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An application of the variational analysis to calculate the meson spectral functions

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We calculate the meson spectral functions (SPFs) via the variational analysis to investigate the behavior of discrete spectra on a finite volume lattice at finite temperature. Although the variational method can not extract the whole information of the SPFs, it can calculate the value of SPFs at several low-lying spectra. Therefore, the method will be useful to test if the low-lying states dissociate above T_c . Moreover, we can improve the signals by increasing the number of basis operators – besides the point source operator, we introduce several smeared operators using Gaussian smearing functions. Our simulations are carried out on a quenched anisotropic lattice using the standard plaquette gauge action and the $O(a)$ -improved Wilson fermion action. We test the method by comparison with the analytic solutions in the free quark case. Furthermore we calculate the 1S, 2S, 1P and 2P charmonia SPFs at temperatures in the range $0.88T_C$ to $2.3T_C$.

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talk

Primary author: OHNO, Hiroshi (University of Tsukuba)

Presenter: OHNO, Hiroshi (University of Tsukuba)

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