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On jet dynamics in the quark-gluon plasma

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Jet physics in hadron collisions is known as one of the most accurate in testing perturbative QCD for 30 years. However, in Heavy-Ion collisions (HIC), at RHIC and at the LHC, the situation is much more involved due to the interaction of jets with the produced quark-gluon plasma right after the collision. Thus, a better theoretical control of jet dynamics in the presence of a QCD medium is becoming crucial if one would like to have a clean access to the properties of the QGP.

To this end, we have investigated medium modification of the radiation pattern of a quark-antiquark antenna traversing a dense medium in order to learn how the QGP alters color coherence which is an important feature of the intRAjet structure in vacuum. In contrast to gluon radiation in vacuum, and unexpectedly, we find anti-angular ordering of gluon radiations and thus only the soft logarithmic divergence remains. These results provide a starting point for further and more complete studies on in-medium jet modification.

Auteur principal: Dr MEHTAR-TANI, Yacine (University of Santiago de Compostela)

Orateur: Dr MEHTAR-TANI, Yacine (University of Santiago de Compostela)

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