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Real-Time-Evolution of Heavy-Quarkonium Bound States

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Elucidating the production process of heavy quark bound states is a central goal in heavy-ion collisions [1]. Two central questions exist: Do bound states of heavy quarks form in the early time evolution of the glasma? If so, in which time regime can that happen? An answer requires the development of a non-perturbative treatment of the real-time-dynamics of heavy quarkonia. To answer those questions we have developed a novel real-time formulation [2] of lattice NRQCD [3,4] to order $1/(aMq)^2$ where we employ a classical statistical simulation for the early-time dynamics of the gauge fields [5]. Here we present results from a simulation of heavy quarkonium dynamics in the glasma. By computing the time-evolution of spectral functions of heavy quarkonium channels we expect to identify the emergence of bound states and their formation time in the evolving glasma.

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- [4] M. Berwein, N. Brambilla, S. Hwang, A. Vairo, TUM-EFT 74/15, 56 pp (2018)
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