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N^* studies using KY electroproduction at CLAS12

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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 to study the spectrum and structure of excited nucleon states. New data from CLAS12 on πN , $\pi\pi N$, and KY electroproduction have been obtained using electron beams with energies of 6.5 and 7.5 impinging upon a liquid hydrogen target. 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 Q^2 dependence of excited baryons electro-couplings allows to probe the dressed quark mass over the full range of distances where the dominant part of hadron mass emerges from QCD. By studying the Q^2 evolution of electroexcitation amplitudes it will be also possible to distinguish between regular N states and possible additional hybrid baryon states 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.

Preliminary results for KY electroproduction will be reported and prospects for future studies will be discussed.

session

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