

11th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



Beitrag ID: 100

Typ: Talk

Hard parton dispersion in the quark-gluon plasma, non-perturbatively

Dienstag, 28. März 2023 10:50 (20 Minuten)

Jet-medium interactions receive large non-perturbative contributions from classical gluons, i.e. infrared gluons with high occupation numbers. These contributions affect transverse jet momentum broadening and medium-induced radiation. Both depend significantly on the in-medium dispersion of hard partons, encoded in their so-called asymptotic mass.

In this talk, I shall show how the analytical properties of thermal amplitudes allow for a non-perturbative determination of the IR classical contribution through lattice determinations in the dimensionally-reduced Effective Theory of hot QCD, EQCD. I will show how these existing lattice determinations need to be complemented by perturbative two-loop matching calculations in EQCD and QCD, so that the unphysical (classical) UV behaviour of EQCD is replaced by its proper quantum QCD counterpart. I will show how lattice and perturbative EQCD are in excellent agreement in the UV and I will discuss the numerical effect of the two-loop quantum QCD contribution, with an outlook on the effect on medium-induced radiation rates.

The talk is based on G.D. Moore, N. Schlusser 2009.06614, J. Ghiglieri, G.D. Moore, P. Schicho, N. Schlusser 2112.01407, J. Ghiglieri, P. Schicho, N. Schlusser, E. Weitz, in preparation

Experiment/Theory

Theory/Phenomenology

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Sitzung Einordnung: Parallel: Jets and their modification in QCD Matter

Track Klassifizierung: Jets and their modification in QCD matter