Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Neutron Production from Atmospheric Neutrino Interactions at the Sudbury Neutrino Observatory MAX SMILEY, University of Pennsylvania, JAVIER CARAVACA, University of California, Berkeley and Lawrence Berkeley National Lab, JYOTIRMAI SINGH, University of California, Berkeley, SNO COLLABORATION — In this analysis we measure the neutron production from atmospheric neutrino interactions in heavy water (D2O) at the Sudbury Neutrino Observatory (SNO). These neutrons form a significant background to nucleon decay analyses but production rates are not very well known mainly due to uncertainties on neutrino cross-section models and final state interactions (FSI). This analysis opens up the possibility to distinguish neutrino and antineutrino events in order to measure more precisely the neutrino mass hierarchy through neutron tagging. We use a likelihood-based reconstruction algorithm to identify the characteristics of the Cherenkov radiation cone from final state particles yielded by atmospheric neutrino interactions and measure its energy and position, and identify the number of particles and neutrino flavor. In this poster we detail the algorithm, how we calibrate energy scale and we show preliminary measurement of the neutron multiplicity as a function of the charged lepton energy, comparing it to the GENIE model.

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Date submitted: 01 Aug 2017 Electronic form version 1.4