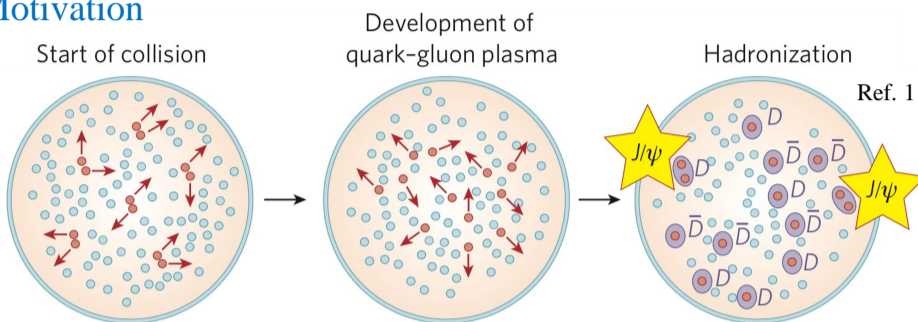


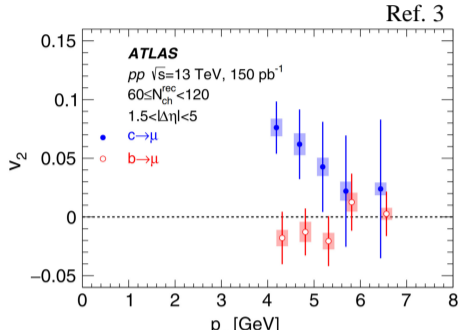
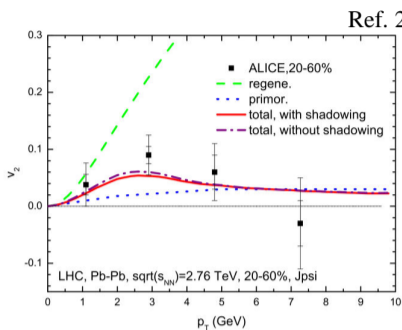
Abstract

Quarkonium production has long been identified as one of the golden probes to study the quark-gluon plasma (QGP). Among many observables, the measurements of azimuthal anisotropies of quarkonia have a special role to shed light on the collective behavior of particles within a strongly interacting medium. In particular, the magnitude of the J/ψ elliptic flow measured at the LHC is interpreted as a signature of the charm quark thermalization in a deconfined medium, supporting the scenario of charmonium (re)generation at low p_T . Interestingly, the observation of collective-like effects in high-multiplicity pp and p-Pb collisions provided new insights on the evolution of effects commonly related to QGP formation when moving from large to small collision systems. The measurements of the J/ψ flow coefficients in pp and Pb-Pb carried out by the ALICE Collaboration will be presented. In addition, thanks to the upgraded detectors in Run 3, more precise measurements of the same quantities will be possible in pp and Pb-Pb collisions at $\sqrt{s} = 13.6$ TeV and $\sqrt{s_{NN}} = 5.36$ TeV, respectively. The status of the ongoing analysis is also discussed.

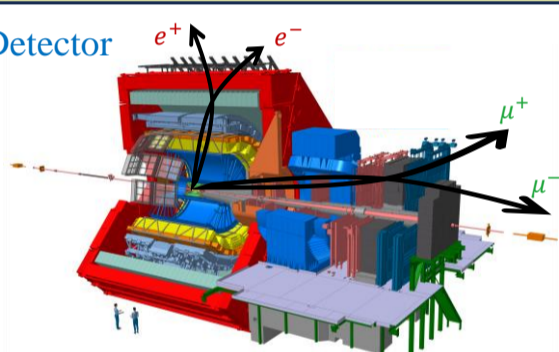
Motivation



- (Anti-) Charm quarks created at initial hard scattering
- Going through all the development of QGP and thermalized at LHC energy
- J/ψ from thermalized (anti-) charm quarks (re-)generation inherit collective behavior
- Large J/ψ v_2 from regeneration (green)
- Small J/ψ v_2 from primordial production (blue)
- Open charm v_2 observed in pp collision
- Not reference anymore?
- J/ψ v_2 in pp collisions should be measured

