

Abstract Submitted
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Thermodynamic properties of a 2D itinerant ferromagnet - a sign-problem free quantum Monte Carlo study¹ SHENG-LONG XU, University of California, San Diego, YI LI, Princeton Center for Theoretical Sciences, Princeton University, CONGJUN WU, University of California, San Diego — We investigate thermodynamic properties of itinerant ferromagnetism by using the non-perturbative method of quantum Monte-Carlo simulation, which is shown free of the sign problem in a multi-orbital Hubbard model in the square lattice in a large region of fermion density. The spin magnetic susceptibility is local-moment-like exhibiting the Curie-Weiss law in the off-critical temperature region, while the compressibility typically exhibits the itinerant nature, which is finite and weakly temperature-dependent. The spin magnetic susceptibility further grows exponentially as approaching zero temperature for the SU(2) invariant models. The long-range ferromagnetic ordering appears when the symmetry is reduced to the Ising class, and the Curie temperature can be accurately determined.

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