

Chiral magnetic effect and anomalous transport in real time

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We present a first-principle study of anomaly induced transport phenomena based on real-time lattice simulations with dynamical fermions coupled simultaneously to non-Abelian $SU(N_c)$ and Abelian $U(1)$ gauge fields. Based on such simulations I will discuss 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. Phenomenological consequences, concerning e.g. the quark mass dependence of these phenomena, will also be discussed along with future prospects for the modeling of anomalous transport phenomena in heavy-ion collisions.

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