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Medium-induced soft gluon distribution inside a jet

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The new studies of heavy ion collisions performed at the LHC have shown the necessity to improve our understanding of parton propagation and gluon emission in the presence of a hot QCD medium. In particular, the ability to measure jets in heavy ion collisions implies that, in order to fully understand jet quenching phenomena, we must go beyond leading parton energy loss and attempt to describe how the jet structure is modified by the presence of the quark-gluon plasma. In this spirit, we study in-medium jet evolution by considering the multiple emission of soft gluons, for which the formation time is much smaller than the size of the medium. This separation of scales implies that one can consider the multiple emissions as independent and ordered in time, therefore allowing for a probabilistic interpretation where the parton shower is built as a classical branching process.

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