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Jet Drift in Heavy Ion Collisions: Acoplanarity and v_2

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We introduce a sub-eikonal anisotropic contribution to jet-broadening, "jet drift," that couples to the flow of the nuclear medium, showing that this effect results in a deflection of hard partons, and thus jets, in the direction of the medium flow. We study Two-jet observables i.e. v_2 and acoplanarity for $\sqrt{s} = 5.02$ TeV PbPb collisions at the LHC. We show that jet drift leads to an enhancement of the elliptic flow (v_2) of charged hadrons and modification of the acoplanarity of dihadrons and discuss the implications for jet substructure and medium response effects. We also demonstrate that we can obtain independent information about the event geometry encoded in the drift modification to acoplanarity vs v_2 enhancement, whereas the temperature dependence of these observables is qualitatively different. By entangling this temperature vs geometry dependence of these observables, we can add discriminatory power to our analysis.
Next, we study acoplanarity & v_2 across different system sizes and collisional energies i.e. 200 GeV AuAu collision at RHIC using our in-house simulation package (APE). Our analysis will be critical for understanding and generalizing dynamical jet-QGP interactions for different collisional systems and energies. We further plan on investigating the "jet drift"effect on these observables for deformed nuclear systems (XeXe, UU, etc.) from ultra central collisions which will aid event engineering (designing selection cuts to maximize jet drift signal) applications in the future.

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