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TMD splitting functions in the parton branching method

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Transverse momentum dependent (TMD) parton distributions enter QCD factorisation formulas which include resummation and nonperturbative contributions to non-inclusive collider observables such as Drell-Yan differential cross sections. Recently, a parton branching (PB) formalism has been proposed for the evolution of TMDs, given in terms of Sudakov form factors and splitting functions. This approach has been matched with next-to-leading hard-scattering matrix elements and applied to obtain predictions for Drell-Yan qT and phi^star differential distributions.

In this talk I describe the basic elements of the PB method and present ongoing work to extend the method towards including the transverse momentum dependence in the splitting functions. To this end, I briefly review the notion of TMD splitting functions which has been used for a long time in the context of high-energy resummation, and describe the implementation of these functions in the PB evolution method. I discuss in detail the collinear (DGLAP) and high-energy (BFKL) limits of the TMD splitting functions. I illustrate the effects of TMD contributions with numerical simulations, and the prospects for using TMD splitting functions in phenomenological predictions.

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