Contribution ID: **115** Type: **Poster Sessions**

Development of very low threshold detection system for low-background experiments

Saturday 7 July 2012 18:00 (1 hour)

A concept of readout of noble gas two-phase emission detectors by means of multipixel avalanche Geiger photodiodes (MGPDs or SiPMs) and a THGEM structure is presented.
It is well known that a two-phase emission technique with noble gases is a very sensitive method of detection of very small ionisation signals (down to few or single ionisation electrons). Electroluminescent "amplification"provides the unique possibility to detect reliably even the single ionisation electron extracted from the liquid to the gas phase. Due to this reason such detectors are currently successfully used in the Dark Matter search experiments and are considered for the use in the neutrino experiments: for coherent scattering of reactor antineutrino off atomic nuclei.
To increase the capabilities of a two-phase detector a system of THGEM + WLS (wavelength shifter) +MGPD is used for its readout. Additional amplification of the charge in the THGEM holes gives the large light signal of electroluminescence detected with an array of SiPMs. This readout system provides the mm accuracy for even very low-energy events, that is important for the reliable separation of the rare physical events from the background ones caused by spontaneous emission of the electrons from the liquid noble gas surface. The results of analysis experimental data and comparison MC simulations are present.

Author: AKINDINOV, Alexander (ITEP Institute for Theoretical and Experimental Physics)

Co-authors: AKIMOV, Dmitri (ITEP, Moscow); Dr ALEXANDROV, Ivan (ITEP (RU))

Presenter: Dr ALEXANDROV, Ivan (ITEP (RU))

Session Classification: Poster Session

Track Classification: Track 13. Detectors and Computing for HEP