

Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Development of a Versatile Array of Neutron Detectors at Low Energy¹ CATALIN MATEI, Oak Ridge Associated Universities, D.W. BARDAYAN, Oak Ridge National Laboratory, J.C. BLACKMON, Louisiana State University, J.A. CIZEWSKI, W.A. PETERS, Rutgers University, R.K. GRZYWACZ, S.N. LIDDICK, S.W. PADGETT, S.D. PAIN, University of Tennessee, F. SARAZIN, Colorado School of Mines — The development of radioactive ion beams at the Holifield Radioactive Ion Beam Facility at ORNL allows the study of many neutron- and proton-rich nuclei. Proton transfer with (d,n) reactions is an excellent tool for measuring single-proton strength in neutron-rich nuclei near the Z=28 and 50 shell closures. On the proton-rich side (d,n) reactions on ⁵⁶Ni and ²⁵Al are relevant for nuclear astrophysics. We also propose measurements of beta decay properties in nuclei near ⁷⁸Ni and ¹³²Sn to determine beta decay lifetimes and branching ratios. The Versatile Array of Neutron Detectors at Low Energy (VANDLE) is a new array of plastic scintillator bars under development at ORNL. The array is highly modular allowing the configuration of the individual elements to be optimized for particular experimental requirements. We propose one configuration optimized for beta-delayed neutron emission studies and one optimized for (d,n) reactions. The scientific motivation and details of the testing and design of the array will be presented.

¹This work is supported in part by the U.S. DOE and NSF.

Catalin Matei
Oak Ridge Associated Universities

Date submitted: 01 Jul 2008

Electronic form version 1.4