

O(g) NLO effects in transport coefficients

Tuesday, February 7, 2017 2:00 PM (20 minutes)

Transport coefficients of QCD like the shear viscosity η and the diffusion of baryon number D have been determined at leading order in perturbation theory by Arnold, Moore and Yaffe (AMY). I will show how these transport coefficients are sensitive to $O(g)$ corrections arising from interactions with soft gluons. These NLO effects enter as corrections to the transverse momentum broadening coefficient \hat{q} , to longitudinal momentum broadening, to quark-gluon conversions, to collinear $1 \leftrightarrow 2$ processes and to wider-angle bremsstrahlung (semi-collinear processes). These corrections have been computed using a Euclidean formalism pioneered by S. Caron-Huot, which exploits the analytical properties of amplitudes supported on light fronts. There remain only two coefficients whose $O(g)$ corrections are unknown, as I will show.

I will show the effect of all known corrections to the value of the transport coefficients. In particular, the large $O(g)$ contribution to \hat{q} is the leading NLO effect and it reduces the value of the transport coefficients very significantly. I will also estimate the effect of the unknown coefficients.

Preferred Track

QCD at High Temperature

Collaboration

Not applicable

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