

Quasi-free Photoproduction of $\pi^0\pi^\pm$ off Unpolarized and Polarized Deuterons

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Exploring the low energy region of QCD requires a detailed study of the nucleon resonances and their decays. Analysing the excitation spectrum of (quasi-) free nucleons is essential to establish a baseline for comparisons with in-medium modifications. Of particular interest are the mixed-charged channels of double-pion photoproduction, as they are sensitive to sequential decays of Δ resonances, but also to the charged ρ channel. The coupling to a ρ could induce substantial in-medium effects when the ρ spectral function is modified in the medium. Recent analysis results from data taken with the A2 experiment at MAMI are presented and compared to recent MAID model calculations. The focus of this talk is on two different experiments. The unpolarized cross sections could be obtained by collecting data with a liquid deuterium target. The double polarization observable E (showing the helicity dependence) could be extracted with a circularly polarized photon beam and a longitudinally polarized D-butanol target. Both observables show a significant contribution of the ρ channel to the second resonance peak.

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