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Correlated azimuthal anisotropies with subevent cumulants in pp and pPb collisions with the CMS experiment

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Multi-particle correlations in hadronic colliding systems at both RHIC and the LHC are under detailed investigation in recent years. A wealth of experimental evidence suggests the presence of collective phenomena and the formation of a quark-gluon plasma (QGP) also in high-multiplicity pp and pPb collisions. In particular, multi-particle cumulant analyses have established the collective nature of these correlations. Nevertheless, despite the fact that a common paradigm seems to emerge for all hadronic systems, the exact underlying mechanism still needs to be understood. In particular, the measurement of long-range collective azimuthal correlations down to low multiplicities is still challenging experimentally due to contamination from jet-like correlations. New methods of multiparticle correlations using subevents were developed to suppress jet-like correlations at low multiplicities. Based on data collected by CMS experiment in pp and pPb collisions, correlated azimuthal anisotropies (v_n) between different orders are studied using the symmetric cumulants without sub-event and also using N subevents (N = 2, 3 and 4). Furthermore, the subevent cumulant method is also applied to extract v_n harmonics using six- and eight-particle correlations. These results provide crucial insights on the physical origin of observed long-range correlations in small colliding systems down to very low multiplicities.

Content type

Experiment

Collaboration

CMS

Centralised submission by Collaboration

Presenter name already specified

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