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On nonequilibrium quarkonium evolution in the QGP fireball

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A Lindblad equation for the evolution of heavy quarkonia in QGP has recently been derived from potential non-relativistic QCD (pNRQCD) and open quantum system framework. We derive the classical limit of the evolution equations for
color-singlet and color-octet quarkonia states. Within the classical approximations, we are able to write the evolution equations respectively as a Langevin equation and Boltzmann equations in two different regimes. This allows us to identify the difference between quantum and classical evolution, and examine the effect of classical approximations. Applications to the study of the quarkonium evolution in QGP are presented.

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