Contribution ID: **163** Type: **Oral Presentation**

Constraints on jet quenching from a multi-stage energy-loss approach

Wednesday, 3 June 2020 13:05 (20 minutes)

A unified description of jet evolution through deconfined QCD matter remains one of the challenging problems in the area of heavy-ion physics. To gain a comprehensive understanding of the properties of the QGP, we need an energy-loss model that effectively captures the physics of multi-scale jet quenching and provides a simultaneous description of a wide variety of integrated and differential jet observables. In this talk, we present such a comprehensive study by performing a model-to-data comparison for leading hadrons, inclusive jets, and jet substructure observables. Within the JETSCAPE framework [1,2], an effective parton evolution is proposed which includes a high-virtuality, radiation dominated region followed by a low-virtuality, scattering dominated phase. Measurements of inclusive jet and single hadron R_{AA} set strong constraints on the phase-space available for each stage of the energy-loss. The jet-medium response is incorporated through a weakly-coupled transport description with recoil particles excited from the QCD medium. This illustrates the central role played by recoil in the description of both integrated jet observables as well as the sub-structure of the jet. We also study cone size dependence of the nuclear modification factor for jets. This serves as an excellent probe to study the detailed mechanism of the lost jet energy inside the plasma.

[1] JETSCAPE Collaboration (J. H. Putschke (Wayne State U.) et al.), The JETSCAPE framework, arXiv:1903.07706 [nucl-th] (2019).
[2] JETSCAPE Collaboration (S. Cao (Wayne State U.) et al.), Multistage Monte-Carlo simulation of jet modification in a static medium, Phys. Rev. C96 (2017) no.2, 024909.

Collaboration (if applicable)

JETSCAPE

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

Primary author: KUMAR, Amit (Wayne State University)

Presenter: PARK, Chanwook (McGill University)

Session Classification: Parallel

Track Classification: Jets and High Momentum Hadrons