

Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Systematics of the Extraction of the Elementary $\gamma n \rightarrow \pi^- p$ Reaction Cross Sections beyond the Impulse Approximation for $\gamma d \rightarrow \pi^- pp$ ¹
OLIVER BERROTERAN, IGOR STRAKOVSKY, The George Washington University — The radiative decay width of neutral baryons may be extracted from π^- and π^0 photo-production off the neutron, involving a bound neutron target, requiring the use of model-dependent nuclear final state interaction (FSI) corrections. The cross section for the processes $\gamma n \rightarrow \pi^- p$ will be extracted from recent CLAS ($E = 400 - 2500$ MeV) and MAX-lab ($E = 146 - 166$ MeV) measurements for $\gamma d \rightarrow \pi^- pp$ accounting for Fermi motion effects in the Impulse Approximation (IA) as well as nucleon-nucleon- and pion-nucleon-FSI effects beyond the IA. To test the GW-ITEP FSI code for $\gamma n \rightarrow \pi^- p$ in a reliable way to obtain information on systematics of the extraction of the elementary $\gamma n \rightarrow \pi^- p$ reaction cross sections beyond the IA for $\gamma d \rightarrow \pi^- pp$, three key factors were chosen and analyzed: (i) The sensitivity to the number of steps of integration for numerical calculations of the five-fold integrals in the determination of FSI amplitudes; (ii) The sensitivity to the alternative deuteron-wave functions. (iii) The sensitivity to the experimental kinematic cut-off of the detected protons (the experimental information is uncertain). Preliminary estimations show that the contribution of all three factors to the overall systematics is less than 4%.

¹U.S. DOE, Office of Science, Office of Nuclear Physics, Grant DE-FG02-99-ER41110

Oliver Berroteran
George Washington Univ

Date submitted: 27 Jul 2015

Electronic form version 1.4