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Background Modeling of AMoRE-I

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AMoRE is an international collaboration to search for the neutrinoless double-beta ($0\nu\beta\beta$) decay of ^{100}Mo, utilizing enriched molybdate scintillating crystals. AMoRE-I, the second phase of the program following the AMoRE-Pilot, was conducted at the Yangyang Underground Laboratory(Y2L) over a period of 29 months (December 2020 –May 2023), using an array of 18 crystals with a total mass of 6.194 kg.
We present a report on the background study of the AMoRE-I experimental data with 8.02 kg·year exposure. The model includes contributions from major background sources. Internal sources such as ^{232}Th, ^{235}U, ^{238}U, ^{40}K, and two-neutrino double-beta decay ($2\nu\beta\beta$) of ^{100}Mo, along with external components including gamma rays from ^{222}Rn daughters, neutrons, and radiation from surrounding rocks, are simulated using Geant4. We compare the experimentally measured beta-gamma spectrum to the results from Monte Carlo simulations.

Collaboration you are representing

AMoRE

Authors: Mr BHANDARI, B. (Sejong University); Dr HA, D.H. (Center for Underground Physics (CUP), Institute for Basic Science (IBS), Daejeon, Korea); Dr JEON, E.J. (Center for Underground Physics (CUP), Institute for Basic Science (IBS), Daejeon, Korea); Prof. KIM, H.S. (Sejong University); Dr SEO, J. (Center for Underground Physics (CUP), Institute for Basic Science (IBS), Daejeon, Korea); Dr KIM, S.C. (Center for Underground Physics (CUP), Institute for Basic Science (IBS), Daejeon, Korea)

Presenter: Mr BHANDARI, B. (Sejong University)

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