



Contribution ID: 329

Type: Poster

## Complex heavy quark potential at high temperature from lattice QCD and its consequences for phenomenology.

*Tuesday, 29 September 2015 16:30 (2 hours)*

We measured recently the complex heavy quark potential at high temperature in lattice simulations [1]. After reviewing shortly the method used, I will discuss the results obtained, explain how to understand them in terms of in-medium screening and show that this potential can be used to obtain a gauge invariant definition of the Debye screening mass [2].

This finite temperature potential also enables a description of quarkonium in a thermal medium with a Schrödinger equation, similar to what is done for the spectroscopy at zero temperature. I will show how these physical spectra inform us about the phenomenology of quarkonium melting and recombination [3] in heavy ion collision. In particular I will show first estimates for the  $\Psi'$  to  $J/\Psi$  ratio in nucleus-nucleus collision at RHIC and LHC, assuming production at the phase boundary and discuss the disappearance of excited states of bottomonium at the LHC.

[1] Y. Burnier, O. Kaczmarek and A. Rothkopf, Phys. Rev. Lett. 114 (2015) 8, 082001 [arXiv:1410.2546 [hep-lat]].

[2] Y. Burnier and A. Rothkopf, arXiv:1506.08684 [hep-ph].

[3] Y. Burnier, O. Kaczmarek and A. Rothkopf, in preparation.

### On behalf of collaboration:

NONE

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**Session Classification:** Poster Session

**Track Classification:** QCD at High Temperature