

Abstract Submitted  
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**Hydrodynamic event-plane correlations in Pb+Pb collisions at LHC<sup>1</sup>** ZHI QIU, ULRICH HEINZ, The Ohio State University — The correlations among event-plane angles measured by the ATLAS collaboration are compared to those from event-by-event viscous hydrodynamic simulations. The results show that the event-plane correlations are rooted in mode-coupling effects during the non-linear hydrodynamic evolution of the fireballs. These mix harmonic deformations of different orders, and this manifests itself in certain correlation patterns among the final flow angles that cannot be directly explained from correlations among the so-called participant plane angles in the initial state. Hydrodynamic evolution of the initial state into the experimentally observed final state is therefore necessary to understand the experimental data. It is also shown that the strength of the observed correlation is sensitive to the specific shear viscosity of the expanding fireball medium. When taken together with other observables, event-plane correlations thus impose constraints on both the initial state fluctuation spectrum and the transport coefficients of the quark-gluon plasma created in ultra-relativistic heavy-ion collision.

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Zhi Qiu  
The Ohio State University

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