

Abstract Submitted
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Investigating Background Sources in the DIANNA Experiment using GEANT4 and MCNPX¹ CATRISH PAGAN, RICHARD SHOWALTER-BUCHER, DAVID YAGER-ELORRIAGA, BRET CRAWFORD, SHARON STEPHENSON, Gettysburg College, DIANNA COLLABORATION — The DIANNA collaboration is pursuing a direct measurement of the 1S_0 neutron-neutron scattering length at the YAGUAR reactor. The neutron background is predicted to depend linearly on the neutron flux, while the neutron-neutron signal should have a quadratic dependence, and therefore, variation in the pulse power of the reactor provides a mechanism for separating the signal from the background. Initial measurements show a non-linear contribution to the background, which could be from both desorption in the aluminum vacuum pipe as well as physical movement of the moderator during the reactor pulse. To study the background effects of various desorption processes, GEANT4 was used. MCNPX was used to model the possible background effects of the moderator movement during the YAGUAR reactor pulse. Results will be presented.

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Catrish Pagan
Gettysburg College

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