Contribution ID: **115** Type: **not specified**

Exploring the flow harmonic correlations via multi-particle symmetric and asymmetric cumulants in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV

Wednesday 15 January 2025 14:48 (7 minutes)

We study multi-particle azimuthal correlations in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. We use initial conditions obtained from a Monte-Carlo Glauber model and evolve them within a viscous relativistic hydrodynamics framework that eventually gives way to a transport model in the late hadronic stage of the evolution. We compute the multi-particle symmetric and asymmetric cumulants and present the results for their sensitivity to the shear and bulk viscosities during the hydrodynamic evolution. We also check their sensitivity to resonance decay and hadronic interactions. We demonstrate that while some of these observables are more sensitive to transport properties than traditional flow observables, others are less sensitive, making them suitable for studying different stages of the evolution.

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Session Classification: Parallel B

Track Classification: 4. Collective dynamics - conserved charges, spin, vorticity, freezeout, afterburner