The Search for Exotic Mesons in $\gamma p \to \pi^+\pi^+\pi^- n$ with CLAS at Jefferson Lab

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In addition to ordinary $q\bar{q}$ pairs, quantum chromodynamics (QCD) permits many other possibilities in meson spectra, such as gluonic hybrids, glueballs, and tetraquarks. Experimental discovery and study of these exotic states provides insight on the nonperturbative regime of QCD. Over the past twenty years, some searches for exotic mesons have met with controversial results, especially those obtained in the three-pion system. Prior theoretical work indicates that in photoproduction one should find gluonic hybrids at significantly enhanced levels compared to that found in pion production. To that end, the g12 run at Jefferson Lab's CEBAF Large Acceptance Spectrometer (CLAS) has recently acquired a high statistics photoproduction dataset, using a liquid hydrogen target and tagged photons from a 5.71 GeV electron beam. The CLAS experimental apparatus was modified to maximize forward acceptance for peripheral production of mesons. The resulting data contains the world's largest 3π photoproduction dataset, with $\gamma p \to \pi^+\pi^+\pi^- n$ events numbering in the millions. Partial-wave analyses are underway in search of the exotic $J^{PC} = 1^{-+}$ $\pi_1(1600)$, and preliminary fit results from these studies will be shown.