



Contribution ID: 261

Type: Oral Presentation

Medium response from mini-jets and in-medium hadronization in relativistic heavy ion collisions

Thursday, June 4, 2020 11:15 AM (20 minutes)

In ultra-relativistic heavy-ion collisions, partons with intermediate energy (5-10) GeV excite ripples as they travel through the Quark-Gluon Plasma (QGP).

These ripples' effect on particle production phenomenology is not very well studied.

In this work, we extend our previous work [\cite{Ryu:2018ckh}](#) and present study using a state-of-the-art hybrid framework that consists of the IP-Glasma pre-thermalization dynamics, viscous hydrodynamics (MUSIC), jet energy loss (MARTINI), and hadronic re-scatterings (UrQMD). This framework consistently handles both soft and hard physics involved in relativistic heavy ion collisions.

We consider the energy loss of mini-jets, whose energy is between 5 to 10 GeV, and their induced medium excitation.

The energy and momentum lost from the mini-jets are treated as either free-streaming wave-packets or causal diffusive perturbations of the hydrodynamic flow.

They alter the energy-stress tensor evaluated on the hadronization hypersurface during the hadronization as jet induced medium response.

In addition, this approach uses a novel in-medium fragmentation where the color neutrality of a string is enforced locally.

We quantify the importance of the medium response from mini-jets propagation and their in-medium hadronization on identified particle p_T -spectra and their flow anisotropic coefficients.

S. Ryu, S. McDonald, C. Shen, S. Jeon and C. Gale,

“Effects of hadronic rescattering in mini-jet production and energy loss at the LHC”

PoS High-pT 2017, 014 (2019).

doi:10.22323/1.320.0014

Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

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Session Classification: Parallel

Track Classification: Jets and High Momentum Hadrons