

Searching the Chiral Magnetic Effect with the STAR Detector: An Overview

Jagbir Singh (for the STAR Collaboration)

Instituto de Alta Investigación, Universidad de Tarapacá, Arica, Chile

Email: jsingh2@bnl.gov

Abstract

The Chiral Magnetic Effect (CME) is a quantum phenomenon arising from the interplay of topological charge fluctuations and strong magnetic fields in the early stages of heavy-ion collisions. The STAR experiment at RHIC provides a unique environment to search for CME signatures through high-energy nucleus-nucleus collisions. This talk presents an overview of STAR's CME program, with a focus on charge-dependent azimuthal correlations, specifically using the γ and δ correlators, which are sensitive to potential CME signals and background contributions. Emphasis is placed on recent high-statistics isobaric collision data (Ru+Ru and Zr+Zr), where a stronger CME signal is expected in Ru+Ru due to its larger magnetic field. This overview aims to summarize the current status of the CME search and highlight future directions.