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Kaon isospin fluctuation in pp collisions at $\sqrt{s} = 13.6$ TeV with ALICE at the LHC

Understanding phase transitions in relativistic heavy-ion collisions provides insights into the properties of strongly interacting matter. Key transitions include the deconfinement phase, marked by fluctuations in conserved quantities, and the chiral phase, characterized by particle ratio fluctuations that indicate chiral symmetry restoration. Kaon isospin fluctuations were studied in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV using the robust v_{dyn} observable. Results indicate behaviour distinct from model predictions by HIJING, AMPT, and EPOS–LHC, suggesting possible signatures of Disoriented Chiral Condensates (DCCs) in strange kaon production at LHC energies. A similar study in pp collisions could serve as a baseline for further investigation of kaon isospin fluctuations in small systems.

In this contribution, the first measurement of $v_{\text{dyn}}[K^+, K^-]$ and $v_{\text{dyn}}[K^0_s, K^\pm_s]$ in different multiplicity classes in pp collisions at $\sqrt{s} = 13.6$ TeV will be presented. This provides insights into the origin of kaon isospin fluctuations corresponding to their production mechanism.

Category

Experiment

Collaboration (if applicable)

ALICE Collaboration

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