# First Measurements of Hyper-Nucleus ${}^{3}_{\Lambda}\mathrm{H}$ Global Polarization in Au+Au collisions at STAR

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**Abstract**

The large angular momentum generated in non-central heavy-ion collisions contributes to the formation of vorticity within the medium, which subsequently induces polarization of particles with non-zero spin. Recent model predictions suggest that the decay products of a polarized ${}^{3}_{\Lambda}\mathrm{H}$-nucleus are highly sensitive to its spin structure [1]. Additionally, in regions of high baryon density, the enhanced production of ${}^{3}_{\Lambda}\mathrm{H}$ makes their polarization measurement feasible.

In order to understand the spin structure of the ${}^{3}_{\Lambda}\mathrm{H}$ hyper-nucleus as well as its production mechanism, we have carried out a systematic study of the global polarization of the ${}^{3}_{\Lambda}\mathrm{H}$ hyper-nucleus using 3 GeV Au+Au collisions with about 2 billion events collected during 2021 by STAR. Both 2-body and 3-body decays are used for the reconstruction of the ${}^{3}_{\Lambda}\mathrm{H}$. Finally, the results will be compared with model predictions based on different assumptions of spin structures.

## References

[1] Kai-Jia Sun, Dai-Neng Liu, Yun-Peng Zhen, Jin-Hui Chen, Che Ming Ko, and Yu-Gang Ma. Global polarization of (anti-)hypertriton in heavy-ion collisions, 2024.