

Abstract Submitted  
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**Correlations of flow and transverse momentum in Pb+Pb and Xe+Xe collisions with ATLAS**<sup>1</sup> ARABINDA BEHERA, Stony Brook University, ATLAS COLLABORATION<sup>2</sup> — The measurement of the correlation between flow harmonics  $v_n$  and average transverse momentum  $[p_T]$  for  $n = 2, 3$  and  $4$  with the ATLAS detector at the LHC is presented, based on  $3\mu\text{b}^{-1}$  Xe+Xe collisions at  $\sqrt{s_{\text{NN}}} = 5.44$  TeV and  $22\mu\text{b}^{-1}$  Pb+Pb collisions at  $\sqrt{s_{\text{NN}}} = 5.02$  TeV. The observable is the Pearson's correlation coefficient  $\rho(v_n^2, [p_T])$  which is measured for several ranges in  $p_T$  and pseudorapidity  $\eta$ . The results show a strong dependence of the  $\rho(v_n^2, [p_T])$  on centrality,  $p_T$  and  $\eta$  ranges. Comparison of  $\rho(v_n^2, [p_T])$  measured using two different methods of event class definitions : the number of charged particles at mid-rapidity and transverse energy at the forward pseudorapidity, shows significant differences between these two methods indicating a strong influence of centrality fluctuations. When compared with theory models it is seen that the models can capture some of the qualitative trends of the measurement but they cannot describe all the quantitative trends. This measurement provides insights on the initial-state geometry and final-state dynamics in heavy ion collisions.

<sup>1</sup>ATLAS Collaboration

<sup>2</sup>ATLAS Collaboration at CERN

Arabinda Behera  
Stony Brook University

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