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Analysis of charmonium at finite temperature from complex Borel sum rules

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Recently, we proposed a new type of QCD sum rules i.e. the complex Borel sum rules (CBSR) [1]. It has been found that the CBSR is superior to the conventional QCD sum rules from the point of view of the maximum entropy method (MEM) analysis. Specifically, we have demonstrated that our novel method can be used to study the excited states of hadrons. The suppression of quarkonium states (e.g. J/ψ and ψ') is an important signature of the hot matter produced in relativistic heavy-ion collisions at RHIC and LHC. Recently, the behavior of the excited states at finite temperature, which can be different from the ground state, has attracted much attention. The suppression of the quarkonium ground states has already been analyzed by conventional QCD sum rules with MEM [2,3].

In this presentation, we report on the results of a reanalysis by CBSR with MEM to investigate the thermal behavior of the charmonium excited states.

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[2] P. Gubler, K. Morita, and M. Oka, Phys. Rev. Lett. 107, 092003 (2011). [3] K. Suzuki, P. Gubler, K. Morita, and M. Oka, Nucl. Phys. A 897, 28 (2013).

Primary author: ARAKI, Kenji (Tokyo Institute of Technology)

Co-authors: SUZUKI, Kei (Tokyo Institute of Technology); Prof. OKA, Makoto (Tokyo Institute of Technology); GUBLER, Philipp (RIKEN)

Presenter: ARAKI, Kenji (Tokyo Institute of Technology)

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