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Efficient description of medium response to jet energy loss

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The injection of energy and momentum from a jet into the QGP generates a wake, which leads to soft and semi-hard particle creation correlated with the jet direction after the QGP hadronizes. As several jet quenching studies have shown, this medium response phenomenon plays a crucial role in our understanding of many jet structure and substructure observables. Nevertheless, a detailed account of the phenomenological consequences of those wakes is still lacking, partly because of the computational complexity of current techniques used to describe their properties. In this work we present a computationally efficient description of the event-by-event, jet-by-jet, determination of the properties of the hadrons coming from QGP wakes. By making use of a single set of universal solutions obtained within linearized hydrodynamics on top of a Bjorken flow, and performing the adequate set of scalings, translations, rotations and boosts, we are able to match the results obtained (with much greater computational cost) using 3+1D hydrodynamics.

Experiment/Theory

Theory/Phenomenology

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