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Jet shape depending on the gradient of jet energy loss in heavy-ion collisions

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Jet shape is studied with a linear Boltzmann transport model for event-by-event simulations of photon-tagged jets in heavy-ion collisions. The transverse momentum asymmetry $A_\perp$ is shown to increase with the initial transverse position when the gradient of jet transport coefficient $\hat{q}$ increases until at the edge of the nonuniform medium. On one hand,the shape of the photon-tagged jet selected by the smaller $A_\perp$ events is "fatter" for the transverse momentum distribution inside the jet due to stronger jet quenching. On the other hand, the jet shape with higher p_T^{jet} is "thinner" due to surface emission of the initial jets. Our numerical results show that the different choices for both final observables $A_\perp$ and p_T^{jet} demonstrate different initial jet creation cites and therefore different jet shapes depending on the gradient of $\hat{q}$.

Theory / experiment

Theory

Group or collaboration name

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