Study of radiative hyperon decays in the reaction $\gamma p \to K^+ \Lambda \gamma$ at GlueX

Kevin Luckas, James Ritman

Institut für Kernphysik - Forschungszentrum Jülich
(on behalf of the GlueX collaboration)

January 2021

The radiative decay of a hyperon is a clean probe of its underlying SU(3) wave function. Measuring these wave functions gives means to discriminate between various theoretical models of their structure. So far only a few measurements of radiative decays of excited hyperons have been published. In this study we focus on the radiative decay of $\Sigma^0(1385) \to \Lambda\gamma$, where the excited hyperon is produced in photoproduction at GlueX. The branching ratio of this particular decay has first been measured in [1]. The GlueX experiment at Jefferson National Laboratory provides excellent opportunities to study excited state hyperons in general and the reaction above in particular in photoproduction with a photon beam of $6.0 - 11.6$GeV incident on a liquid hydrogen target with high statistics. In this talk, we will discuss the ongoing analysis effort for the reaction $\gamma p \to K^+\Sigma^0(1385) \to K^+\Lambda\gamma$, emphasizing the reduction of background.

References

[1] Electromagnetic Dacay of $\Sigma^0(1385)$ to $\Lambda\gamma$, D. Keller et. al (The CLAS collaboration), Phys. Rev. D 83, 072004, 2011