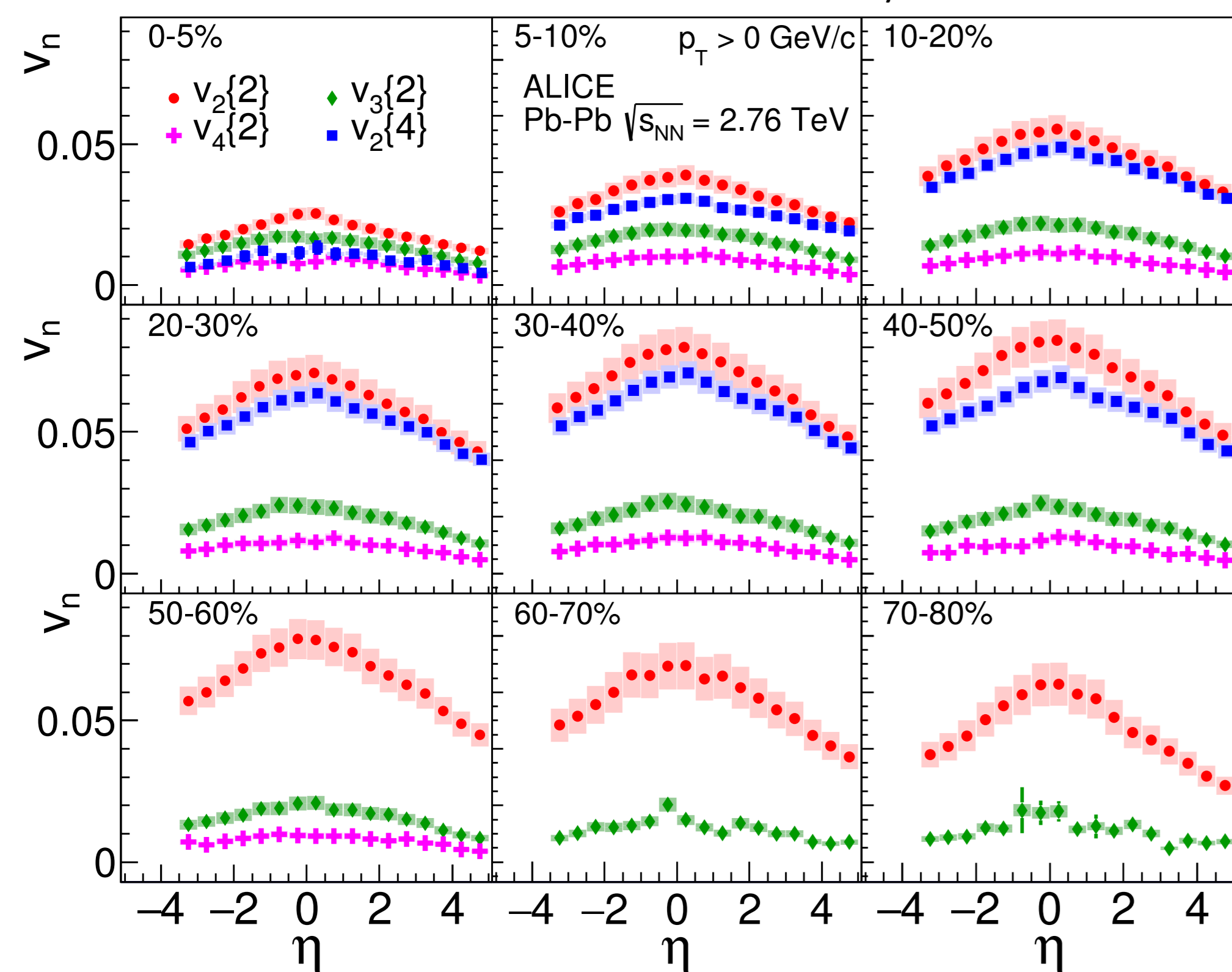


Introduction

Anisotropic flow (v_2 , v_3 , and v_4) has been measured by ALICE versus centrality and over a wide pseudorapidity range ($-3.5 < \eta < 5$) employing two- and four-particle correlations. The shape of $v_n(\eta)$ is investigated versus centrality to evaluate the role of initial state fluctuations. Comparisons to other experiments and energies are done to explore phenomena such as extended longitudinal scaling. The scaling behaviour with $dN_{ch}/d\eta$ is examined to investigate what drives the flow. Comparisons to hydrodynamic and non-equilibrium models are performed to evaluate their validity in heavy-ion collisions at the LHC.

