Inclusive J/ψ and ψ(2S) production in p-Pb collisions with ALICE at the LHC

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p-Pb collisions

→ We study p-A collisions to understand Cold Nuclear Matter (CNM) effects such as nuclear parton shadowing/color glass condensate, energy loss and comovers absorption

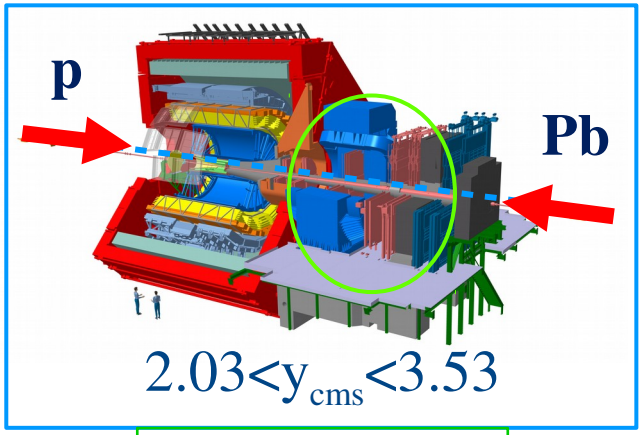
→ No Quark-Gluon Plasma (QGP) is expected to be produced in p-A collisions. So, the measurement of CNM effects in p-A collisions is important to quantify the QGP effects in A-A collisions

→ Quarkonium in ALICE can be measured in two ways:

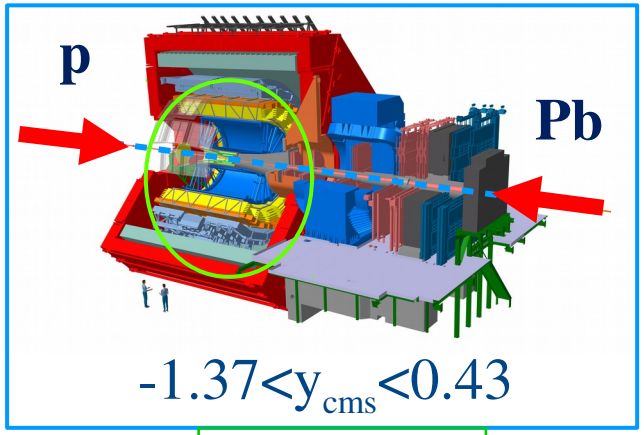
Central Barrel:	$J/\psi \rightarrow e^+e^-$ ($\|y\| < 0.9$)
Forward muon arm:	$J/\psi \rightarrow \mu^+\mu^-$ ($2.5 < y < 4$)

→ p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ and 8.16 TeV

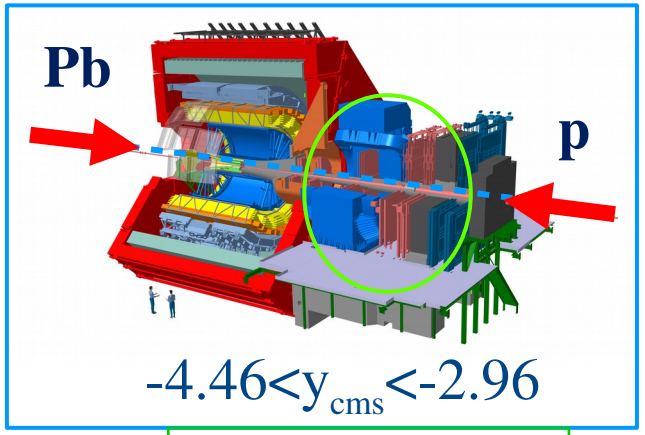
→ ALICE data are collected with two beam configurations: p-Pb and Pb-p, with $\Delta y = 0.465$



