

Fully-augmented Matrix Product States: algorithm, application, and parent Hamiltonian

Friday, 29 March 2024 10:00 (1 hour)

I will introduce a new tensor network states ansatz called Fully-augmented Matrix Product States (FAMPS), in which MPS is augmented with disentanglers to encode area-law-like entanglement entropy (entanglement entropy supported in FAMPS scales as l for an $l \times l$ system). I will discuss the optimization algorithm of FAMPS in the study of 2D quantum system. With FAMPS, we reexamine the $J_1 - J_2$ Heisenberg model on square lattice and find the absence of the spin liquid phase in the phase diagram. I will also discuss the 2D parent Hamiltonian of FAMPS.

[1] Xiangjian Qian, Mingpu Qin, Chin. Phys. Lett. 40, 057102 (2023) (Express Letter).

[2] Xiangjian Qian, Mingpu Qin, arXiv:2309.13630 (2023).

[3] Xiangjian Qian, Mingpu Qin, arXiv:2401.07659 (2023).

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