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Chasing the onset of QCD thermalisation with ALICE

Tuesday 5 September 2023 13:00 (20 minutes)

Deciphering the process of hadronization has long been a formidable challenge, in part due to its non-perturbative nature. Over the years, various phenomenological models have emerged, all attempting to unravel the complexity of hadron production. Despite their different theoretical foundations, many of these models successfully account for the average yield of hadrons. This has spurred the scientific community to search for innovative observables capable of discerning the fundamental principles governing these models. In pursuit of this goal, the ALICE Collaboration has studied an extensive array of event-by-event Pearson correlations between hadrons with distinct quantum numbers. Conducting a system size scan of these measurements unveils a powerful means to identify and analyze emerging QCD phenomena in small collision systems. In this presentation, ALICE will show the latest findings on antiproton–antideuteron and net-kaon–net-Xi correlations in various collision systems (pp, p–Pb, and Pb–Pb). These observables offer the advantage of being unaffected by resonance or weak decays. The measurements will be compared to various hadronization models, delving into the intriguing topic of the onset of thermalization in QCD matter. The measured correlations are used to estimate the correlation volume between hadrons stemming from the conservation of baryon and strange quantum numbers.

Category

Experiment

Collaboration (if applicable)

ALICE

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