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Fast quantum annealing for the infinite-range Ising model by mean-field counterdiabatic driving

Finite-time adiabatic dynamics can be realized in the strategy of shortcuts to adiabaticity, for examples, the invariant-based inverse engineering and counterdiabatic driving. On the analogy of the invariant-based inverse engineering with the mean-field ansatz [1], we propose mean-field counterdiabatic driving for the infinite-range Ising model [2]. This method is demonstrated in the quantum annealing process.

[1] Kazutaka Takahashi, Phys. Rev. A 95, 012309 (2017).

[2] Takuya Hatomura, submitted.