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Helical vortical effect and matter/anti-matter polarization asymmetry

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It is well-known that vorticity induces polarization in quantum plasmas via chiral vortical effect (CVE). Besides the CVE-induced axial current, vorticity gives rise in the presence of a net baryon charge also to a helicity current via the novel helical vortical effect (HVE) [1], which is the focus of the present talk. The HVE and CVE applied together naturally explain the matter/anti-matter polarization asymmetry seen in the experimental data for hyperons reported by STAR [2].

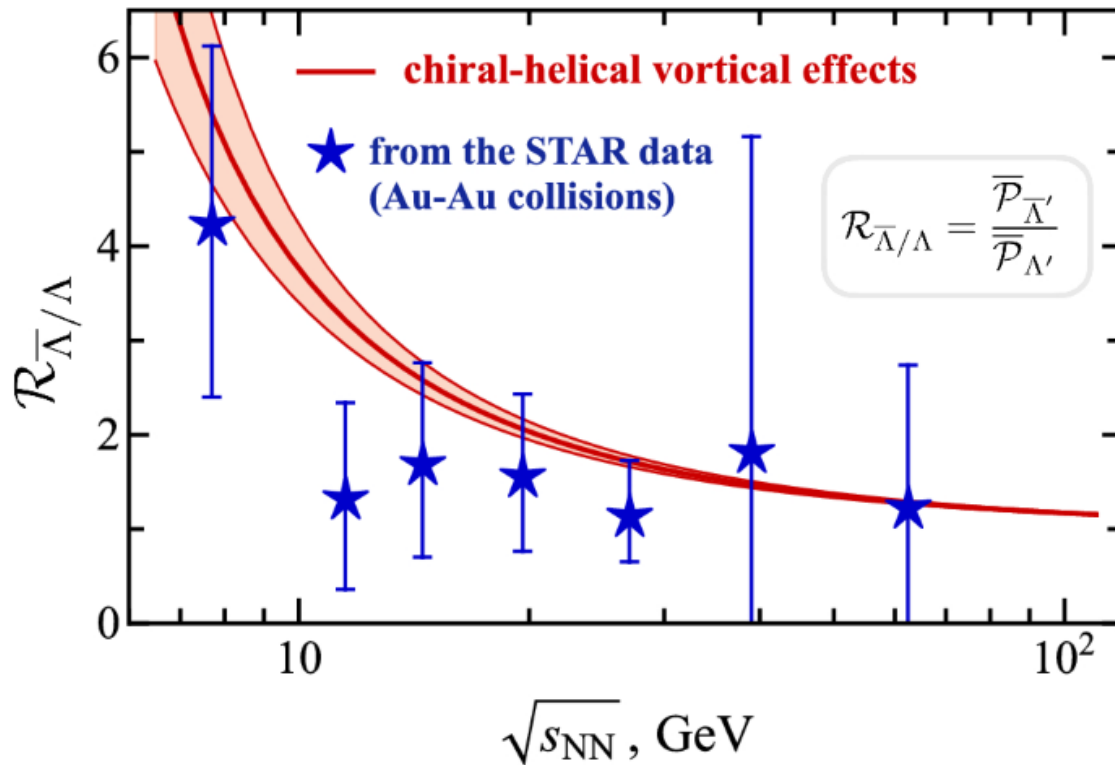


Figure 1: Ratio between anti-Lambda and Lambda hyperon polarization with respect to the collision energy

[1]: Victor E. Ambrus, M. N. Chernodub, Eur. Phys. J. C 83 (2023) 111. DOI: 10.1140/epjc/s10052-023-11244-0.

[2]: Victor E. Ambrus, M. N. Chernodub, Eur. Phys. J. C 82 (2022) 61. DOI: 10.1140/epjc/s10052-022-10002-y.

Category

Theory

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