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Longitudinal flow decorrelation in ^{96}Zr+^{96}Zr and ^{96}Ru+^{96}Ru collisions within a multiphase transport model

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Longitudinal fluctuation which is the initial geometry fluctuates along pseudorapidity η, is found to be significantly important in understanding the full space time evolution of the fireball. Recent studies show that anisotropic flow coefficients are also sensitive to the shape of the nuclei, owing to the intrinsic deformation, while the deformation effect on the longitudinal physics is not studied in those deformed collision systems. With a multiphase transport model, we conduct the systematic study on longitudinal flow decorrelation in the deformed Zr+Zr and Ru+Ru collisions. The results suggest the strength of flow decorrelation can be suppressed via the hadronic transport process. The longitudinal flow decorrelation also show sensitivity on the shape of the nuclei, with a $\beta_{2,Ru} \gg \beta_{2,Zr}$ and $\beta_{3,Ru} \ll \beta_{3,Zr}$, clear difference is observed in r_2 in mid-central collisions and r_3 in central collisions between the two collision systems. Our results suggest longitudinal flow decorrelation can provide new constrains on the nuclear structure study in heavy-ion collisions.

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