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A new contribution to transverse single spin asymmetry at two loops

Wednesday, 25 March 2020 17:40 (20 minutes)

The main focus of this talk is our recent work [1] on transverse single spin asymmetry (SSA) in semi-inclusive DIS in a collinear twist-3 framework. I will explicitly demonstrate that a genuinely new contribution containing the g_T distribution function (alongside the kinematical and the dynamical Qiu-Sterman functions) is first seen at two loops. The phase required for a non-zero SSA from g_T is generated by a mechanism completely distinct from the familiar Qiu-Sterman and Collins contributions as it originates purely within the parton-level cross section. I will explain the structure of our all-order gauge invariant result for the hadronic tensor in SIDIS and show a complete set of gauge invariant diagrams that contribute at two loops. Finally, I will discuss collinear factorization in our final formula for the g_T contribution as well as its phenomenological implications.

[1] S. B., Y. Hatta, H.-N. Li and D.-J. Yang, Phys.Rev. D100 (2019) no.9, 094027.

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