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Studying strangeness enhancement in small systems through $\Xi-$hadron correlations using the ALICE detector

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One of the remaining puzzles in heavy-ion physics is that strangeness enhancement - believed to be a signature of the Quark-Gluon Plasma - is 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 (used in the Angantyr extension of Pythia) and core-corona models (used in EPOS). A prediction of the string/rope model is that strangeness is produced in $s\bar{s}$ pair breakings, so there will be correlations between strange and anti-strange hadrons in the same event, even between different hadronic species. By studying these correlations one can learn more about the strangeness production mechanism and test if it changes with multiplicity.

In this study, these predictions are tested by comparing angular correlations between in particular $\Xi^- - K^+$ ($\overline{\Xi}^+ - K^-$) and the reference $\Xi^- - \pi^+$ ($\overline{\Xi}^+ - \pi^-$) as a function of multiplicity, in pp collisions at $\sqrt{s} = 13$ TeV using the ALICE detector. The results are compared to theoretical predictions by Angantyr and EPOS. A comparison will also be done between $\Xi-$baryon and $\Xi-$meson correlations. While this probes different physics, it further aids in the understanding of the production of multi-strange hadrons in small systems.

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