Estimation of CMW fraction with event shape engineering in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 200 GeV at RHIC-STAR

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Abstract

In heavy-ion collisions, Chiral Magnetic Wave (CMW) induces electric quadrupole resulting in difference between elliptic flow of positively and negatively charged particles [1]. Experimental searches on the charge-dependent elliptic flow as a function of the charge asymmetry ($A_{\rm ch}$) agree qualitatively with the predictions of the CMW. However various backgrounds such as Local Charge Conservation (LCC) can be responsible for at least large part of the signal. We use Event Shape Engineering technique [2], which differentiates between the background and the CMW signal [3], to study charge asymmetry dependence on the elliptic flow. For this, the flow vector (q_2) distribution for a given collision centrality is sliced into ten percentile bins and the q_2 dependence of $\Delta v_2\,(A_{\rm ch})$ is investigated. An attempt has been made to extract the CMW fraction for all centrality classes.

References

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