ID de Contribution: **21** Type: **Non spécifié**

Invited : AXEL : high pressure xenon gas time projection chamber foor neutrinoless double beta decay search

The AXEL (A Xe ELectroluminescence) project aims to search for neutrinoless double beta (0νββ) decay of 136Xe using high xenon gas time projection chamber. Electroluminescence (EL) mode is used to readout the ionization signal in order to achieve high energy resolution. We have developed a new modularized cellular readout method called "Electroluminescence Light Collection Cell (ELCC)". Cells are made as holes penetrating an PTFE board sandwiched by a thin electrode plate with holes and a mesh. The cell interval is 10 mm. Ionization electrons are drifted and pulled into the cells by the electric field and generate EL lights, then EL photons are detected by VUV-sensitive SiPMs attached to that cell (Fig. 1). It has uniform sensitivity for entire region of the detector because all ionization electrons are once pulled into cells. Its rigid structure is an advantage to enlarge the detector.
We built a large size prototype detector with 180 L volume and 672 ch readout. The detector performance was evaluated with 8 bar xenon gas. As a source having similar energy as the signal (2458 keV), gamma-rays with energy of 1836 keV from 88Y is used to evaluate the energy resolution. Achieved energy resolution is 0.92 % (FWHM) at 1836 keV. This corresponds to 0.78 % (FWHM) when extrapolated to 2458 keV. Event topology is also reconstructed as shown in Fig. 2. In the presentation, the performance of this detector will be reported.
The construction of a new detector with 1000 L volume is on going, aiming to take physics data. I will also present the status and prospect of this new detector.

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Classification de Session: 0√2β session 1, chair Julien Masbou