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## The Parton Branching Sudakov and its relation to CSS

*Monday 21 August 2023 18:00 (15 minutes)*

The Transverse Momentum Dependent (TMD) Parton Branching (PB) method is a Monte Carlo (MC) framework to obtain QCD high energy collider predictions grounded in ideas originating from the TMD factorization. It provides an evolution equation for the TMD parton distribution functions and allows to use those within TMD MC generators.

In this work, we analyze the structure of the TMD PB Sudakov form factor. We discuss the logarithmic order of the low- $q_t$  resummation achieved so far by the PB method by comparing its Sudakov form factor to the Collins-Soper-Sterman (CSS) one and we illustrate how the accuracy of PB can be increased by using the ideas of physical (effective) coupling. By using appropriate integration limits in PB, we show how we can analytically identify a term analogous to Collins-Soper (CS) kernel. We investigate the effects of different evolution scenarios on PB TMDs and integrated TMDs and on a numerical extraction of the CS kernel.

### Collaboration / Activity

TMD Parton Branching team

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