

Search for hybrid baryons with CLAS12 and KY electroproduction

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An experimental program has been approved at the Thomas Jefferson National Accelerator Facility to measure the $(ep,e'K^+)Y$ reactions using the CLAS12 setup in Hall B.

Data have been obtained using electron beams with energies of 6.5, 7.5, and 10.2 GeV, impinging upon a liquid hydrogen target in the CLAS12 center. Scattered electrons have been detected in a polar angle range of 2.5° to 4.5° by the Forward Tagger (FT) and at angles greater than 6° in the CLAS12 Forward Detector, allowing to measure the KY electro-production differential cross section and to probe the Q^2 evolution of the nucleon resonances electro-couplings in the Q^2 range from 0.05 GeV^2 to 3 GeV^2 . The study of the Q^2 dependence of the electro-couplings will provide a crucial tool to investigate the possible hybrid nature of the nucleon resonances in the mass range of $2.0 \text{ GeV} < W < 2.5 \text{ GeV}$ where the lightest hybrid baryons are expected to be located based on LQCD studies of the N^* spectrum. Experimental results for KY electroproduction will be reported and prospects for future studies will be discussed.

Primary author: LANZA, Lucilla (Istituto Nazionale di Fisica Nucleare)

Presenter: LANZA, Lucilla (Istituto Nazionale di Fisica Nucleare)

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