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Jet Drift in Heavy Ion Collisions

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We introduce a sub-eikonal anisotropic contribution to jet-broadening, “jet drift”, that couples to the flow of the medium, showing that this effect results in a deflection of hard partons, and thus jets, in the direction of the medium flow. Next, we study this effect in both toy models and a full-fledged hybrid transport simulation of $\sqrt{s} = 5.02$ TeV PbPb collisions at the LHC, tracking trajectories of hard partons with perturbative energy loss and drift. We show that sub-eikonal anisotropic effects, including flow-mediated jet drift, are sensitive to properties of the medium that traditional eikonal isotropic effects are insensitive to, demonstrating that including these effects leads to modifications to jet and hard particle observables that survive averaging over events. We show that jet drift leads to an enhancement of the elliptic flow (v_2) of hard particles and discuss the implications for jet substructure and medium response effects.

Category

Theory

Collaboration

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