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

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

References

[1] J. Singh, A. Attri, and M. M. Aggarwal, Proceedings of the DAE Symp. on Nucl. Phys. 64, 830 (2019) "<http://www.sympnp.org/proceedings/64/E66.pdf>".

Primary author: Mr SINGH, Jagbir (Panjab University, Chandigarh)

Co-author: STAR COLLABORATION

Presenter: Mr SINGH, Jagbir (Panjab University, Chandigarh)

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