

Abstract Submitted
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Thermodynamic properties of the $SU(2N)$ ultra-cold fermions in optical lattices HSIANG-HSUAN HUNG, ZI CAI, Department of Physics, University of California, LEI WANG, Institute for Theoretical Physics, ETH, DONG ZHENG, Department of Physics, Tsinghua University, CONGJUN WU, Department of Physics, University of California — We investigate the thermodynamic properties of a half-filled $SU(2N)$ Fermi-Hubbard model in the two-dimensional square lattice using the determinantal quantum Monte Carlo simulation, which is free of the fermion “sign problem”. The large number of hyperfine-spin components enhances spin fluctuations, which facilitates the Pomeranchuk cooling to temperatures comparable to the superexchange energy scale at the case of $SU(6)$. Various quantities including entropy, charge fluctuation, and spin correlations have been calculated.

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