

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



Beitrag ID: 272

Typ: Talk

Simulating hard probes in the early-stages of heavy-ion collisions

Dienstag, 28. März 2023 12:10 (20 Minuten)

We study the impact of the Glasma fields, used to describe the very-early stage of heavy-ion collisions, on the transport of hard probes, namely heavy quarks and jets. We perform numerical simulations of the strong classical fields using techniques from *real-time lattice gauge theory*. The resulting fields are used as background for the classical transport of ensembles of particles, described by *Wong's equations*. We develop a numerical solver for the transport of the probes, based on *colored particle-in-cell* methods.

We focus on the dynamics of heavy quarks and jets in the classical colored fields. To quantify the effect of the Glasma, we extract *momentum broadening* of hard probes and evaluate the *anisotropy* transfer from the Glasma to the probes. We investigate other ways to measure the imprint of the Glasma, such as *two-particle angular correlations* of quark pairs or gauge invariant correlators of color Lorentz forces exerted on the probes.

A. Ipp, D. I. Muller, D. Schuh - Jet momentum broadening in the pre-equilibrium Glasma

P. Khowal, S. K. Das, L. Oliva, M. Ruggieri - Heavy quarks in the early stage of high energy nuclear collisions at RHIC and LHC

D. Avramescu, V. Băran, V. Greco, A. Ipp, D. I. Müller, M. Ruggieri - Simulating jets and heavy quarks in the early stages of heavy-ion collisions using the colored particle-in-cell method (*in preparation*)

Experiment/Theory

Theory/Phenomenology

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Sitzung Einordnung: Parallel: Early-Time Dynamics & nPDFs

Track Klassifizierung: Early time dynamics and nuclear PDFs