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Recombination in liquid xenon using the Large Underground Xenon (LUX) Experiment

Saturday, 2 December 2017 14:40 (20 minutes)

Two-phase xenon time projection chambers are a leading strategy for dark matter direct detection experiments. Some of the leading limits in the field are from the Large Underground Xenon experiment (LUX), XENON1T, and PANDAX-II. These experiments operate by measuring the scintillation and ionization of xenon when an incident particle interacts in the medium, potentially including WIMPs. As a result, it is crucial to calibrate these detectors and understand the light and charge yields from nuclear recoils and electron recoils. This is complicated by the fact that when xenon atoms are ionized, the positive ions and liberated electrons can recombine to form more scintillation light, and the recombination fraction depends on factors such as energy deposited, electric field, and particle type. I will present work done on the second science search (WS2014-16) of LUX to explain how recombination is a function of both the electric drift field and the energy deposited by electron recoils.

Session

Works in Progress (15+5 min)

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Session Classification: Works in Progress