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Distance between configurations in MCMC simulations and the geometrical optimization of the tempering algorithms

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In papers [Fukuma, Matsumoto, Umeda, arXiv:1705.06097, arXiv:1806.10915], we defined for a given Markov chain Monte Carlo (MCMC) algorithm a distance between two configurations that quantifies the difficulty of transition from one configuration to the other configuration. In this talk, we discuss its application to the optimization of parameters in various tempering algorithms. Examples include the standard simulated/parallel tempering algorithms with respect to energy potentials, and also the tempered Lefschetz thimble method for the sign problem which uses the flow time as a tempering parameter. This talk is based on a paper in preparation [Fukuma, Matsumoto].

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