

Low energy electron recoil searches within LZ and using FlameNEST for future work

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LUX-ZEPLIN (LZ) is a direct dark matter (DM) detection experiment utilising a 7-tonne active target of liquid xenon, searching primarily for WIMP candidates that produce nuclear recoils (NR) of xenon nuclei. LZ recently published results from the 60 live-day science run one (SR1), producing new world-leading limits for the upper bound of the spin-independent and neutron spin-dependent WIMP-nucleon cross-sections. In 2023, LZ published results in a search for new physics in low-energy electron recoils from the first LZ exposure, which looked for signals from exotic physics models that produce electron recoils, such as DM candidates that couple to electrons. The search included solar axions, axion-like particles, hidden photons, and solar neutrino magnetic moment and millicharge. This talk will discuss the results featured in this paper, the work done to calculate projected limits by combining SR1 with planned exposures from SR3 to estimate future sensitivity and discuss using FlameNEST, a statistical framework being developed within LZ, to produce improved sensitivity results for these models compared to previous statistical methods used by LZ.

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