

Abstract Submitted  
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**A study of neutron structure with (un)polarized deuterons and forward spectator tagging at EIC** KIJUN PARK, Old Dominion University — An Electron-Ion Collider (EIC) would enable measurements of neutron structure through deep-inelastic electron-deuteron scattering with coincidence tagging of the forward-moving spectator proton. This technique allows to identify the active neutron and control its quantum state in the deuteron through measurement of the recoil proton momentum. An intensive study has established the feasibility of spectator tagging, including measurements of neutron spin structure with a polarized deuteron beam. A Monte Carlo simulation with the GEANT4 modular framework is developed with the physical processes, the MEIC accelerator/detector design and used to optimize the analysis strategy. A technique is implemented for obtaining the free neutron structure function by extrapolating the measured recoil momentum to the on-shell point. Such measurements provide essential information for the flavor separation of the nucleon parton densities, the nucleon spin decomposition, and precision studies of QCD evolution. The EMC effect in light nuclei can be elucidated by studying the recoil momentum dependence of the nuclear modification away from the on-shell point. In this talk, I describe the proposed experimental set up, analysis procedure, and present results of the neutron structure functions.

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