

${}^4_{\Lambda}\text{He}$ Production in $\sqrt{s_{NN}} = 3$ GeV Au+Au Collisions

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Abstract

Hypernuclei, bound states of nuclei with one or more hyperons, serve as a natural laboratory to investigate the hyperon-nucleon interaction. Low energy heavy-ion collisions, creating high-baryon density conditions, provide a unique opportunity to study the production mechanism of hypernuclei. Comparison of ${}^4_{\Lambda}\text{He}$ yield with its isobar ${}^4_{\Lambda}\text{H}$ sheds light on the hyperon-nucleon interactions under finite pressure.

In this talk, we will present the first results on the ${}^4_{\Lambda}\text{He}$ differential yield as a function of rapidity and transverse momentum. These results are from the data recorded by the STAR experiment with fixed-target Au+Au collisions at $\sqrt{s_{NN}} = 3$ GeV. The differential yield of ${}^4_{\Lambda}\text{He}$ will be compared to that of ${}^4_{\Lambda}\text{H}$ in 0-50% central collisions at the same energy. The results will be compared to different model calculations and the relevant physics implications will be discussed.