Contribution ID: **191**   Type: **Oral**

Heavy quark momentum diffusion coefficient during hydrodynamization via effective kinetic theory

Tuesday 5 September 2023 09:50 (20 minutes)

We compute the heavy quark momentum diffusion coefficient κ using QCD effective kinetic theory for a system going through bottom-up isotropization until approximate hydrodynamization. This transport coefficient describes heavy quark momentum diffusion in the quark-gluon plasma and is used in many phenomenological frameworks, e.g. in the open quantum systems approach. Our extracted nonthermal diffusion coefficient matches the thermal one for the same energy density within 30%. At large occupation numbers in the earliest stage, the transverse diffusion coefficient dominates, while the longitudinal diffusion coefficient is larger for the underoccupied system in the later stage of hydrodynamization.

Category

Theory

Collaboration (if applicable)

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Session Classification: Heavy Flavor

Track Classification: Heavy Flavor