Contribution ID: **11** Type: **Poster**

Collective flow in asymmetric collisions of deformed nuclei

In this research, we investigate the influence of nuclear structure parameters on the collective flow observed in symmetric and asymmetric nuclear collisions at ultra-relativistic energies. Our approach involves introducing an approximate yet realistic analytical model for the collision process, which allows us to emphasize the pivotal role played by the structural characteristics of the colliding ions. This versatile model facilitates exploring a broad range of collision scenarios, spanning from light to heavy nuclei.

We leverage the connections between N-particle correlations in the final stages of nuclear collisions and N-nucleon density distributions within the colliding nuclei to discern the impacts. Notably, multi-particle correlations in the final stages of high-energy nucleus-nucleus collisions prove to be sensitive indicators of the collective correlations among nucleons in the wave functions of the colliding nuclei.

Our work sheds light on the intricate interplay between nuclear structure and collision dynamics, offering exciting prospects for advancing our understanding of these fundamental processes.

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Session Classification: 墙报展及评选

Track Classification: 重离子物理