Contribution ID: **56** Type: **Poster Presentation**

Local Thermalization of Gluons in a Nonlinear Model

Tuesday, June 2, 2020 7:30 AM (1h 20m)

Analytic solutions of a nonlinear boson diffusion equation (NBDE) with schematic initial conditions account for the fast local equilibration of gluons in relativistic heavy-ion collisions. The exact solutions are achieved through a nonlinear transformation that was proposed in Ref. [1], but in addition, include the singularity at $\epsilon = \mu < 0$, and boundary conditions at the singularity. As a consequence, the analytic time-dependent solutions asymptotically approach the Bose-Einstein distribution not only in the UV, but also in the IR. Calculations are performed with a local equilibration time of $\tau_{\rm eq} \simeq 0.1$ fm/c and a local temperature of the order of 600 MeV in the initial stages of Pb-Pb collisions at energies reached at the Large Hadron Collider (LHC). The nonlinear NBDA solutions are suited to replace the conventional linear relaxation-time approximation that enforces equilibration from the initial nonequilibrium to the thermal distribution.

[1] G. Wolschin, Physica A 499, 1 (2018), and preprint (2020).

Collaboration (if applicable)

Track

Initial State

Contribution type

Contributed Talk

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Session Classification: Poster session

Track Classification: Initial State