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Jet substructure modifications in heavy-ion collisions

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Significant experimental and theoretical activity at the LHC is dedicated to the study of hot and dense QCD matter created in head-on heavy-ion collisions. Measurements of fully reconstructed jets in these collisions allow to examine new aspects of this exotic state via its coupling to perturbative degrees of freedom. The potential sensitivity of jet substructure observables to modifications in the plasma has recently sparked an intense theoretical activity leading to an improved understanding of jet fragmentation and the dynamics of the underlying medium. In this talk, I will review the recent advances and highlight the role of quantum and colour decoherence processes that govern how jets are resolved and, subsequently, lose energy through medium-induced bremsstrahlung. These processes have a profound effect on the jet sample and lead to substructure modifications. I will also discuss how these modifications can be observed in experiments, focussing on aspects of the hardest splitting in the jet cone, as well as provide an overview of possible contamination of non-perturbative processes.

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