

Abstract Submitted  
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**Local Parity Violation or Local Charge Conservation/Flow? A Reaction-Plane-Dependent Balance Function Study** HUI WANG, Michigan State University, STAR COLLABORATION — STAR has recently reported charge-dependent azimuthal correlations using a three particle correlator that is sensitive to the charge separation effect in Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 200$  GeV. Qualitatively, these results agree with some of the theoretical predictions for local parity violation in heavy-ion collisions. However, a study using reaction-plane-dependent balance functions shows an alternative origin of this signal. The balance function, which measures the correlation between oppositely charged pairs, is sensitive to the mechanisms of charge formation and the subsequent relative diffusion of the balancing charges. We report reaction-plane-dependent balance functions for Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 200$  GeV using the STAR detector. The reaction-plane-dependent balance function analysis is consistent with the three particle correlator analysis as expected mathematically. The model of Schlicting and Pratt incorporating local charge conservation and elliptic flow can reproduce most of the three-particle azimuthal correlation results at 200 GeV.

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