



Contribution ID: 695

Type: **Contributed talk**

Azimuthal anisotropy harmonics from long-range correlations in high multiplicity pp collisions at CMS

Tuesday, 29 September 2015 15:00 (20 minutes)

Observation of a long-range, near-side, two-particle correlation (known as the “Ridge”) in high-multiplicity pp and pPb collisions opened up new opportunities of exploring novel QCD dynamics in small collision systems. While extensive studies of this long-range correlation phenomenon in pPb collisions have revealed its collective properties, the nature of the ridge in pp collisions still remains unknown. New measurements of two-particle angular correlations for charged particles, and identified K_s^0 and Λ particles emitted in 7 TeV pp collisions are presented using the CMS detector. With the implementation of a high-multiplicity trigger during the 2010 LHC pp run, CMS is capable of probing the most exotic high multiplicity pp collisions. The second-order (v_2) and third-order (v_3) anisotropy harmonics of charged particles, K_s^0 and Λ particles are extracted from long-range correlations as a function of particle multiplicity and p_T , after correcting for the contribution of back-to-back jet correlations. Four-particle cumulants ($c_2\{4\}$) are also measured for charged particles as a function of multiplicity. The results are compared to 5.02 TeV pPb data covering a similar range of particle multiplicity. These new studies will provide stringent constraints on the possible origin of long-range correlations observed in small collision systems.

On behalf of collaboration:

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Session Classification: QGP in Small Systems II

Track Classification: QGP in Small Systems