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Complex heavy quark potential at high temperature from lattice QCD

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A precise definition of the $Q\bar{Q}$ potential at high temperature
was obtained in the framework of effective field theories.
The potential was calculated in hard thermal loop resummed perturbation theory and happens to be complex [1].
In ref. [2] the definition was adapted to Euclidean lattice simulations but difficulties were encountered with the infinite real time limit required to extract the potential.
I will discuss how to disentangle precisely the short and long time physics from which the potential is defined [3]
and present a new method to perform the analytic continuation from Euclidean to real time [4].
After these improvements, the procedure to extract the potential produces precise results [5] and its application to quenched lattice QCD data [4, 6] gives us an estimate of both the real and imaginary part of the nonperturbative complex $Q\bar{Q}$ potential across the phase transition. The final results are very encouraging since the precision obtained for the real part of the potential is below the percent level. Even if only a rough estimate of the imaginary part is obtained in ref [4], we show that it could also be settled by more precise Euclidean data.

[1] M. Laine, O. Philipsen, P. Romatschke and M. Tassler, JHEP 0703 (2007) 054

[2] A. Rothkopf, T. Hatsuda and S.Sasaki, Phys. Rev. Lett. 108 (2012) 162001

[3] Y. Burnier and A. Rothkopf, Phys. Rev. D 86 (2012) 051503

[4] Y. Burnier and A. Rothkopf, Phys. Rev. Lett. 111 (2013) 182003

[5] Y. Burnier and A. Rothkopf, Phys. Rev. D 87 (2013) 114019

[6] Y. Burnier and A. Rothkopf, In preparation

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