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# Flow and transverse momentum correlations in Pb+Pb and Xe+Xe collisions with ATLAS

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Fluctuations of event-wise average transverse momentum ($[p_{\mathrm{T}}]$)
and the harmonic flow ($v_n$) carry important information
about initial-state geometry.
Collisions of nuclei with large quadrapole deformation are predicted
to produce an initial state with enhanced shape and size fluctuations,
and result in non-trivial correlation between $v_n$ and $[p_{\mathrm{T}}]$
in the final state.
In particular, the $v_2 - [p_{\mathrm{T}}]$ correlations are predicted to be
different between collisions of spherical $^{208}$Pb and collisions of
deformed $^{129}$Xe.
This poster presents new measurement of $v_n - [p_{\mathrm{T}}]$ correlation in
$\sqrt{s_{\mathrm{NN}}} = 5.44$~TeV Xe+Xe collisions and compared with
Pb+Pb at $\sqrt{s_{\mathrm{NN}}} = 5.02$~TeV for harmonics $n = 2$, 3 and 4.
The correlation strength is found to depend strongly on centrality and
also on the choice of transverse momentum range of the particles
for all harmonics.
Comparison with theoretical model calculations are used to shed light on
the system-size dependence of this correlation and the influence of deformations.
This measurement provides inputs for better understanding of the
initial-state nuclear geometry and dynamics of heavy ion collisions.

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