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Energy loss and chiral magnetic effect

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Chiral media, such as quark-gluon plasma, possess a number of unique properties originating from the quantum phenomenon of the chiral anomaly. These properties can be measured by observing the propagation of fast charged particles moving through the medium and the radiation produced in the process. We show how the chiral anomaly confers distinctive features onto the particle energy loss and its radiation spectrum. We argue then that this makes quantum tomography a powerful and versatile tool to investigate the properties of chiral systems ranging from the Weyl semimetals to the quark-gluon plasma to the axion stars.

Based on Hansen and Tuchin, Phys. Rev. C 104, no.3, 034903 (2021) and Phys. Rev. D 105, no.11, 116008 (2022).

Category

Theory

Collaboration (if applicable)

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