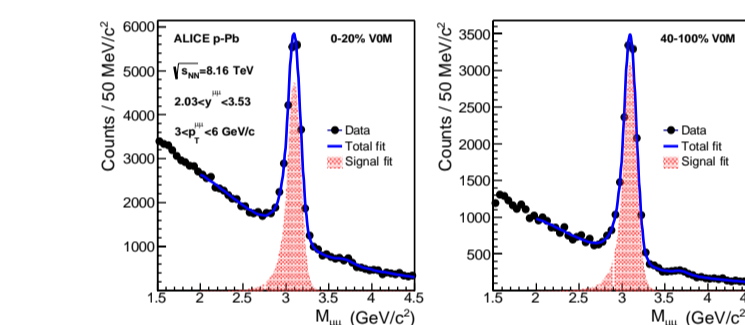


Detector

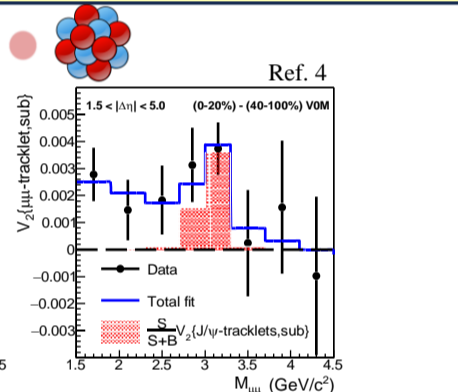


- $J/\psi \rightarrow e^+e^-$ (TPC): $|y| < 0.9$
- $J/\psi \rightarrow \mu^+\mu^-$ (MCH): $2.5 < y < 4$
- J/ψ down to $p_T = 0$
- ITS Upgrade: 6 layers → 7 layers

J/ψ v_2 measurement in small systems

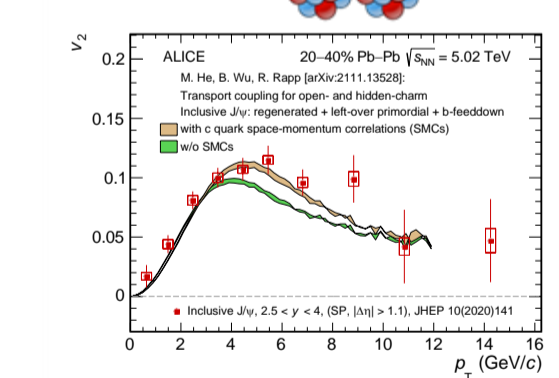


- Subtract peripheral from central yields to suppress non-flow effects

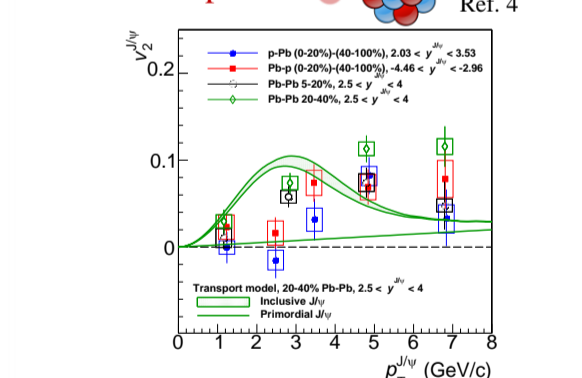


- Flow coefficient acquisition with fit:

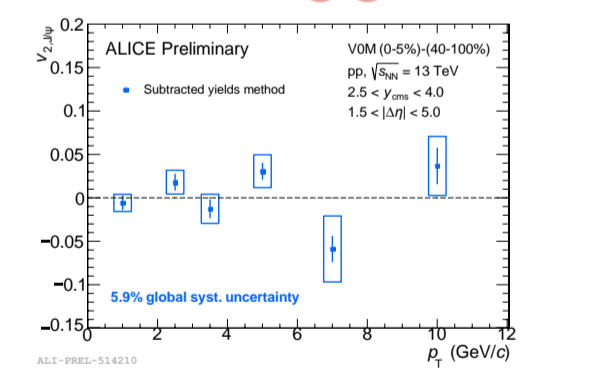
Results



- A significant J/ψ v_2 is observed in Pb-Pb collisions.
- J/ψ v_2 described well by a coalescence model where charm thermalized

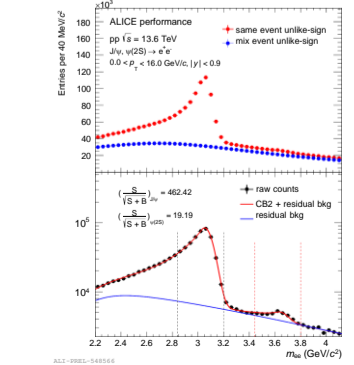
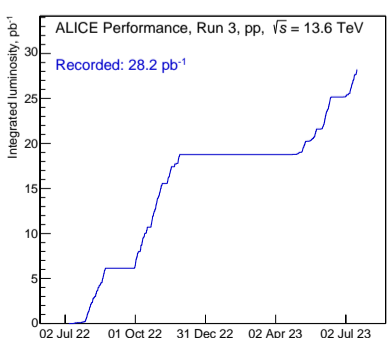


- J/ψ v_2 in p-Pb collisions is consistent with 0 at the low p_T ,
- but increases to the similar values to Pb-Pb at high p_T .



- J/ψ v_2 in pp collisions compatible with 0 with large uncertainties

Conclusions and Outlook



- Statistic increased a lot in RUN 3
- Plentiful J/ψ counts

- In Pb-Pb collisions, J/ψ v_2 is described well by a model with charm thermalized
- In p-Pb collisions, significant J/ψ v_2 is observed at $p_T > 3$ GeV/c but no signal is found at low p_T
- In pp collisions, J/ψ v_2 is compatible with 0.

References

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