Quantum Monte Carlo simulation of the power-law correlated SU(6) quantum magnets with ^{132}Yb fermions DA WANG, Department of Physics, University of California, San Diego, CA92093, ZI CAI, Department of Physics and Arnold Sommerfeld Center for Theoretical Physics, Ludwig-Maximilians-Universität München, D-80333 München, Germany, CONGJUN WU, Department of Physics, University of California, San Diego, CA92093 — We systematically investigate the half-filled SU(2N) Hubbard model on the two dimensional square lattice, using the projector quantum Monte-Carlo method which is free of sign problem. We find that the ground state changes from the long-range Neel order in the SU(2) case to a paramagnetic state in the large N limit, in which no long-range order was observed. Employing Maximum entropy method to analytically continue imaginary-time data, we obtain both one-particle and two-particle spectral functions in the whole Brillouin zone. As N increases, the charge gap is quickly suppressed and the spin-wave feature with linear dispersion around (π,π) is finally destroyed. The related physics is discussed as well as some applications to the experiments.

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