

SHINCHON : Framework for model study on bottomonia in small collision systems



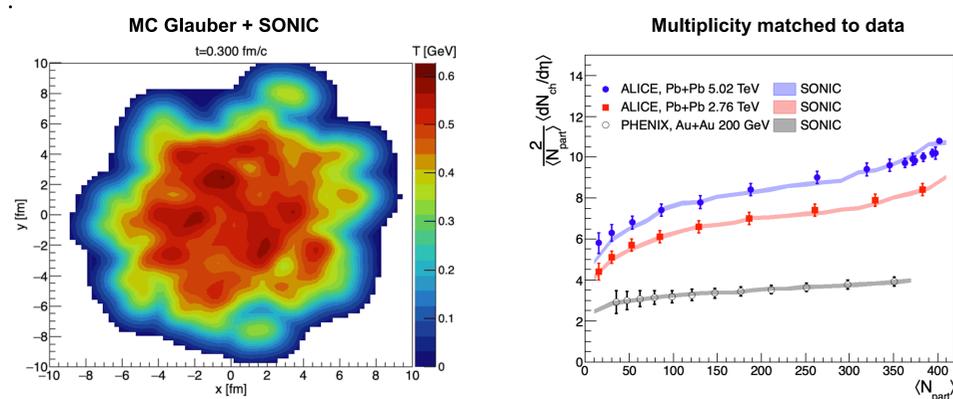
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SHINCHON framework

SHINCHON : Simulation for **Heavy Ion Collision** with **Heavy-quark** and **ONia**

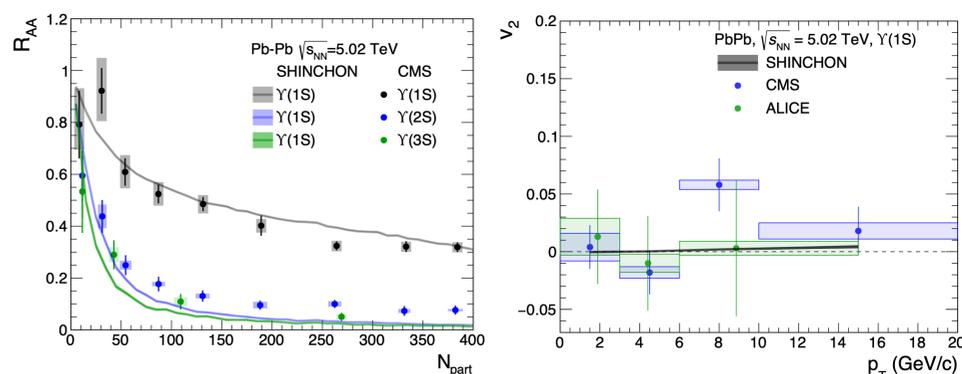
- Simulation Framework based on MC Glauber + SONIC
- Incorporating theoretical descriptions on bottomonia
- Study theory model performances in a controlled environment for initial geometry & hydrodynamical evolution



Framework demonstration

Demonstration in Pb+Pb

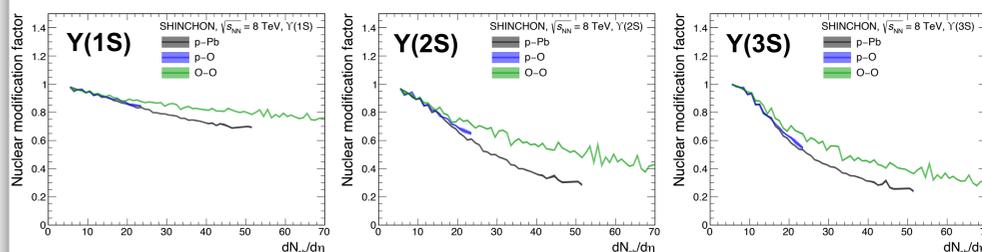
- Demonstration of SHINCHON framework for R_{AA} and v_2 in Pb+Pb
- No regeneration included in this work



