Contribution ID: **21** Type: **not specified**

Overview of Hyperon Physics in Photoproduction at GlueX

Thursday, 4 April 2024 14:30 (30 minutes)

The GlueX experiment in Hall D at Jefferson Lab has amassed high-statistics data on photoproduction processes. By leveraging the high-intensity linearly polarized photon beam the hyperon program at GlueX has made many contributions to this sector. With these results, contributions that advance the GlueX mission of understanding hadrons have been achieved through measurements of various important observables.

In recent years, contributions to the understanding of pseudoscalar meson and hyperon production in high energy t-channel photoproduction has been published through measurements of the beam asymmetry in $\gamma p \rightarrow K^{+}\Sigma^{0}$ \[1\] and Spin Density Matrix Elements (SDMEs) in $\Lambda(1520)$ \[2\]. Furthermore, important studies on the controversial nature of the $\Lambda(1405)$ have been presented \[3\] and ongoing studies of the "lineshape" of the resonance could shed light on its internal structure.

In the doubly strange sector, quark models and, more recently, lattice QCD calculations have predicted many more Ξ baryon states than have been experimentally observed. Moreover, the production mechanisms of these states are very poorly understood. By capitalizing on the narrow peaks, as compared to the broad and overlapping N^{*} states, characteristic of the lowest lying Ξ states, we can analyze the systematic aspects of the spectrum. In addition, we can measure the differential cross section and polarization observables to study the production mechanisms that produce these Ξ resonances.

I will present on the past and ongoing results and the future of the hyperon program at GlueX with a focus on the doubly strange sector.

---

1. Phys. Rev. C 101, 065206
2. Phys. Rev. C 105, 035201
3. EPJ Web of Conferences 271, 07005

Primary author: HERNANDEZ, Jesse (Florida State University)

Presenter: HERNANDEZ, Jesse (Florida State University)

Session Classification: Session 6