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(Anti) matter and hyper-matter production at the LHC with the ALICE experiment

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The excellent particle identification capabilities of the ALICE experiment allow the studies of (anti) matter and hyper-matter production. (Anti) deuterons, tritons, ^3He and ^4He as well as the corresponding antinuclei can be cleanly identified based on their specific energy loss in the Time Projection Chamber and velocity information in the Time-Of-Flight detector. The (anti) hyper-triton signal can be extracted from the study of its mesonic decay ($^3_\Lambda\text{H} \rightarrow ^3\text{He} + \text{pion}$) via the topological identification of secondary vertices.

The (^3He , pion) invariant mass spectrum will be shown, and the measurement of production yield will be provided. Transverse momentum (p_t) spectra of (anti) nuclei along with their production yield and mean p_t will be presented.

In addition to this, searches for even lighter hyper-matter systems, i.e. $\Lambda\text{-}\Lambda$ and $\Lambda\text{-}n$ bound states will be discussed. The results will also be compared with the expectations from the thermal and coalescence models.

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