Contribution ID: **74**   Type: **Presentation**

Prospects for strong coupling measurement using jet grooming at hadron colliders

Thursday 18 August 2022 15:20 (15 minutes)

In this talk, we study prospects for measuring the strong coupling α_s using the soft-drop jet-mass cross section in hadronic collisions. We compute the normalized cross section for quark and gluon jets to NNLL accuracy, and estimate the nonperturbative hadronization corrections using a model-independent field-theory based formalism involving $\mathcal{O}(\Lambda_{\text{QCD}})$ constants for quark and gluon jets and perturbative Wilson coefficients computed to NLL'accuracy. We clarify the impact of higher logarithmic resummation, that significantly modifies the leading logarithmic shape. Using these calculations, we assess the theoretical uncertainties on an α_s-precision measurement due to scale variations, nonperturbative corrections, and quark/gluon fractions. We identify which soft-drop parameters are well-suited for measuring α_s, and highlight differences in the α_s sensitivity between quark and gluon jets. This analysis thus paves the way for using soft-drop jet-mass cross section for a measurement of α_s at hadron colliders.

Authors: PATHAK, Aditya (University of Manchester); HANNESDOTTIR, Hofie; STEWART, Iain; SCHWARTZ, Matthew

Presenter: HANNESDOTTIR, Hofie

Session Classification: Top/EW/QCD