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Chiral magnetic effect and anomalous transport from real-time lattice simulations

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We present a first-principles study of anomaly induced transport phenomena by performing real- time lattice simulations with dynamical fermions coupled simultaneously to non-Abelian SU(Nc) and Abelian U(1) gauge fields. We investigate the behavior of vector and axial currents
during a sphaleron transition in the presence of an external magnetic field, and demonstrate how the interplay of the Chiral magnetic (CME) and Chiral separation effect (CSE) lead to the formation of a propagating wave. We also analyze the quark mass dependence of these phenomena
and extract spectral information about the carriers of axial and vector charge.

Summary

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