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Progress in Understanding Heavy Quark Fragmentation in the Transverse Plane

lunedì 27 maggio 2024 16:30 (30 minuti)

I discuss ongoing progress in the understanding of heavy-quark transverse momentum-dependent (TMD) fragmentation functions (FFs). These advances include their explicit next-to-leading order calculation in massive QCD and boosted Heavy-Quark Effective Theory (bHQET), exposing a rich singularity structure that is also relevant for the extension of fixed-order subtraction schemes to quasi-collinear limits, and a novel form of Collins-Soper-style evolution with respect to a dimensionless boost parameter. I further present how many independent nonperturbative bHQET functions are needed to fully characterize heavy-quark fragmentation in the transverse plane, accounting – for the first time – for arbitrary heavy hadron polarization. This analysis exposes powerful spin symmetry relations across all possible (polarized) TMD FFs for heavy quarks.

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