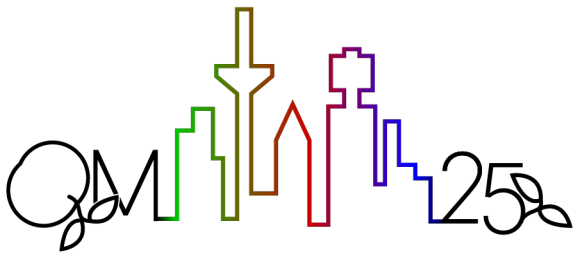

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First measurement of high p_{T} azimuthal anisotropy using subevent cumulants in small system collisions at CMS

Thursday 10 April 2025 09:20 (20 minutes)

Measurements at the LHC have provided evidence for collective behavior in high-multiplicity pp and pPb collisions through multiparticle correlation techniques. However, no conclusive evidence of jet quenching —characterized by the energy loss of high-p_{T} partons traversing the medium—have been observed in these smaller systems. This paradox raises an intriguing question: How can a medium that exhibits hydrodynamic-like behavior and substantially modifies the distribution of final-state hadrons have little to no effect on high-p_{T} particles? To explore this, we present a comprehensive analysis of differential Fourier coefficients (v_n) as a function of particle transverse momentum (p_{T}) and event multiplicity in pp and pPb collisions, recorded by CMS at 13 TeV and 8.16 TeV, respectively. In particular, first measurements of p_{T}-differential multiparticle cumulants using the subevent method are reported, probing an extended phase space region up to high p_{T} values. Furthermore, we compare the results across pp, pPb, and PbPb collisions within similar multiplicity ranges. This comparison will help assess similarities and differences in the medium's interaction with high-p_{T} particles in these three collision types.

Category

Experiment

Collaboration (if applicable)

CMS

Author: SINGH, Rohit Kumar (Indian Institute of Technology Madras (IN))

Presenter: SINGH, Rohit Kumar (Indian Institute of Technology Madras (IN))

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