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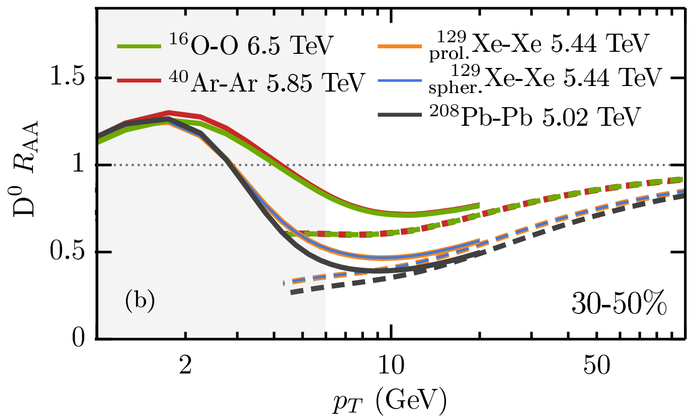
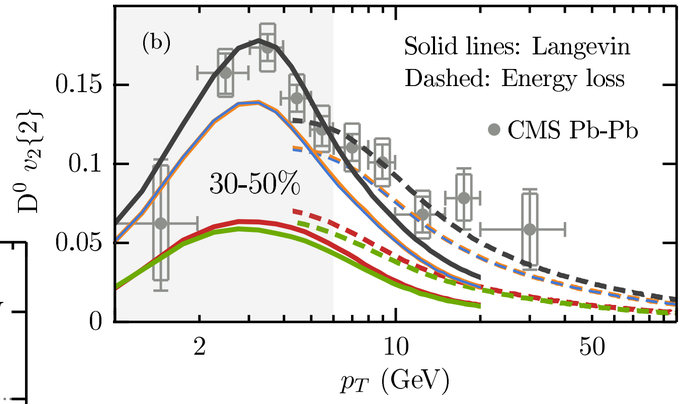
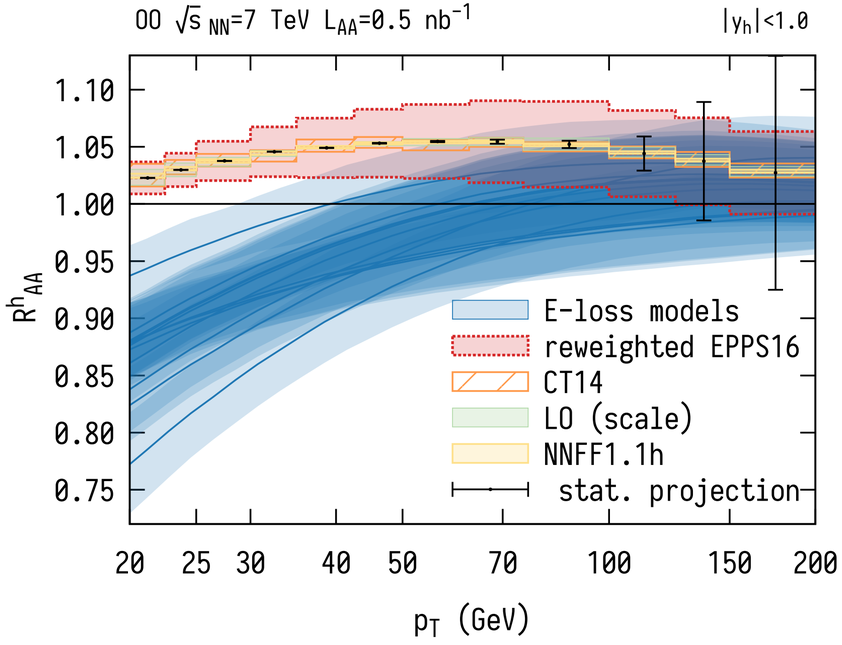
Short Small Systems LoI discussion

- Major unresolved (IMO) question in *p*+A systems at RHIC/LHC: how to connect soft QGP-like signals with (lack of) modification in the hard sector - e.g. large HF v_2 but $R_{pA} \sim 1$
- Lots of interesting physics to do with new capabilities and luminosity for *p*+A-style collisions
- Should particularly argue that O+O and Ar+Ar collisions can offer qualitatively new insights

