

Abstract Submitted
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Analytical Studies of EIC Collider Kinematics SEAMUS GALLAGHAR, BERND SURROW, Temple University — A US-based collider facility capable of colliding high-energy polarized electron (e) and ion beams (Proton (p) / Nucleus (A)) at high luminosity will address some of the most profound questions concerning the emergence of nuclear properties. The precise reconstruction of relativistic-invariant variables such as the negative four-momentum transfer squared, Q^2 , and the Bjorken- x scaling variable is a crucial aspect for any physics measurements in deep-inelastic ep/eA scattering (DIS). ep/eA scattering can be viewed as the scattering of a lepton (e) with a struck quark (q) resulting in a scattered lepton (e) (Energy E'_e and polar angle θ'_e) and a struck quark (q) (Energy E'_q and polar angle θ'_q) in the final state. Relativistic invariant variables can be reconstructed by any two of the four measured quantities, E'_e , θ'_e , E'_q and θ'_q , resulting in six distinct reconstruction methods. The full determination of DIS relativistic-invariant quantities will be presented in terms of those measured quantities including a full analytical error analysis including a discussion of the properties of each of the six reconstructions methods and further plans such as the comparison to a MC simulation.

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