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**Development of an Experiment to Measure  $a_{nn}$  Using  ${}^3H(\gamma,p)nn$  at the Triangle Universities Nuclear Laboratory<sup>1</sup>**  
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An experiment for determining the  ${}^1S_0$  neutron-neutron (nn) scattering length ( $a_{nn}$ ) with an accuracy of  $\pm 1$  fm from measurements of three-body photodisintegration of the triton is under development at TUNL. This experiment will provide the first data for the proton energy spectrum in this reaction. A linearly polarized 15-MeV gamma-ray beam from the High Intensity Gamma-ray Source (HI $\gamma$ S) is incident on tritium gas contained in thin-walled cells. A collimator system followed by thin scintillator and silicon detectors identify and select charged particles in the angular region of maximum sensitivity. Outgoing neutrons and protons are detected in coincidence, allowing for kinematic cuts to better select the nn final state interaction. Considerations relevant to the tritium target system will be discussed. The experiment will be commissioned with  ${}^3He$ , which will provide data to aid in assessment of ab initio 3N calculations. Results from a GEANT4 simulation of the apparatus will also be presented.

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