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Directed Flow of Λ, $^{3}_{\Lambda}\mathrm{H}$, and $^{4}_{\Lambda}\mathrm{H}$ in Au+Au collisions at $\sqrt{s_{NN}}$ = 3.2, 3.5, 3.9 and 4.5 GeV at RHIC

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Studying hyper-nuclei production and their collectivity can shed light on their production mechanism as well as the hyperon-nucleon interactions. Heavy-ion collisions from the RHIC beam energy scan phase II (BES-II) provide an unique opportunity to understand these at high baryon densities.

In this presentation, we will show a systematic study on energy dependence of the directed flow for Λ and hyper-nuclei ($^{3}_{\Lambda}\mathrm{H}$, $^{4}_{\Lambda}\mathrm{H}$) from mid-central Au+Au collisions at $\sqrt{s_{NN}}$ = 3.2, 3.5, 3.9 and 4.5 GeV, collected by the STAR experiment with the fixed-target mode during BES-II. The rapidity (y) dependence of the hyper-nuclei v_1 is studied in mid-central collisions. The extracted v_1 slopes ($dv_1/dy|_{y=0}$) of the hyper-nuclei are positive and decrease gradually as the collision energy increases. These hyper-nuclei results will be compared to that of light-nuclei including p, d, t/^{3}He and ^{4}He. Finally, discussions will be made using comparison to hadronic transport model including coalescence after-burner calculations.

Auteur principal: HAN, Junyi

Co-auteur: RADHAKRISHNAN, Sooraj (Kent State University/Lawrence Berkeley National Laboratory)

Orateur: HAN, Junyi

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