Contribution ID: **87** Type: **Oral Presentation**

Jet fragmentation in a dense medium from perturbative QCD

Monday, June 1, 2020 11:40 AM (20 minutes)

We study the fragmentation of an energetic jet propagating through a dense quark-gluon plasma within perturbative QCD. We use a recently developed factorisation scheme (and the associated Monte-Carlo generator), in which the standard vacuum-like parton branchings are factorised in time from the medium-induced emissions triggered by multiple soft scattering in the medium. Besides the Monte-Carlo results, we present analytic calculations based on piecewise approximations which render the physical interpretation transparent. Our results for the nuclear modification factor for the jet fragmentation function are in qualitative agreement with the experimental data in Pb+Pb collisions at the LHC. In particular, we reproduce the enhancements seen in the data at both relatively soft and relatively large transverse momenta, with clear physical interpretations. The perturbative predictions however are quite sensitive to the value of the infrared cutoff (the confinement scale), due to the fact that the fragmentation function is not an infrared safe quantity. To remedy this, we propose a new observable — the (primary) subjet fragmentation function — which is infrared safe and has features similar to the fragmentation function. We provide predictions for this observable that could be tested against the experimental data.

Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

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