

Transverse Polarization of $\Sigma^+(1189)$ in Photoproduction on Hydrogen Target with CLAS

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Abstract

Experimental results on the measurement of $\Sigma^+(1189)$ hyperon transverse polarization in photoproduction on a hydrogen target with CLAS are presented for the first time. The $\Sigma^+(1189)$ is reconstructed in the exclusive reaction $\gamma + p \rightarrow K_S \Sigma^+(1189)$ via the decay $\Sigma^+ \rightarrow p\pi^0$. The K_S is reconstructed in the invariant mass of two oppositely charged pions and π^0 is identified in the missing mass of detected proton, π^+ and π^- . We observe significant negative polarization of as much as 60%. Experimental data are collected in the photon energy range 1-3.5 GeV. As the mechanism of large transverse polarization of hyperons produced in unpolarized hadro-, and photo production experiments is still not well understood, these results will help to distinguish between different theoretical models on hyperon production. Current status of the analysis and future prospects are discussed.