

Exotic Hybrid Meson Spectroscopy with the GlueX detector at JLab

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The GlueX experiment[1] is scheduled to begin taking data in 2015. The goal is to discover evidence for the existence of exotic hybrid mesons and to map out their spectrum in the light quark sector. Hybrid mesons, and in particular exotic hybrid mesons, provide the ideal laboratory for testing QCD in the confinement regime since these mesons explicitly manifest the gluonic degrees of freedom. Recent theoretical developments using Lattice QCD [2] predict exotic hybrid states in a mass range accessible using the newly upgraded 12GeV electron accelerator at Jefferson Lab. The experiment will use 9 GeV linearly polarized photons produced via coherent bremsstrahlung to produce the exotic hybrids. The decay products will be detected in the solenoid-based GlueX detector which is currently under construction at Jefferson Lab. The status of the GlueX experiment including detector parameters will be presented along with theoretical motivation for the experiment.

[1] JLab Experiment E12-06-102. *Mapping the Spectrum of Light Quark Mesons and Gluonic Excitations with Linearly Polarized Photons*. http://www.jlab.org/exp_prog/proposals/06/PR12-06-102.pdf.

[2] Jozef Dudek. The lightest hybrid meson supermultiplet in QCD. *Physical Review D*, 84(7), 2011.