

Polarization of the Ξ^- Baryon in Photoproduction off a Proton Target

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Abstract

The weak decay of hyperons offers a valuable means of measuring their polarization and providing insight to their production mechanisms. Jefferson Lab's CLAS collaboration has performed some of the best measurements of the Λ polarization in photo and electroproduction to date. No such study however has yet been published for the Ξ baryon in photoproduction. Through the $\gamma p \rightarrow k^+ k^+ \pi^- (\Lambda^0)$ reaction the induced and transferred polarization of the Ξ^- will be determined where the $\Xi^- \rightarrow \pi^- \Lambda^0$ decay has occurred.

The analysis will span two data sets taken by CLAS in 2004 and 2008. The former set, with beam energies of 2.8-3.8 GeV was produced with unpolarized beam and target for which the induced polarization, orthogonal to the production plane has been investigated. This data is virtually background free with close to 1100 Ξ^- events. The later set with beam energies of 2.8-5.4 GeV was produced with a circularly polarized beam and unpolarized target so that the polarization transfer can be studied. This data has approximately five times the statistics as the older data. The basic data features and preliminary results will be presented. Comparisons with the results of the Λ polarization experiments are of particular interest.