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Jets and high-pT probes of the QGP measured by the ALICE experiment

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Hard-scattered partons are produced early in heavy-ion collisions, prior to the formation of the strongly interacting nuclear medium, the quark-gluon plasma (QGP). These partons lose energy as they traverse the medium and eventually fragment into jets, which exhibit a modification when compared to jets produced in pp collisions. Large transverse momentum (p_T) particles, which are proxies for jets, and inclusive jets are suppressed in heavy-ion collisions at both RHIC and the LHC. Di-hadron correlation measurements have shown that the parton fragmentation is modified by the medium. At LHC energies the parton production cross-section is much larger than at RHIC, allowing jets to be reconstructed over a much wider kinematic range. Such measurements provide the possibility for a differential investigation of the parton energy loss.

The ALICE experiment at LHC, with its powerful tracking and particle identification capabilities and calorimetric systems, performs measurements of high- p_T particles, jets (composed of charged or charged plus neutral particles) as well as their correlations. The calorimeters are used as trigger detectors and extend the measurable p_T range for such probes.

In this talk, a summary of the recent results of the ALICE experiment on the measurement of high- p_T particles, jets and high- p_T di-hadron/hadron-jet correlations in pp, p-Pb and Pb-Pb collisions at the LHC between years 2010 and 2013 will be shown. Pb-Pb and p-Pb measurements will be compared to the pp baseline measurements to determine the effect of the QGP (Pb-Pb) or the initial cold nuclear matter (p-Pb).

Summary

Primary author(s) : Mr. CONESA BALBASTRE, Gustavo (LPSC-CNRS)

Presenter(s) : Mr. CONESA BALBASTRE, Gustavo (LPSC-CNRS)

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