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## Light (anti-)nuclei and (anti-)hypernuclei production with ALICE at the LHC

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The high energy pp, p-Pb, and Pb-Pb collisions at the LHC offer a unique opportunity to study the production mechanisms of light nuclei, their corresponding anti-nuclei and hyperon-baryon bound systems, called hypernuclei. Measurements at different energies and with various system sizes allow to constrain the models of the production mechanisms of light flavour baryon clusters, in particular those based on coalescence and on statistical hadronization approaches. Moreover, the study of the production yield of (anti-)(hyper-)nuclei in heavy-ion collisions at the LHC energy can help to probe the late stages of the evolution of the hot and dense nuclear matter created in the collision and serves as baseline for the search of exotic multi-baryon states. In addition, the measurements in smaller collision systems provide constraints to cosmological searches for segregated primordial anti-matter and dark matter.

Thanks to its excellent particle identification and tracking capabilities, the ALICE detector allows for the measurement of deuterons, tritons,  $^3\text{He}$ ,  $^4\text{He}$  and their corresponding anti-nuclei. Furthermore, the Inner Tracking System is able to separate primary from secondary vertices allowing the measurement of (anti-)hypernuclei via their two and three body mesonic weak decays.

Results on the production yields of light nuclei and anti-nuclei in pp, p-Pb, and Pb-Pb collisions will be presented, together with the measurements of hypertriton lifetime and production rates in Pb-Pb collisions. The experimental results will be compared to the predictions of statistical (thermal) models and baryon coalescence models. Further constraints on the production mechanism of light nuclei are obtained from measurements of the elliptic flow of deuterons (and  $^3\text{He}$ ) and their comparison to expectations from coalescence and hydrodynamic models.

Plans for the future LHC Run 3, scheduled to start in 2021, with the expected improvements in the statistics and precision will be also presented.

### Selected session

Heavy Ion collisions and QCD phases

**Primary author:** Dr PIANO, Stefano (TS)

**Presenter:** Dr PIANO, Stefano (TS)

**Session Classification:** Heavy Ion collisions and QCD phases