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Research on Collective Flow in Small Systems with Special Geometric Initialization Structure

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A multiphase transport model (AMPT) is successful in describing the experimental data, mainly from heavy ion collisions at the BNL Relativistic Heavy Ion Collider. By using this AMPT model,
the initial geometry effect on collective flows, which are inherited from initial projectile structure, is studied in 4He+12C system. Elliptic flow (v2) and triangular flow (v3) which are significantly resulted from the chain and triangle structure of 12C with three-alpha clusters, respectively, in 4He+12C collisions are compared with the flow from the Woods-Saxon distribution of nucleons in 12C. We use an exact method which based on multiparticle correlations (cumulants) to suppress nonflow contribution. Our study demonstrates that the initial geometry of the collision zone can be explored by collective flow at the final stage in heavy-ion collisions.

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