

Development of Micromegas readout planes for Rare Event Searches

Friday 24 June 2011 14:00 (20 minutes)

Detectors in rare-event searches are required to follow a strict budget on radiopurity, but should also show good energy and space resolution, and stability over long periods of operation.

The Micromegas detectors have attracted a lot of attention since their invention in 1996, for their potential use in this field of particle physics, among others.

One example is the CAST (CERN Axion Solar Telescope) experiment which is searching for axions. The energy range of the expected signal is between 1 and 10 keV and therefore low background detectors are necessary for the experiment's sensitivity. The new microbulk micromegas installed in CAST the last years have registered periods where the background has been reduced even down to a level of $\sim 2 \times 10^{-7} \text{s}^{-1} \text{cm}^{-2} \text{keV}^{-1}$.

Double decay experiments' main requirements are as well very good energy resolution and ultra-low background levels, apart from big masses. NEXT (Neutrino Experiment with a Xenon TPC) will construct a 100 kg high-pressure xenon gas (HPGXe) TPC, looking for the neutrinoless double beta decay in the Canfranc Underground Laboratory (LSC). Micromegas planes have been one of the proposed technologies for the equipment of this detector.

We report on the effort that has been invested in the development of detectors which push the technology in order to meet the characteristics for this type of experiments.

Primary author: Dr DAFNI, Theopisti

Presenter: Dr DAFNI, Theopisti

Session Classification: Contributed Talks

Track Classification: Neutrinos and Dark Matter