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Quarkonia at $T>0$ and lattice QCD

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Heavy quarkonium presents a unique observable for the study of the quark-gluon plasma in relativistic heavy-ion collisions. While Bottomonium is expected to act as a test particle traversing the medium in the collision center, recent measurements of finite J/ψ flow by the ALICE collaboration hint at the participation of the charm quarks in the collectivity of the bulk.

Here we present recent results on the in-medium properties of kinetically thermalized heavy quarkonium obtained using lattice QCD methods. Particular emphasis is placed on the computation of spectral functions either from lattice effective field theory approaches such as NRQCD [1], or via a complex real-time potential extracted from Wilson line correlators on the lattice [2]. Consequences for phenomenology e.g. for the $J/\psi / \psi'$ ratio [3], as well as $\chi_c(nP)$ feed-down [4] are discussed.

[1] see e.g. S.Kim, P.Petreczky, A.R. in preparation, 1512.05289 and Phys.Rev. D91 (2015) 054511

[2] Y. Burnier, O.Kaczmarek, A.R. PRL 114 (2015) 082001

[3] Y. Burnier, O.Kaczmarek, A.R. JHEP 1512 (2015) 101

[4] Y. Burnier, O.Kaczmarek, A.R. in preparation

Summary

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