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Small-x evolution and the proton spin puzzle

In recent years, the study of transverse momentum dependent parton distribution function (TMD) received considerable attention in the literature. The understanding of those distributions may help to the resolution of the proton spin puzzle which is one of the main goals of hadron physics. In this presentation I will highlight the use of the small-x formalism in the context of this puzzle and show recent developments with corresponding evolution equations of those TMD. At double logarithmic accuracy, the sub-eikonal evolution for the helicity TMD shows some non-trivial mixing between polarized and unpolarized operators. Those mixing allows the recovery of DLA polarized DGLAP evolution from the small-x formalism at the sub-eikonal level. Those steps (in the polarized sector) fit in an ongoing effort to extend said formalism to interface with the full polarized DGLAP evolution at single logarithmic accuracy.

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