

Chiral separation effect and Kondo effect in finite-density SU(2) gauge theory with dynamical fermions

пятница, 12 ноября 2021 г. 10:00 (30)

We present the results of a first-principles lattice study of the Chiral Separation Effect in finite-density gauge theory with dynamical fermions. We find that the CSE is well described by the free quark result in the high-temperature quark-gluon plasma phase. As one enters the confinement regime with broken chiral symmetry at chemical potential smaller than half of the pion mass, the CSE response is gradually suppressed towards low temperatures in comparison to the free quark result. This suppression can be approximately described by assuming that the CSE current is proportional to the charge density, rather than the chemical potential, as suggested in ArXiv:1712.01256. We also present numerical evidence for the enhancement of the CSE response in the presence of heavy quarks, which, according to ArXiv:2012.15173, might be a manifestation of Kondo effect in non-Abelian gauge theory.

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Session Classification : Morning session 9

Track Classification : Quark-Gluon Matter at Finite Densities and Temperatures