Contribution ID: **37** Type: **not specified**

Two-loop anomalous dimension for the resummation of non-global observables

Wednesday 20 April 2022 10:00 (20 minutes)

The soft radiation emitted in jet cross sections can resolve the directions and colors of individual hard partons, leading to a complicated pattern of logarithmically enhanced terms in the perturbative series. Starting from a factorization theorem and solving the renormalization group equations for its ingredients, these large logarithms can be resummed. We extract the two-loop anomalous dimension governing the resummation of subleading logarithms in jet cross sections and other non-global observables. This anomalous dimension can be obtained by considering soft limits of hard amplitudes, but the presence of collinear singularities in intermediate expressions makes its extraction delicate. As a consistency check, we use our results to predict the known subleading non-global logarithms in the two-jet cross section.

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Session Classification: NGL and Glauber