



Contribution ID: 132

Type: Postar

Search for jet quenching with high p_T hadron azimuthal anisotropy using subevent cumulants in pPb collisions at CMS

Measurements at the LHC have provided evidence for collective behavior in high-multiplicity proton-lead (pPb) collisions through multiparticle correlation techniques. Yet, no conclusive evidence of jet quenching, indicating the energy loss of high- p_T partons as they traverse the medium, has been detected in pPb. This raises the intriguing question: How can a medium described by hydrodynamics, and that significantly modifies the distribution of final-state hadrons, yet has no significant impact on the distribution of high- p_T particles? To investigate this, a comprehensive study of differential Fourier coefficients (v_n) in particle transverse momentum (p_T) and event multiplicity is presented in pPb collisions recorded by the CMS experiment at a nucleon-nucleon center-of-mass energy $\sqrt{s_{NN}} = 8.16$ TeV. In particular, new measurements of p_T -differential multiparticle cumulants using the subevent method probes an extended phase space region up to a high particle p_T . Additionally, we compare the results between pPb and PbPb collisions in the same multiplicity window. This comparison will help assess similarities and differences in the medium's interaction with high- p_T particles in these two collision types.

Field of contribution

Experiment

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Track Classification: Heavy ion and QCD