

1  ${}^3_{\Lambda}\text{H}$  and  ${}^4_{\Lambda}\text{H}$  directed flow measurements in  
2  $\sqrt{s_{NN}} = 3$  GeV Au+Au collisions from STAR

3 Yapeng Zhang (for STAR Collaboration)

Institute of Modern Physics, China

4 October 2021

5 **Abstract:** Collective flow has been commonly used for studying the prop-  
6 erties of matter created in high-energy heavy-ion collisions, due to its high sen-  
7 sitivity on early stage collision dynamics. The first-order Fourier coefficient of  
8 azimuthal distributions of produced particles  $v_1$ , also called directed flow, has  
9 been analyzed for different particle species from the lightest mesons to light  
10 nuclei in such collisions. In this talk, we report  ${}^3_{\Lambda}\text{H}$  reconstruction from its two-  
11 body and three-body pionic decay channels, and  ${}^4_{\Lambda}\text{H}$  reconstruction from its  
12 two-body pionic decay channel. Then, the first observation of the hyper-nuclei  
13  ${}^3_{\Lambda}\text{H}$  and  ${}^4_{\Lambda}\text{H}$  directed flow  $v_1$  from  $\sqrt{s_{NN}} = 3$  GeV mid-central (5–40%) Au+Au  
14 collisions at RHIC will be presented. The directed flow of  ${}^3_{\Lambda}\text{H}$  and  ${}^4_{\Lambda}\text{H}$  are com-  
15 pared with those of the copiously produced particles such as p,  $\Lambda$ , d, t,  ${}^3\text{He}$  and  
16  ${}^4\text{He}$ . It is observed that the slopes of  $v_1$  at midrapidity for the hyper-nuclei  ${}^3_{\Lambda}\text{H}$   
17 and  ${}^4_{\Lambda}\text{H}$  follow a baryon number scaling implying that coalescence process is a  
18 dominant mechanism for the hyper-nuclei production in these collisions. Hy-  
19 pernuclei directed flow measurement would shed light on the hyperon-nucleon  
20 (YN) interaction in condensed nuclear medium with finite pressure.