



ID de Contribution: 40

Type: **Oral presentation**

## Progress towards a THGEM-based detector of single photons

*mercredi 5 mai 2010 09:25 (25 minutes)*

The novel and robust Thick GEM (THGEM) electron multiplier, coupled to a solid state photon converter, represents a promising option for covering, at affordable costs, large areas with photon detectors, in particular, in Cherenkov imaging counters where single photons must be detected with high efficiency.

Multistage structures, where the first THGEM layer is coated with a photosensitive CsI film, guarantee UV light sensitivity, allow for gas multiplication factors  $>10^5$ , for high rate operation, and provide fast pulses with a few nanosecond rise-time.

The reduction of photon and ion feedback and of the related photocathode bombardment is obtained thanks to the closed geometry structure; this architecture can overcome the limitations affecting the present generation of gaseous photon detectors for RICH applications, based on open geometries.

The main goal of our project is to demonstrate the feasibility of reliable gaseous detector of single photons based on the use of THGEM multipliers, able to stably operate at high gain and high rate, and to build and validate a large size prototype of such a detector.

Project status and perspectives are reported; in particular attention is dedicated to the simulation and laboratory studies performed to understand the photoelectron extraction performance attainable using a solid photocathode coated onto a THGEM substrate.

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plenary

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**Classification de Session:** Photon detection for Cherenkov Counters - gaseous devices

**Classification de thématique:** Photon detection for Cherenkov counters