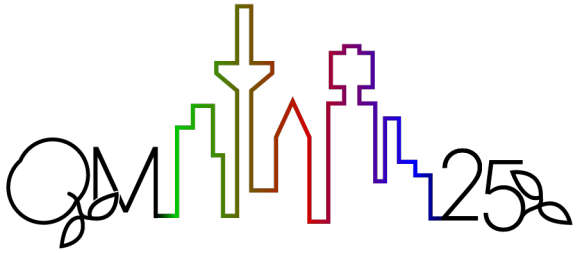

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General Linblad equation for in-QGP quarkonia evolution

Accurate modeling and understanding of quarkonium production in AA collisions requires a formalism that preserves the quantum properties of a microscopic $Q\bar{Q}$ systems while treating the interaction of such pairs with the QGP. The open quantum system approach has recently emerged as one of the most fruitful schemes to meet such requirements. However, the quantum master equations obtained so far in this approach and currently used to make predictions for the upsilon suppression at RHIC and LHC are derived assuming a strict ordering between the QGP temperature T and the energy gaps (ΔE) of the upsilon bound states. This limits their predictive power as the QGP cooling interpolates between the quantum Brownian regime (T $gtrsim\Delta E$) and the quantum optical regime (T $lesssim\Delta E$). In our contribution, we derive and present a more general non-abelian quantum master equation of the Linblad type, which does not suffer from these limitations and thus allows to faithfully describe the quantum evolution of the $b\bar{b}$ pairs during the whole QGP evolution. We also establish the contact with the QME previously obtained in the QBM and QO regimes and provide some concrete perspectives for its efficient solution.

Category

Theory

Collaboration (if applicable)

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