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From perturbative to non-perturbative QCD emissions with jets

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In this work, by exploiting jet substructure techniques, we identify the transition from early-time perturbative splittings to late-time non-perturbative emissions and its associated timescale at both RHIC and LHC energies. We introduce three experimentally robust splittings along the jet clustering tree, each related to the perturbative, non-perturbative-like regions and the transition between them. The population of such splittings is quantified via a first phenomenological study of the formation time in a Monte Carlo model to highlight its sensitivities and discuss its experimental feasibility. Finally, we show how these timescales change in a scenario when jet quenching effects, induced by an extended Quark-Gluon Plasma, take place along the parton shower.

Experiment/Theory

Theory/Phenomenology

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