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The hypertriton and hyperquadron directed flow measurements in √sNN = 3 GeV Au+Au collisions from STAR

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Collective flow has been commonly used for studying the properties of matter created in high-energy heavy-ion collisions, due to its high sensitivity on early stage collision dynamics. The first-order Fourier coefficient of azimuthal distributions of produced particles v_1, also called directed flow, has been analyzed for different particle species from the lightest mesons to light nuclei in such collisions. In this talk, we report ${}^{3}_{\Lambda}\mathrm{H}$ reconstruction from its two-body and three-body pionic decay channels, and ${}^{4}_{\Lambda}\mathrm{H}$ reconstruction from its two-body pionic decay channel. Then, the first observation of the hyper-nuclei ${}^{3}_{\Lambda}\mathrm{H}$ and ${}^{4}_{\Lambda}\mathrm{H}$ directed flow v_1 from $\sqrt{s_{NN}} = 3$ GeV mid-central (5–40%) Au+Au collisions at RHIC will be presented. The directed flow of ${}^{3}_{\Lambda}\mathrm{H}$ and ${}^{4}_{\Lambda}\mathrm{H}$ are compared with those of the copiously produced particles such as p, Λ, d, t,^{3}He and ^{4}He. It is observed that the slopes of v_1 at midrapidity for the hyper-nuclei ${}^{3}_{\Lambda}\mathrm{H}$ and ${}^{4}_{\Lambda}\mathrm{H}$ follow a baryon number scaling implying that coalescence process is a dominant mechanism for the hyper-nuclei production in these collisions. Hyper-nuclei directed flow measurement would shed light on the hyperon-nucleon (YN) interaction in condensed nuclear medium with finite pressure.

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