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A Background Model for MiniCLEAN DONGMING MEI, University of South Dakota, ANDREW HIME, Los Alamos National Laboratory, DEAP/CLEAN COLLABORATION — MiniCLEAN is aimed at the direct detection of Weakly Interacting Massive Particles (WIMPs) that as they recoil from liquid argon and liquid neon targets operating deep beneath the Earth's surface. Fast neutrons are naturally produced by the inherent radioactivity of detector construction materials and form an irreducible background to a potential WIMP signal. This paper describes our evaluation of neutron background for the proposed MiniCLEAN detector utilizing a fiducial mass of 1- ton. The neutron yield and energy spectra through (α,n) reactions in various materials will be discussed. We will present simulation results for both liquid argon and liquid neon and emphasize our strategy for controlling background. The projected sensitivity for a WIMP search in MiniCLEAN will also be discussed.

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