

Abstract Submitted
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Low-background Gamma Spectroscopy at Sanford Underground Laboratory¹ CHRISTOPHER CHILLER², ANGELA ALANSON³, DONGMING MEI⁴, Univ. of South Dakota — Rare-event physics experiments require the use of material with unprecedented radio-purity. Low background counting assay capabilities and detectors are critical for determining the sensitivity of the planned ultra-low background experiments. A low-background counting, LBC, facility has been built at the 4850-Level Davis Campus of the Sanford Underground Research Facility to perform screening of material and detector parts. Like many rare event physics experiments, our LBC uses lead shielding to mitigate background radiation. Corrosion of lead brick shielding in subterranean installations creates radon plate-out potential as well as human risks of ingestible or respirable lead compounds. Our LBC facilities employ an exposed lead shield requiring clean smooth surfaces. A cleaning process of low-activity silica sand blasting and borated paraffin hot coating preservation was employed to guard against corrosion due to chemical and biological exposures. The resulting lead shield maintains low background contribution integrity while fully encapsulating the lead surface. We report the performance of the current LBC and a plan to develop a large germanium well detector for PMT screening.

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