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Collision Energy and Centrality Dependence of Light Nuclei (Triton) Production at RHIC with the STAR Experiment

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In high-energy nuclear collisions, light nuclei provide a unique tool to explore the QCD phase structure. The production of light nuclei is sensitive to the temperature and phase-space density of the system at freeze-out. In addition, phase transition will lead to large baryon density fluctuations, which will be reflected in the light nuclei production. For example, the ratio of proton ($N(p)$) and triton ($N(t)$) to deuteron ($N(d)$) yields, which is defined as $N(t)\cdot\mathrm{N(p)}/N^2(d)$, may be used as a sensitive observable to search for the QCD critical point [1].

In this poster, we will report the first results of the collision energy and centrality dependence of triton production in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}}$ = 7.7, 11.5, 14.5, 19.6, 27, 39, 62.4 and 200 GeV, measured by the STAR experiment at RHIC. We will present the beam energy dependence of the coalescence parameter $B_3(t)$, directed flow (v_1) of light nuclei (d, t, ^{3}He), and the yield ratio $N(t)\cdot\mathrm{N(p)}/N^2(d)$. We will also show the energy dependence. Their physics implications will be discussed.

Reference
[1] K.J. Sun, L.W. Chen, C.M. Ko and Z.B. Xu, Phys. Lett. B 774, 103 (2017), arXiv:1702.07620.

Content type

Experiment

Collaboration

STAR

Centralised submission by Collaboration

Presenter name already specified

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