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Background Simulations for the LUX-ZEPLIN Experiment

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The LUX-ZEPLIN experiment will use a seven tonne dual-phase xenon TPC for the direct detection of dark matter. Understanding and mitigating background signals are crucial in its aim to push to an unprecedented sensitivity for WIMPs. I will describe the methods used to assess these, including simulations that characterise the electron and nuclear recoil responses in the detector from both internal and external background sources. Combined with the results of ongoing radioactive assays, these give an estimate of the expected background rates. Suppression of these backgrounds is achieved through fiducialisation and a veto strategy involving anti-coincidence between the main TPC and outer detectors (an instrumented xenon 'skin' and liquid scintillator detector). Under the present background model, LZ is projected to have a baseline sensitivity, with 1000 live days, of 2.3 x 10-48 cm2 for a 40 GeV/c2 WIMP mass.

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