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Exploring Meson Photoproduction with the GlueX Experiment

Thursday, 22 June 2023 11:30 (30 minutes)

An outstanding puzzle in our study of strong interactions is understanding how the spectrum of mesons arises from Quantum Chromodynamics. There is a growing body of evidence that QCD generates mesons and baryons beyond quark-antiquark and three-quark configurations. In addition, theoretical calculations of the spectrum of mesons predict states with gluonic degrees of freedom that arise from the gluon-gluon interaction in QCD. A key objective of the GlueX experiment is search for these hybrid mesons in the light quark sector. Results concerning production of conventional mesons with linearly-polarized photons will presented. These measurements allow one to learn about photoproduction mechanisms of conventional hadrons, knowledge that can be leveraged in the search for hybrid mesons. The current status of and future plans for the light hybrid meson search program at GlueX will be presented. In addition, the GlueX results on production of charmonium will be presented. These results provide constraints on interpretation of pentaquark candidates in the heavy quark sector and suggest the need for additional investigations in photoproduction.

Collaboration

GlueX

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