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Measuring correlation between flow harmonics with moments in ALICE experiment in LHC

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One of the important results in Heavy Ion collisions is anisotropic distribution of particle production. This collective phenomena is known as anisotropic flow, and successfully parameterized by a Fourier harmonics. The correlation between different flow harmonics may provide a new window into both the early stage dynamics and transport properties of QGP. Several flow observables have been studied by measuring moments [1], with two symmetric sub-events group separated by a single rapidity gap. The advantage of using this method is that we can suppress non-flow (e.g. from jets and/or resonances) in addition to suppressing self-correlation effects. We measure the correlation between different flow harmonics (both magnitude and event plane angle direction) and estimate non-linear coefficients of the hydrodynamic response. In this presentation, our methods will be discussed in detail, and our results will be compared to the AMPT simulation and various hydrodynamic calculations.

[1] R. S. Bhalerao, J. Y. Ollitrault, S. Pal, arXiv:1307.0980, R.S. Bhalerao et al., Phys. Lett. B **742** (2015) 9498

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