

Electroproduction of Cascade Hyperons using CLAS12 at Jefferson Lab

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Abstract

Cascade hyperons, despite being discovered over half a century ago, remain considerably less studied compared to the non-strange Δ and N baryons. This disparity is primarily due to the energetic challenges associated with producing two strange quarks. The objective of this analysis is to provide the first cross-section measurements for the ground state cascade, Ξ^- , using electron beam energies of 6.5 and 7.5 GeV. These measurements span both the quasi-real photoproduction regime ($Q^2 \leq 0.5 \text{ GeV}^2$) and the purely electroproduction regime ($Q^2 > 0.5 \text{ GeV}^2$), while also shedding light on the still-unclear production mechanisms of cascade. The data for this study were collected using Jefferson Lab's CEBAF Large Acceptance Spectrometer at 12 GeV (CLAS12). Preliminary cross section results from the exclusive electroproduction reaction $ep \rightarrow e'K^+K^+(\Xi^-)$ will be presented.