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Radon Reduction Strategies and Detection Techniques for Ultra-Clear Liquid Nitrogen in the CDEX Experiment

Wednesday 27 August 2025 18:00 (2 hours)

Liquid nitrogen is regarded as a radioactivity-free material with minimal concerns related to cosmic-rays; however, radon emissions from shielding and potential leaks can still pose challenges in the search for dark matter and neutrinoless double beta decay in the CDEX experiments. Achieving radon activity levels below sub-μBq/kg is a key milestone for current rare event experiments. We have developed two methods for detecting low concentrations of radon: one using a 300-ml liquid scintillator with a background level of 30 micro-Bq, and the other utilizing a 100 L electrostatic collection chamber with a radon concentration of 0.08 mBq/m^3 in gas. With the application of cryogenic activated carbon enrichment, sensitivity can be further enhanced to the sub-μBq/kg range. We will discuss radon reduction strategies and insights into radon transport.

Collaboration you are representing

CDEX

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