B production in pPb at 5.02 TeV from CMS

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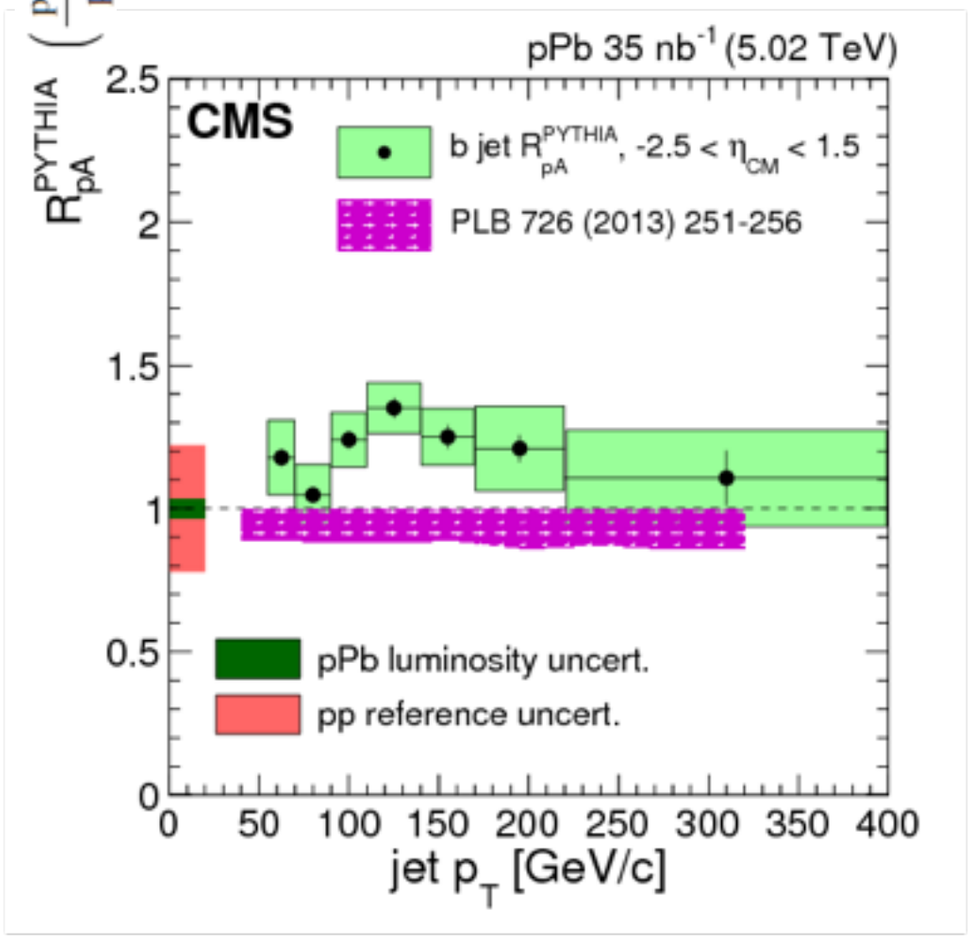
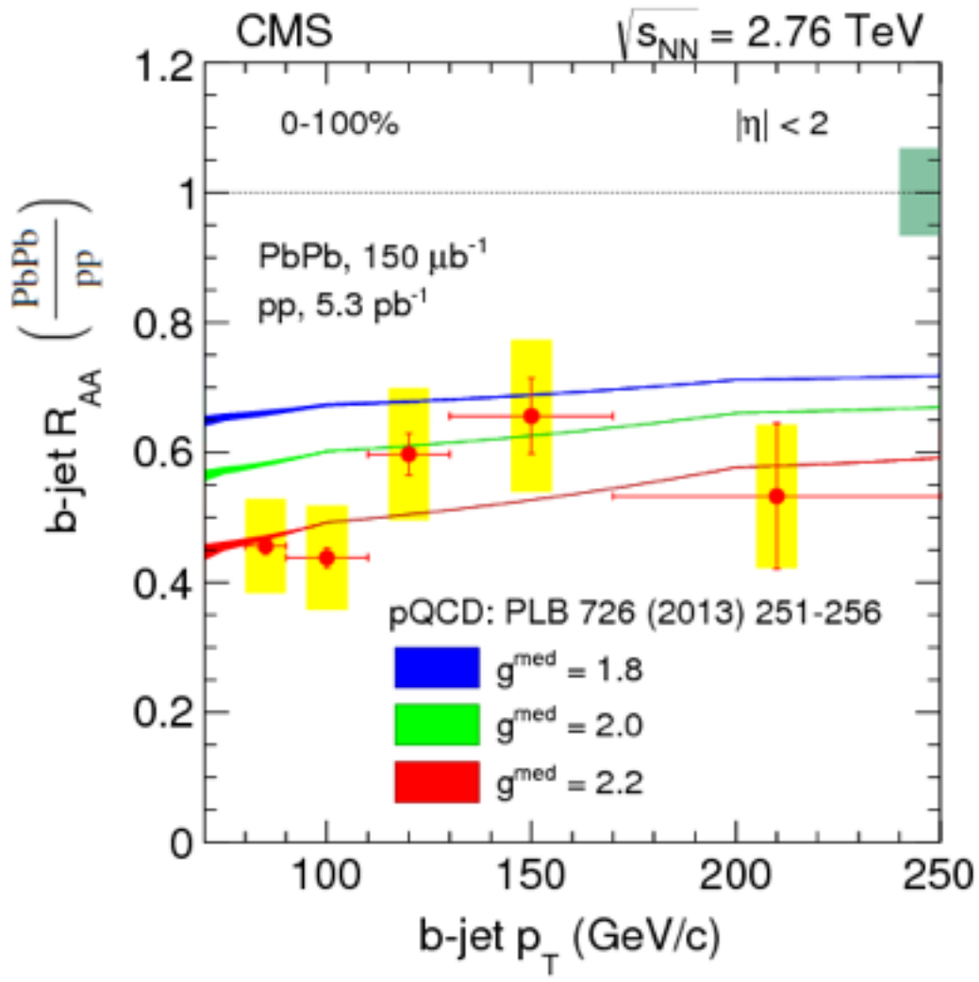
on behalf of the CMS collaboration

