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#### Abstract

Measurement of the ${ }^{1} \mathrm{~S}_{0}$ Neutron-Neutron Scattering Length in nd Breakup Using a Coincidence Geometry at $19 \mathrm{MeV}^{1}$ 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 ${ }^{1} \mathrm{~S}_{0}$ neutron-neutron scattering length, $a_{n n}$, in neutron-deuteron ( $n d$ ) breakup were made at Triangle Universities Nuclear Laboratory (TUNL) at an incident neutron energy of 19.0 MeV . A coincidence geometry was utilized so that the momenta of the two neutrons in the final-state-interaction pair were measured along with the energy of the proton. A second detector pair was used to measure the well-established neutron-proton scattering length, $a_{n p}$, as a check of our techniques. The scattering lengths were extracted from the experimental cross sections by comparison to rigorous three-nucleon calculations using the CD Bonn nucleonnucleon potential for various values of $a_{n p}$ and $a_{n n}$. Experimental details and our preliminary results will be presented.


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A.S. Crowell

Duke University and TUNL

