

Background Determination for the LUX-ZEPLIN Experiment

Friday 31 March 2023 15:00 (15 minutes)

LUX-ZEPLIN (LZ) is a direct dark matter detection experiment, primarily designed to search for WIMPs, currently taking data. The detector comprises a position sensitive xenon time projection chamber surrounded by an instrumented xenon “Skin” and liquid scintillator active vetoes. An active mass of 7 tonnes of xenon is used, from which a fiducial region of mass 5.6 tonnes is formed that has minimal gamma-ray and neutron activity. The radiopure environment has been further ensured through an extensive material screening and selection campaign, together with in-house xenon purification. These background mitigation strategies underpin LZ’s unprecedented projected sensitivity to WIMPs. This talk will detail the background model derived for LZ’s first science run, in which new limits on WIMP-nucleon interactions were set, down to a spin-independent cross-section of $6.5 \times 10^{-48} \text{ cm}^2$ for a mass of 30 GeV/c² at 90% confidence level.

Author: COTTLE, Amy

Presenter: COTTLE, Amy

Session Classification: SESSION 13: Direct detection: Technical Development-1 (CHAIR: Chamkaur Ghag - University College London)

Track Classification: Non-directional direct dark matter detection