

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 results from the exclusive electroproduction reaction $ep \rightarrow e'K^+K^+(\Xi^-)$ will be presented.