Results

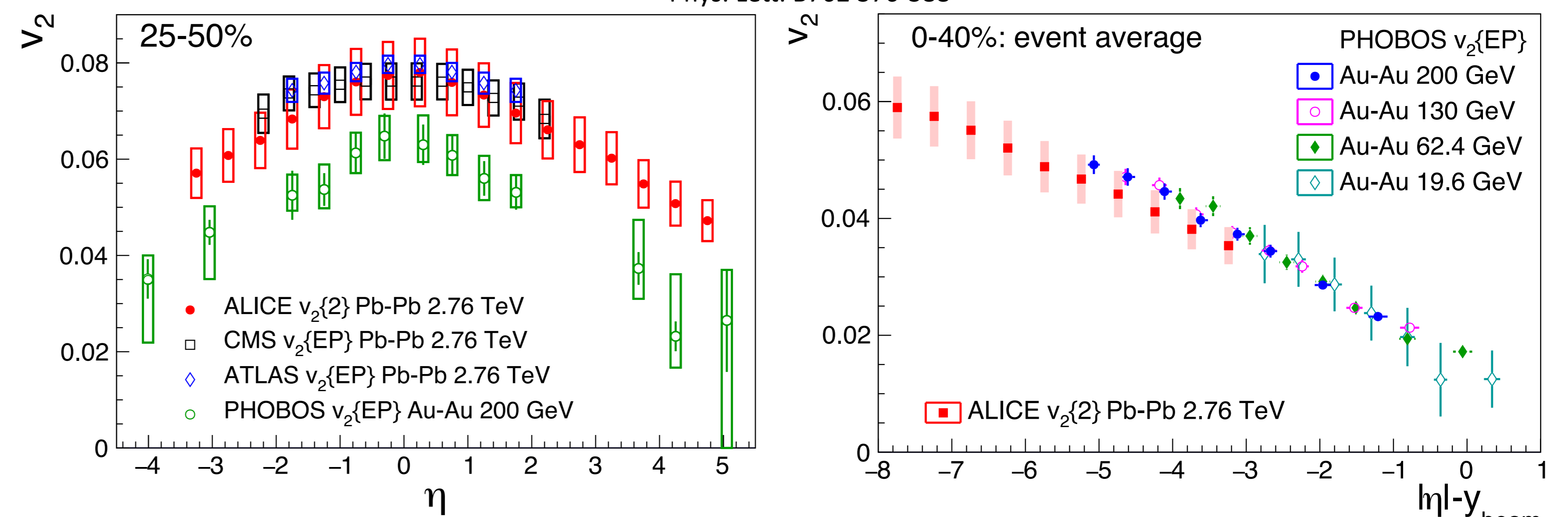
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- $v_2\{2\}$, $v_3\{2\}$, $v_4\{2\}$, and $v_2\{4\}$ vs η
- v_2 has strong centrality dependence
 - Due to nuclear overlap
- v_3 and v_4 have weaker centrality dependence
 - Dominated by initial state fluctuations

