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Quark Sivers Function at Small-x: Return of a Spin-Dependent Odderon

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We apply the formalism developed earlier [1, 2] for studying the small-x asymptotics of transverse momentum dependent parton distribution functions (TMDs) to construct the small-x asymptotics of the quark Sivers function. We explicitly construct the transversely polarized, fundamental "Wilson line" operator to sub-sub-eikonal order. We then express the Sivers function in terms of dipole scattering amplitudes containing the transversely polarized "Wilson line", and show that the main term which contributes to the Sivers function is the spin-dependent odderon, similar to the case of the gluon Sivers function derived by Boer, Eschevarria, Mulders and Zhou [3] (see also [4]).
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Primary authors: SANTIAGO, M Gabriel (Ohio State University); KOVCHEGOV, Yuri (The Ohio State University)

Presenter: SANTIAGO, M Gabriel (Ohio State University)

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