

SIMULTANEOUS PHOTOPRODUCTION OF NEUTRAL AND CHARGED PIONS ON THE DEUTERON AT ELPH

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Baryon spectroscopy is an important subject in the non-perturbative QCD domain. Highly excited nucleon and delta resonances have a large branching ratio of $\pi\pi N$ decay modes and hardly couple to πN , and they are not well investigated via elastic πN scattering. Double π photoproduction is expected to be an alternative probe to study them. So far, only one experiment for $\pi^0\pi^+$ photoproduction on the proton at MAMI has been reported [1]. This experiment covers the baryon masses below 1550 MeV because the maximum incident photon energy is 820 MeV. The reactions $\gamma p \rightarrow \pi^0\pi^+n$ and $\gamma n \rightarrow \pi^0\pi^-p$ on the proton and deuteron have been measured at ELPH for the photon energies below 1150 MeV [2] corresponding to the baryon masses below 1750 MeV. All the final state particles are detected with an electromagnetic calorimeter complex, FOREST [3]. The invariant mass distributions are obtained for each incident energy bin for two out of three final state particles π^0 , π^\pm , and N . The baryon resonances coupling to ρ^+n and ρ^-p are observed together with a Δ -Kroll-Ruderman background component. In this contribution, the baryon resonances observed in these reactions will be presented.