

Abstract Submitted
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Measurements of the 1S_0 Scattering Lengths in Neutron-Deuteron Breakup at 19 MeV in a Coincidence Geometry¹ A.S. CROWELL, J. DENG, J.H. ESTERLINE, C.R. HOWELL, M.R. KISER, R.A. MACRI, S. TAJIMA, W. TORNOW, Duke University and TUNL, B.J. CROWE III, North Carolina Central University, R.S. PEDRONI, North Carolina A&T State University, W. VON WITSCH, University of Bonn, H. WITALA, Jagellonian University — Measurements of the 1S_0 neutron-neutron (nn) and neutron-proton (np) scattering lengths, a_{nn} and a_{np} respectively, using neutron-induced deuteron breakup were made at Triangle Universities Nuclear Laboratory (TUNL) at an incident neutron energy of 19.0 MeV. Six liquid scintillator detectors were configured in a coincidence geometry to measure the momenta of the two neutrons in two nn and np final-state-interaction (FSI) pairs while the energy of the proton was determined using a C_6D_{12} active target. The scattering lengths were extracted from the experimental cross sections by comparison to rigorous three-nucleon calculations using the CD Bonn nucleon-nucleon potential for various values of a_{nn} and a_{np} . In this talk results from the two nn and np FSI measurements and the analysis to obtain a_{nn} will be presented.

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