Extraction of CMW fraction with event shape engineering in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV at RHIC

Ankita S. Nain
(for the STAR Collaboration)
Panjab University, Chandigarh, India

Abstract

The Chiral Magnetic Wave (CMW), induces electric quadrupole moment in quark-gluon plasma produced in heavy-ion collisions, which leads to the difference between elliptic flows of positively and negatively charged particles [1]. The charge-dependent elliptic flow as a function of the charge asymmetry (A_{ch}) serves as an important tool in the search for the CMW. 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 dependence of $\Delta v_2 (A_{\mathrm{ch}})$ on the elliptic flow of sliced q_2 samples is investigated. An attempt has been made to extract the CMW fraction for all centrality classes. In addition, we will also compare results obtained using the three particle correlator ($\langle v_2^{\pm} A_{\mathrm{ch}} \rangle - \langle A_{\mathrm{ch}} \rangle \langle v_2^{\pm} \rangle$) for different collision centralities.

References

[1] Y. Burnier, D.E. Kharzeev, J. Liao, H.U. Yee, Phys. Rev. Lett. 107, 052303 (2011).

[2] J. Schukraft, A. Timmins, S.A. Voloshin, Phys. Lett. B 719, 394 (2013).

[3] C.Wang *et al.*, Phys. Lett. B 820, 136580 (2021).