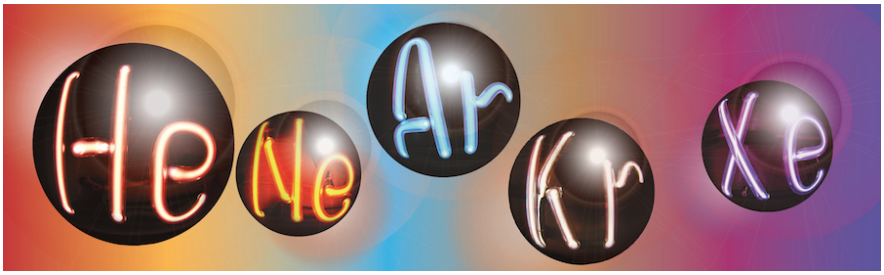

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Analysis and suppression of delay photon and delay electron backgrounds of liquid xenon TPCs for ultra-low energy detection

Tuesday, 21 October 2025 22:00 (50 minutes)

Liquid xenon time projection chambers (LXeTPC) own the detection sensitivity of light dark matter and neutrino CEvNS signals due to its ultra-low energy threshold. However, the sensitivity in sub-keV region is significantly limited by the instrument background, specifically delay photons and delay electrons. In this talk, we will present our investigation into the origins of these backgrounds, including material optical properties, xenon purity, and electric field effects, based on recent experimental data. Based on that, we optimized the design of a prototype LXeTPCs, and will present corresponding test results here. These advancements will help to lowering the energy threshold and further enhancing the sensitivity of LXeTPCs to low-energy nuclear recoil signals.

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