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The Search for Lightly Ionizing Particles in the LUX Detector[1]
PAUL TERMAN[2], Texas A&M University, LUX COLLABORATION — The question of the nature of dark matter has become increasingly puzzling as more experiments exclude larger portions of the favored WIMP parameter space. Previous theoretical work has suggested the existence of Lightly Ionizing Particles (LIPs) with charge $e \cdot f$, where e is the electron charge and $f < 1$. At least a part of the dark matter could consist of these LIPs. We seek to utilize data from the first underground WIMP search of the Large Underground Xenon (LUX) experiment, using a dual-phase xenon Time Projection Chamber (TPC), to search for LIPs in the range $f = 0.01$ to 0.3. To accomplish the aforementioned search new methods of Geant4 based simulation and data processing have been implemented including the first use of pulse *chopping* for merged signals in a dual-phase TPC and use of secondary pulse classification.

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