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Anomalous transport phenomena on the lattice

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We present the first continuum extrapolated results for the chiral magnetic effect (CME) and the chiral separation effect (CSE) conductivities in equilibrium with staggered fermions at physical masses. We simulate QCD in a constant magnetic background and measure respective chemical potential derivatives of the currents appearing in each effect. The conductivities are calculated as a function of relevant parameters as the temperature and the mass of the quarks. We emphasize the importance of choosing the correct discretization of the currents, which we verify by turning off gluonic interactions and comparing to analytical results; as well as by comparing to results using the Wilson fermion formulation. We also present results for the quenched theory for both staggered and Wilson fermions, where the role of the Polyakov loop for the CSE will be discussed.

Topical area

QCD at Non-zero Temperature

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