Contribution ID: **52** Type: **Talk**

Results on polarization observables in two pion photoproduction at CLAS

Thursday 19 October 2023 16:20 (30 minutes)

The nature and identification of N*and* ☒ excitations and the search for missing baryonic resonances are still open issues in the present hadron spectroscopy scenario.
In photon-induced interactions some couplings with the nucleons could be enhanced, as well as the chance of observing signatures of these poorly known resonances. However, the integrated information available from unpolarized ☒p cross sections measurements does not provide enough details for spectroscopic purposes, due to the large width of most of the baryonic intermediate states and their overlap in the same mass spectrum region.
An alternative approach stands in the study of polarization variables, which are theoretically related to partial wave amplitudes and therefore can provide additional information on the amplitude interference. These studies can be more effectively pursued exploiting data that feature both a polarized beam and a polarized target. The polarization variables, in fact, are experimentally related to asymmetries in the cross sections, measured in different configurations of beam helicity and target polarization.
These experimental conditions could be met in the g14 experiment, run at CLAS (Jefferson Lab, USA) in the years 2011-2012: a circularly polarized photon beam, with momentum in the 0.6-2.3 GeV/c range, interacted on a HD longitudinally polarized target. In this talk, results on beam-helicity and target-spin asymmetries in the photoproduction of $\pi^+\pi^-$ pairs with these data will be presented. Indeed, the two pion channel represents the dominant contribution to the total cross section, therefore it favors, especially in the second resonant region, the observation of intermediate states whose decay leads to an exclusive final state with two pions and a nucleon.
The results obtained so far will be shown and compared to earlier results by CLAS and other experiments.

Parallel Session

Hadron Spectroscopy

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Session Classification: Hadron spectroscopy