QUARK MATTER 2015
Sep. 27 – Oct. 3, 2015 Kobe, Japan

Contribution ID: **592** Type: **Poster**

Quarkonium melting in the QGP fireball from the stochastic potential

Tuesday 29 September 2015 16:30 (2 hours)

Elucidating the sequential suppression patterns of Bottomonium discovered in dilepton yields during run1 at the LHC urges theory to develop non-perturbative real-time descriptions of in-medium quark bound states out of equilibrium. The recent treatment of Bottomonium as open-quantum system [1,2] promises a viable path towards this goal.

Here we present results from a first simulation of quarkonium dynamics in a realistic quark-gluon plasma, based on the concept of stochastic potential [1]. The values of this proper potential is extracted from first principles (Nf=2+1) lattice QCD simulations and does not contain modeling input [3].

Initializing with the wave function of a localized quark-antiquark pair obtained in non-relativistic QCD effective theory [4], we solve the stochastic Schrödinger equation for Bottomonium according to the local temperature obtained from 2+1 dimensional hydrodynamics [5]. Including the effect of feed down after bottomonium hadronization, we compare our results with experimental data, in particular the centrality dependence of the bottomonium nuclear modification factor R_AA. Possible signatures of thermalization are discussed by comparing to the predictions of the statistical model of hadronization.

[1] Y. Akamatsu, A. Rothkopf, Phys. Rev. D85, 105011 (2012)
[2] Y. Akamatsu Phys. Rev. D91 056002 (2015)
[3] Y. Burnier, O. Kaczmarek, A. Rothkopf, Phys.Rev.Lett. 114 (2015), 082001
[4] J. Casalderrey-Solana, JHEP 1303 (2013) 091
[5] Y.Akamatsu, S.I. Inutsuka, C.Nonaka and M. Takamoto, J.Comput.Phys. 256 (2014) 34-54

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Session Classification: Poster Session

Track Classification: Quarkonia