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# Studying strangeness and baryon production in small systems through Ξ–hadron correlations using the ALICE detector

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One of the remaining puzzles in heavy-ion physics is that enhanced yields of multistrange hadrons —believed to be a signature of the quark–gluon plasma —are not only observed in heavy-ion collisions, but also in high-multiplicity proton-proton and proton-nucleus collisions. Various phenomenological models have been developed to try to understand this, such as rope hadronisation (available in PYTHIA 8.230) and core-corona models (used in EPOS). A prediction of the string/rope model is that strangeness is produced through $s\bar{s}$ pair breakings in the hadronisation phase, resulting in close correlations in phase space between strange and anti-strange hadrons, whereas in a core-corona model, strange quarks are produced earlier in the collision than strange hadrons, resulting in much weaker correlations. Experimentally, this can be studied by triggering on a (multi)strange hadron and studying the distribution of particle pairs of opposite strangeness. Here the same-strangeness pairs provide an estimate for the combinatorial background, so by subtracting these, one can access the part which is due to balancing quantum numbers.

In this talk, we present results on the correlations between strange particles in pp collisions at $\sqrt{s} = 13$ TeV that are studied by triggering on $\Xi^-$ or $\Xi^+$ baryons and measuring per-trigger yields of charged kaons, $\Lambda$ and $\Xi$ baryons for several multiplicity classes, using the ALICE detector. Similarly, charge and baryon correlations are studied by measuring also per-trigger yields of pions and protons. The results are compared to theoretical predictions by PYTHIA and EPOS, where for PYTHIA two extensions are included: rope hadronisation and string junctions. The latter provides an alternative mechanism for baryon production. These results allow one to learn more about the strangeness and baryon production mechanisms, and how they change with multiplicity.

## Collaboration

ALICE

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