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(I) Pushing the Size of the Quantum Cluster Numerical Simulations

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A method to calculate the one-body Green's function for ground states of correlated electron materials is formulated by extending the variational Monte Carlo (VMC) method [1]. We apply the method to larger-sized Hubbard model on the square lattice correctly reproduces the Mott insulating behaviour at half-filling and gap structures of d-wave superconducting state on the 12 by 12 cluster of the Hubbard model.

[1] Charlebois M, and Imada M., Phys. Rev. X, 10:4(041023) (2020)

Author: CHARLEBOIS, Maxime (Université du Québec à Trois-Rivières)

Presenter: CHARLEBOIS, Maxime (Université du Québec à Trois-Rivières)

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