

Measurement of the charge separation along the magnetic field with Signed Balance Function in 200 GeV Au + Au collisions at STAR

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Experimental searches for CME in heavy ion collisions have been going on for a decade, and so far there is no conclusive evidence for its existence. Recently, the Signed Balance Function (SBF), based on the idea of examining the momentum ordering of charged pairs along the in- and out-of-plane directions, has been proposed as a probe of Chiral Magnetic Effect (CME) [1]. In this approach a pair of observables are invoked, they are, the out-of-plane to in-plane ratio of fluctuation of the difference between signed balance functions measured in pairs rest frame (r_{rest}), and the ratio ($R_B = r_{rest}/r_{lab}$) of it to a similar measurement made in the laboratory frame (r_{lab}). These two observables give opposite responses to the CME-driven charge separation and background correlations arising from resonance flow and global spin alignment.

In this talk, we will present r_{rest} and R_B measurements in Au+Au collisions at 200GeV. The two observables will be cross examined and compared to model calculations. The procedure-similarity and difference between this approach and previous methods will be compared, and the physics implications of the measurement will be discussed.

[1] A. H. Tang, arXiv:1903.04622.

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