

The 12 GeV upgrade at Jefferson Lab has opened up new opportunities in intermediate-energy nuclear science, not least in photoproduction, where the GlueX facility provides a purpose-built beamline for the delivery of a real photon beam to a large-acceptance detector system. It has been postulated that at the JLab upgrade energies, quark systems beyond the three quark and quark-antiquark systems of baryons and mesons, such as hybrid mesons, tetraquarks and glueballs, should exist, and studies of these systems could shed new light on how quarks combine under the Strong force, particularly the role played by gluons.

Meticulous study of the spectrum of hadronic states is required to further understand the strong force in the non-perturbative energy regime, and the light scalar meson sector is an area that remains poorly understood in this respect. GlueX has already taken new data encompassing final states at energies where photoproduction of the $a_0(980)$ and $f_0(980)$ mesons can inform our understanding of meson photoproduction dynamics, and performing detailed measurements of experimental observables for these states is considered a priority of the ongoing research program.

The work presented focuses on efforts to measure the beam asymmetry of the $a_0(980)$ meson from the reaction $\gamma p \rightarrow p\pi\eta$ using linearly polarized photons of $E_\gamma = 9$ GeV. Future prospects for related analyses in the light scalar meson sector, informed by this measurement, will also be discussed.