

Jet momentum broadening beyond the jet quenching parameter from QCD kinetic theory

Monday 23 September 2024 17:30 (20 minutes)

The study of the initial nonequilibrium stages in heavy-ion collisions is an exciting research frontier. In particular, for jet quenching observables, jet-medium interactions during the initial stages have been argued to be one of the major theoretical uncertainties. To calculate the medium-induced gluon spectrum and jet energy loss, knowledge of the momentum broadening kernel is required, which is often used in a harmonic approximation with the jet quenching parameter \hat{q} . In this talk, I will present our results for the momentum-broadening kernel from the gluonic sector of QCD kinetic theory, which describes the probability for a jet parton to exchange a specific momentum with the medium. In particular, we find that at early times, processes with small-momentum exchange are more likely than in a corresponding thermal system, which reverses at large momenta. Our results for the kernel are consistent with the previous extraction of \hat{q} while encoding more information and hence leading to a better description of jet quenching during the initial stages.

Category

Theory

Collaboration

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Session Classification: Parallel 7: early time dynamics

Track Classification: 5. Nuclear PDFs, saturation, and early time dynamics