Abstract Submitted
for the DNP08 Meeting of
The American Physical Society

Differential cross sections for $\gamma p \to p\pi^+\pi^-$ using CLAS MATTHEW BELLIS, Stanford University, CLAS COLLABORATION — The Constituent Quark Model predicts multiplets which are absent from the observed spectra. These states may couple strongly to $\Delta\pi$ and $p\rho$, both of which appear as intermediate states in $p\pi^+\pi^-$. The g1c experiment used the CLAS detector to collect data using brehmstrallung photons (0.8-2.4 GeV) directed onto a liquid hydrogen target and collected over 10 million events for this 2π final state alone. The challenge with this analysis is not the statistics, but the 3-body nature of the reaction and the overlapping intermediate states produced. The finite coverage of most detectors also introduces holes in the acceptance which can lead to ambiguities in the extrapolation of the physics solution. We attack this problem by observing the final state in multiple ways: by missing any of the three particles (p,π^+, π^-) in the detector and reconstructing it from missing mass as well as detecting all three tracks. We require a physics solution to be consistent amongst all 4 topologies in order to achieve full coverage of the phase space. This allows us to quote differential cross sections for this reaction in two-body masses ($d\sigma/dM_{ij}$), center-of-mass production angles ($d\sigma/d\cos(\theta_i)$) and helicity angles ($d\sigma/d\cos(\theta_{hel}), d\sigma/d\phi_{hel}$) These measurements achieve at a higher sensitivity than has previously been reported and will provide valuable input for extracting resonance information at later stages of analysis.

Matthew Bellis
Stanford University

Date submitted: 30 Jun 2008 Electronic form version 1.4