Motivation

CMS Collaboration, PLB 753.59

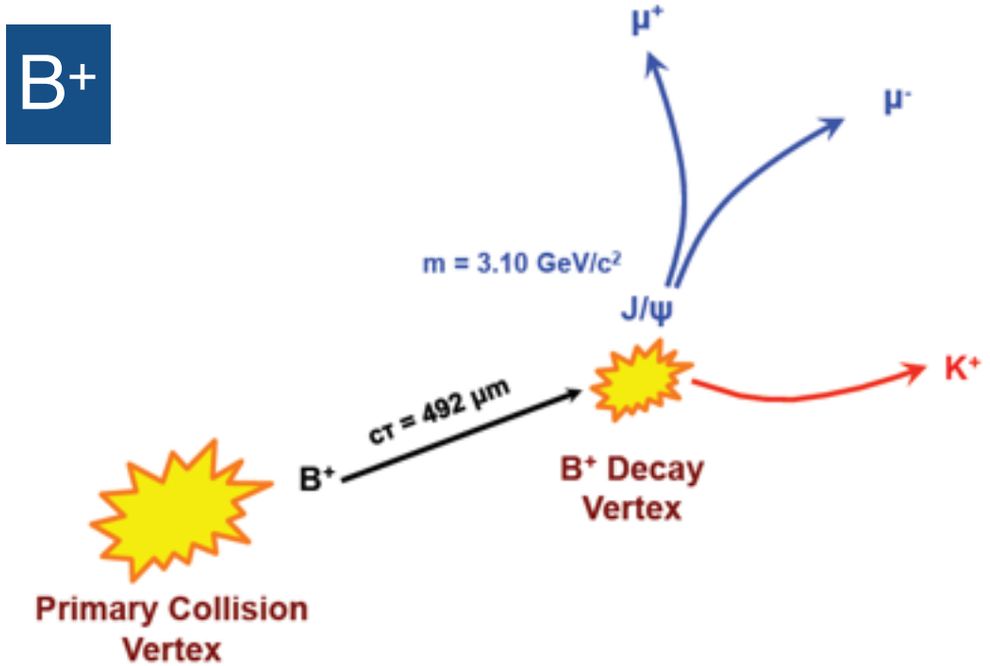


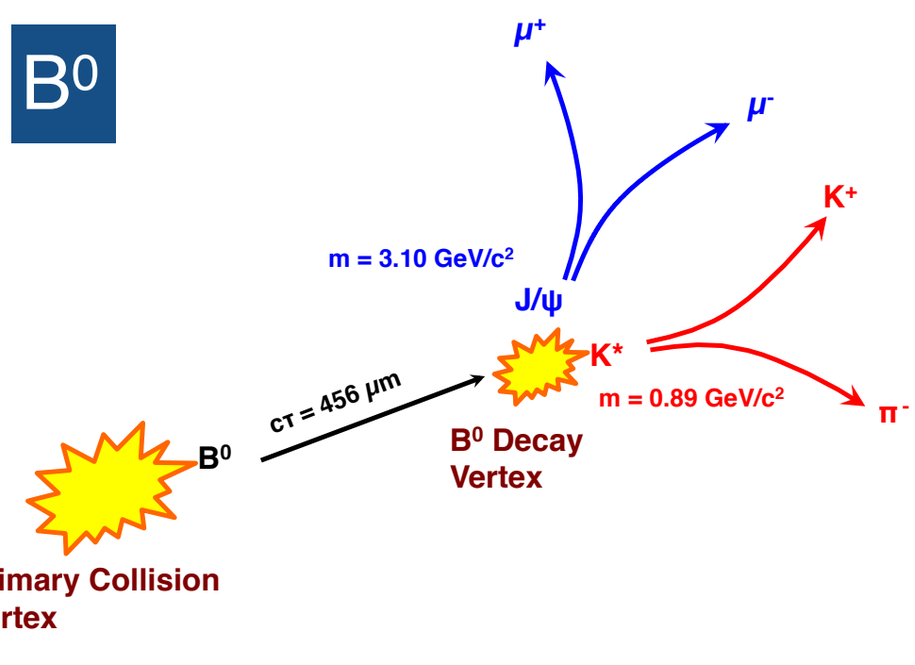
CMS Collaboration,PRL 113.132301

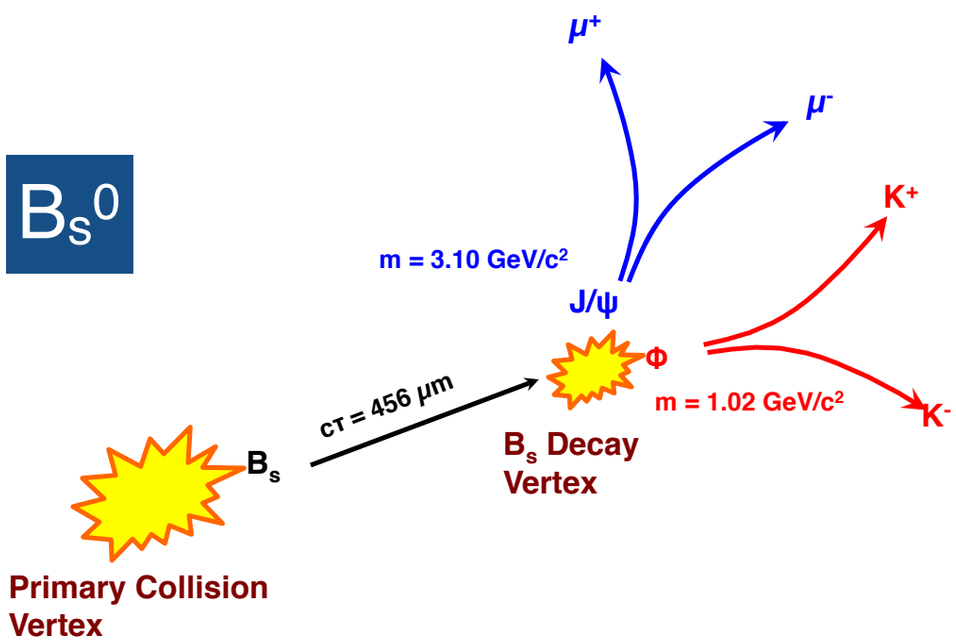


- Large suppression of b-jet was observed in PbPb collision
- The pPb data is expected to provide a baseline for the study of the b-quark modification at hadron level produced by PbPb collisions

