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T-odd proton-helicity asymmetry in semi-inclusive DIS in perturbative QCD

Thursday, May 26, 2022 12:00 PM (20 minutes)

We compute the single-spin asymmetry A_{UL} in semi-inclusive deep-inelastic scattering of unpolarized leptons and longitudinally polarized protons at large transverse momentum of the produced hadron. Our calculation is performed in collinear factorization at the lowest order of QCD perturbation theory. For photon exchange the asymmetry is T-odd and receives contributions from the interference of the tree level and one-loop absorptive amplitudes. We consider the behavior of the spin asymmetry at low transverse momentum where contact to the formalism based on transverse-momentum dependent distribution functions can be made. We also present some phenomenological results relevant for the COMPASS and HERMES experiments and the future Electron-Ion Collider.

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