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Study of the ^{15}C$(d,p)^{16}$C reaction A.H. WUOSMAA, J.C. LIGHTHALL, S.T. MARLEY, D.V. SHETTY, Western Michigan University, J.P. SCHIFFER, B.B. BACK, S. BAKER, C.M. DEIBEL, C.R. HOFFMAN, B.P. KAY, R.C. PARDO, K.E. REHM, Argonne National Laboratory, B.A. BROWN, Michigan State University, P. FALLON, A.O. MACCHIAVELLI, Lawrence Berkeley National Laboratory, H.Y. LEE, Los Alamos National Laboratory, M. WIEDEKING, Lawrence Livermore National Laboratory — We report on a study of the neutron transfer reaction ^{15}C$(d,p)^{16}$C in inverse kinematics, using HELIOS (the HELIcal Orbit Spectrometer) at Argonne National Laboratory. Previous measurements of electromagnetic transition rates suggested exotic phenomena in ^{16}C. The spectroscopic factors for neutron stripping provide complementary information about the wave functions of the relevant states in ^{16}C. An 8 MeV/u ^{15}C beam with intensity 1-2$\times10^6$ particles per second bombarded a 110 μg/cm^2 CD_2 target. The emitted protons were transported in the HELIOS magnetic field and detected in the HELIOS silicon array. Angular distributions were measured for the lowest 5 states in ^{16}C and relative spectroscopic factors were extracted. Mixing parameters for the two 0^+ states were determined. Results will be compared to shell-model calculations. Work supported by the U. S. DOE, Office of Nuclear Physics, under Contracts DE-FG02-04ER41320, DE-AC02-06CH11357, DE-AC02-05CH11231, DE-AC52-06NA25396, and DEAC52-07NA27344, and NSF Grants PHY-02-16783 and PHY-07-58099.

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