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Using HiRA and the (p,d) Reaction to Explore Single-Hole State Evolution Near the N=50 Shell Closure M.E. HOWARD, A.S. ADEKOLA, J.A. CIZEWSKI, B. MANNING, E. MERINO, Rutgers, P.D. O'MALLEY, D. BAZIN, Z. CHAJECKI, D. COUPLAND, R. HODGES, J. LEE, W. LYNCH, A. SANETULLAEV, M.B. TSANG, J. WINKLEBAUER, M. YOUNGS, National Superconducting Cyclotron Laboratory, T.K. GHOSH, Variable Energy Cyclotron Centre, R.R.C. CLEMENT, Los Alamos National Laboratory, D.W. BARDAYAN, K.Y. CHAE, D. SHAPIRA, Oak Ridge National Laboratory, S.H. AHN, K. SCHMITT, University of Tennessee — The 84Se(p,d)83Se and 86Kr(p,d)85Kr reactions at 45 MeV/u in inverse kinematics were measured at the National Superconducting Cyclotron Laboratory in May 2010, using the charged particle detector HiRA and the S800 spectrometer. The experiment described here is the first to utilize the entire HiRA array of 20 telescopes. The primary goal is to extract angular momentum quantum numbers and neutron spectroscopic factors for the ground and first excited states of 83Se. Measuring neutron single-hole states in the N=50 closed shell region will refine the nuclear Hamiltonians for the shell model description of heavier neutron-rich nuclei further from stability. This work is a model for future rare isotope beam experiments that could make meaningful contributions to r-process nucleosynthesis modeling. This work is supported in part by the U.S. National Science Foundation and Department of Energy.

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