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(Hyper-)nuclei and exotica production measured with ALICE at the LHC

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The high collision energies reached at the Large Hadron Collider (LHC) lead to significant production of light (anti-)(hyper-)nuclei in proton-proton (pp), proton-lead (p-Pb) and lead-lead (Pb-Pb) collisions.

The excellent particle identification (PID) capabilities of the ALICE detector are exploited to identify rarely produced particles such as deuterons, ^{3}H, ^{3}He, ^{4}He and their antiparticles, in addition to light hadrons.
PID is performed by measuring the specific energy loss in the Time Projection Chamber (TPC) and the particle velocity with the Time-Of-Flight (TOF) detector.

In addition, the high-resolution vertexing provided by the Inner Tracking System (ITS) allows for the separation of primary and secondary vertices.

The precise secondary vertex reconstruction allows one to study the (anti-)^{3}H production via its mesonic weak decay channel ($^{3}\mathrm{H} \rightarrow {}^{3}\mathrm{He} + \pi^{-}$) and the search for weakly bound states containing a Λ hyperon, such as the H-dibaryon (H$\rightarrow \Lambda$+p+π^{-}) and Λn ($\Lambda\mathrm{n} \rightarrow \mathrm{d}+\pi^{-}$).

We present the results on the production yields of light nuclei and anti-nuclei in the following collision systems: pp at $\sqrt{s}$= 7 TeV, p-Pb at $\sqrt{s}$= 5.02 TeV and Pb-Pb at $\sqrt{s_{NN}}$= 2.76 TeV.

The measurement of production rates and lifetime of the hypertriton in Pb-Pb together with the upper limits on the production of exotic bound states will also be shown.

The experimental results will be compared with the prediction of thermal (statistical) and coalescence models.

Summary

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