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

Contribution ID: **713** Type: **Contributed talk**

Charmonium and bottomonium spectral functions from lattice QCD at finite temperature

Wednesday, 30 September 2015 09:00 (20 minutes)

Dissociation of heavy quarkonia is expected to happen in the quark-gluon plasma due to the Debye screening, which causes suppression of quarkonium yields in relativistic heavy ion collisions. Actually the J/ψ suppression in SPS, RHIC and LHC as well as the sequential Υ suppression in LHC have been observed. However, since there are not only the medium effect but also other processes, e.g. cold nuclear matter effects, to contribute to the quarkonium suppression and production, the experimental results are still not fully understood. Therefore theoretical understanding of in-medium quarkonium properties plays an important role to explain the experimental data. Moreover, since the elliptic flow suggesting collective motion of heavy quarks due to the hydrodynamic effects has been observed, in-medium behavior of a single heavy quark is also of great theoretical interest.

In this talk we report our study on charmonium and bottomonium in lattice QCD at finite temperature. Similarly to a previous study [1] simulations have been performed on large and fine isotropic lattices by using quenched gauge field configurations. A couple of lattice spacings towards the continuum limit were also chosen. At temperatures in a range from $0.73T_c$ to $2.2T_c$ we construct charmonium and bottomonium spectral functions from temporal Euclidean meson correlators which have been computed in our previous studies [2,3]. From the temperature and quark mass dependence of the spectral functions we discuss the dissociation of the quarkonium states. We will also extract the transport properties of heavy quarks from the spectral function in the vector channel and estimate the heavy quark diffusion coefficient for both charm and bottom.

[1] H.-T. Ding, A. Francis, O. Kaczmarek, F. Karsch, H. Satz and W. Soeldner, Phys. Rev. D **86**, 014509 (2012).

[2] H. Ohno, PoS LATTICE **2013**, 172 (2014).

[3] H. Ohno, H.-T. Ding and O. Kaczmarek, PoS LATTICE **2014**, 219 (2014).

On behalf of collaboration:

NONE

Primary author: Dr OHNO, Hiroshi (Center for Computational Sciences, University of Tsukuba)

Presenter: Dr OHNO, Hiroshi (Center for Computational Sciences, University of Tsukuba)

Session Classification: Quarkonia III

Track Classification: Quarkonia