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Heavy quarkonium dynamics at next-to-leading order in the binding energy over temperature

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We present a systematic method for solving the Lindblad equation for heavy-quarkonium dynamics in the quark-gluon plasma which accounts for corrections that are next-to-leading order (NLO) in the ratio of the binding energy of the state and the temperature. The method used relies on mapping the three-dimensional Lindblad evolution to the solution of the one-dimensional Schrodinger evolution with stochastically sampled quantum jumps. We demonstrate how to achieve this dimensional reduction by writing the NLO effective Hamiltonian and jump operators in the spherical basis in which operators act only on the reduced radial part of the wave function. As a result, one can implement the quantum trajectories method to solve the NLO Lindblad equation. Using the resulting NLO framework we can more reliably extend the calculation of heavy-quarkonium suppression to lower temperatures than is possible with the LO formalism.

Present via

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Primary authors: BRAMBILLA, Nora (Tech Univ Muenchen); A ESCOBEDO, Miguel (Santiago de Compostela U., IGFAE); ISLAM, Ajaharul (Kent State University); STRICKLAND, Michael (Kent State University); TIWARI, Anurag (Kent State University); VAIRO, Antonio (Tech Univ Muenchen); V GRIEND, Peter (Tech Univ Muenchen)

Presenter: ISLAM, Ajaharul (Kent State University)

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