Contribution ID: **180** Type: **Oral Presentation**

Quantifying heavy quark transport coefficients within an improved transport model LIDO

Tuesday, 5 November 2019 18:00 (20 minutes)

The heavy-flavor transport coefficients contain important information on the strong interaction at finite temperatures. Extraction of these numbers from experimental data requires dynamical modeling of heavy-flavor transport that is coupled to a realistic medium evolution. Furthermore, meaningful extractions necessitate both a faithful implementation of the physical inputs to be tested and the quantification of model uncertainty. For these purposes, we have developed a partonic transport model LIDO. It has improved treatment of in-medium parton bremsstrahlung, which has been calibrated to analytical theoretical baselines in a simple medium to reduce modeling uncertainty. Regarding the interaction between heavy quarks and the medium, few-body perturbative scatterings are applied to large-momentum transfer (Q) processes, while a diffusion equation models the dynamics of small-Q processes. Such a separation restricts the explicit use of medium quasi-particles to large-Q processes only. Another advantage is that deviations from the leading-order probe-medium coupling can be parameterized as an additional contribution to the diffusion coefficient.

The heavy quark transport coefficients are then extracted with uncertainty quantification from a Bayesian analysis including both RHIC and LHC data. The results are found to be consistent with earlier extractions of the light-quark transport coefficients at high momentum and are comparable to lattice calculations of the heavy-flavor diffusion coefficient in the static limit at low momentum.

Primary authors: KE, Weiyao (Duke University); XU, Yingru (Duke University); Prof. BASS, Steffen A. (Duke University)

Presenter: KE, Weiyao (Duke University)

Session Classification: Parallel Session - Heavy flavor III

Track Classification: Heavy flavor and quarkonium