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Recent results of charged pion and kaon photoproduction on the proton at SPring-8/LEPS

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We have been carrying out photoproduction experiments by using linearly polarized tagged photon beams with energies of 1.5-2.9 GeV at SPring-8/LEPS. Charged pions and kaons were detected at forward angles. We studied the γp -> $\pi^- \Delta^{++}$, $\pi^+ n$, and $K^+ \Lambda(\Sigma^0)$ reactions. In the final states of these reactions, $u\bar{u}$, $d\bar{d}$, and $s\bar{s}$ quark-antiqurk pairs are produced, respectively. The differential cross sections and photon beam asymmetries were measured. It is interesting that only the $\pi^- \Delta^{++}$ reaction is found to have negative asymmetries and the other reactions have positive asymmetries. In the $\pi^- \Delta^{++}$ reaction, a d quark in the proton is replaced with a u quark. In the other reactions, a u quark is replaced with a d or an s quark. The difference in asymmetries might originate from different characteristics between the u and d quarks in the proton. We newly analyzed the data for the γp -> $\pi^+ \Delta^0$ reaction. The comparison between the $\pi^- \Delta^{++}$ and $\pi^+ \Delta^0$ reactions plays an important role for distinguishing N^* from Δ^* in the s channel. We present preliminary results for the $\pi^+ \Delta^0$ reaction in the NSTAR2019 workshop.

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