

TITLE: Search for exotic-quantum-number mesons with the GlueX experiment

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ABSTRACT:

The primary motivation of the GlueX experiment at Jefferson Lab experimental Hall D is the search for light hybrid mesons that are quark-antiquark pairs coupled to gluonic field excitation. GlueX uses a  $\approx 9$  GeV linearly-polarized real photon beam incident on LH2 target and a solenoid based, large-acceptance detector. The facility completed the initial phase of data taking in 2018 and has many analysis efforts well underway. These studies include searches for the  $\pi_1(1600)$  hybrid meson with exotic  $J^{PC} = 1^{-+}$ . Contributions of resonances with different spins in the mass spectrum of the  $\eta^{(\prime)}\pi$  system are studied via partial wave analysis, where we use a newly developed model for photo-production via linearly polarized beam. There are parallel studies of  $\eta^{(\prime)}\pi$  system, by considering various decay modes ( $\gamma p \rightarrow p\eta\pi^0, \gamma p \rightarrow \Delta^{++}\eta\pi^-, \gamma p \rightarrow p\eta'\pi^0, \gamma p \rightarrow \Delta^{++}\eta'\pi^-$ ). The status of these efforts will be reported.

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