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Nonrelativistic QCD Study of Bottomonia at Finite Temperatures on a Finer Lattice

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Lattice nonrelativistic QCD study of ground and excited bottomonia at finite temperatures is presented. The correlation functions are computed using extended bottomonium operators with wave-function optimizing for excited states and also Gaussian shape for ground S- and P-wave states. Lattice calculations are performed on (2+1)-flavor gauge configurations using HISQ action near physical point within a wide temperature range 133-250 MeV, with fixed spatial extent equal to 64 and a finer lattice spacing 0.0493 fm compared with previous studies [1, 2]. We analyze the bottomonium correlation functions based on the parametrization adopted from previous studies [1, 2] to get insights into the in-medium modifications of excited bottomonia. We compare the temperature dependence of the correlators with different types of extended sources and find that this temperature dependence is very similar for different types of correlators [3].

References:

- [1] R. Larsen, S. Meinel, S. Mukherjee, P. Petreczky, Phys. Rev. D 100 (2019) 074506.
- [2] R. Larsen, S. Meinel, S. Mukherjee, P. Petreczky, Phys. Lett. B 800 (2020) 135119.
- [3] H.-T. Ding, W.-P. Huang, R. Larsen, S. Mukherjee, P. Petreczky, work in progress.

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