Contribution ID: **15** Type: **not specified**

Real-time non-perturbative dynamics of jet production in the Schwinger model: from quantum entanglement to thermalization

Saturday 9 March 2024 09:00 (35 minutes)

The production of jets should allow the testing of the real-time response of the QCD vacuum disturbed by the propagation of high-momentum color charges. Addressing this problem theoretically requires a real-time, non-perturbative method. As a step in developing such an approach, we report on fully quantum simulations of a massive Schwinger model coupled to external sources representing quark and antiquark jets as produced in e+e−e+e− annihilation. It is well known that the Schwinger model [QED in (1+1) dimensions] shares many common properties with QCD, including confinement, chiral symmetry breaking, and the existence of vacuum fermion condensate. This allows us to study, for the first time, the modification of the vacuum chiral condensate by the propagating jets and the quantum entanglement between the fragmenting jets. Our results indicate robust entanglement between the fragmentation products of the two jets. We also discuss how this entanglement manifests itself in terms of potentially measurable correlations. It also gives us unique opportunities to investigate how such systems thermalize.

Presenter: FLORIO, Adrien

Session Classification: Talks