Contribution ID: **379** Type: **Oral presentation**

Quarkonium suppression in strongly coupled plasmas

Friday 27 September 2024 09:07 (5 minutes)

Suppression of open heavy flavor quarks and quarkonia in heavy-ion collisions are among the most informative probes of quark-gluon plasma (QGP). Interpreting the full wealth of data obtained from the collision events requires a precise theoretical understanding of the evolution of heavy quarks and quarkonia as they propagate through strongly coupled plasma.

Such calculations require the evaluation of a gauge-invariant correlator of chromoelectric fields. This chromoelectric correlator encodes all the characteristics of QGP that the dissociation and recombination dynamics of quarkonium are sensitive to, which is to say can in principle measure. In this talk, we will review its calculation and its distinctive qualitative features at weak coupling in QCD up to next-to-leading order and at strong coupling in $\mathcal{N} = 4$ SYM using the AdS/CFT correspondence, as well as its formulation in Euclidean QCD, paving the way for a lattice QCD calculation of it.

Finally, we report on recent progress in applying our results to the calculation of the final quarkonium abundances after propagating through a cooling droplet of QGP, which illustrates how we may learn about QGP from quarkonium measurements. We devote special attention to how the presence of a strongly coupled plasma modifies the transport description of quarkonium, in comparison to approaches that rely on weak coupling approximations to describe quarkonium dissociation and recombination.

Based on 2306.13127 and 2310.09325.

Collaboration

Category

Theory

Authors: SCHEIHING HITSCHFELD, Bruno Sebastian (Massachusetts Institute of Technology); NIJS, Govert Hugo (CERN); YAO, Xiaojun (University of Washington)

Presenter: SCHEIHING HITSCHFELD, Bruno Sebastian (Massachusetts Institute of Technology)

Session Classification: Plenary Session VIII (Flash talks)