Search for intermediate cascade Ξ state in the reaction $ep \rightarrow e^{'}K^{+}K^{+}K^{-}(\Lambda/\Sigma)$ using CLAS12

Achyut Khanal

June 2021

The CLAS12 very strange physics program aims to study the electroproduction of doubly strange cascade (Ξ) hyperons. Cascade hyperons are experimentally underexplored. The reaction $ep \rightarrow e^{'}K^{+}K^{+}K^{-}(\Lambda/\Sigma)$ is being investigated for an electron-beam energy of 10.6GeV from CLAS12 first experiment data. We detect scattered electrons with either the forward detector, covering a polar angle range of 5° to 35° to study electroproduction at high Q^2, or with the forward tagger covering a polar angle range of 2.5° to 4.5° to study quasi-real photoproduction. Multiple kaons in the final state are detected with the CLAS12 detector, which covers a solid angle of nearly 4π. (Λ/Σ) hyperons can be reconstructed using missing mass technique in the K^+, K^+ and, K^- system. Reconstructed (Λ/Σ) hyperons are then combined with K^- to search for the intermediate double strange hyperons using invarient mass technique. In this talk, basic data features and preliminary mass spectrum from the study will be presented.