Lambda-Proton Elastic Scattering Using Inclusively Produced Beams*

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The use of short-lived beams in nuclear physics research has been established by a recent publication on Λp scattering. Extending this technique to beams with shorter lifetimes requires inclusive production, in which the beam properties are determined using only the final-state particles. We are repeating the $\Lambda p \rightarrow \Lambda p$ measurement with CLAS, using a different dataset; the beam Λ comes from the process $\gamma p \rightarrow \Lambda X$. Using only the scattered proton and the products of the $\Lambda \rightarrow \pi^- p$ decay, we reconstruct the $Xp \rightarrow \Lambda p$ process to determine the number of events. A separate analysis of $\gamma p \rightarrow \Lambda X$ is used to determine the incident flux of the beam Λs. The angle and momentum of the beam Λ determine the effective target thickness. A parallel measurement of the process $pp \rightarrow pp$ will verify the determination of the beam flux and target thickness; this measurement will test our ability to correct for the decay of the Λ. Strong cuts on the Λp vertex position reveal a fairly clean spectrum. This technique will be used not only for further measurements with Λ beams, but also with beams of other short-lived particles, such as K_S, Σ, Ξ, and Ω. This poster will present the motivation and history of this work, the current status of our analysis using inclusively produced beams, and prospects for future work in this field.

*This work is supported by the US Department of Energy and by the CSUDH Office of Undergraduate Research.