

Towards Electron-Recoil Background Models for LUX and LZ

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Direct detection of dark matter is probably the most exciting and long-awaited missing piece in the puzzling world of particle physics. Being amongst the world's leading direct dark matter search programmes, LUX and its successor, LUX-ZEPLIN (LZ), aim to detect interactions of Weakly Interacting Massive Particles (WIMPs), or other dark matter candidates such as certain classes of axions, using the dual phase xenon time projection chamber technology. This provides high efficiency, low threshold, 3D reconstruction of events, together with the ability to discriminate between interactions that generate nuclear recoils (e.g. WIMPs) from those that generate electron recoils (e.g. axions). In general, nuclear recoil backgrounds are controlled significantly more effectively than electron recoil backgrounds, making searches for signals such as axions more difficult. Consequently, the success of such searches depends critically on the accuracy of the modelling of electron recoil backgrounds. Here we summarise some of the issues and their solutions that are being addressed within the LUX and LZ collaborations.