Contribution ID: **81** Type: **Invited parallel**

Strangeness Production at GlueX

Friday, 26 June 2026 15:00 (25 minutes)

The GlueX experiment at Jefferson Lab is uniquely suited for exclusive studies of strangeness production using a linearly polarized photon beam and the large acceptance GlueX detector. The combination of exclusive event reconstruction and access to spin observables at photon energies between 8.0 and 8.8 GeV provides a clean environment to study t-channel exchange processes, particularly in reactions with weakly decaying recoil hyperons off the proton target.

In this talk, we focus on precise measurements of spin-dependent observables in $K^*(892)$ photoproduction with a recoiling Λ, which serves as a standard candle for the GlueX strange meson program. The well-established properties of the $K^*(892)$, together with the GlueX detector[1] and analysis framework[2], provide an ideal setting to develop and validate amplitude analysis methodologies that can be extended to more complex strange meson channels. In particular, the GlueX data show clear evidence of the $K^*(892)$ resonance in the $K\pi$ mass spectrum, along with structures at higher masses that may correspond to excited K^* states, enabling precise measurements of the K^* spin-density matrix elements and their correlations with the recoiling Λ polarization. This motivates a complete helicity amplitude based description that can be combined with GlueX's partial-wave analysis framework to fully exploit the statistical precision of the data while maintaining minimal model dependence.

We also highlight newly published measurements of baryon–antibaryon production in particular $\gamma p \to \Lambda\bar{\Lambda}p$[3], where cross sections are measured over a wide kinematic range. These results provide a framework for modeling the reaction mechanism in terms of Regge-like single and double t-channel exchange, enabling further studies of spin correlations and the role of strangeness in hadronization. In the broader context of the GlueX strangeness program, recent results include beam asymmetries in Σ^0 photoproduction[4], spin observables for $\Lambda(1520)$[5], ongoing studies of the $\Lambda(1405)$ lineshape, and investigations of excited $\Xi^{(*)}$ states. Together, these efforts illustrate the breadth of the GlueX strangeness program and its capability to provide a comprehensive picture of strange hadron production.

References
[1] GlueX Collaboration, *Nucl. Instrum. Methods Phys. Res. A* **987**, 164807 (2021)
[2] GlueX Collaboration, *Phys. Rev. C* **108**, 055204 (2023)
[3] GlueX Collaboration, arXiv:2510.26890 (2025)
[4] GlueX Collaboration, *Phys. Rev. C* **101**, 065206 (2020)
[5] GlueX Collaboration, *Phys. Rev. C* **105**, 035201 (2022)

Collaboration

GlueX

Presenter: LI, Hao (William & Mary)

Session Classification: Parallel session B3

Track Classification: Hadron-hadron interactions