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Jets and medium evolution in Pb-Pb collisions at the LHC energies from the EPOS initial state

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We present the results for PbPb collisions at 2.76 TeV LHC energy from a parton shower integrated with a hydrodynamic evolution. The initial hard (jet) partons are produced along with soft partons in the initial state EPOS approach (EPOS3 model). The EPOS3 initial state typically contains multiple hard scatterings in each event. The soft partons, represented by strings, melt into a thermalized medium which is described with a 3 dimensional event-by-event viscous hydrodynamic approach. The jet partons then propagate in the hydrodynamically expanding medium. The total jet energy gets progressively “degraded” according to a state-of-the-art microscopic radiative energy loss Monte Carlo for the low-virtuality jet partons. Also, partons reaching a certain lower cut off are “melted” into the hydrodynamic medium via the source terms. The full evolution proceeds in a concurrent mode, without separating hydrodynamic and jet parts. We discuss two features of PbPb collision:

- a jet overlap effect [1] which emerges due to multiple hard parton production in each heavy-ion collision event,
- jet energy loss in the medium and its modification due to the LPM effect.

[1] Iurii Karpenko, Joerg Aichelin, Pol Gossiaux, Martin Rohrmoser, and Klaus Werner, Phys. Rev. C 101, 014905 (arXiv:1908.00836)

Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

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