Contribution ID: **495** Type: **Oral**

Holographic jet shapes and their evolution in strongly coupled plasma

Tuesday, February 7, 2017 12:00 PM (20 minutes)

Recently our group analyzed how the probability distribution for the jet opening angle is modified in an ensemble of jets that has propagated through an expanding cooling droplet of plasma [1]. Each jet in the ensemble is represented holographically by a string in the dual 4+1-dimensional gravitational theory with the distribution of initial energies and opening angles in the ensemble given by perturbative QCD. In [1], the full string dynamics were approximated by assuming that the string moves at the speed of light. We are now able to analyze the full string dynamics for a range of possible initial conditions, giving us access to the dynamics of holographic jets just after their creation. We show that, after a period of time that we compute, the string nullifies: the force of gravity accelerates each section of string until it approaches the speed of light. The nullification timescale and the features of the string when it has nullified are all results of the string evolution. This emboldens us to analyze the full jet shape, rather than just the opening angle of each jet in the ensemble as in [1]. We find the striking result that the jet shape scales with the opening angle at any particular energy. We construct an ensemble of dijets with energies and energy asymmetry distributions taken from events in proton-proton collisions, opening angle distribution as in [1], and jet shape taken from proton-proton collisions and scaled according to our result. We study how all of these observables are modified after we send the ensemble of dijets through the strongly-coupled plasma.

[1] Krishna Rajagopal, Andrey V. Sadofyev, Wilke van der Schee, "Evolution of the jet opening angle distribution in holographic plasma", PRL 116, 211603 (2016)

Preferred Track

Jets and High pT Hadrons

Collaboration

Not applicable

Primary author: BREWER, Jasmine (MIT)

Presenter: BREWER, Jasmine (MIT)

Session Classification: Parallel Session 2.4: Jets and High pT Hadrons (II)

Track Classification: Jets and High pT Hadrons