Contribution ID: **4** Type: **Talk**

Real-time dynamics of the Chiral Magnetic Effect

Thursday, July 14, 2016 4:00 PM (30 minutes)

We present a first-principles study of the dynamics of the Chiral Magnetic Effect based on real-time lattice gauge theory simulations with dynamical fermions. We demonstrate how topological densities and transitions during the early stages of high-energy collision lead to the production of axial charge imbalances via the the axial anomaly and investigate in detail the interplay between axial and vector currents in the presence of strong magnetic fields. We also discuss how such simulations can be utilized to provide initial conditions for the evolution in anomalous hydrodynamics, to improve the understanding of experimental signatures of the effects in high-energy heavy-ion collisions.

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Session Classification: Parallel Track 2