Quantum Monte Carlo Studies on Attractive Hubbard Model with Anisotropic Spin-dependent Hopping on Two-leg Ladder Lattice[1] HO KIN TANG, The Chinese University of Hong Kong, ZHONG BING HUANG, HuBei University , JIN HUA SUN, HAI QING LIN, The Chinese University of Hong Kong — Using spin-dependent hopping, it is possible to have a fully paired state with a gap for single fermion excitation and gapless Cooper pair excitation, called 'Cooper-pair Bose-metal' phase. Recently, the existence of this phase was suggested by a density matrix renormalization group studies[2] on the attractive Hubbard Model with two-leg ladder geometry and anisotropic spin-dependent hopping. We here present a detailed Quantum Monte Carlo (QMC) studies on this model to investigate its finite temperature properties, including correlation function, s-wave and d-wave pairing function, and finally to deduce the existence and behavior of 'Cooper-pair Bose-metal' phase.

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