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Three-dimensional structure of the proton and Siverts asymmetry within the BLFQ framework

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The three-dimensional internal structures of the proton play a central role in the upcoming electron-ion colliders, among which TMDs have received increasing concentrations. They depict the proton in three-dimensional momentum space, and, via TMD factorization and evolution, can be connected to the cross-section of SIDIS process. In this talk, we start with an effective Hamiltonian to calculate all eight leading-twist quark TMDs within the Basis Light-front Quantization framework. We expand the gauge link to the first order and use the famous OGE approximation. After investigating some properties of the obtained TMDs, we further compute the Siverts asymmetry of SIDIS process. We conclude this talk by comparing our calculations with the experimental measurements.

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