Production of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H in Au+Au collisions from the STAR BES II

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Hypernuclei are bound states of nuclei with one or more hyperons. Hypertriton (${}^{3}_{\Lambda}$H, $np\Lambda$) and ${}^{4}_{\Lambda}$H ($nnp\Lambda$) are the two simplest observed hypernuclei, yet their binding energies exhibit significant difference. Precise measurements of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H yields in heavy ion collisions provide important guidance on the understanding of hypernuclei production mechanisms as well as the role of the hyperon and nucleon (Y-N) interaction in hypernuclei formation. The second phase of the Beam Energy Scan program at RHIC (BES-II) offers us a great opportunity to investigate collision energy and system size dependence of hypernuclei production.

In this talk, we will present new measurements on the production yields of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H and their ratios to Λ from Au+Au collisions at $\sqrt{s_{NN}}$ = 3 to 27 GeV utilizing the STAR BES-II datasets. We will also report the measurements on the rapidity (y) and centrality dependence of the production yields (dN/dy) of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H in $\sqrt{s_{\mathrm{NN}}}$ = 3.2, 3.5, 3.9, 4.5 GeV Au+Au collisions. The physics implications of these results will be discussed together with theoretical model calculations.