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Probing Final State Effects in Relativistic Heavy-Ion Collisions via Elliptic Flow and Production measurement of $K^{*0}(892)$ and $\phi(1020)$ Resonances in Pb-Pb Collisions with ALICE

Hadronic resonances serve as valuable probes for investigating the late-stage evolution of the system formed in ultra-relativistic heavy-ion collisions. Since the lifespans of resonances are comparable to the lifetime of the hadronic phase, they are affected by the competing re-scattering and regeneration mechanisms, which may alter their momentum distributions and can result in the suppression and enhancement of their measured yields, respectively. These effects can be investigated by analyzing the yield ratio of resonances to their stable hadrons. Previous ALICE results on K^{*0} and ϕ measurements in Pb–Pb collisions at 5.02 TeV have suggested the dominance of the re-scattering effect.

Another crucial observable offering insights into final state effects is the measurement of elliptic flow, which characterizes the azimuthal anisotropy of particle emission in the transverse plane of non-central heavy-ion collisions. Late-stage hadronic re-scattering can modify the momentum distributions of resonances, affecting the observed elliptic flow. Therefore, measuring the elliptic flow of resonances like K^{*0} and ϕ , and comparing them with other hadrons enables a detailed study of re-scattering effects.

In this contribution, we present the latest ALICE results from Run 3. The measurement of elliptic flow and production of K^{*0} and ϕ resonances in Pb–Pb collisions will be shown. The results will be discussed with the ALICE findings from Run 2 data.

Field of contribution

Experiment

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