

Abstract Submitted
for the TSS13 Meeting of
The American Physical Society

Elastic and Inelastic Neutron Scattering Cross Sections on ^{23}Na ¹

L. SIDWELL, B. COMBS, S.F. HICKS, University of Dallas, J.R. VANHOY, United States Naval Academy, E.E. PETERS, B.C. CRIDER, A. KUMAR, M.T. MCELLISTREM, F.M. PRADOS-ESTÉVEZ, S.W. YATES, University of Kentucky — Elastic and inelastic neutron scattering differential cross sections from ^{23}Na , useful in certain fission reactor applications, were measured using the neutron scattering and detection facilities at the University of Kentucky (UK) in June of 2012. A pulsed proton beam was accelerated using the 7-MV Van de Graaf accelerator, and neutrons were produced using the $^3\text{H}(p,n)^3\text{He}$ source reaction, which occurred when the proton beam was incident on a tritium cell at the end of the beam line. The neutrons were scattered off a ^{23}Na sample and detected by a C_6D_6 liquid scintillation detector using pulse shape discrimination and time-of-flight methods. Angular distributions of scattered neutrons were measured for incident neutron energies of 3.20 and 3.40 MeV. These incident neutron energies were chosen because they are of interest for reactor applications and because few previous measurements exist in this region. As the result of data analysis performed at the University of Dallas, the elastic and inelastic neutron scattering differential cross sections on ^{23}Na were determined for the 3.20 and 3.40 MeV incident neutron energy measurements. Results from this analysis and comparisons to evaluated nuclear data predictions for these cross sections will be presented.

¹This work was supported by the Department of Energy, through the NEUP Program, and by the Cowan Physics Fund at the University of Dallas.

L. Sidwell
University of Dallas

Date submitted: 01 Mar 2013

Electronic form version 1.4