The simulation for Xe+Xe collision at $\sqrt{s_{NN}} = 5.44$TeV By CLVisc

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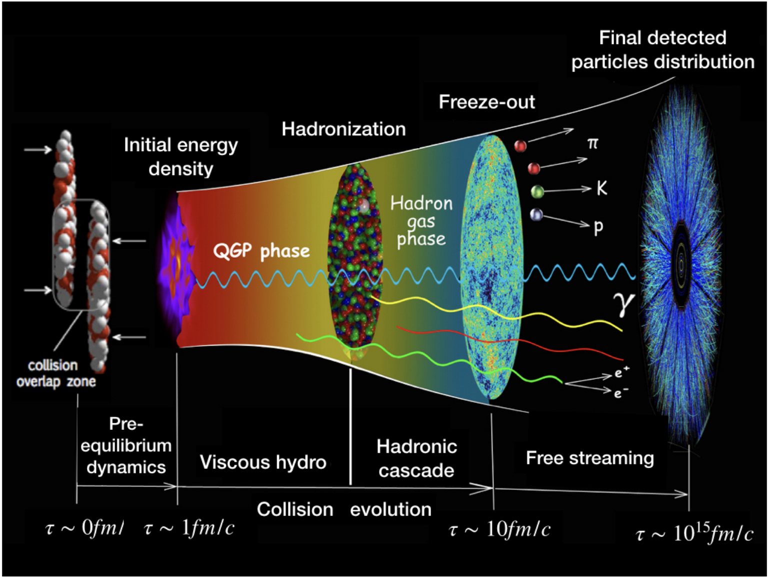
Outline

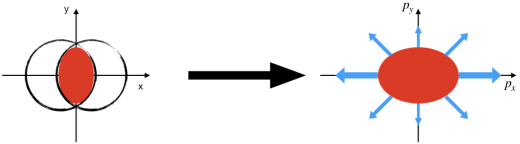
Introduction

Relativistic Heavy-Ion collisions

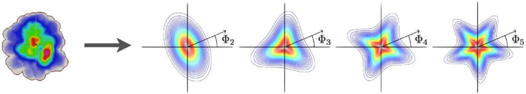


Introduction

Collective flow



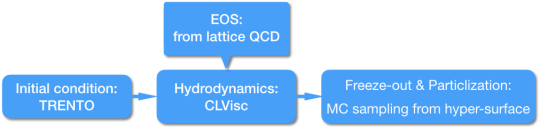
The initial asymmetry in coordinate space evolves into the final asymmetry in momentum space by the collective interaction.



The fluctuations of the initial density distribution cause the anisotropic flows.

Introduction

Simulation method



- Trento:
  - Deformation: For a deformed Woods-Saxon nucleus(Xe):

$$\rho\left(r,\theta\right)=\rho_0\frac{1}{1+\exp\left(\frac{r-R(\theta)}{a}\right)}$$

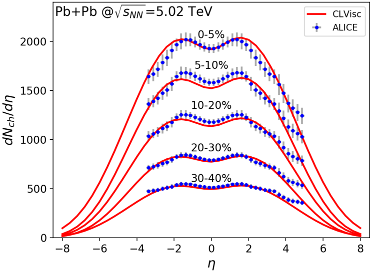
  - Longitudinal distribution:

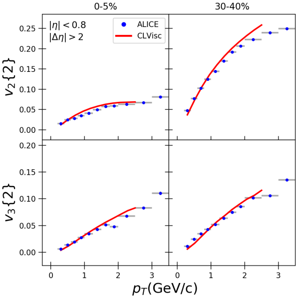
$$H(\eta_s)=\exp\left(-\frac{|\eta_s|-\omega/2}{2\sigma_\omega^2}\theta\left(|\eta_s|-\omega/2\right)\right)$$

- CLVisc:[L.G.Pang, et al,(2018),arXiv:1802.04449.]
  - Preliminary: Pb+Pb collisions to Xe+Xe collisions
  - Fixed: experimental data
- MC Sampling for thermal particles:Adaptive Rejection Sampling (ARS)

Preliminary results

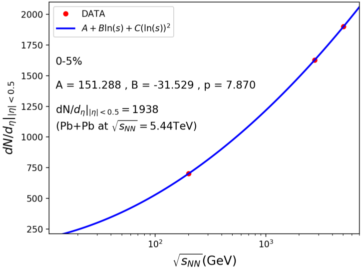
Pb+Pb collision at $\sqrt{s_{NN}} = 5.02\text{TeV}$

