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Hadron Production in terms of Green's Functions in Non-Equilibrium Matter

Tuesday 13 July 2021 19:30 (2 minutes)

We consider the hadronization of the deconfined matter arising in high-energy particle collisions, based on the quark-hadron duality concept. The number of generated hadrons is shown to be entirely determined by the exact non-equilibrium Green's functions of partons in the deconfined matter and the vertex function governed by the probability of the confinement-deconfinement phase transition.
Compactifying the standard (3+1) chromodynamics into $QCD_2 + QCD_2$, the rate of hadrons produced in particle collisions with respect to both the rapidity and p_T distributions is derived in the flux tube approach. Provided that the hadronization is the first order phase transition, we obtain the hadron rate in the explicit form. The derived rate turns out to be strongly dependent on the energy of colliding particles, the number of tubes, the hadron mass as well as on the temperature of the confinement-deconfinement phase transition. In the case of pion production in pp collisions we obtain a good agreement to the experimental results on the pion yield with respect to both the rapidity and p_T distributions.

Preferred track

High-temperature QCD

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