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Fast neutron measurement at Soudan Mine using a large liquid scintillation detector[1] CHAO ZHANG, DONGMING MEI, University of South Dakota — Characterizing neutron background is extremely important to the success of rare-event physics searching for neutrinoless double-beta decay and dark matter searches. Measuring the energy spectrum of fast neutrons for an underground laboratory is difficult and it requires intensive R&D for a given technology. EJ-301 liquid scintillator(known also as NE-213) is implemented as the target for a 12 liter neutron detector fabricated at the University of South Dakota. The light output response to atmospheric neutrons from a few MeV up to $\sim$ 70 MeV has been calibrated for this detector. The detector has been taking data at Soudan Mine for over two years. We report the measured muon-induced neutrons in this paper.

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