

The Environmental Monitoring Station: Measuring Cavern Backgrounds for the LUX-ZEPLIN experiment

Wednesday 9 April 2025 11:00 (15 minutes)

LUX-ZEPLIN (LZ) is the world's most sensitive direct dark matter detector. It is located deep underground at the 4850 ft level at the Sanford Underground Research Facility (SURF) in Lead, South Dakota. This is a quiet environment, shielded from cosmic rays. LZ utilises 7 tonnes of liquid xenon in a time projection chamber as a target for extremely rare dark matter particle interactions. LZ primarily looks for weakly interacting massive particles (WIMPs) which are one of the leading candidates for dark matter. LZ has been designed to be very sensitive to rare signals, however this means that it is also sensitive to the remaining backgrounds we cannot remove or completely shield against. Characterising and mitigating these backgrounds is crucial. The Environmental Monitoring Station (EMS) consists of a suite of detectors which measure key cavern backgrounds. Demonstrating a complete and thorough understanding of our backgrounds is vital for physics searches with LZ. In this talk I will discuss the design of the EMS and present preliminary results from analysis of EMS data.

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