

# Investigating the Chiral Magnetic Wave at RHIC-STAR

Ankita S. Nain

*(for the STAR Collaboration)*  
Panjab University, Chandigarh, India

## Abstract

In heavy-ion collisions, the Chiral Magnetic Wave (CMW) is theorized to produce an electric quadrupole moment, leading to differences in elliptic flow between positively and negatively charged particles. This CMW signal can be detected by examining the correlation between charge-dependent elliptic flow and event charge asymmetry. This study focuses on the difference in covariance of elliptic flow ( $v_2$ ) and charge asymmetry ( $A_{ch}$ ) for positively and negatively charged particles across various collision centralities.

To explore collision system dependence, we will analyze results from Au+Au collisions as well as isobar (Ru+Ru and Zr+Zr) collisions at a center-of-mass energy of  $\sqrt{s_{NN}} = 200$  GeV. A comparison between the two isobar systems will be conducted to investigate any potential enhancement of the CMW signal in Ru+Ru collisions, which may be attributed to the stronger magnetic field generated by the additional four protons in Ru. Additionally, we will present correlations between triangular flow ( $v_3$ ) and  $A_{ch}$  to assess background contributions.