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Characterizing flow fluctuations with moments

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We present a complete set of multiparticle correlation observables for ultrarelativistic heavy-ion collisions. These include moments of the distribution of the anisotropic flow in a single harmonic, and also mixed moments, which contain the information on correlations between event planes of different harmonics. We explain how all these moments can be measured using just two symmetric subevents separated by a rapidity gap. This procedure is less demanding in terms of detector acceptance than the one based on several rapidity windows separated pairwise by gaps. These moments present a multi-pronged probe of the physics of flow fluctuations. For instance, they allow to test the hypothesis that event-plane correlations are generated by non-linear hydrodynamic response. They can be measured easily at LHC and even with detectors having smaller acceptance, and can be directly compared with theoretical calculations. We illustrate the method with simulations of events in A MultiPhase Transport (AMPT) model [1]. It is important to test if experimental data at LHC confirm these predictions.

[1] R.S. Bhalerao, J.-Y. Ollitrault, S. Pal, Phys. Lett. B 742 (2015) 94

On behalf of collaboration:

NONE

Primary author: BHALERAO, Rajeev (TIFR)

Co-authors: OLLITRAULT, Jean-Yves (CNRS); PAL, Subrata (Tata Institute of Fundamental Research, Mumbai, India)

Presenter: BHALERAO, Rajeev (TIFR)

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