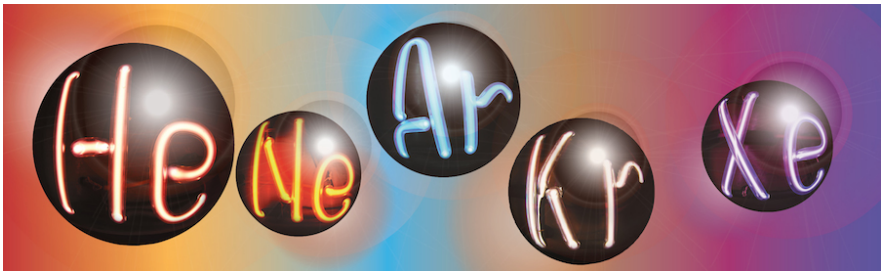

Contribution ID: **57** Type: **Talk**

Optical properties of materials under Liquid Xenon VUV scintillation light

Efficient detection of 178 nm VUV scintillation light is a staple of xenon-based detectors for rare-event searches, including next-generation experiments to search for neutrinoless double beta (0νββ) decay like nEXO. nEXO is a 5-tonne liquid xenon (LXe) time-projection chamber enriched to 90% Xe-136 designed to search for 0νββ decay with a projected half-life sensitivity of 1.35*10ˆ28 years over a 10-year lifespan. Achieving this sensitivity requires excellent collection of scintillation light and accurate modeling of the detector VUV optics, motivating a rigorous characterization of light sensors, including silicon photomultipliers (SiPMs), and of the optical properties of detector materials. We present selected results from a small, optically simple cryogenic cell at UMass Amherst to study light collection in LXe. The setup is equipped with a Fondazione Bruno Kessler HD3 VUV SiPM and an 241Am alpha source. Results from optical measurements of silicon and aluminum-coated surfaces will be presented.

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