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QCD Kondo effect under magnetic catalysis

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We discuss the QCD phase diagram under the effects of heavy quarks and a magnetic field. The effect of the heavy-quark impurity is significantly enhanced by the quantum many-body effect called the QCD Kondo effect within a mean-field theory. Solving the gap equation, we find that the QCD Kondo condensate emerges due to the formations of a pairing between a light quark and a heavy quark. We focus on the competition between the chiral symmetry breaking and the QCD Kondo effect, and show that such a competition induces a quantum critical point separating the two phases. The QCD Kondo effect at vanishing Fermi surface can be studied in the relativistic heavy ion collisions as well as in the Monte Carlo lattice simulations.

Theory / experiment

Theory

Group or collaboration name

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