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Quantifying the degree of hydrodynamic behaviour in hadronic collisions

Exploiting the first measurements of the same ion species in O+O collisions at RHIC and LHC, we propose an experimentally accessible observable to distinguish whether collective behavior builds up through a hydrodynamic expansion of a strongly interacting QGP or through few rescatterings in a non-equilibrated dilute medium. Our procedure allows to disentangle the effects of the initial state geometry and the dynamical response mechanism on the total resulting anisotropic flow. We validate the ability of our proposed observable to discriminate between systems with different interaction rates using results from event-by-event simulations in RTA kinetic theory. As a proof of concept, we extract the degree of hydrodynamization for Pb+Pb collisions at LHC from experimental data.

Category

Theory

Collaboration (if applicable)

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