Beitrag ID: **110** Typ: **Poster**

Thermalization and quark production in a spatially homogeneous system of gluons

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We present a full set of the Boltzmann Equation in Diffusion Approximation (BEDA) for studying thermal equilibration of quarks and gluons. Using BEDA, we first analyse thermalization and quark production of spatially homogeneous systems initially made of pure gluons. We observe that soft partons, dominantly produced via medium-induced radiation, rapidly fill a thermal distribution with an effective (time-dependent) temperature and an effective Baryon chemical potential during the entire process. Without allowing quark production, the system is found to establish thermal equalibrium through distict three strages for initially under-populated cases and two stages for initially over-populated cases. Then, we study the production of quarks (and anti-quarks) in such a system. The baryonic fermions are produced predominantly due to the $g \to qq$ splitting. We find that the quark production does not modify the early stages for both initially under- and over-populated systems due to Pauli blocking. During such early stages, the quark (and antiquark) number density increases linearly with time. In contrast, the later stages are modified significantly by quark production. The relation of our studies to those using effective kinetic theory and the jet evolution in QCD medium will also be discussed.

Experiment/Theory

Theory/Phenomenology

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