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Principal component analysis and factorization breaking

Tuesday, 29 September 2015 16:30 (2 hours)

We perform a Principal Component Analysis (PCA) of $v_3(p_T)$ in event-by-event hydrodynamic simulations of Pb+Pb collisions at the LHC. We show that factorization matrix $r_3(p_{T1}, p_{T2})$ can be economically presented in terms of two dominant principal components of the two particle correlation function. We find that the subleading flow is predominantly a response to the radial excitations of third order eccentricity. We present a systematic study of the hydrodynamic response to these radial excitations in 2+1D viscous hydrodynamics. Finally, we construct a good geometrical predictor for the orientation angle and magnitude of the leading and subleading flows using two Fourier modes of the initial geometry.

References:

A. Mazeliauskas and D. Teaney, Phys. Rev. C 91,(2015) 044902

R.S. Bhalerao, J.Y. Ollitrault, S. Pal, and D. Teaney, Phys. Rev. Lett. 114, (2015) 152301

On behalf of collaboration:

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