Results for p+O, O+O, p+Pb 8 TeV

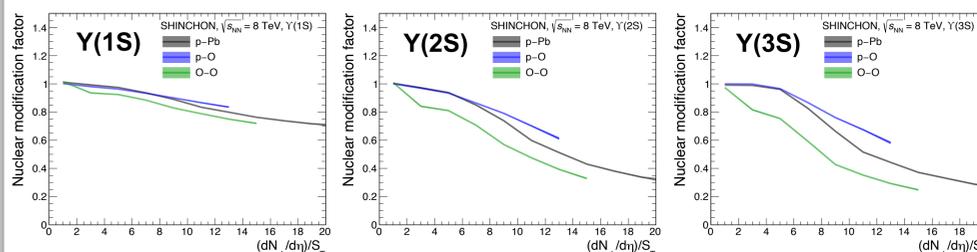
Nuclear modification factor

- Sequential suppression : correlated with medium size and energy density
- System size : O+O > p+Pb ≥ p+O Energy density : p+Pb > p+O > O+O



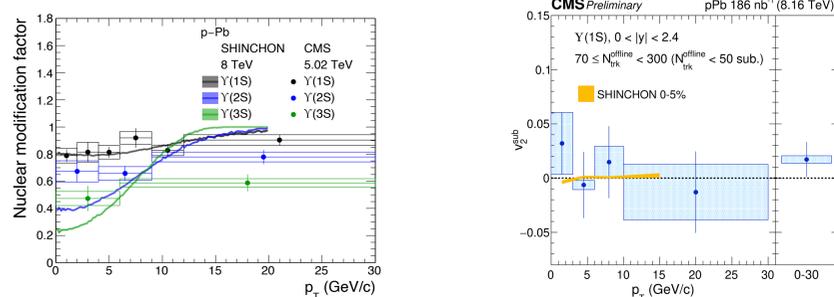
Density scaled modification

- Nuclear modification scaled by sphericity : $S_T = \pi\sqrt{\langle x^2 \rangle \langle y^2 \rangle - \langle xy \rangle^2}$
- System size hierarchy seen in the same charged particle density
Suppression : O+O > p+Pb > p+O (longer hydrodynamical evolution)



Data comparison

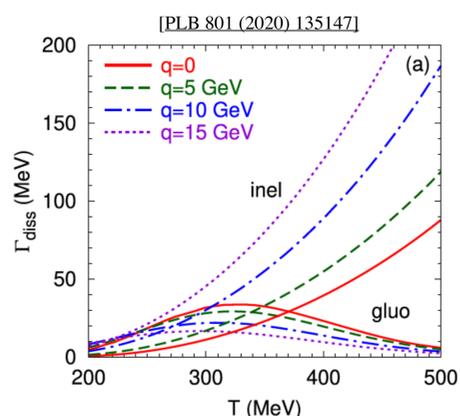
- Deviation at low- p_T for excited states - formation time / initial geometry
- Nevertheless small v_2 predicted and consistent with CMS data in pPb 8 TeV



Bottomonium medium response

Medium response

- Gluo-dissociation (LO) + Inelastic parton scattering (NLO)
- Solving Boltzmann equation :
$$\left(\frac{\partial}{\partial t} + \mathbf{v} \cdot \frac{\partial}{\partial \mathbf{x}}\right) f_Y(t, \mathbf{x}, \mathbf{q}) = -\Gamma_{\text{diss}}^{\text{gluo+inel}}(t, \mathbf{x}, \mathbf{q}) f_Y(t, \mathbf{x}, \mathbf{q})$$
- Regeneration not included : assumed to be sub-dominant in small systems)



Feed down correction

- Data-driven feed down correction from LHC pp data at 7 & 8 TeV
- Extrapolation to low- p_T for P-wave states because of limited data
- Apply as weight for each Y state

