Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

Fast Timing Measurements Using $CeBr_3$ Scintillators[1] N. D'OLYMPIA, S. LAKSHMI, P. CHOWDHURY, E. JACKSON, UMass Lowell, J. GLODO, U. SHIRWADKAR, K. SHAH, RMD Inc. — Continued research in advancing scintillation detector technology for both basic and applied nuclear science has recently focused on novel alkali halides. One candidate, $CeBr_3$, is capable of achieving $\approx$120 ps timing resolution, and has also been found to have an energy resolution on the order of 3-5%. In this work, the utility of $CeBr_3$ detectors for research in basic nuclear physics has been investigated through fast-timing measurements of nanosecond and sub-nanosecond isomer half-lives. A $t_{1/2}$=1.4 ns 2^+ state in ^{152}Sm was populated in the decay of a ^{152}Eu γ-calibration source, and a $t_{1/2}$=537 ps $9/2^-$ state in ^{177}Hf in the decay of ^{177}Lu, produced through thermal neutron activation of a natural Lu foil in the UMass Lowell Research Reactor. Half-lives were measured using a multi-parameter data acquisition setup to obtain energy gated time spectra. Results of these measurements with $CeBr_3$ detectors will be discussed in the context of next generation nuclear science research.

[1]This work was supported by the U.S. Department of Energy

Nathan D'Olympia
UMass Lowell

Date submitted: 30 Jun 2011 Electronic form version 1.4