Contribution ID: **11** Type: **not specified**

# The soft drop momentum sharing fraction zg beyond leading-logarithmic accuracy

*Tuesday, 3 August 2021 16:30 (15 minutes)*

Based on: https://arxiv.org/abs/2106.04589

Abstract:

Grooming techniques, such as soft drop, play a central role in reducing sensitivity of jets to e.g. underlying event and hadronization at current collider experiments. The momentum sharing fraction zg, of the two branches in a jet that pass the soft drop condition, is one of the most important observables characterizing a collinear splitting inside the jet, and directly probes the QCD splitting functions. In this work, we present a factorization framework that enables a systematic calculation of the corresponding cross section beyond leading-logarithmic (LL) accuracy, showing that thi measurement is not only sensitive to the QCD charge but also the spin of the parton that initiates
the jet. Our results at next-to-leading logarithmic (NLL') accuracy include non-global logarithms, and provide a first meaningful assessment of the perturbative uncertainty. We present a comparison to the available experimental data from ALICE, ATLAS, and STAR and find excellent agreement.

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**Session Classification:** Precision Calculations + Experimental Heavy-Ions Results