Abstract Submitted
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Computations of fermion pairing by stochastic sampling in Hartree-Fock-Bogoliubov space[1] HAO SHI, SHIWEI ZHANG, College of William and Mary — We describe the computational ingredients for an approach to treat interacting fermion systems in the presence of pairing fields, based on path-integrals in the space of Hartree-Fock-Bogoliubov (HFB) wave functions[2]. The path-integrals can be evaluated by Monte Carlo, via random walks of HFB wave functions whose orbitals evolve stochastically. The approach combines the advantage of HFB theory in paired fermion systems and many-body quantum Monte Carlo (QMC) techniques. A constrained-path or phaseless approximation can be applied to the random walks of the HFB states if a sign problem or phase problem is present. With these techniques, we study the nature of the superconducting order in the two-dimensional Hubbard model by applying an external pairing finning field.

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[2]H. Shi and S. Zhang, ArXiv:1611.02689(2016).

Hao Shi
College of William and Mary

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