Contribution ID: **59** Type: **Talk**

Recent results on strangeness enhancement in small collision systems with ALICE

Monday, September 2, 2024 12:00 PM (20 minutes)

The strangeness enhancement, defined as the increased relative production of strange hadrons in heavy-ion collisions with respect to the production rate in pp interactions, was originally proposed as a signature of the quark-gluon plasma formation. At the LHC, the ALICE experiment observed that the yield ratios of strange hadrons to charged pions increase with the charged-particle multiplicity at mid-rapidity independently of $\sqrt{s}$ and of the collision systems, starting from pp where it was unexpected, passing by p–Pb and reaching Pb—Pb.

More insightful information about the strangeness production mechanisms could be provided by measuring the (multi-)strange particle multiplicity distribution, P(n_S), using a novel method based on counting the number of strange particles event-by-event. In this contribution, ALICE results on K^0_S, Λ, Ξ and Ω multiplicity distributions in pp collisions at $\sqrt{s}$ = 5.02 TeV as a function of the charged particle multiplicity, together with the average probability for the production multiplets are presented. This measurement extends the study of strangeness production beyond its average and represents a new test bench for production mechanisms, probing events with a large imbalance between strange and non-strange content.

In addition, a multi-differential approach has been exploited in pp collisions at $\sqrt{s}$ = 13 TeV measuring the production of (multi-)strange hadrons as a function of the very forward energy measured by the ALICE Zero-Degree Calorimeters. This study allows to correlate the production of strangeness with the energy deposited at forward rapidity, that is correlated to the mid-rapidity activity only in the early stages of the collision.
Another multi-differential approach has been utilized to measure the light-flavor particle production as a function of the transverse spherocity ($S_0^{p_T=1}$) in pp collisions at $\sqrt{s}$ = 13 TeV. This observable allows for a topological selection of events that are either "isotropic" (dominated by multiple soft processes) or "jet-like" (dominated by one or few hard scatterings).

The results are compared to state-of-the-art phenomenological models implemented in commonly-used Monte Carlo event generators, drastically enhancing the sensitivity to the different processes implemented in each approach.

Internet talk

No

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

ALICE (https://alice-collaboration.web.cern.ch/)

Is the speaker for that presentation defined?

Yes

Details

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