

Beam asymmetry of the photoproduction of the ω meson off bound protons in CLAS

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Our research contributes to a larger experimental program that seeks to shed light on the evolving status of the proton spectrum. Determining the hadronic spectrum is a complicated task due to the high number of excited states of the nucleon, all of which have large widths causing resonances to overlap. Also, these resonances may decay into a multitude of decay channels.

In this talk, we focus on the photoproduction of ω mesons off the bound proton in the deuterium which is a significant channel for several reasons. First, the ω meson being isospin 0 acts as an isospin filter, providing us information specifically about N^* resonances. Second, since its threshold is above the π and η photoproduction thresholds, it should give information for higher mass resonances. Third, by studying production on protons bound in deuterium will also help with a greater understanding of the quasi-free events, which is of vital importance for the study of reactions with a bound neutron target. We present preliminary results for the quasi-free $\vec{\gamma}d \rightarrow \omega p(n)$ photon beam asymmetry polarization observable. The data were taken with the CLAS detector in Hall B at the Thomas Jefferson National Accelerator Laboratory (JLab). The experiment provided high-quality beam of linearly-polarized photons in the energy range from 1.1 to 2.3 GeV.