

Study of Chiral Magnetic Effect in Isobar (Ru+Ru and Zr+Zr) and Au+Au collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV at STAR using Sliding Dumbbell Method

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Abstract

1 To probe the Chiral Magnetic Effect (CME) in heavy-ion collisions, a new
2 technique, Sliding Dumbbell Method (SDM) [1] is developed to search for
3 the back-to-back charge separation on event-by-event basis. The SDM helps
4 in selecting the events corresponding to different charge separations (f_{D_bCS}).
5 The charge separation distributions for each collision centrality is divided
6 into 10 percentile bins to select potential CME-like events corresponding to
7 the maximum charge separation (e.g. top 10%) in a given collision centrality.
8 Results will be discussed for two- and three-particle correlators with respect
9 to each bin of f_{D_bCS} for each collision centrality for isobaric and Au+Au
10 collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV. The background contribution due to statistical
11 fluctuations is obtained by shuffling the charges of particles in a given collision
12 centrality. The correlated background amongst the produced particles which
13 got removed due to shuffling is determined by restoring the shuffled charges.

14 References

- 15 [1] J. Singh, A. Attri, and M. M. Aggarwal, Proceed-
16 ings of the DAE Symp. on Nucl. Phys. **64**, 830 (2019)
17 "http://www.sympnp.org/proceedings/64/E66.pdf".