

Soft-gluon effective coupling: perturbative results and the large- n_F limit to all orders

Saturday 20 July 2024 15:45 (15 minutes)

We consider extensions of the soft-gluon effective coupling that generalize the Catani-Marchesini-Webber (CMW) coupling in the context of soft-gluon resummation beyond the next-to-leading logarithmic accuracy. Starting from the probability density of correlated soft emission in d dimensions we introduce a class of soft couplings relevant for resummed QCD calculations of hard-scattering observables. We show that at the conformal point, where the d -dimensional QCD beta-function vanishes, all these effective couplings are equal to the cusp anomalous dimension. We present explicit results in d dimensions for the soft-emission probability density and the soft couplings at the second-order in the QCD coupling. Finally, we study the structure of the soft coupling in the large- n_F limit and we present explicit expressions to all orders in perturbation theory. We also check that, at the conformal point, our large- n_F results agree with the known result of the cusp anomalous dimension.

Alternate track

I read the instructions above

Yes

Author: DE FLORIAN, Daniel (International Center for Advanced Studies (AR))

Presenter: DE FLORIAN, Daniel (International Center for Advanced Studies (AR))

Session Classification: Strong interactions and Hadron Physics

Track Classification: 06. Strong Interactions and Hadron Physics