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Non-global logarithms in jet and isolation cone cross sections

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Starting from a factorization theorem in effective field theory, we derive a parton-shower equation for the resummation of non-global logarithms. We have implemented this shower and interfaced it with a tree-level event generator to obtain an automated framework to resum the leading logarithm of non-global observables in the large- N_c limit. Using this setup, we compute gap fractions for dijet processes and isolation cone cross sections relevant for photon production. We compare our results with fixed-order computations and LHC measurements. We find that naive exponentiation is often not adequate, especially when the vetoed region is small, since non-global contributions are enhanced due to their dependence on the veto-region size. Since our parton shower is derived from first principles and based on renormalization-group evolution, it is clear what ingredients will have to be included to perform resummations at subleading logarithmic accuracy in the future.

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