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Background simulation for AMoRE-II experiment

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The Advanced Mo-based Rare process Experiment (AMoRE) is an underground experiment that aims to detect the neutrino less double beta decay of ^{100}Mo isotope. Reducing the detector background to as low as possible, ideally, zero level, is one of the key requirements of double beta decay experiments. Radioactive contaminants in the construction materials, such as ^{232}Th and ^{238}U daughters, are the most prevalent background sources in the experiments. The environmental fluxes of neutrons, muons, and gamma rays at the experimental site also contribute to the background levels.

The AMoRE-II aims to achieve a background level of 10^{-4} events/keV/kg/year and is in preparation at the Yemi Underground Laboratory (Yemilab), located in the Handuk mine of Yemi mountain. To estimate the background conditions in the AMoRE-II, we conducted simulations using the GEANT4 Toolkit. These simulations focused on determining the background levels arising from external shield materials, detector modules and details nearby the detectors. We will present a detailed account of our various background simulations and estimate of the background levels within the region of interest.

Submitted on behalf of a Collaboration?

Yes

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