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Symmetric and asymmetric cumulants from transverse momentum conservation and flow

The multi-particle cumulants method is a powerful tool for revealing long-range collectivity in small and large colliding systems. The three-particle asymmetric cumulant $ac_2\{3\}$, four-particle symmetric cumulant $sc_{2,3}\{4\}$, $sc_{2,4}\{4\}$, and higher order six-particle symmetric cumulant $sc_{2,3,4}\{6\}$, from the transverse momentum conservation (TMC) and flow are calculated. Due to the interplay between TMC and flow, our results agree with the recent LHC measurements and the simulations using the realistic Monte Carlo models of iEBE-VISHNU and HIJING, which provides new insight into the origin of collective flow in small systems.

Reference:

[1] J.-L. Pei, G.-L. Ma and A. Bzdak,

“Symmetric cumulant $sc_{2,4}\{4\}$ and asymmetric cumulant $ac_2\{3\}$ from transverse momentum conservation and flow,”

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doi:10.1103/PhysRevC.110.024901

[arXiv:2403.05782 [hep-ph]].

[2] J.-L. Pei, G.-L. Ma and A. Bzdak,

“Effect of transverse momentum conservation and flow on Symmetric cumulants $sc_{2,3}\{4\}$ and $sc_{2,3,4}\{6\}$ ”, in preparation.

Category

Theory

Collaboration (if applicable)

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