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Properties of light (anti)nuclei production in Pb-Pb collisions at LHC energy

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The Large Hadron Collider (LHC) at the European Organization for Nuclear Research(CERN) can provide a good experimental condition to study the production of light (anti) nuclei and to understand the underlying physical mechanisms for collision physics.The centrality dependence of light (anti)nuclei and (anti)hypertriton production in Pb-Pb collisions at LHC energy are investigated using the dynamically constrained phase-space coalescence(DCPC) model and the parton and hadron cascade (PACIAE) model. We find that the yields of light (anti)nuclei and (anti)hypertriton strongly depend on the centrality, i.e., their yields decrease rapidly with the increase of centrality; but their yield ratios are independent of centrality. The results from our theoretical model are well consistent with ALICE data. Furthermore, the integrated yields of (anti)nuclei per participant nucleon increase from peripheral to central collisions, and a higher mass number corresponds to a more rapid increase of these yields. The coalescence parameters (BA) of light (anti)nuclei and (anti)hypernuclei are also analyzed. In addition, nuclear modification factors (RAA or RCP) and the number-of-nucleon scaling of (anti-)proton and (anti-)deuteron has also been discussed.

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