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Production properties of Λ-hypernuclei and Ω-hypernuclei in the coalescence mechanism in relativistic heavy-ion collisions

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We study the productions of Λ-hypernuclei ${}^{3}_{\Lambda}\mathrm{H}$, ${}^{4}_{\Lambda}\mathrm{H}$, ${}^{4}_{\Lambda}\mathrm{He}$ and Ω-hypernuclei $H(p\Omega^{-})$, $H(n\Omega^{-})$, $H(pn\Omega^{-})$ in the coalescence mechanism in relativistic heavy-ion collisions. Considering the abundance and great importance of baryons and light (hyper-)nuclei on the collision dynamics, we include not only nucleon+Λ coalescence but also nucleus+nucleon(Λ) coalescence. We present contributions from different coalescence channels for ${}^{3}_{\Lambda}\mathrm{H}$, ${}^{4}_{\Lambda}\mathrm{H}$ and ${}^{4}_{\Lambda}\mathrm{He}$ in their productions. We predict the production asymmetry between ${}^{4}_{\Lambda}\mathrm{H}$ and ${}^{4}_{\Lambda}\mathrm{He}$, characterized by yield ratios ${}^{4}_{\Lambda}\mathrm{He}/{}^{4}_{\Lambda}\mathrm{H}$ and $({}^{4}_{\Lambda}\mathrm{H}-{}^{4}_{\Lambda}\mathrm{He})/({}^{4}_{\Lambda}\mathrm{H}+{}^{4}_{\Lambda}\mathrm{He})$, which can shed light on the existence constraints of the possible neutron-Λ bound states ${}^{2}_{\Lambda}n$ $(n\Lambda)$ and ${}^{3}_{\Lambda}n$ $(nn\Lambda)$.

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