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Studies of Final-State Interactions via Helicity Asymmetries in Exclusive Pseudoscalar Meson Photoproduction off Deuteron[1] YORDANKA ILIEVA, University of South Carolina, CLAS COLLABORATION — Exclusive meson photoproduction off deuteron is a great tool to study final-state interactions (FSI) between the hadrons produced in the scattering of the incident photon off one of the target nucleons and the spectator nucleon. FSI in the reaction $\gamma d \to K^+\Lambda n$ enable access the dynamics of Λn elastic scattering and provide a method of studying the hyperon-nucleon interaction. Also, as deuteron is often used as a neutron target, FSI in reactions such as $\gamma d \to p\pi^+\pi^-$ contribute to the reaction dynamics in addition to the quasi-free $\gamma n \to p\pi^-$ and their understanding is critical for the estimate of observables off the free nucleon. In this talk we will show preliminary results for beam-helicity asymmetries for the reactions $\vec{\gamma}d \to K^+\Lambda n$, $\vec{\gamma}d \to pp\pi^-$, and $\vec{\gamma}d \to p\pi^+\pi^-n$ and their evolution over the spectator-nucleon virtuality. The data were obtained with the CLAS at Jefferson Lab in experiment E06-103 where a circularly-polarized photon beam with energies between 0.5 GeV and 2.5 GeV was incident on unpolarized deuteron target. We will present an interpretation of our $K^+\Lambda n$ results in terms of Λn elastic scattering. We will also discuss the extraction of polarization observables for photoproduction off the free nucleon using our helicity asymmetries for reactions off the deuteron.

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