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Productions of light nuclei and hyper-nuclei in heavy-ion collisions at the LHC

We extend an analytical coalescence model to include the hyperon coalescence besides the nucleon coalescence to simultaneously study production properties of light nuclei and hyper-nuclei in heavy ion collisions at the LHC. We derive the formula of the momentum distribution of two baryons coalescing into deuteron-like states and that of three baryons coalescing into triton-like states. We explain the centrality-dependent behaviors of the coalescence factors B_2 and B_3, the transverse momentum spectra, averaged transverse momenta, yield rapidity densities and yield ratios of the deuteron, anti-helium-3, anti-triton and hypertriton measured by the ALICE collaboration. We give predictions of different Ω-hypernuclei, e.g., $H(n\Omega)$, $H(\Omega\Omega)$, $H(nn\Omega)$ and $H(n\Omega\Omega)$, for further experimental measurements.

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