

Sensitivity analysis of the chiral magnetic effect observables using a multiphase transport model

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The chiral magnetic effect is a good observable to investigate the topological and electromagnetic properties of the QGP. But the γ correlator, a common observable used to detect the CME, contains both contribution from the CME and its background. This observable can not identify the CME from its background. Recently, a new observable of R_{Ψ_m} has been proposed, which is expected to distinguish the CME from the background. We apply mixing particles method and shuffling particles method to calculate R_{Ψ_m} using a multiphase transport model without or with a percentage of CME-induced charge separation.

Summary

From the results, we found that the shape of final R_{Ψ_2} distribution is flat for the case without CME, but concave for that with some amount of the CME. And we also study the stage evolution of R_{Ψ_2} to understand the CME well. By comparing the responses of R_{Ψ_2} and γ to the strength of the CME, we observe that two observables show different nonlinear sensitivities to the CME. We found that the shape of R_{Ψ_2} has an advantage in measuring a small amount of the CME but it requires large event statistics.

Abstract Type

Talk

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