

# Recent ATLAS measurements of correlations in Pb+Pb and Xe+Xe collisions

Friday 31 July 2020 12:12 (24 minutes)

ATLAS measurements of flow harmonics ( $v_n$ ) and their fluctuations in Pb+Pb and Xe+Xe collisions covering a wide range of transverse momenta, pseudorapidity and collision centrality are presented. The measurements are performed using data from Xe+Xe collisions at 5.44 TeV and Pb+Pb collisions at 2.76 and 5.02 TeV. The  $v_n$  are measured up to  $n = 6$  using the two-particle correlations, multi-particle cumulants, and scalar product methods. The  $v_n$  values are also performed using a non-flow subtraction technique that was developed for flow measurements in  $pp$  and  $p+Pb$  collisions. This non-flow subtraction is found to have a significant effect on the measured  $v_n$  at high- $p_T$  and in peripheral collisions.

A universal scaling in the  $p_T$  dependence of the  $v_n$  is observed for both systems. Measurements of correlations between the  $v_n$  for different order  $n$ , studied with three- and four-particle mixed-harmonic cumulants, are also presented, and contributions to these correlations from “centrality fluctuations” are also discussed. Measurements of longitudinal flow decorrelations involving two- and four-particle correlations for  $v_2$  and  $v_3$  in Xe+Xe and Pb+Pb collisions are also presented and compared with predictions from theoretical calculations. The four-particle decorrelation is found to not factorize as a product of two-particle decorrelations. The ability of such measurements to distinguish between different models of initial geometry and to reduce the uncertainty in determining the effective shear-viscosity to entropy-density ratio of the QGP is demonstrated.

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## Secondary track (number)

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**Session Classification:** Heavy Ions

**Track Classification:** 07. Heavy Ions