Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

(n,p) and (n,alpha) measurements using LENZ instrument to improve reaction model prediction[1] HYE YOUNG LEE, MATTHEW DEVLIN, ROBERT HAIGHT, BRETT MANNING, SHEA MOSBY, Los Alamos Natl Lab — Understanding neutron-induced charged particle reactions is of interest for nuclear astrophysics and applied nuclear energy. Often, direct measurements of these reactions are not feasible at neutron beam facilities due to the short half-lives of the targets and the reduced cross sections at astrophysically relevant energies given the large Coulomb barriers. Instead, the Hauser-Feshbach formalism is used to study this reaction mechanism for predicting cross sections. We have developed the LENZ (Low Energy n,z) instrument to measure the (n,p) and (n,α) reactions using a time-of-flight method for incident neutron energies from thermal to several tens of MeV at LANSCE. The LENZ has improved capabilities including a large solid angle, a low detection threshold, and good signal-to-background ratios using waveform digitizers. We have performed an in-beam commissioning measurement on ^{59}Co(n,α/p) at E_n = 0.7 – 12 MeV. In this paper, we will discuss the results of the ^{59}Co(n,α/p) measurements and present the status of the reaction studies on ^{16}O(n,α) for nuclear energy applications and ^{77}Se(n,p) for reaction mechanism studies.

[1]This work is funded by the US Department of Energy - Los Alamos National Security, LLC under contract DE-AC52-06NA25396.

Hye Young Lee
Los Alamos Natl Lab

Date submitted: 01 Jul 2015 Electronic form version 1.4