Study of Kaon Identification for Hyperon Photoproduction in JLab's Hall B CLAS12

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The CLAS12 physics program includes the study of baryon spectroscopy in quasi-real photoproduction of a large variety of final states. This program includes the photoproduction of singly, doubly and triply strange hyperons. The photoproduction of the very strange hyperon, the Ω^-, is of particular interest. Its photoproduction cross section is unknown. Furthermore, the dynamics of the Ω^- photoproduction is unclear, as there are no strange quarks in the initial state while there are three in the final state. The available theoretical predictions for the Ω^- hyperon photo- and electroproduction cross section vary from 1 to 300 pb. As of today, there is only an upper limit of the cross section ($\sigma_{tot} <$ 17 nb at 20 GeV) reported by SLAC. To identify the final state for $\gamma p \rightarrow \Omega^- K^+ K^+ K^0$ the minimal requirement is to detect three kaons: two K^+ and one K^0_s. The latter is identified by its decay to $\pi^+\pi^-$. We will discuss our study of kaon identification in CLAS12 based on Monte Carlo simulations and real data collected by Run Group A, which used a ∼11 GeV beam incident on a liquid hydrogen target.

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