

A Neutron-induced Background Mitigation Study for Axion-like Particle Search at Rare Nuclear Isotope Accelerator Facilities

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Rare nuclear isotope accelerator facilities require high-intensity proton beams to produce different types of nuclear isotopes more copiously. Such requirements provide an excellent opportunity to search for dark-sector particles such as axion-like particles (ALPs). This presentation will introduce an experimental proposal called DAMSA (Dump-produced Aboriginal Matter Searches at Accelerator) at the RAON (Rare isotope Accelerator complex for ONline experiment) facility, which is under construction in Korea. One of the main features of DAMSA is the proximity of the detector to the target, which enables the exploration of the high-mass region of ALP parameter space. The proximity, however, requires a method to effectively control beam-related neutron backgrounds effectively. We performed a Geant4 Monte Carlo simulation for the neutron production at the target, the proton beam dump, and their interactions inside the detector system. In this talk, we will discuss the current status of the study and its results.

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Yes

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