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Flow as an interplay of fluid-like and non-fluid like excitations

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To study the microscopic structure of quark-gluon plasma produced in hadronic collisions, data must be confronted with models that go beyond fluid dynamics. In order to illustrate the importance of non-fluid like excitations in small systems such as pp and pA collisions, I shall discuss the interplay of fluid-like and non-fluid like excitations in a simple kinetic theory model that encompasses fluid dynamics but contains also particle-like excitations in a boost invariant setting with no symmetries in the transverse plane and with large initial momentum asymmetries. This kinetic theory is confronted with data on azimuthal flow coefficients over a wide centrality range in PbPb collisions at the LHC, in AuAu collisions at RHIC, and in pPb collisions at the LHC. In this way, I shall present the evidence that non-hydrodynamic excitations make the dominant contribution to collective flow signals in pPb collisions at the LHC and contribute significantly to flow in peripheral nucleus-nucleus collisions, while fluid-like excitations dominate collectivity in central nucleus-nucleus collisions at collider energies.

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