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Modeling neutron events in MoNA-LISA using MCNPX<sup>1</sup> MAR-GARET KENDRA ELLISTON, ALEXANDER PETERS, KRISTEN STRYKER, SHARON STEPHENSON, Gettysburg College, MONA COLLABORATION — The MoNA-LISA collaboration uses time-of-flight techniques and charged particle detectors to determine the structure of exotic nuclei such as  $^{24}O$  and  $^{12}Be$ . To determine the decay energy in particular, a neutron that hits the Modular Neutron Array and the Large multi-Institutional Scintillator Array has its energy, position and angle of incidence recorded if and only if the charged particle detector system detects an appropriate charged-particle fragment. However, the analysis uses only the first neutron to hit the detector array even in the case of 2n events, since the data acquisition system cannot distinguish between simultaneous but random 2n events and events due to 2n reactions. We are using MCNPX to model the reaction channels possible in the MoNA-LISA detector system in an effort to better improve the resolution on decay energy spectra for events with multiple neutrons.

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