



Contribution ID: 295

Type: **Contributed Oral Presentation**

Flow measurements of hyper- and light-nuclei in Au+Au collisions at 3.0 GeV at RHIC

Monday, 26 May 2025 17:40 (15 minutes)

Studying hyper-nuclei yields 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 report on the directed flow (v_1) and the elliptic flow (v_2) of hyper-nuclei, including Λ , ${}^3_\Lambda\text{H}$, ${}^4_\Lambda\text{H}$ and ${}^4_\Lambda\text{He}$, using approximately 2 billion minimum-bias events from Au+Au collisions at $\sqrt{s_{NN}} = 3.0$ GeV, collected by the STAR experiment in the fixed-target mode during BES-II. The large event statistics will enable detailed differential flow measurements of hyper-nuclei in rapidity (y) and transverse momentum (p_T), and extend v_2 measurements to ${}^3_\Lambda\text{H}$, ${}^4_\Lambda\text{H}$ and ${}^4_\Lambda\text{He}$. These hyper-nuclei results are compared to that of light-nuclei including p, d, t, ${}^3\text{He}$ and ${}^4\text{He}$. Finally, these results are compared with calculations from a hadronic transport model.

Consent

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Session Classification: Parallel Session

Track Classification: Hot and Dense Nuclear Matter