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## Insight into thermal modifications of quarkonia from a comparison of continuum-extrapolated lattice results to perturbative QCD

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Spectral functions of quarkonia hold many information on bound states and their in-medium modifications as well as on transport properties. Determining spectral functions is subject of many calculations, in lattice QCD as well as in perturbation theory.

We compare continuum extrapolated lattice results [1] to a perturbatively determined spectral function obtained by interpolating between vacuum asymptotics at high frequencies and resummed thermal effects around the threshold [2]. Modest differences are observed, which may originate from non-perturbative mass shifts and renormalization factors. However, in the pseudoscalar channel no resonance peaks are needed for describing the quenched lattice data for charmonium at and above  $T \sim 1.1T_c$ . In the bottomonium case a good description of the lattice data is obtained with a spectral function containing a single thermally broadened resonance peak at  $T$  up to  $\sim 1.5T_c$ .

The knowledge gained from the pseudoscalar channel is used to improve the studies in the vector channel [3]. In addition to information on the in-medium modification of charmonium and bottomonium bound states, this allows for continuum estimates on the temperature and quark mass dependence of heavy quark diffusion coefficients.

- [1] H.-T. Ding, O. Kaczmarek, A.-L. Kruse, H. Ohno, H. Sandmeyer, *Continuum extrapolation of quarkonium correlators at non-zero temperature*. [arXiv 1710.08858]
- [2] Y. Burnier, H.-T. Ding, O. Kaczmarek, A.-L. Kruse, M. Laine, H. Ohno and H. Sandmeyer, *Thermal quarkonium physics in the pseudoscalar channel*. JHEP 1711 (2017) 206 [arXiv 1709.07612]
- [3] Y. Burnier, M. Laine, *Massive vector current correlator in thermal QCD*. JHEP 1211 (2012) 086 [arXiv 1210.1064]

### Content type

Theory

### Collaboration

### Centralised submission by Collaboration

Presenter name already specified

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