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## Transport coefficients from energy loss studies in an expanding QGP

Sunday 25 September 2016 08:50 (20 minutes)

Based on:

"Relating  $\hat{q}$ ,  $\eta/s$  and  $\Delta E$  in an expanding Quark-Gluon Plasma" A. Ayala, I. Dominguez, J. Jalilian-Marian and M. E. Tejeda-Yeomans e-Print: arXiv:1603.09296 [hep-ph] submitted to Phys. Rev. C

## Summary

We present a study where we explore the connection between transport coefficients and the description of in-medium energy loss within a linear viscous hydrodynamical evolution of the bulk. We use linear viscous hydrodynamics to describe the energy and momentum deposited by a fast moving parton in a quark gluon plasma. This energy-momentum is in turn used to compute the probability density for the production of soft partons by means of the Cooper-Frye formula. We use this probability density to render manifest a relation between the average transverse momentum given to the fast moving parton from the medium  $\hat{q}$ , the shear viscosity to entropy density ratio  $\eta/s$  and the energy loss by the fast moving parton  $\Delta E$  in an expanding medium under similar conditions to those generated in nucleus-nucleus collisions at the LHC. We find that  $\eta/s$  has a non-trivial path length and trigger energy loss dependence, it reaches a limiting value as a function of  $\hat{q}$ . We will show that  $\eta/s$  can be extracted in a more reliable manner for events where the trigger particle has lost a large amount of energy and for events with a larger eccentricity. Our findings also indicate that the extraction of reliable values of  $\eta/s$ , can be better achieved by looking at events with an energetic jet.

## **Presentation type**

Oral

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