

Innovative radon removal system for dark matter searches using silver-zeolite adsorbent

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The NEWS-G (New Experiments With Spheres-Gas) uses a spherical proportional counter to search for low-mass dark matter at the SNOLAB underground laboratory. Radon, a significant source of contamination for the NEWS-G detector and other rare event search detectors, requires effective mitigation strategies. This talk presents the performance of a novel radon trap using silver zeolite, which significantly outperforms the commonly used activated charcoal in radon capture efficiency. These results highlight silver zeolite as a promising new adsorbent for dark matter and neutrinoless double beta-decay experiments. Integrated into the NEWS-G detector at SNOLAB, this trap efficiency in a low-background environment is evaluated through alpha analyses, distinguishing radon-induced events from other alpha emitters like Po-210 on the detector's inner surface. These findings will guide future radon reduction strategies, enhancing the sensitivity of NEWS-G dark matter searches.

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