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Exploring Photoproduced $\eta^{(\prime)}\pi^0$ Systems in the Search for Exotic Hadrons at GlueX

Probing the non-perturbative regime of Quantum Chromodynamics (QCD) remains a critical challenge in hadron spectroscopy, particularly concerning the role of gluonic excitations in shaping the hadronic spectrum. The GlueX experiment at Jefferson Lab is designed to address this challenge through the search for exotic hybrid mesons, states predicted by QCD to include gluonic degrees of freedom beyond the conventional quark-antiquark framework. This presentation highlights the ongoing amplitude analyses of the $\eta\pi$ and $\eta'\pi$ systems, produced via photoproduction with a polarized photon beam. Recent efforts involve refining resonance modeling through the usage of mass-dependent parameterizations that embed proper physics constraints. These developments aim to enhance the robustness of amplitude fits and improve their sensitivity to potential underlying exotic contributions. The resulting analyses offer a clearer window into hadronic structure and provide a step forward in the experimental exploration of QCD's predicted exotic hadrons.

Secondary track

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