

Quarkonium dynamics in the quantum Brownian regime with non-abelian quantum master equations

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Quarkonium production in ultrarelativistic heavy ions collisions is one of the best probes of the QGP formed in these collisions. Resorting to accurate methods to describe the $Q\bar{Q}$ evolution in a QGP is a prerequisite for the precise interpretation of experimental data. Following [1], we present exact numerical solutions in a 1D setting of quantum master equations (QME) derived in [2]. Distinctive features of the $Q\bar{Q}$ evolution with the QME are presented; phenomenological consequences are addressed by considering evolutions in EPOS4 temperature profiles. Next, we investigate the accuracy of the semiclassical approximation (often used to describe charmonium production in URHIC, e.g. [1,3]) by benchmarking the corresponding evolutions on the exact solutions derived with the QME for the case of a $c\bar{c}$ pair.

refs:

1. S. Delorme et al., arxiv 2402.04488
2. J.-P. Blaizot and M.A. Escobedo, JHEP06(2018)0344.
3. D.Y. Arrebato Villar et al., Phys.Rev.C 107 (2023) 5, 054913

Alternate track

1. Strong Interactions and Hadron Physics

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