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Updates on Kinematically Complete Photodisintegration of ^3He ¹

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Kinematically complete measurements of the three-body photodisintegration of ^3He were performed with nearly monoenergetic 15 MeV photons using the High Intensity Gamma-ray Source (HI γ S) at the Triangle Universities Nuclear Laboratory. The experimental technique was based on two-particle coincidence measurements involving both proton-proton (pp) and neutron-proton (np) pairings, with proton-deuteron coincidences from the two-body reaction used as an in-situ luminosity monitor. There was good agreement between ab-initio theoretical calculations and measurements in the vicinity of the np collinear point (proton at rest). The measured np final state interaction (FSI) peak included low-energy neutrons that were not predicted by the GEANT4 simulation. This discrepancy between data and the simulated experiment in the kinematic region of the np FSI is being investigated and will be discussed in the talk. The pp coincidence cross-section data are consistently about 40% larger than the predictions across the measured kinematic range. This talk will present an overview of the methods employed in the measurement and an update on the analysis.

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