Multiplicity dependence of Hyperon and Hypertriton Production in Zr+Zr and Ru+Ru collisions at $\sqrt{s_{\mathrm{NN}}} = 200\,\mathrm{GeV}$

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In heavy-ion collisions, the production mechanism of hypernuclei, bound states of hyperons and nucleons, is still not fully understood. Recent theoretical model calculations show that a systematic measurement of the multiplicity dependence of yield ratios, such as ${}^{3}_{\Lambda}\mathrm{H}/\Lambda$ and $\mathrm{S}_3 = ({}^{3}_{\Lambda}\mathrm{H}/{}^{3}\mathrm{He})/(\Lambda/\mathrm{p})$, can provide strong distinguishing power between different production mechanisms and offer insights into the possible connection between hypernuclei production yields and their internal structure. In 2018, STAR recorded a huge sample of about 4 billion minimum bias events from Zr+Zr and Ru+Ru collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV, enabling a detailed investigation of the multiplicity dependence of hyperon and hypertriton production.

In this presentation, we present new measurements on hyperons ($\Lambda, \bar{\Lambda}$ and $\Xi^{-}, \bar{\Xi}^{+}$) and hypertriton, including their transverse momentum (p_{T}) spectra and p_{T}-integrated yields ($\mathrm{d}N/\mathrm{d}y$), in four different centrality classes of Zr+Zr and Ru+Ru collisions at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV. The hyperon yields will be compared to those in Au+Au collisions to study the system size dependence of strangeness production. The yield ratios of ${}^{3}_{\Lambda}\mathrm{H}/\Lambda$ and S_3 will be shown as a function of multiplicity and compared with model calculations. Physics implications on hypernuclei production mechanism as well as Y-N interaction will be discussed.