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Process dependence and Siverts effect-SIDIS and inclusive jet production

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We consider the role process dependence in the Siverts effect from analyzing the single transverse spin asymmetry for inclusive jet production in proton-proton collisions recently collected by AnDY experiment at RHIC, and the asymmetry data from semi-inclusive deep inelastic scattering experiments are presented. After carefully taking into account the initial-state and final-state interactions between the active parton and the remnant of the polarized hadron, the calculated jet spin asymmetry based on the Siverts functions extracted from HERMES and COMPASS experiments is consistent with the AnDY experimental data. This provides a first indication for the process-dependence of the Siverts effect in different processes. We make predictions for both direct photon and Drell-Yan spin asymmetry, to further test the process-dependence of the Siverts effect in future experiments.

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