Abstract Submitted
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Measuring fast neutrons with large liquid scintillator for ultra-low background experiments[1] CHAO ZHANG, DONGMING MEI, PATRICK DAVIS, BRIAN WOLTMAN, University of South Dakota, FREDERICK GRAY, Regis University, CUBED COLLABORATION — Characterizing neutron background is extremely important to the success of rare event physics research such as 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. We developed a neutron detector that is constructed using an aluminum tube with one meter long and 5 inch in diameter filled with 12 liter liquid scintillators(EJ-301). The inner surface of the tube is painted with specular reflector and there are two 5" PMTs(Hamamatsu H4144) attached to both ends. The detector is calibrated with cosmic muons and radioactive sources. Good neutron/gamma discrimination is found from few MeV up to hundred MeV. We report the result for the measurements of muons and fast neutrons in Soudan Mine for over one year data.

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