Abstract Submitted
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Improving Energy Resolution for Neutron-Transfer Experiments at the HRIBF[1] B.A. SCHWER, J.A. HOWARD, R.L. KOZUB, N.D. SMITH, Tennessee Tech. Univ., A. KRONENBERG, M.S. JOHNSON, ORAU, D.W. BARDAYAN, J.C. BLACKMON, C.D. NESARAJA, D.C. RADFORD, M.S. SMITH, ORNL, J.A. CIZEWSKI, K.L. JONES, S.D. PAIN, J.S. THOMAS, Rutgers Univ., R.J. LIVESAY, Col. Sch. of Mines — Theories of the formation of heavy elements by the r-process require information on neutron-capture reactions. To better understand these, (d,p) reactions using radioactive ion beams in inverse kinematics are being studied at the Holifield Radioactive Ion Beam Facility (HRIBF) at Oak Ridge National Laboratory. In such experiments, the proton energy resolution is degraded by energy loss effects in the deuterated polyethylene (CD_2) targets. To improve the energy resolution, γ-rays in coincidence with the protons are detected with a segmented germanium detector array. While the γ-ray energy resolution is not affected by the thickness of the target, the energy spectrum of the γ-rays is Doppler broadened, because of the high velocity of the heavy recoil nucleus. GEANT simulations were performed to find methods of correcting for the Doppler effect with the segmented germanium detectors. A (d,pγ) test run using a 352-MeV ^{88}Sr beam with CD_2 targets of various thicknesses will soon be conducted at the HRIBF. The progress of this run and the results of the GEANT simulations will be presented.

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Raymond Kozub
Tennessee Tech. Univ.

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