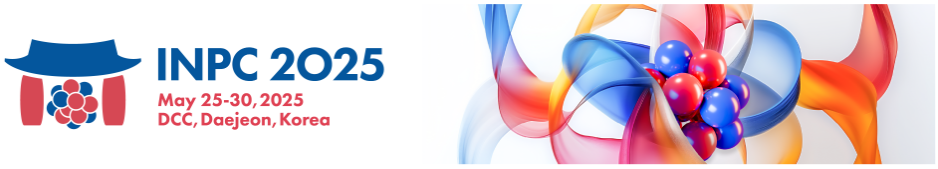

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Light nuclei collective flow in Au+Au Collisions from STAR BES-II experiment

Monday, 26 May 2025 17:55 (15 minutes)

Study of light nuclei flow in heavy-ion collisions provides valuable insights into their production mechanisms and the underlying collision dynamics, making it of particular interest for both theoretical and experimental research.
Previous measurements by the STAR experiment have shown the light nuclei directed flow v_1 follow a mass number scaling at $\sqrt{s_{NN}}$ =3 GeV[1].
At the same time there is a hint that the deuteron v_1 slope shows an opposite sign compared to that of the proton at $\sqrt{s_{NN}}$ >7.7 GeV, which is in conflict with the nucleon coalescence picture[2].

In this talk, we will show measurements of directed and elliptic flow (v_2) for light nuclei (deuteron, triton, ^{3}He and ^{4}He) in Au+Au collisions at $\sqrt{s_{NN}}$ =3.0-4.5 GeV, along with new precision measurements of v_1 of deuterons and anti-deuterons at $\sqrt{s_{NN}}$ =7.7-19.6 GeV by the STAR experiment at RHIC from the Beam Energy Scan Phase - II. The rapidity and transverse momentum dependence of flow will be presented and compared with those of protons and anti-protons. These results will also be discussed within the framework of nucleon coalescence.

[1] M.S. Abdallah *et al.* (STAR Collaboration), Phys. Lett. B **827**, 136941 (2022)
[2] J. Adam *et al.* (STAR Collaboration), Phys. Lett. B **102**, 044906 (2020)

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