

## **Azimuthal anisotropies for low- and high-p<sub>T</sub> particles in PbPb and pPb collisions with CMS**

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Previous measurements have demonstrated the collective nature of multiparticle correlations in high-multiplicity pPb collisions at the LHC. This collectivity, while consistent with a hydrodynamic flow origin, can also be interpreted in terms of initial state effects arising from gluon saturation. To investigate the detailed properties of this collectivity, differential Fourier coefficients in transverse momentum and pseudorapidity are presented based on a variety of analysis methods using data obtained with the CMS detector at the LHC. The multiparticle nature of the correlations is explored using 4-, 6- and 8-particle cumulant analyses as well as a Lee-Yang Zeros analysis that accounts for correlations among all particles. An event-plane analysis using the scalar product method is performed where the influence of recently demonstrated event-plane decorrelation on the pseudorapidity dependence is considered. The pPb collision results are compared to peripheral PbPb collision results obtained with comparable mid-rapidity charged particle densities. While a significant pseudorapidity dependence is observed in the azimuthal dependence of the particle yields, a decorrelation of the event-plane angle with pseudorapidity can account for much of the observed behavior.

### **Collaboration**

CMS

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