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Fusion reactions with the halo nucleus ^{15}C[1] M. ALCORTA, K.E. REHM, B.B. BACK, P.F. BERTONE, B. DIGIOVINE, H. ESBENSEN, J.P. GREENE, C.R. HOFFMAN, C.L. JIANG, R.C. PARDO, A.M. ROGERS, Argonne National Laboratory, S. BEDOOR, A.H. WUOSMAA, Western Michigan University, C.M. DEIBEL, Argonne National Laboratory and JINA, J.C. LIGHTHALL, S.T. MARLEY, Argonne National Laboratory and Western Michigan University, M. PAUL, Hebrew University, C. UGALDE, Argonne National Laboratory and University of Chicago and JINA — We have for the first time studied the fusion-fission excitation functions for the systems ^{14,15}C + ^{232}Th at energies in the vicinity of the Coulomb barrier. A radioactive ^{15}C beam was produced using the ATLAS In-Flight Technique at Argonne National Laboratory. The intensity of the ^{15}C beam was on the order of 1×10^6 ions/s at the highest energy with a ^{14}C contamination of only 3%. The results of the experiment show that at energies below the barrier, the fusion cross section of the halo nucleus ^{15}C, with an $s_{1/2}$ neutron weakly bound to the closed neutron shell nucleus ^{14}C, is enhanced by a factor of 2-5, while the fusion cross section for ^{14}C follows a trend similar to that of ^{12,13}C. The experimental results will be presented and compared to various theoretical models.

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