

Abstract Submitted
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Study of (α, n) reactions from the Calibration Sources of the MAJORANA DEMONSTRATOR Experiment¹ TUPENDRA OLI, Univ of South Dakota — Neutrinoless double beta ($0\nu\beta\beta$) decay is a hypothesized lepton-number-violating nuclear transition. If observed, $0\nu\beta\beta$ decay would unambiguously demonstrate the violation of an empirical symmetry of the Standard Model and establish the Majorana nature of neutrinos. The MAJORANA DEMONSTRATOR experiment, currently operating at the 4850' level of the Sanford Underground Research Facility in Lead SD, is searching for such decay in ^{76}Ge with high purity Germanium (HPGe) detectors. MAJORANA has achieved an excellent energy resolution of 2.5 keV FWHM and a low background rate. The DEMONSTRATOR regularly deploys a ^{228}Th line source to perform energy calibration based on the detection of the gamma ray photopeaks. The calibration source inevitably produces several alpha particles with energies of several MeV within the ^{228}Th chain before it ends with the stable ^{208}Pb . When traversing through surrounding materials, these alpha particles can potentially produce neutrons and coincident gammas from (α, n) reactions and nuclear de-excitations that follow. In this talk, we will discuss our efforts studying such neutrons originating from the calibration sources via their coincident gamma signatures.

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