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Probe Chiral Magnetic Effect with Signed Balance Function

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In this talk a pair of observables are proposed as alternative ways to study the charge separation induced by Chiral Magnetic Effect (CME) in relativistic heavy ion collisions. They are, the out-of-plane to in-plane ratio of fluctuation of the difference between signed balance functions measured in pairs rest frame, and the ratio of it to similar measurement made in the laboratory frame. Both observables have been studied with simulations including flow-related backgrounds, and for the first time, backgrounds that are related to resonance's global spin alignment. The two observables have similar positive responses to signal, and opposite, limited responses to identifiable backgrounds arising from resonance flow and spin alignment. Both observables have also been tested with two realistic models, namely, a multi-phase transport (AMPT) model and anomalous-viscous fluid dynamics (AVFD) model. These two observables, when cross examined, will provide useful insights in the study of CME-induced charge separation.

(<https://arxiv.org/abs/1903.04622>)

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