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Early quark production and approach to chemical equilibrium

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We present results from real-time lattice simulations of out-of-equilibrium quark production in non-Abelian gauge theory in 3+1-dimensions. Our simulations include the backreaction of quarks onto the dynamical gluon sector, which is particularly relevant for strongly correlated quarks. We observe fast isotropization and universal behavior of quarks and gluons at weak coupling and establish a quantitative connection to previous pure glue results. In order to understand the strongly correlated regime, we perform simulations for a large number of flavors and compare them to those obtained with two light quark flavors. By doing this we are able to provide estimates of the chemical equilibration time. The presentation is based on our recent publication in Phys. Rev. D93 no. 8, (2016) 085001, arXiv:1601.03576.

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