Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Angular distributions of dark scattered neutrons in plastic scintillators ANDREA ROBINSON, CAROLINE CAPUANO, ANTHONY KUCHERA, Davidson College, PAUL GUEYE, Michigan State University, THE MONA COLLABORATION — Experimental studies of nuclei near the neutron drip line often rely on simulation to interpret the results. The accuracy of simulating neutron scattering in plastic scintillators is imperative, and a previous experiment conducted by the MoNA Collaboration at the Los Alamos Neutron Science Center (LANSCE) highlighted the need to improve these simulations, particularly by increasing knowledge of dark scattered neutrons. The latter occur when neutrons leave insufficient light to be detected, making it difficult to accurately reconstruct their trajectories. One of the goals of this experiment was to measure the angular distribution of dark scattered neutrons using a plastic scintillator array optimized to study dark scattering. 2D (limited to the center of each detector) and 3D (across the entire detector) angular distributions were determined for incoming neutrons with energies of 50-400 MeV. Additionally, preliminary scattering probabilities were calculated. These results provide necessary information needed to more accurately model neutron scattering in plastic scintillators.

Andrea Robinson
Davidson College

Date submitted: 31 Jul 2020 Electronic form version 1.4