Production of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H in Au+Au collisions at $\sqrt{s_{NN}}$ = 3.2, 3.5, 3.9 and 4.5 GeV at STAR

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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. The ${}^{3}_{\Lambda}$H is the loosest bound hypernucleus, with a Λ binding energy of $\sim$0.1 MeV, while the ${}^{4}_{\Lambda}$H is more strongly bound, with a Λ binding energy of $\sim$2 MeV. 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-nucleon (Y-N) interaction in hypernuclei formation. The second phase of the Beam Energy Scan program at RHIC (BES-II) offers a great opportunity to investigate collision energy and system size dependence of hypernuclei production.

In this poster, the measurements of the production yields of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H and their ratios to Λ in Au+Au collisions at $\sqrt{s_{NN}}$ = 3.2, 3.5, 3.9 and 4.5 GeV will be presented. The rapidity (y) and centrality dependence of the production yields (dN/dy) of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H will also be reported. The physics implications of these results will be discussed together with theoretical model calculations.