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Type: **Parallel Talk**

## Second-order transport coefficients at NLO in pQCD

*Tuesday, May 15, 2018 10:00 AM (20 minutes)*

In this talk we will study the relaxation coefficients  $\tau_\pi$  and  $\tau_J$  of the shear stress tensor  $\pi^{\mu\nu}$  and the light quark current  $J$  respectively. These are second-order transport coefficients which can be determined in perturbation theory. After reviewing the perturbative kinetic theory framework that has been recently used to determine their respective first-order coefficients  $\eta$  and  $D$  (shear viscosity and quark diffusion) at NLO in pQCD we will apply it to these second-order coefficients. While  $\eta$  and  $D$  get reduced by a factor of 5 at NLO for  $\alpha_s \sim 0.3$ , the dimensionless ratios  $T\tau_\pi/(\eta/s)$  and  $\tau_J/D$  show a mild increase ( $< 50\%$ ) at NLO. We further argue that, through the properties of the collision operator, lower bounds can be obtained in kinetic theory for these coefficients. After presenting the bounds, we compare our results with the strong-coupling AdS/CFT ones: we argue that, while (NLO) kinetic theory can yield first-order transport coefficients in the ballpark of the strong-coupling ones, the lower bounds imply widely different behaviours at second order.

### Content type

Theory

### Collaboration

### Centralised submission by Collaboration

Presenter name already specified

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