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Backreaction of QGP fluids from recoil partons

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Modification of jets is a powerful tool to diagnose a quark gluon plasma (QGP) in high-energy heavy-ion collisions. During propagation of partons in a jet through the QGP medium, constituents of the medium acquire high energy and momentum from them and are kicked out to be non-equilibrated partons. These partons are called the recoil partons. Together with how the jet partons radiate energy and momentum during traversing the medium, the recoil process is also crucial in description of jet modification and in understanding of properties of the QGP in high-energy heavy-ion collisions.

Due to the energy-momentum conservation, the backreaction of the QGP would occur when the partons are kicked out from the QGP medium. To develop a general-purpose event generator which respects the energy-momentum conservation, the recoil process should be implemented as "deposition of negative energy and momentum"into the fluids.

In this study, we introduce the negative source terms in hydrodynamic equations to consider the dynamical evolution of backreaction of the QGP medium in recoil processes. Using this framework, we analyze effects of the backreaction on the jet structure function toward comprehensive understanding of jet propagation in medium.

Category

Theory

Collaboration

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