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# Jet momentum broadening during initial stages in kinetic theory

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The jet quenching parameter $\hat{q}$ encodes jet medium interactions during the entire quark-gluon plasma evolution in heavy-ion collisions. For a long time, the impact of pre-equilibrium stages has not been properly treated in jet quenching calculations, although recent studies find large values for $\hat{q}$ in the earliest (glasma) stage. For the first time, we show that QCD kinetic theory smoothly connects these values to the later hydrodynamic ones, providing the missing link for a consistent $\hat{q}$ evolution. We find that its evolution during the bottom-up kinetic scenario shows little sensitivity to the initial conditions, jet energies and models of the transverse momentum cutoff. We also observe that, similarly to the glasma case, the jet quenching parameter is enhanced along the beam axis as compared to the transverse direction during most of the kinetic evolution. With our results, jet quenching can thus become a promising experimental probe to gain insight into the nonequilibrium properties of the quark-gluon plasma.

## Category

Theory

## Collaboration (if applicable)

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