Comparison with other measurements

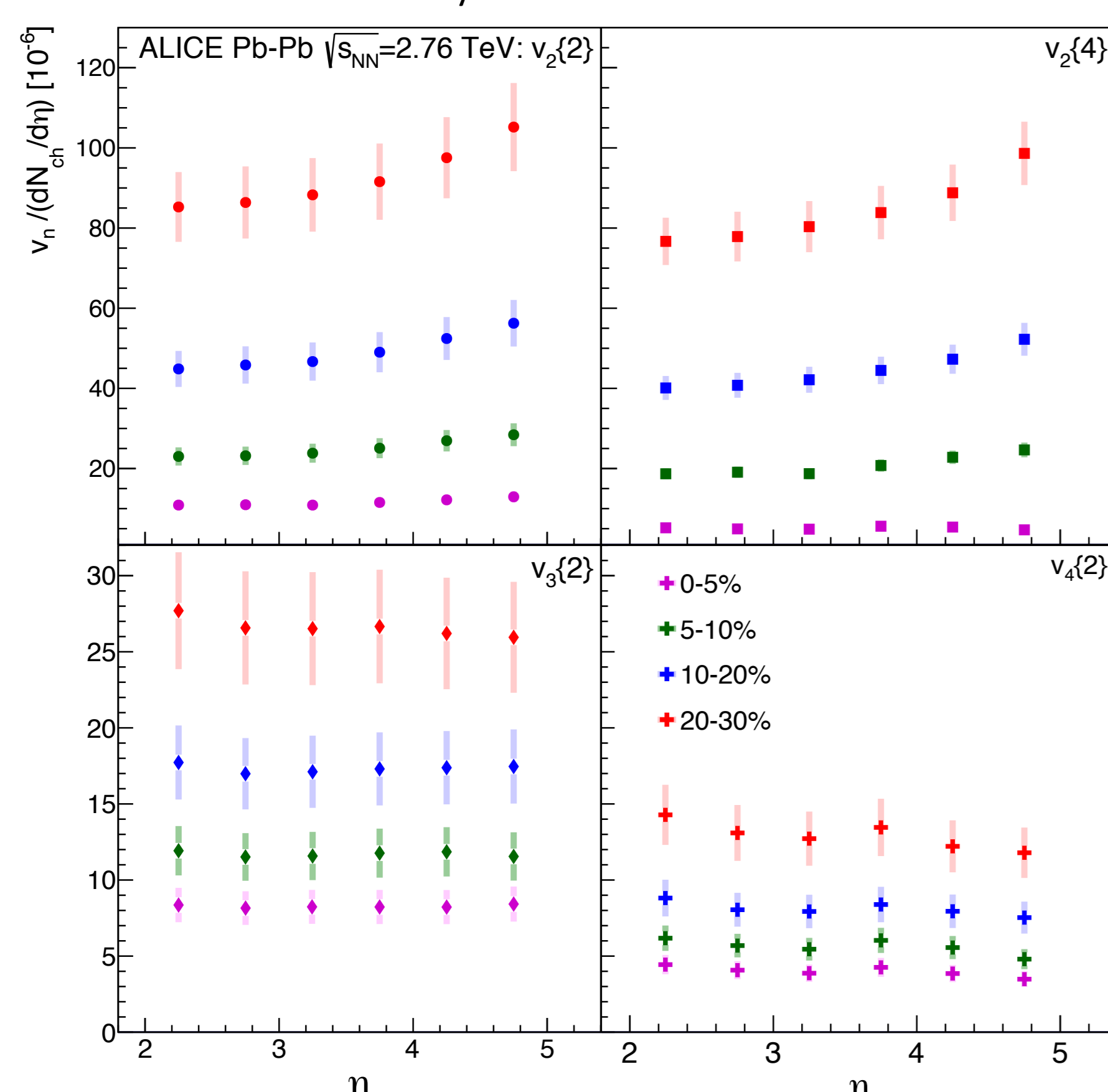
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- v_2 by ALICE, CMS, and ATLAS consistent in overlap region
- ALICE greatly extends η coverage
- v_2 increases from RHIC to LHC
 - Consistent with larger $\langle p_T \rangle$ at LHC
- Extended longitudinal scaling
 - universality of observable versus $|\eta| - y_{beam}$
 - Holds at RHIC energies
 - ALICE measurement confirms it to LHC energies

