

Measurements of internal alpha activities in the AMoRE-pilot CaMoO₄ crystals

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AMoRE (Advanced Mo-based Rare process Experiment) is an experimental search for neutrinoless double beta decay of Mo-100. A pilot experiment, AMoRE-Pilot, has been operating with six ⁴⁰Ca¹⁰⁰MoO₄ (CMO) crystals, total mass 1.9 kg, in a cryostat at the Yangyang underground laboratory (Y2L), with an overburden of 700 m. It is unavoidable that the materials of the crystals suffer from some contaminations of radioactive isotopes such as U-238, Th-232, U-235, and their decay particles. They can originate from the chemical powders that were used to grow the crystals and/or may be introduced during the crystal growing and polishing procedures. From fits to the measured energy spectra for background alpha decay events, the levels of contamination from U-238, Th-232, U-235, and their decay particles can be estimated. The estimated information can be used to provide important input to the development strategies for reducing backgrounds in the future crystals. We will present preliminary results of internal alpha activity measurements in the AMoRE-Pilot crystals.

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