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Chiral Magnetic Effect in the Dirac-Heisenberg-Wigner formalism

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The emergence of the Chiral Magnetic Effect (CME) and the related anomalous current is investigated using the real time Dirac-Heisenberg-Wigner formalism. This method is widely used for describing strong field physics and QED vacuum tunneling phenomena as well as pair-production in heavy-ion collisions. We extend earlier investigations of the CME in constant flux tube configuration by considering time dependent fields. In our model we can follow the formation of axial charge separation, formation of axial current and then the emergence of the anomalous electric current. Qualitative results are shown for special field configurations that help interpret the predictions of CME related effects in heavy-ion collisions in the RHIC Beam Energy Scan program.

Experimental Collaboration

Theoretical Paper

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