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Determination of the Azimuthal Asymmetry for Deuteron Photodisintegration at $E_\gamma = 1.1 - 2.3$ GeV NICHOLAS ZACHARIOU, George Washington University, YORDANKA ILIEVA, University of South Carolina, CLAS COLLABORATION — Deuteron photodisintegration is a benchmark process for investigating the role of quarks and gluons in nuclei. Existing theoretical models of this process describe the cross sections with the same degree of success. Therefore, to distinguish between models, spin-dependent observables are crucial for a better understanding of the underlying dynamics. The induced polarization (P_y) and the polarization transfers ($C_{x'}$ and $C_{z'}$) have been instrumental in proving that a pQCD treatment is not applicable at medium energies; however, these observables are relatively insensitive to different non-perturbative models and do not provide further insight into the physics of the process. By contrast, the azimuthal asymmetry Σ is predicted to have a large sensitivity and can help in identifying the energy at which the transition from the hadronic to the quark-gluon picture takes place. We present results for the azimuthal asymmetry for deuteron photodisintegration at photon energies $E_\gamma = 1.1$-2.3 GeV and proton center-of-mass angles $\theta_p = 20°$-$160°$ taken with the CLAS detector at Jefferson Lab. Our preliminary analysis shows that our results have the kinematic coverage and statistics needed to test the available non-perturbative QCD-inspired models.

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