Hard Sector



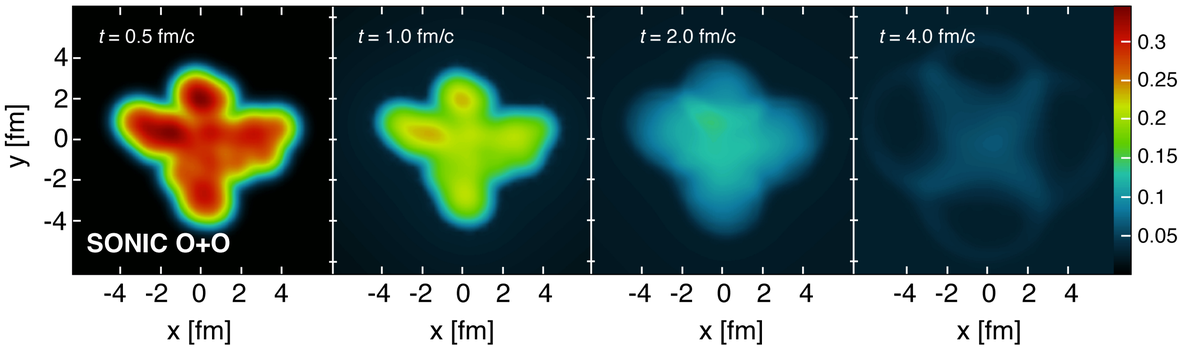


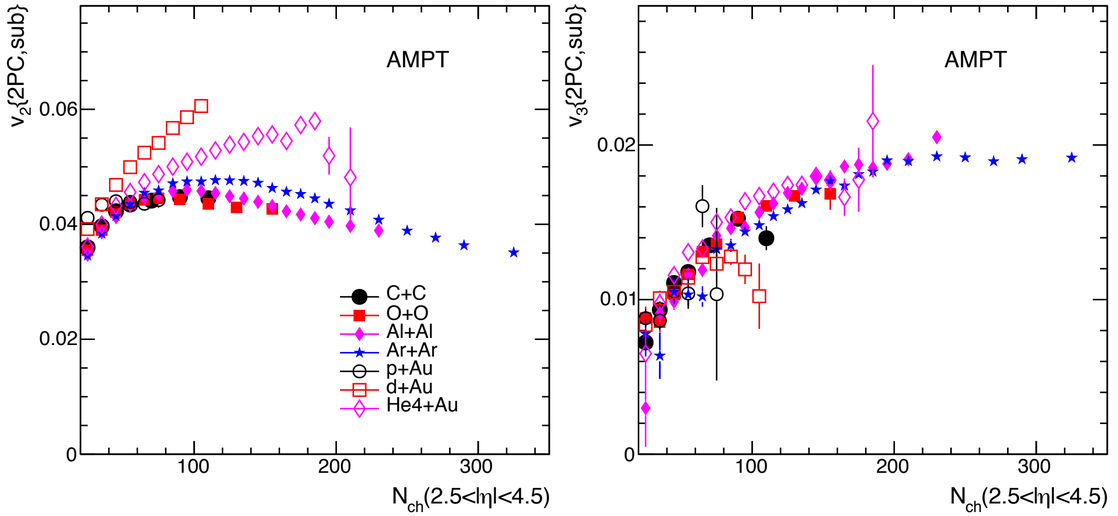


1907.03308, Katz et al.: non-trivial combination of path length and eccentricity effects for HF modification in O+O and Ar+Ar

2007.13754, Huss et al.: sufficient theoretical & experimental control to see jet quenching signal in O+O collisions at LHC

Soft Sector





1812.08096, Lim et al.: symmetric systems can better test initial correlation vs final state interaction pictures (+ sensitivity to α-clustering)

1904.10415, Huang et al.: symmetric systems offer different mix of global geometry and (sub-)nucleon-level fluctuations, valuable to have RHIC-LHC overlap on O+O

- See also discussion in Run 3+4 CERN Yellow Report , other works not shown here
- Lots of interest from theoretical and experimental communities in small symmetric systems
  - ➡ through better controlled initial geometry, can we bridge the gap between our understanding of the soft and hard sectors and arrive at a comprehensive understanding of many-body QCD effects in small systems?
  - ➡ opportunity to answer the big questions first raised in 2010-2013!
- Contact Dennis, Jaki, Wei to get involved (dvp@colorado.edu, jnorhos@illinois.edu, davidlw@rice.edu)