Contribution ID: **265** Type: **Talk**

LHM: a new noble-liquid detector concept based on bubble-assisted electroluminescence

Thursday 18 February 2016 10:15 (20 minutes)

We present a new noble-liquid detection concept and experimental results in LXe, based on the bubble-assisted Liquid Hole Multiplier (LHM). In this "local dual-phase detection element", a gas bubble is supported underneath a micro-pattern electrode (THGEM, GEM etc.) immersed inside the liquid. Ionization electrons and scintillation-induced photoelectrons (PE) extracted from a CsI photocathode, drift through the electrode's holes; they induce electroluminescence (EL) in the bubble, with tens of photons emitted per drifting electron. A cascaded-LHM detector, operated through photon-mediated process in noble-liquid, would provide high light yields –detectable with internal or external photo-sensors. We will present LHM-prototype results in LXe, demonstrating the stability of the bubble-assisted concept in GEM and THGEM. Examples are: energy resolution (7.5% for ˜6,000 electrons), efficient PE extraction from a CsI-coated THGEM and GEM in LXe and their collection into holes; EL photo-yields, time resolution (10ns) with scintillation photons and results of the cascaded-LHM operation will be provided. The merits of the bubble-assisted LHM concept will be discussed in the context of future applications for rare-event and other searches.

Authors: BRESKIN, Amos (Weizmann Institute of Science (IL)); Dr VARTSKY, David (Weizmann Institute of Science); Mr ERDAL, Eran (Weizmann Institute of Science); ARAZI, Lior (Weizmann Institute of Science); Dr RAPPAPORT, Michael (Weizmann Institute of Science); Dr CHEPEL, Vitaly (Coimbra University, Coimbra)

Presenter: Mr ERDAL, Eran (Weizmann Institute of Science)

Session Classification: Gas Detectors

Track Classification: Gaseous Detectors