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Finite-temperature critical point of heavy-quark QCD on large lattices

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We study the finite-temperature critical point of QCD in the heavy-quark region by a scaling study of the Binder cumulant on large lattices to determine the critical point in the thermodynamic limit with a high precision. We perform simulations on $N_t = 6$ and 8 lattices with spatial volumes up to the aspect ratio $LT = N_s/N_t = 18$ and 15, respectively. To enable simulations with large spatial volumes, we adopt the hopping parameter expansion combined with a method to effectively incorporate high order terms of the expansion. The reliability of the method is confirmed by examining the effect of high order terms up to quite high orders. Together with our previous result at $N_t = 4$, we also attempt a preliminary continuum extrapolation of the critical point in physical units.

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