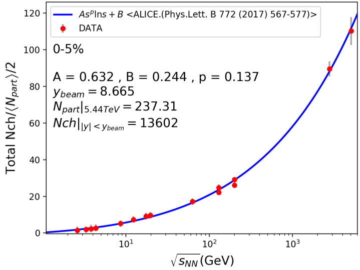




Preliminary results

empirical formulas



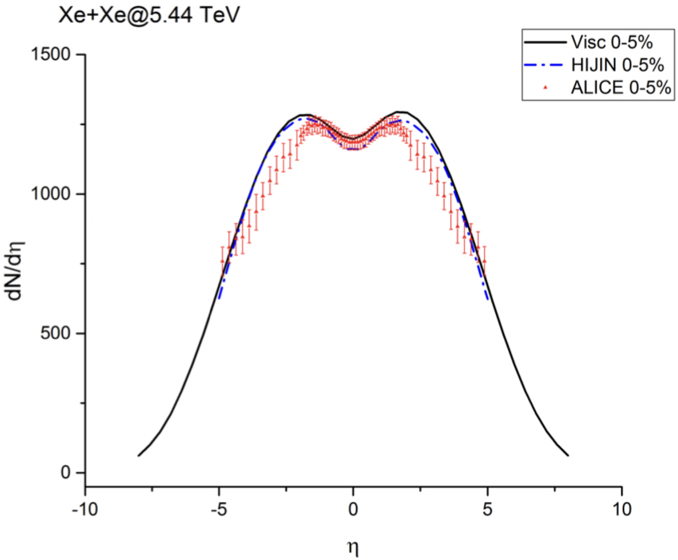


- Kfactor
-

$$H(\eta_s) = \exp\left(-\frac{|\eta_s| - \omega/2}{2\sigma_\omega^2}\theta\left(|\eta_s| - \omega/2\right)\right)$$

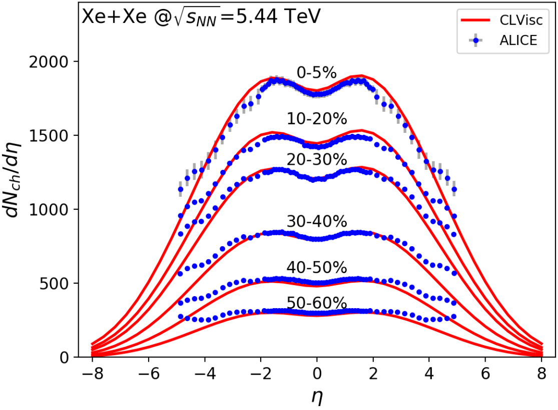
Preliminary results

Pseudo-rapidity distribution for charged hadrons in Xe+Xe collisions at 5.44 TeV



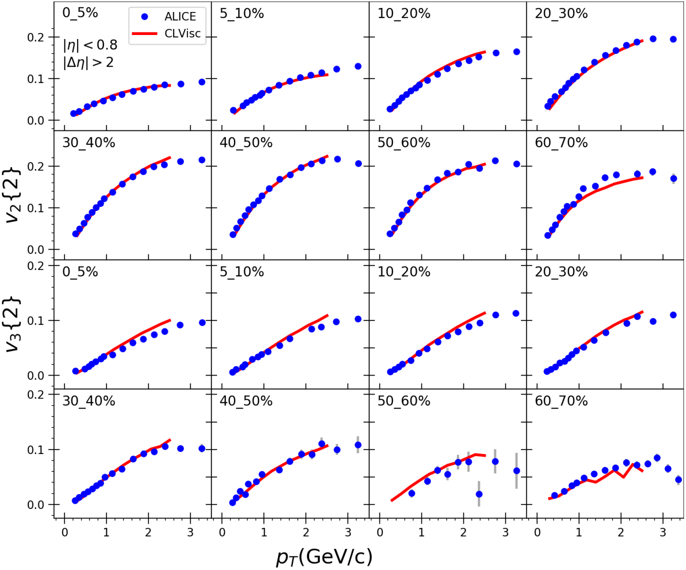
Fixed results

Charged-particle multiplicity density in Xe+Xe collisions at 5.44 TeV



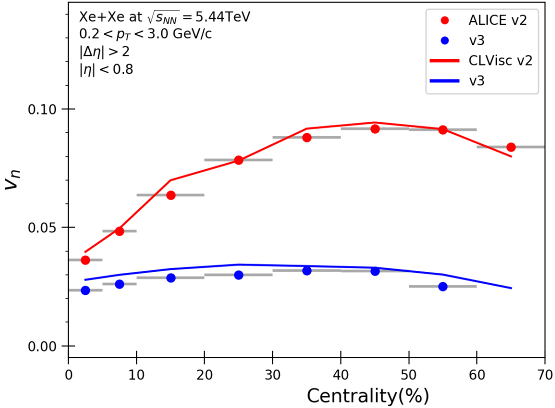
Fixed results

Anisotropic flow in Xe–Xe collisions at 5.44 TeV



Fixed results

Integrated $v_n 2$ over the transverse momentum



Conclusion

- CLVisc model can simulate viscous hydro-dynamics very well.
- The Final state of momentum asymmetry comes from the positions asymmetry of initial state
- When$p_T > 2.5$, non-flow makes the dominated contributions to the anisotropic flow.