Forward rapidity

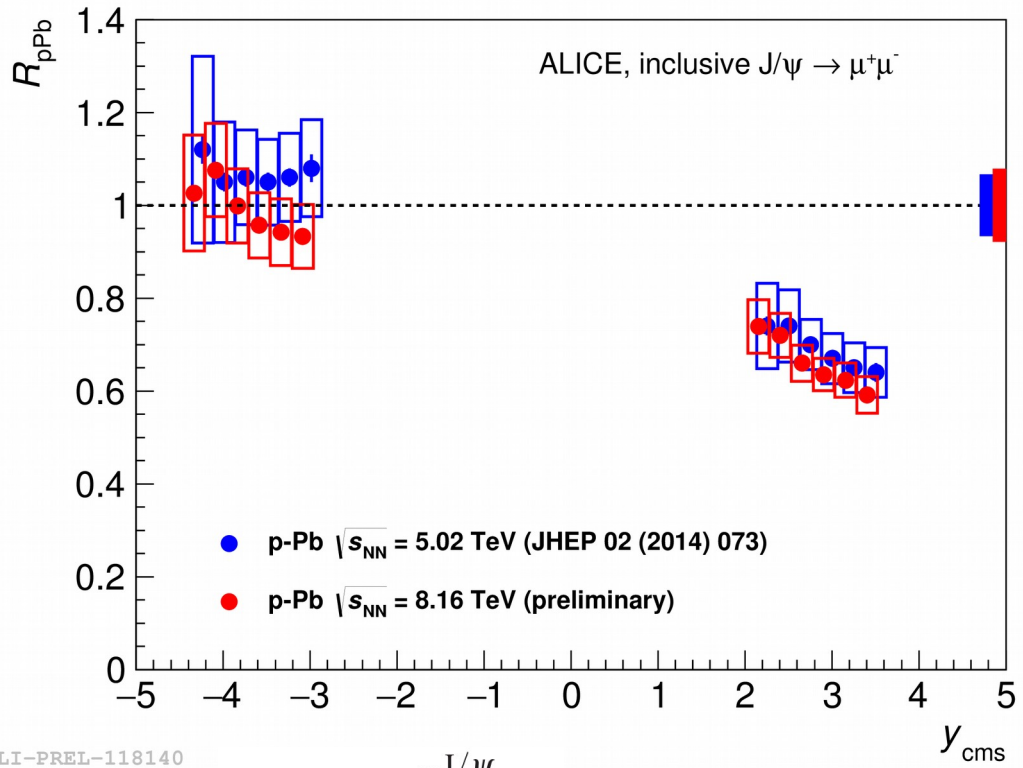


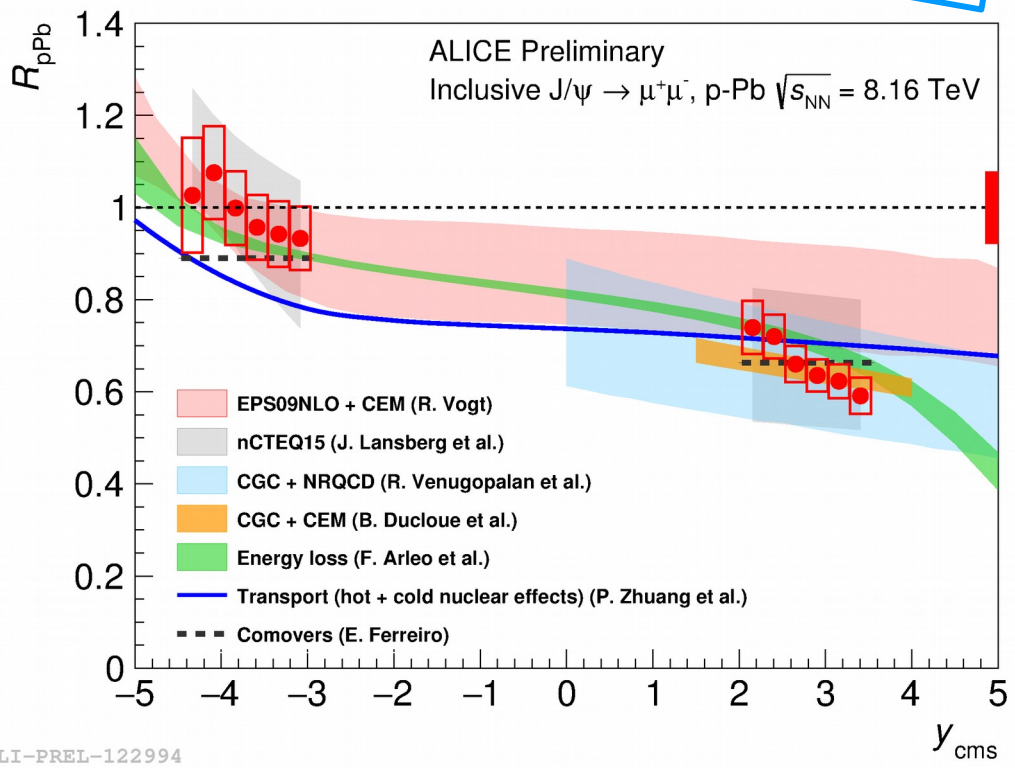
Mid rapidity



Backward rapidity

J/ψ R_{pPb}

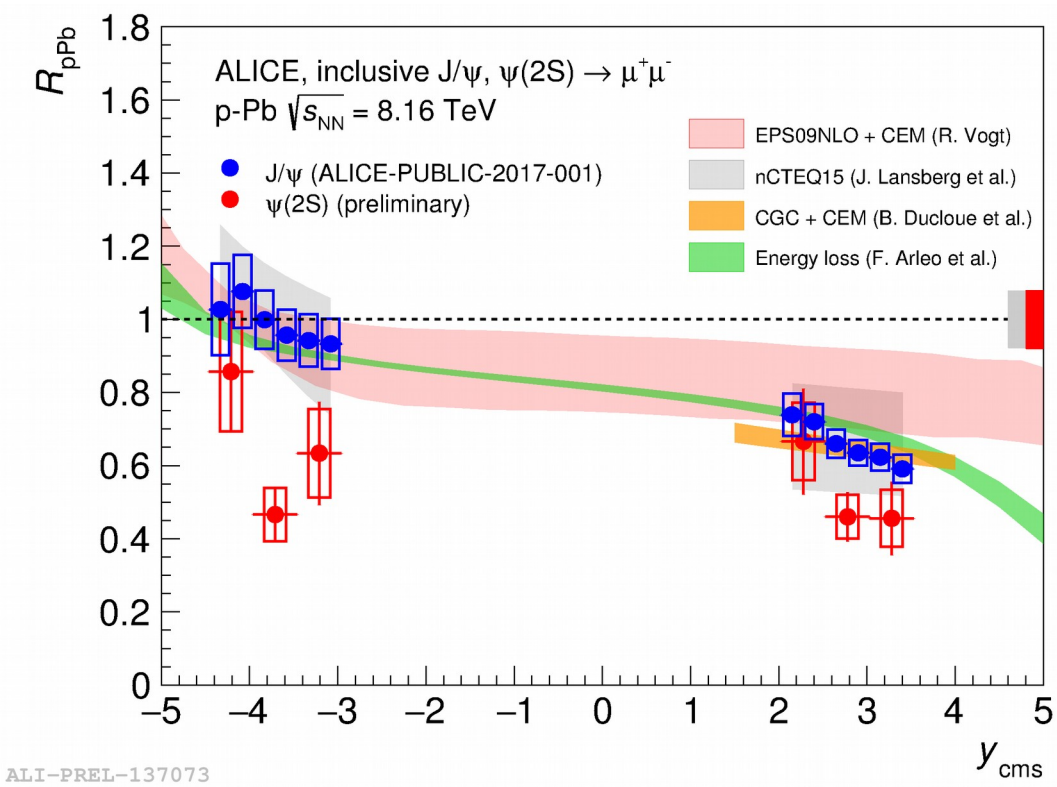


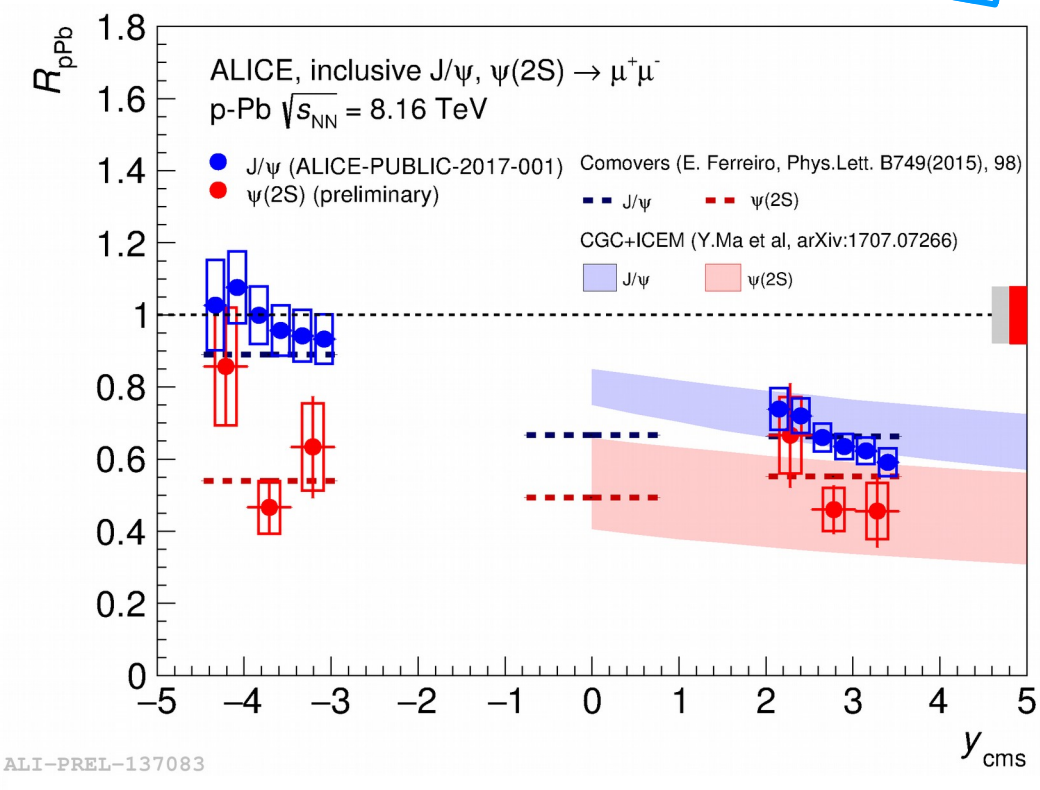


$$R_{\mathrm{pPb}}^{\mathrm{J}/\psi} = \frac{Y_{\mathrm{pPb}}^{\mathrm{J}/\psi}}{\langle T_{\mathrm{pPb}} \rangle \, \sigma_{\mathrm{pp}}^{\mathrm{J}/\psi}}$$

- Clear J/ψ suppression at forward rapidity, and compatible with unity at backward rapidity
- Compatible R_{pPb} at $\sqrt{s_{\mathrm{NN}}} = 5.02$ and 8.16 TeV even if x_{F} coverage is slightly different
- Good agreement between data and models based on shadowing and/or energy loss, CGC, comover and tranport

ψ(2S) R_{pPb}





- ψ(2S) suppression is stronger than the J/ψ one
- Theoretical predictions based on shadowing and energy loss can not describe the stronger ψ(2S) suppression, especially at backward rapidity
- Models including final-state effects reproduce ψ(2S) behaviour both at $\sqrt{s_{NN}} = 5.02$ and 8.16 TeV

Conclusions

- J/ψ shows a suppression with a strong kinematic dependence, with a similar pattern at the two centre-of-mass energies
- Theoretical models based on shadowing and/or energy loss are in fair agreement with J/ψ results but cannot explain the ψ(2S) suppression
- Final-state effects needed to explain ψ(2S) suppression

Thank you