

The Search for Lightly Ionizing Particles Using the 90-day Run Data of the Large Underground Xenon Experiment

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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 90-day WIMP search of the Large Underground Xenon (LUX) experiment to search for LIPs in the charge range $f = 0.01$ to 0.3 . To accomplish the aforementioned search new methods of Geant4 based simulation and data processing have been implemented.

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