

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 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 its 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 up to 60%. It is opposite to the polarization of $\Lambda(1116)$ in photoproduction. Experimental data are collected in the photon energy range 1-3.5 GeV. As currently the mechanism of large transverse polarization of hyperons produced in unpolarized hadro-, and photo production experiments is still not well understood, presented results will be a valuable source of additional information to disentangle between different theoretical models on hyperon production. Current status of the analysis and future prospects are discussed.