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Search for the pentaquark partners: Σ^0 , N^0 and Θ^{++} YI QIANG, Massachusetts Institute of Technology, JLAB HALL A COLLABORATION, E04-012 COLLABORATION — In 1997 based on chiral soliton model a narrow exotic state, $\Theta^+(1540)$, which has quark component $uudd\bar{s}$, was predicted in a $SU(3)_F$ antidecuplet of pentaquarks. If such state exists, other members of the antidecuplet could be expected to have sufficiently narrow widths to be observed as well. The Jefferson Laboratory experiment E04-012 focused on the search for Σ^0 and N^0 partner states in the missing mass spectra of the $H(e,e'K^+)X$ and $H(e,e'\pi^+)X$ channels. In addition, if the Θ^+ has non-zero isospin then a hypothetical isospin partner, Θ^{++} , might be expected in the $H(e,e'K^-)X$ channel which was also studied. The experiment was performed in Hall A at Jefferson Lab using a 5 GeV CW electron beam incident on a liquid hydrogen target. The two high resolution spectrometers were coupled to septum magnets to get 6 degrees' forward angles. Kaons were identified using a combination of a ring-imaging Cherenkov detector and two aerogel Cherenkov counters. The missing mass resolution was determined to be 3.5 MeV FWHM using neutron, $\Lambda(1116)$ and $\Sigma(1193)$ productions and provided a high sensitivity to narrow resonances. A precise measurement of the $\Lambda(1520)$ resonance has also been conducted for a cross-section comparison. As a result, no significant narrow structures were observed in any of the three channels so a Feldman-Cousins approach was used to determine the 90% confidence interval.

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