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Light (Hyper-)Nuclei production at the LHC measured with ALICE

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The high collision energies reached at the LHC lead to significant production yields of light (hyper-)nuclei in proton-proton, proton-lead and, in particular, lead-lead collisions. The excellent particle identification capabilities of the ALICE apparatus, based on the specific energy loss in the time projection chamber and the velocity information in the time-of-flight detector, allow for the detection of these rarely produced particles. Furthermore, the inner tracking system gives the possibility to separate primary nuclei from those coming from the decay of heavier systems. One example is the hypertriton (${}^{3}_{\Lambda}\mathrm{H} \rightarrow {}^{3}\mathrm{He} + \pi^{-}$) another one is the possible decay of a hypothetical bound state of a Λ with a neutron decaying into deuteron and pion.
We present results on the production of stable nuclei and anti-nuclei in Pb–Pb and lighter collision systems. Hypernuclei production rates in Pb-Pb will also be shown, together with a measurement of the hypertriton lifetime and upper limits estimated on the production of lighter exotica candidates. All results are compared with predictions for the production in thermal (statistical) models and alternatives using coalescence.

On behalf of collaboration:

ALICE

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