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## Study of non-flow baseline for the CME signal via two-particle ( $\Delta\eta$ , $\Delta\phi$ ) correlations in isobar collisions at STAR

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Recently, STAR reported the isobar ( $^{96}_{44}\text{Ru} + ^{96}_{44}\text{Ru}$ ,  $^{96}_{40}\text{Zr} + ^{96}_{40}\text{Zr}$ ) results for chiral magnetic effect (CME) search [1]. The Ru+Ru to Zr+Zr ratio of the CME-sensitive observable  $\Delta\gamma$ , normalized by elliptic anisotropy ( $v_2$ ), is close to the inverse multiplicity ( $N$ ) ratio. In other words, the ratio of the  $N\Delta\gamma/v_2$  observable is close to the naive background baseline of unity. However, non-flow correlations are expected to cause the baseline to deviate from unity. To further understand the isobar results, we study non-flow effects using the same isobar data by two-particle correlations as functions of pseudorapidity and azimuthal angle differences ( $\Delta\eta$ ,  $\Delta\phi$ ) of the pairs. We extract the charge-dependent correlations by the difference between the opposite-sign (OS) and same-sign (SS) charge pairs, properly normalized such that the correlations vanish at  $|\Delta\eta| \rightarrow \infty$ . These charge-dependent correlations come primarily from resonance decays, intra-jet (near-side) correlations, and Coulomb effects. We study the charge-independent correlations by examining the small and large  $|\Delta\eta|$  behaviors of the SS correlations. The intra-jet (near-side) can be well isolated at small  $|\Delta\eta|$  and  $|\Delta\phi|$ . We investigate the inter-jet (away-side) correlations by exploiting Pythia and HIJING simulations, together with the knowledge of near-side correlations obtained from the data. By comparing the two isobar systems, many systematic uncertainties can be minimized. By studying how non-flows differ between the two isobar systems, we can gain insights into the baseline of the CME.

[1] M. Abdallah et al. [STAR], [arXiv:2109.00131 [nucl-ex]].

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