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Detailed Study of Event Reconstruction in e-p and e-A Collisions at an EIC

The electron-nucleus (and electron-proton) inclusive scattering cross section is a function of the center-of-mass energy, \sqrt{s} , and of two kinematic variables. Therefore, an accurate reconstruction of the event kinematics is vital at a future electron-ion collider. Various methods for reconstructing the event kinematics exist. For neutral-current processes, the kinematics can be reconstructed using either the scattered electron, the final-state hadronic system, or a combination of both. For charged-current scattering, reconstruction relies on the hadronic system. In addition, the accuracy of a given reconstruction method depends non-trivially on the kinematic regime under study, detector acceptance and resolution effects, and the size of radiative processes. In this talk, we will show new detailed simulation studies of kinematic reconstruction for e-p and e-A collisions at the EIC. These simulations reconstruct the products of e-p and e-A Monte Carlo generators using possible EIC detectors with various acceptance and resolution characteristics. We focus on event reconstruction for the low-x regime, for events where the incoming (or scattered) electron radiates a hard photon, and for hard diffractive deep inelastic scattering.

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