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Centrality dependence of collectivity in kinetic theory

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To what extent are fluid-dynamic or particle-like excitations at the origin of the flow phenomena observed in pp, pA and AA collisions? And how does the interplay between these two sources of collectivity change as a function of system size and energy density? Here, we address this question in a simple transport theory that interpolates between free-streaming and viscous fluid dynamics. We discuss how this transport theory accounts for the centrality dependence of v_2 and v_3 between 1% and 90% centrality. Investigating the properties of the energy-momentum tensor evolved in this kinetic theory, we conclude that kinetic theory is consistent with a fluid dynamic picture of central PbPb collisions at the LHC, but that it strongly deviates from such a picture in peripheral PbPb collisions.

based on A. Kurkela, U.A. Wiedemann and B. Wu, arXiv:1803.02072 arXiv:1805.04081 and work in preparation.

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