

Background Modeling in the LUX Detector for an Effective Field Theory Dark Matter Search

Friday 27 March 2020 14:15 (15 minutes)

Historically, dark matter direct detection experiments searching for dark matter in the form of Weakly Interacting Massive Particles (WIMPs) typically consider only two couplings between atomic nuclei and the WIMP: spin-independent and spin-dependent interactions. However, the lack of an observed WIMP signal encourages consideration of more WIMP-nucleon interaction types, and recent theoretical work provides a basis composed of 14 independent effective field theory (EFT) operators. The inclusion of these additional operators leads to the possibility of WIMP interactions at higher energies than traditional WIMP analyses. In this presentation we will report on the search for WIMP-nucleon interactions at higher energies with data collected by the LUX detector during its tenure in the Davis Campus of the Sanford Underground Research Facility. Specifically, we will discuss background modeling for an EFT dark matter search, and we will present the results of the EFT analyses using LUX data.

Author: RISCHBIETER, Gregory

Presenter: RISCHBIETER, Gregory

Session Classification: Session 13

Track Classification: Non-directional direct dark matter detection