

Beam asymmetry in ω photoproduction

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Abstract

In this talk, we shall discuss our preliminary results for the photon beam asymmetry Σ in the $\vec{\gamma}d \rightarrow \omega p(n)$ channel through the $\omega \rightarrow \pi^+\pi^-\pi^0$ decay mode. We studied the evolution of Σ as a function of the kinematic variables E_γ and $\cos\theta_{CM}$. We identified the final-state particles using the CLAS detector in Hall B of Jefferson Laboratory. Also, we made use of the Hall-B Coherent Bremsstrahlung Facility to provide a high quality beam of linearly-polarized photons in the energy range from 1.1 to 2.3 GeV.

We measured the photon beam asymmetry of the photoproduced ω 's from quasi-free protons in deuterium. Extracting these asymmetries afforded by linearly-polarized photons provides information on the underlying mechanisms responsible for s - and t -channel processes. Further, since the ω meson is an isoscalar ($I_\omega = 0$), photoproduced ω 's serve as an ideal isospin filter, as only N^* states may contribute to the production process. This work is funded in part by NSF grant PHY-1307340.