently detect single gas-ionization electrons or radiation-induced electrons from a solid converter – e.g. a photocathode deposited on its top surface. The former is important for particle tracking, x-ray imaging etc, and the latter has important applications in photon and neutron imaging. The results of recent studies will be presented, including sub-mm imaging properties of a 100x100 mm² detector prototype. Potential applications will be discussed: UV-photon imaging in RICH, moderate-resolution tracking, TPC read out, sampling elements in calorimetry, x-ray and neutron imaging, charge and light detection in 2-phase noble-liquid detectors etc.

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