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Quantifying the Chiral Magnetic Effect in Isobaric Heavy Ion Collisions Using Hydrodynamic Simulations[1] ELIAS LILLESKOV, Macalester College, JINFENG LIAO, YIN JIANG, SHUZHE SHI, Indiana University — The quark-gluon plasma created in heavy ion collisions is an exotic state of matter in which many unusual phenomena are manifested. One such phenomenon is the "Chiral-Magnetic Effect" (CME), wherein the powerful magnetic fields generated by colliding ions spin-polarize chiral quarks, causing a net transport effect in the direction of the fields. The CME predicts specific charge-dependent correlation observables, for which experimental evidence was reported, although the evidence is subject to background contamination. Isobaric collision experiments have been planned for 2018 at RHIC, which will study this effect by comparing 96Ru-96Ru and 96Zr-96Zr collisions. The two colliding systems are expected to have nearly identical bulk properties (including background contamination), yet about 10% difference in their magnetic fields due to different nuclear charges. This provides a unique opportunity to disentangle the CME observable and background effects. By simulating this effect using anomalous hydrodynamic simulations, we make a quantitative prediction for the CME-induced signal for several centralities in each of these two colliding systems. Our results suggest a significant enough difference in the signal to be experimentally detected- on the order of 15-20%.

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