

Status of the pentaquark search at LEPS

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There were no experimental evidence for existence of a hadron with a quark configuration rather than three quarks or a quark-antiquark pair although QCD does not forbid the existence of other combination such as $qqqq\bar{q}$ or $q\bar{q}qq\bar{q}$. Since the LEPS at SPring-8 collaboration reported the first evidence for the Θ^+ which has a quark configuration of $uudd\bar{s}$, extensive experimental efforts have been made to confirm the existence of the Θ^+ and other pentaquark baryons.

In my talk, I will report on the experimental evidences and counter evidences for pentaquark baryons, especially on the Θ^+ . Recent results from CLAS will be discussed. The results from the LEPS deuterium data will be explained intensively. The talk will be concluded with future prospects.

Θ formation in inclusive $\gamma D \rightarrow pK^- X$ reaction

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We analyze the possibility to produce an intermediate Θ^+ via a $KN \rightarrow Tp$ formation process in $\gamma D \rightarrow pK^- X$ ($X=nK^+, pK^0$) reactions at some specific kinematical conditions, in which a pK^- pair is knocked out in the forward direction and its invariant mass is close to the mass of $\Lambda(1520)$. The Θ^+ signal may appear in the $[\gamma D, pK^-]$ missing mass distribution. The ratio of the signal (cross section at the Θ^+ peak position) to the smooth background processes varies from 0.7 to 2.5 depending on the spin and parity of Θ^+ . We analyze the recent CLAS search for the Θ in the $\gamma D \rightarrow pK^- nK^+$ reaction and show that the conditions of this experiment greatly reduce the Θ^+ formation process making it difficult to extract a Θ^+ peak from the data.

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The Colloquium will be given in English

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