

The LZ Outer Detector

Monday, 8 July 2024 16:50 (20 minutes)

LUX-ZEPLIN (LZ) is a direct dark matter detection experiment primarily designed to search for WIMPs with a dual-phase Xenon Time Projection Chamber (TPC). It stands at the forefront of dark matter research after obtaining world-leading WIMP-nucleon cross-section constraints with an exposure of 60 days and a fiducial mass of 5.5 t. Located at the Sanford Underground Research Facility (SURF), LZ is currently taking data with the aim of increasing exposure towards a first discovery or improved limits on WIMPs and other dark matter models. The success of LZ is aided by an excellent characterisation of the backgrounds affecting this type of search. Among them, neutron backgrounds are a particularly relevant concern as they can mimic the interaction between WIMPs and nucleons. Fortunately, the LZ Outer Detector (OD) is able to tag these particles with high efficiency, allowing LZ to reach its full potential. The OD consists of 17 t of gadolinium-doped liquid scintillator surrounding the xenon target, viewed by 120 PMTs inside the water tank. The goal of this talk will be to present the OD design, calibration, and performance in past and current LZ science runs.

Primary author: USÓN, Alberto (University of Edinburgh)

Presenter: USÓN, Alberto (University of Edinburgh)

Session Classification: Parallel 1

Track Classification: Parallel session: Direct detection