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Energy loss effects in EECs at LO

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In recent years, there has been an effort towards establishing a more complete picture for jet substructure in the presence of the quark gluon plasma. Such a program requires not only a more detailed description of medium induced effects, but also the design of novel substructure observables. Very recently, it has been noticed that energy-energy correlators (EECs) might provide one type of such observables. Although the full extent of their sensitivity to the medium has not been completely explored, they are capable to resolve the transverse structure of the jet. In particular, they are sensitive to the critical angle separating coherent and decoherent jet evolution in the medium. In this talk, we show for the first time the effects of medium induced radiative energy loss in EECs at leading order in the number of vacuum-like emissions. The calculation takes into account all order soft gluon emissions, in the large N_c limit and neglecting subdominant interfering contributions. Similar to other jet quenching observables, energy loss leads to an overall suppression of the EECs. More importantly, this is accentuated in the decoherent regime and results in an important competing effect when trying to extract the critical angle. We further comment on how the current calculation can be extended beyond leading order accuracy, important to compute more complex observables.

Experiment/Theory

Theory/Phenomenology

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