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Twist-3 fragmentation contribution to single transverse-spin asymmetry in polarized hyperon production

We discuss the contribution of the twist-3 fragmentation function to the production of transversely polarized hyperons in unpolarized proton-proton collisions. In the framework of the collinear factorization, this contribution arise from the quark fragmentation correlators corresponding to the twist-3 quark fragmentation functions(FFs) and especially from the gluon fragmentation correlators corresponding to the twist-3 2-gluon and 3-gluon FFs. For the former contribution, we calculated the frame-independent cross-section by taking into account the constraint relations among twist-3 FFs which follow from the QCD equation-of-motion and the Lorentz invariance property of the nonlocal operators. In the same way, we derived the formalism for the later contribution by using collinear expansion and the equation-of-motion among twist-3 gluon FFs. In this talk, we first show the overview of the calculation of the twist-3 quark fragmentation contribution and then present our recent study for the twist-3 gluon fragmentation contribution.

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