

Overview of Light Meson Results from the GlueX Experiment
D. Mack for the GlueX Collaboration, TJNAF

The GlueX experiment in Hall D at Jefferson Lab consists of a well-instrumented photon beamline in conjunction with a solenoidal spectrometer providing near-hermetic coverage for charged particles and photons. Since 2016, the experiment has had several run periods with a 9 GeV linearly polarized photon beam on a 30cm liquid hydrogen target, completing its initial low-intensity program. Light (i.e., $< 1.05 \text{ GeV}/c^2$) meson studies have been critical to commissioning the GlueX detector, elucidating the photo-production reaction mechanism in this photon energy range, and testing the event selection techniques needed to search for exotic hybrid mesons. We have measured the beam asymmetries for photo-production of pseudo-scalar mesons including π^0 , η , and η' , and have preliminary results for the Spin Density Matrix Elements (SDMEs) for the vector mesons ω , ρ , and ϕ . Cross-section determinations are in progress for all these mesons, usually in more than one decay branch, and with 3-7 particles exclusively detected in the final state. The outlook appears encouraging for GlueX to measure precise, competitive Dalitz plots for $\eta \rightarrow 3\pi$ and $\eta' \rightarrow \eta 2\pi$. The latter $\eta' \rightarrow \eta 2\pi$ studies are synergistic with exploratory studies of the continuum $M(\eta 2\pi)$ spectrum between 1.5 to 2.5 GeV/c^2 where we plan to search for hybrid exotic mesons.