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Discrimination of electron recoils from nuclear recoils in two-phase xenon time projection chambers VETRI VELAN, University of California, Berkeley, LARGE UNDERGROUND XENON (LUX) COLLABORATION — The two-phase liquid xenon time projection chamber is one of the leading technologies used for dark matter direct detection. World-leading limits on dark matter interactions have been set by LUX and XENON1T, and the upcoming LZ and XENONnT experiments seek to push further. A crucial part of using this technology is being able to classify energy deposits as nuclear recoils (NR) or electron recoils (ER). In my talk, I will discuss how ER-NR discrimination can influence the performance of future detectors, informed by our analysis of LUX calibration data. I will focus on this via two paradigms: effects on discrimination from detector parameters like electric field and light collection, and from physical variables like pulse-shape and energy. I will also discuss the physical origins of fluctuations in electron recoil signals and how LUX data can inform our understanding of these effects.

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