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Measurements of light hypernuclei properties and production yields in Au+Au collisions from the STAR experiment

Monday 24 April 2023 16:15 (25 minutes)

Hypernuclei are bound states of nucleons and hyperons. Precise measurements of hypernuclei properties and production yields can shed light on the poorly understood hyperon−nucleon (Y-N) interaction and production mechanisms of hypernuclei.

Thanks to the high statistics data and low collision energies, the STAR beam energy scan phase-II program provides a great opportunity to study hypernuclei production. In this presentation, we will report production yields of ${}^{3}_{\Lambda}\mathrm{H}$, ${}^{4}_{\Lambda}\mathrm{H}$ in Au+Au collisions at $\sqrt{s_{NN}}$ = 3, 19.6, and 27 GeV. The strangeness population factors ($\mathrm{S_A} = {}^{\mathrm{A}}_{\Lambda}\mathrm{H}/({}^{\mathrm{A}}\mathrm{He} \times \frac{\Lambda}{\mathrm{p}})$), S_3 and S_4, and A=4 hypernuclei yield ratio (${}^{4}_{\Lambda}\mathrm{He}/{}^{4}_{\Lambda}\mathrm{H}$) will also be presented. We will also report precise measurements of ${}^{3}_{\Lambda}\mathrm{H}$ branching ratio and lifetimes of light hypernuclei. The results will be compared with model calculations and physics implications will be discussed.

Theory / experiment

Experiment

Group or collaboration name

the STAR Collaboration

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