Contribution ID: **769** Type: **Poster**

Angular correlations between heavy and light jet-particles as a means to study in-medium heavy-quark energy loss

Tuesday, 15 May 2018 19:10 (30 minutes)

Energetic heavy quarks passing through the hot and dense medium of a quark-gluon plasma (QGP), represented by the resulting mesons, are viewed as a suitable probe for the interactions inside of the QGP, in particular the mechanisms of energy loss, as they are less likely to thermalize within the medium and are mostly created at early stages of the medium evolution.
However, models of both, purely collisional energy loss as well as combinations of collisional and radiative energy loss are equally successful for reproducing the nuclear modification factor R_{AA} and the elliptic flow v_2 [1]. In an attempt to discriminate between the two different energy-loss mechanisms,an alternative observable, the angular correlations between two mesons were investigated. Azimuthal correlations between pairs of heavy mesons, like D-$\bar{D}$ pairs, allow for distinguishing the energy-loss scenarios [2].

We continue these studies by investigating the angular correlations between pairs of heavy and light mesons (D and π), originating from a heavy quark jet. This is motivated by the fact that the emitted gluon in radiative collisions hadronizes and these hadrons are correlated to the emitting heavy quark.

We created a Monte-Carlo code for the parton splitting in the vacuum together with an effective medium model. This program represents a consistent framework to study the influences of either collisional or radiative processes on parton propagation, and the resulting two-particle correlations. In order to learn at which stages of their space-time evolution jets are affected the most by interactions with the medium we studied contributions to angular correlations from different jet topologies.

[1] P. B. Gossiaux, J. Aichelin, T. Gousset and V. Guiho,
J. Phys. G **37** (2010) 094019
[arXiv:1001.4166 [hep-ph]].

[2] M. Nahrgang, J. Aichelin, P. B. Gossiaux and K. Werner,
J. Phys. Conf. Ser. **509** (2014) 012047
[arXiv:1310.2218 [hep-ph]].

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

Primary author: ROHRMOSER, Martin (Jan-Kochanowski University Kielce)

Co-authors: GOSSIAUX, Pol (Subatech); AICHELIN, joerg (Subatech/CNRS); Prof. GOUSSET, Thierry (SUBATECH)

Presenter: ROHRMOSER, Martin (Jan-Kochanowski University Kielce)

Session Classification: Poster Session

Track Classification: Open heavy flavour