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Measuring jet quenching with a Bayesian Inference analysis of hadron and jet data by JETSCAPE

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The JETSCAPE Collaboration reports new studies of jet transport in the QGP using Bayesian Inference, incorporating both hadron and jet inclusive yield suppression data, and jet substructure data. This analysis extends the previously published JETSCAPE Bayesian determination of \hat{q} , which was based solely on inclusive hadron suppression data.

JETSCAPE is a modular framework for multi-stage modeling of in-medium jet evolution and medium response, with rigorous data-model comparison using a Bayesian formalism. The theoretical model in the current study utilizes virtuality-dependent in-medium partonic energy loss coupled to a detailed dynamical model of QGP evolution.

The \hat{q} analysis presented in this talk includes, for the first time, all reported hadron and jet inclusive yield suppression measurements at RHIC and the LHC. The uncertainty covariance of the data is estimated, where not reported. We explore the tension in this determination of \hat{q} between the hadron and the various jet measurements, and between different kinematic regions. In addition we examine the additional information that jet substructure observables provide beyond that contained in inclusive jet and hadron suppression observables. These studies provide new insight into the mechanisms of jet interactions in matter, and point to next steps in the field for comprehensive understanding of jet quenching as a probe of the QGP.

Category

Theory

Collaboration (if applicable)

JETSCAPE Collaboration

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