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Study of the Exclusive d(e,e′p)n Reaction Mechanism at High Q^2
NATALIA DASHYAN, KIM EGIYAN, Yerevan Physics Inst., Armenia and Jefferson Lab, USA, CLAS COLLABORATION — High Q^2 d(e,e′p)n scattering is one of the simplest and best ways to investigate the short range properties of the deuterium wave function (WF), possible modifications of the bound nucleon structure, as well as of the structure and nature of short range nucleon correlations (SRC). For these investigation, the mechanisms of this reaction should be understood properly. Although the d(e,e′p)n reaction is the simplest one, its mechanism remains to be checked at high Q^2: short distances are involved and, therefore, it is unclear what degrees of freedom (nucleonic or quark-gluonic) play a more important role in electron-nucleon interaction. There are also subtle interplays between the interaction of different intermediate exited states of the struck fast nucleon with the second nucleon. To solve these problems the reaction should be investigated as completely as possible, at different kinematic conditions. We investigated the d(e,e′p)n reaction mechanism in the Q^2 = (2 - 6) GeV^2 interval using the CLAS detector at Jefferson Lab. The angular and momentum distributions of recoil neutrons were studied in detail at momenta of p_n = (0 - 2) GeV/c and in angular (relative to the transfered momentum direction) range 20^o - 160^o. The experimental data are compared with the theoretical calculations [1] based on the diagrammatic approach of , and reasonable agreement was obtained at least in the momentum range $p_n \leq 1$ GeV/c.
[1]J.-M. Laget, Phys. Lett. **B609**, 49 (2005).

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