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Study of the nuclear deformation in relativistic isobar collisions at STAR

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Collective phenomena in heavy-ion collisions are very sensitive to initial geometry including nuclei deformation effects. In the hydrodynamic model description of heavy ion collisions, the final-state anisotropic flow v_n are linearly related to the strength of the multi-pole shape of the nucleon density distribution in the transverse plane $\epsilon_n, v_n \propto \epsilon_n$. The ϵ_n are sensitive to the shape of the colliding ions, characterized by nuclear deformation. Results on the v_n from isobar collisions at $\sqrt{s_{NN}} = 200$ GeV with the STAR detector will be presented. The precise calculations with Monte-Carlo Glauber and a multi-phase transport (AMPT) model could be helpful to understand the role of the shape of atomic nuclei in heavy-ion collisions.

Primary author: Dr ZHANG, Chunjian (stony brook university)

Co-authors: JIA, Jiangyong (Stony Brook University (US)); HUANG, Shengli (Stony Brook University)

Presenter: Dr ZHANG, Chunjian (stony brook university)

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