

1 Directed Flow of Λ , ${}^3_{\Lambda}\text{H}$, and ${}^4_{\Lambda}\text{H}$ in Au+Au collisions at 2 $\sqrt{s_{NN}} = 3.2, 3.5, 3.9$ and 4.5 GeV at RHIC

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

9 In this presentation, we will show a systematic study on energy dependence of the directed
10 flow for Λ and hyper-nuclei (${}^3_{\Lambda}\text{H}$, ${}^4_{\Lambda}\text{H}$) from mid-central Au+Au collisions at $\sqrt{s_{NN}} = 3.2, 3.5,$
11 3.9 and 4.5 GeV, collected by the STAR experiment with the fixed-target mode during BES-
12 II. The rapidity (y) dependence of the hyper-nuclei v_1 is studied in mid-central collisions.
13 The extracted v_1 slopes ($dv_1/dy|_{y=0}$) of the hyper-nuclei are positive and decrease gradually
14 as the collision energy increases. These hyper-nuclei results will be compared to that of light-
15 nuclei including p, d, t/ ${}^3\text{He}$ and ${}^4\text{He}$. Finally, discussions will be made using comparison to
16 hadronic transport model including coalescence after-burner calculations.