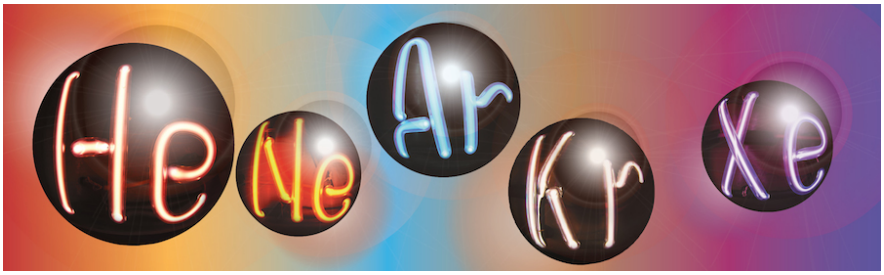

Contribution ID: **52** Type: **Oral**

Enhanced electroluminescence in LXe on thin strips

Wednesday 28 August 2024 11:35 (20 minutes)

Single-phase noble-liquid detectors have been proposed as a potential solution to the limitations introduced by the liquid-gas interface of dual-phase time projection chambers.

Following our previous research on electroluminescence (EL) production in liquid xenon (LXe) using a classical microstrip plate design, we report our findings on the operation in LXe of a microstrip plate with a virtual cathode (VCC) design and 2-um-wide parallel anode strips deposited on one face.

Electrons extracted from alpha-particle tracks induce EL in the intense non-uniform electric field in the vicinity of the strips. The signals produced (S2) are recorded along with the primary scintillation ones (S1) by a PMT immersed in the liquid. Moreover, the intense field near the strips induces charge avalanches, which are also detected. We find that this strip-plate configuration provides enhanced light and charge yields as well as better electrical stability at higher potentials than a plate with interlaced anode and cathode strips deposited on the same face. We will present our preliminary results on the operation of a VCC plate with a semi-conductive glass substrate (s8900), demonstrating its superior photoyield - reaching hundreds of photons/ionization electrons. The impact of the substrate material on the performance of the device will also be discussed.

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Session Classification: Applications

Track Classification: Applications (dark matter, neutrino, precision frontier, medicine, etc.): Dark matter