

# Study of the nuclear deformation in relativistic isobar collisions at STAR

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1 Collective phenomena in heavy-ion collisions are very sensitive to initial ge-  
2 ometry including nuclei deformation effects. In the hydrodynamic model de-  
3 scription of heavy-ion collisions, the final-state anisotropic flow  $v_n$  are linearly  
4 related to the strength of the multi-pole shape of the nucleon density distribu-  
5 tion in the transverse plane  $\epsilon_n$ ,  $v_n \propto \epsilon_n$ . The  $\epsilon_n$  are sensitive to the shape of the  
6 colliding ions, characterized by nuclear deformation. Results on the  $v_n$  from  
7 various collision systems measured with the STAR detector will be presented.  
8 The precise calculations with Monte-Carlo Glauber [1] and a multi-phase trans-  
9 port (AMPT) model [2, 3] could be helpful to understand the role of the shape  
10 of atomic nuclei in heavy-ion collisions.

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[1] Jianguong Jia, [arXiv:2106.08768](#).

[2] Giuliano Giacalone, Jianguong Jia and Chunjian Zhang, [arXiv:2105.01638](#).

[3] Chunjian Zhang and Jianguong Jia, [arXiv:2109.01631](#).