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High Resolution Single Photon Scanning Device for TGEMs

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TGEM based micropattern gaseous photon detecotrs suffer from inefficiencies on photo-electron collection and detection due to the microstructure of the TGEM's surface. An exploration of this structure can lead to deeper understanding and optimization of construction parameters. Built from a proper optical section attached to a three dimensional scanning device a focused single photo-electron response could be measured, with 0.07mm precision. This allows separate high resolution mapping of the photo-electron detection probability and the TGEM avalanche gain. The presentation will give a detailed description of the setup and demonstrate the applicability in MPGD quality control. The first interesting results include the experimental quantification of the efficiency drop in the critical symmetry lines and points, and the demonstration that each TGEM hole has an individual constant gain covering its hexagonal collection zone.

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