Scaling behaviour

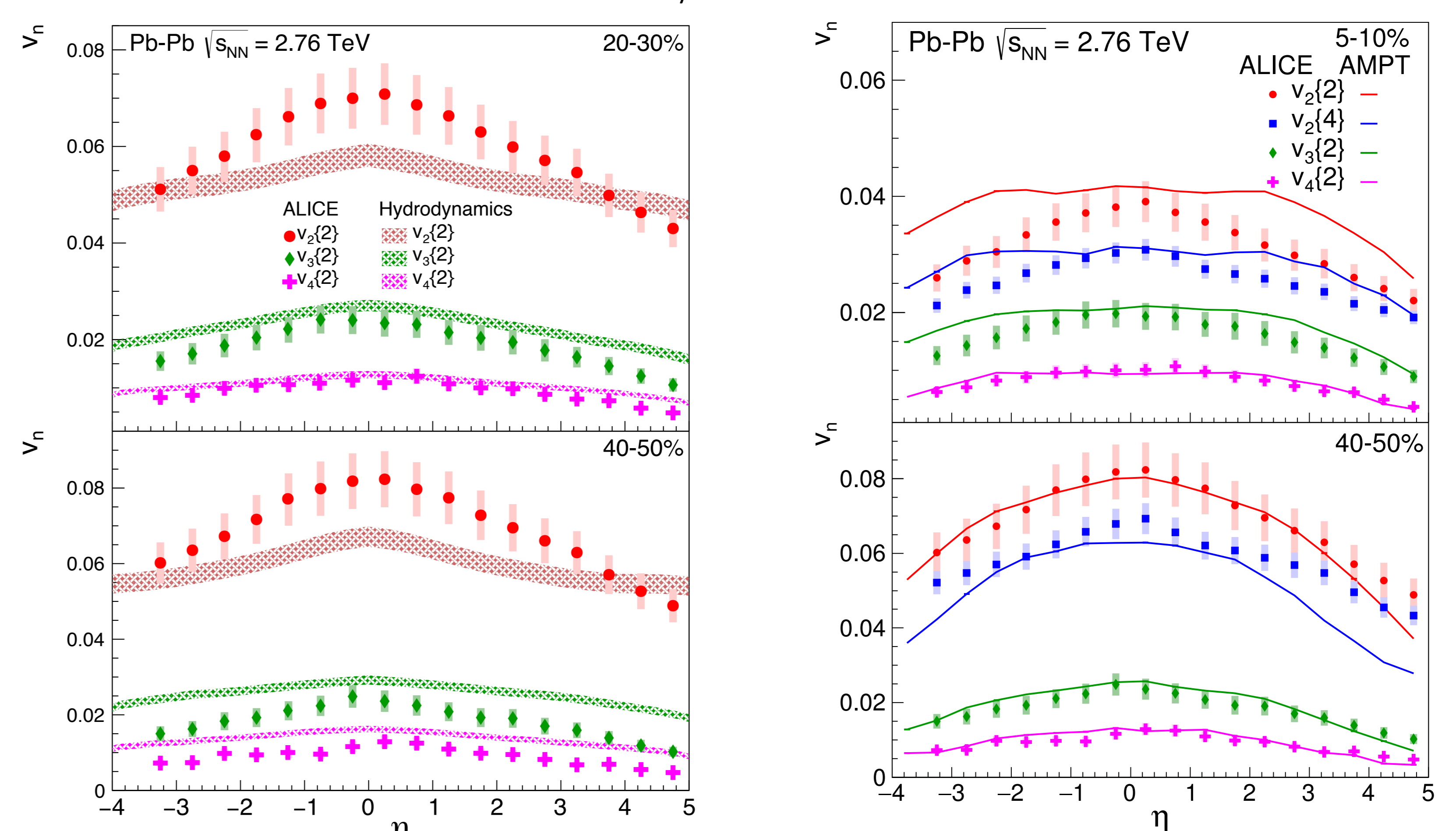
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- Scaling with $dN_{ch}/d\eta$
 - Small difference between η and y for $\eta > 2$
 - Ratio flat for v_3 and v_4 (not for v_2)
 - v_3 and v_4 driven by local particle density
- OR
- driven primarily by number of interactions like $dN_{ch}/d\eta$

Comparison with models

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- Comparison with hydrodynamic calculations (Phys. Rev. Lett. 116, 212301)
 - Tuned to RHIC data through a parameterization of η/s
 - v_2 generally underestimated
 - v_3 and v_4 overestimated
 - Hydrodynamics does not reproduce v_n shape in data
 - data provides constraints for transport properties and initial state models
- Comparison with AMPT simulations (Phys. Rev. C72 064901 & Phys. Rev. C83 034904)
 - Non-equilibrium with hadronic and partonic rescatterings
 - Tuned to agree with v_2 vs p_T for the 40-50% most central events
 - Reproduces η dependence in 40-50% centrality except for $v_2\{4\}$
 - Overestimates results for central events (except for v_4)