Polarization observables from the photoproduction of ω-mesons using linearly polarized photons

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We report on the Spin Density Matrix Elements (SDMEs), for the ω meson using a beam of linearly polarized photons in the photon energy region of $E_\gamma = 1.3$ to 1.9 GeV. The angular distribution of the ω meson and, in turn, the angular distributions of the daughter pions from ω decay give critical information on the mechanisms for the photoproduction of ω mesons. Other observables can be obtained using the SDMEs, such as the photon beam asymmetry and the parity asymmetry, which will be extracted as functions of the Mandelstam variables s and t. These observables provide additional constraints on the analyses used to extract the nucleon excitation spectrum from the available data and will help in distinguishing between pion exchange and pomeron exchange (VDM model). The SDMEs that parametrize the ω meson decay angular distribution will then provide an understanding of the reaction mechanisms by showing dynamical information crucial in determining the spin and parity of the exchanged particle in the t-channel production process and deviations from the Vector Dominance Model (VDM). Since the ω is an isoscalar, it may only couple to N^* states, i.e. $I = \frac{1}{2}$. This eliminates Δ resonance production and makes for cleaner data samples. These preliminary results are from the g8b dataset collected in the summer of 2005 with the CLAS detector in Hall B of Jefferson Lab.