Contribution ID: **728**

Type: **Parallel Talk**

Charmonium and bottomonium spectral functions from high precision lattice QCD computations

Monday 14 May 2018 17:50 (20 minutes)

Understanding experimental results on nuclear modification factors of heavy quarkonia as well as open heavy mesons is complicated due to the interplay between the cold and hot medium effects. In order to disentangle these two effects it is crucial to have a good understanding of thermal behavior of quarkonia and heavy quarks in the hot medium. The quarkonium spectral function is of the most interest, as the deformation of its resonance peak structure relates to the dissociation temperatures of quarkonia and its slope at the vanishing frequency in the vector channel is connected to the heavy quark diffusion coefficient.

We will present our recent results on quarkonia spectral functions obtained from quenched lattice QCD simulations at $T \in [0.35, 2.25]T_c$. The simulations have been performed on very large and fine lattices where both charm and bottom quarks can be treated relativistically. Using multiple random sources we have computed charmonia and bottomonia correlators being 2 times more precise compared to our previous study[1,2]. In order to gain more robust information on the quark mass dependences of the thermal modifications we also computed the hadron correlators with additionally 4 different values of heavy quark masses ranging in between those of charm and bottom quarks.

We show reconstructed spectral functions from another two stochastic methods [3] besides the Maximum Entropy Method. This allows us to study systematic uncertainties of the dissociation of quarkonium states from temperature and quark mass dependence of the spectral functions. We also estimate heavy quark diffusion coefficients using the low-frequency behavior of vector spectral functions.

[1]H. Ohno, Quark Matter 2017

[2]H. Ohno, PoS LATTICE 2015 (2016) 175

[3]H.-T. Ding, O. Kaczmarek, S. Mukherjee, H. Ohno, H.-T. Shu, in preparation

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

Authors: Mr SHU, Hai-Tao (Central China Normal University); Mr SANDMEYER, Hauke (Bielefeld University); DING, Heng-Tong (Central China Normal University); Dr OHNO, Hiroshi (Center for Computational Sciences, University of Tsukuba); KACZMAREK, Olaf (University of Bielefeld); Dr LARSEN, Rasmus (Brookhaven National Laboratory); MUKHERJEE, Swagato (Brookhaven National Laboratory)

Presenter: Mr SHU, Hai-Tao (Central China Normal University)

Session Classification: Quarkonia

Track Classification: Quarkonia