

APR15-2015-000776

Abstract for an Invited Paper  
for the APR15 Meeting of  
the American Physical Society

### **Meson Spectroscopy at Jefferson Lab**

CARLOS SALGADO, Norfolk State University and Jefferson Lab

The goal of meson spectroscopy experiments is to provide crucial data to help understand the binding of quarks and gluons into hadrons. The production of hybrid mesons, and in particular exotic hybrid mesons at intermediate energies, will provide an ideal laboratory for testing these strong interactions (QCD) effects. Hybrid mesons explicitly manifest the gluonic degrees of freedom. Photoproduction is expected to be effective in producing these exotic hybrids but there is little data on the photoproduction of light mesons. Photoproduction experiments at Jefferson Lab have already made some exploratory studies in this regime. Two new experiments, GlueX (in Hall D) and CLAS12 (in Hall B), will use the new 12-GeV electron beam to extend these measurements to higher meson masses and to collect very large statistics. GlueX will use a 9-GeV beam of linearly polarized photons using the technique of coherent bremsstrahlung. CLAS12 will use quasi-real photoproduction at equivalent energies and polarizations (very low  $Q^2$  electron scattering). The new data will exceed by several orders of magnitude all previously obtained photoproduction data at those energies. This talk will give an update on the already obtained data and on the preparations for the new experiments, as well as briefly delineate theoretical developments to help understand and analyze how these data can provide insights into the fundamental theory of strong interactions.