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Quantum phase transition of frustrated triangle lattice Ising model coupled to a fermi surface[1] ZI HONG LIU, XIAO YAN XU, Institute of Physics,Chinese Academy of Sciences, YANG QI, Massachusetts Institute of Technology, ZI YANG MENG, Institute of Physics,Chinese Academy of Sciences — Employing a newly developed quantum Monte Carlo algorithm, we investigate the frustrated transverse field triangle lattice Ising model coupled to a fermi surface. Without the coupling between Fermion and Ising fields, the bosonic system goes through a quantum phase transition from clock ordered phase to paramagnetic phase, where the quantum critical point (QCP) is associated with an emergent U(1) symmetry. With the coupling, the bosonic fluctuations introduced effective interaction among the fermions and have distorted the bare Fermi surface of the triangle lattice tight-binding model towards an interacting fermi surface with hot spots and fermi pockets. As the transverse field is gradually tuned towards to U(1) critical point, the gapped hot spots develop evidence of non-fermi-liquid behavoir, renders the original QCP in the frustrated triangle lattice Ising model even more non-trivial. The detailed properties of this QCP and its relevence towards recent developments of metallic QCP is also discussed.

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