Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Spectroscopic Investigations with Dual Neutron-Gamma Scintillators[1] P. CHOWDHURY, T. BROWN, E. DOUCET, C.J. LISTER, C. MORSE, A.M. ROGERS, G.L. WILSON, University of Massachusetts Lowell, M. DEVLIN, N. FOTIADES, J.A. GOMEZ, S. MOSBY, Los Alamos National Laboratory — The spectroscopic capabilities of ^{7}Li-enriched $Cs_2{}^{7}LiYCl_6$ ($C^{7}LYC$) dual neutron-gamma scintillators are being tested in diverse application arenas to exploit the excellent pulse-shape discrimination together with the unprecedented pulse height resolution ($\sim$10%) for fast neutrons in the < 8 MeV range via the ^{35}Cl(n,p) reaction [1]. Test experiments include both elastic and inelastic neutron scattering cross-sections on ^{56}Fe at Los Alamos with a pulsed white neutron source, as well as (p,n) and (d,n) reactions on low-Z targets using monoenergetic proton and deuteron beams from the 5.5 MV Van de Graaff accelerator at the UMass Lowell Radiation Laboratory. Tests of waveform digitizers with different sampling rates are also being performed. A key goal is to evaluate whether the low intrinsic efficiency of $C^{7}LYC$ for fast neutrons compared to traditional neutron detectors, such as liquid scintillators, can be effectively offset by the gain in solid angle obtained by positioning the detectors much closer to the target, since the typical long time-of-flight arms for energy resolution are not necessary.
1. N. D'Olympia et al., Nucl. Inst. Meth. A694, 140 (2012), and A763, 433 (2014).

[1]Supported by the NNSA Stewardship Science Academic Alliance Program under Grant DE-NA0002932

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Date submitted: 30 Jun 2017 Electronic form version 1.4