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Flow Cumulants for Multi Particle Azimuthal Correlations in Heavy-Ion Collisions[1] SOMADUTTA BHATTA, Stony Brook University — Cumulant expansion of multiparticle azimuthal correlations is one of the most effective methods to measure the transverse momentum azimuthal anisotropy without the errors arising from non-uniform detector acceptance. These correlations are sensitive to the initial fluctuations and transport properties of the medium created in heavy ion collisions. In one of the first ATLAS measurements of azimuthal anisotropy in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV using a dataset of approximately 7 μb^{-1}, the Fourier coefficients were evaluated using multi-particle cumulants calculated with the generating function method. This work shows that the v_n measured with four-particle cumulants are significantly reduced compared to the measurement involving two-particle cumulants and that the models of the initial spatial geometry and its fluctuations fail to describe the flow fluctuations measurements. In another ATLAS measurement using using 470 μb^{-1} of Pb+Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV provided new information to disentangle flow fluctuations from the initial and final states, as well as gave new insights on the influence of centrality fluctuations. Sign change of multi-particle mixed-harmonics was emphasized in this work.

[1]ATLAS Collaboration

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