

Probing signals of the Chiral Magnetic Effect from the 2+1 PNJL model

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Abstract

We study the Chiral Magnetic Effect (CME) in relativistic heavy-ion collisions using charge fluctuations and their correlations generated in the early stages of the collision. Employing the 2+1 flavor Polyakov-loop-extended Nambu–Jona-Lasinio (PNJL) model, we compute the charge separation associated with the CME. A central challenge in interpreting these correlations experimentally is contamination from background effects unrelated to the CME. To address this, we probe the system at finite charge chemical potential, which comes from charge fluctuations from sources independent of the CME. We find that the charge separation induced by a finite charge chemical potential differs from that arising from the CME itself. This suggests that our approach offers a route toward understanding contaminants of the CME signals in heavy-ion collision observables.

Keywords: chiral magnetic effect, charge correlations, heavy ion collisions.