

Influence of quark anomalous magnetic moment on QCD phase diagram under magnetic field

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Several previous studies imply that the quark anomalous magnetic moment (AMM) is dynamically generated through the spontaneous chiral symmetry breaking in the low energy QCD. Even though the exact form of the quark AMM still remains unclear, the AMM would be an essential ingredient for quark matter properties and QCD phase diagram under external magnetic field.

In this talk, I will discuss the quark AMM effect on the chiral phase transition under the magnetic field at finite temperature and chemical potential based on the effective model approach. First, I will deduce the effective form of the AMM to satisfy the observations of the chiral phase transition in the lattice QCD simulations. By using the deduced AMM, I will show the phase diagram of the magnetized quark matter. It is found that the AMM effect significantly affects the phase boundary, and then the first order line shortens. The phenomenological implications of the AMM effect will be also discussed.

Theory / experiment

Theory

Group or collaboration name

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