Decay Channels



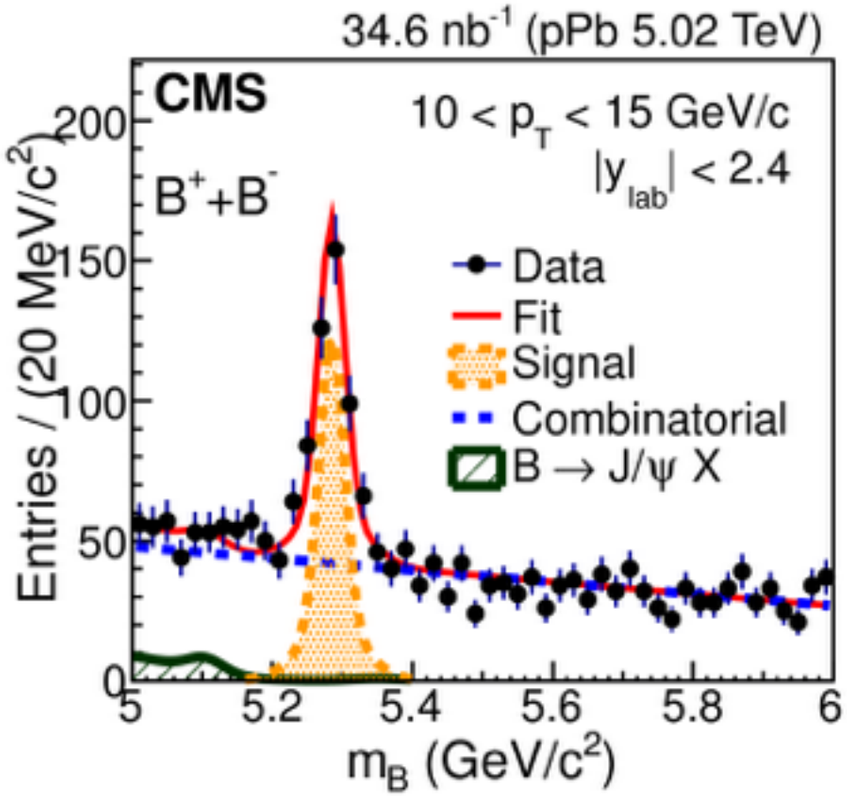


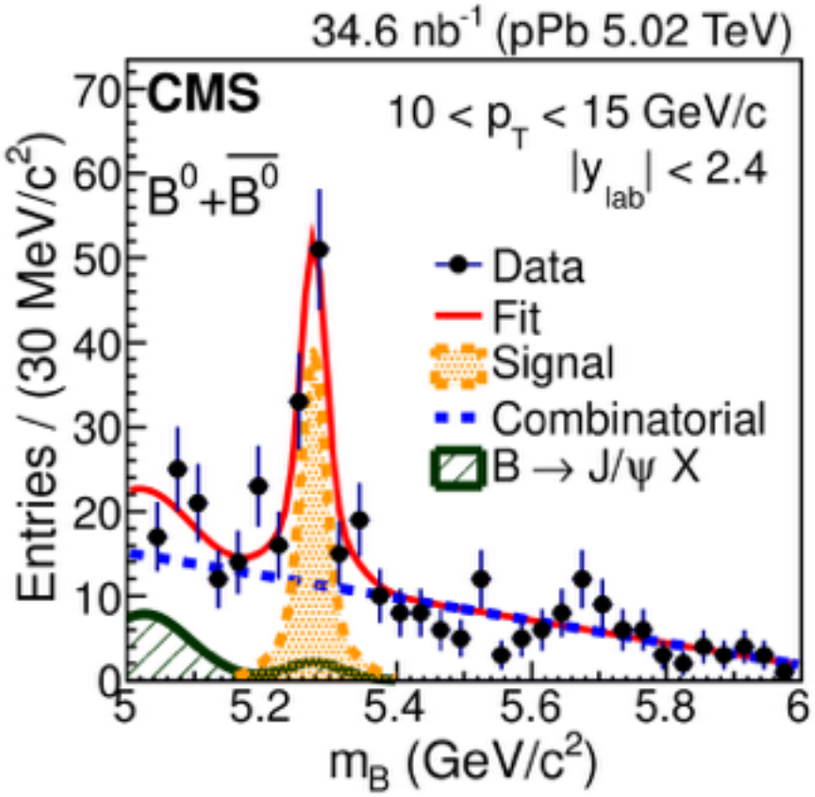


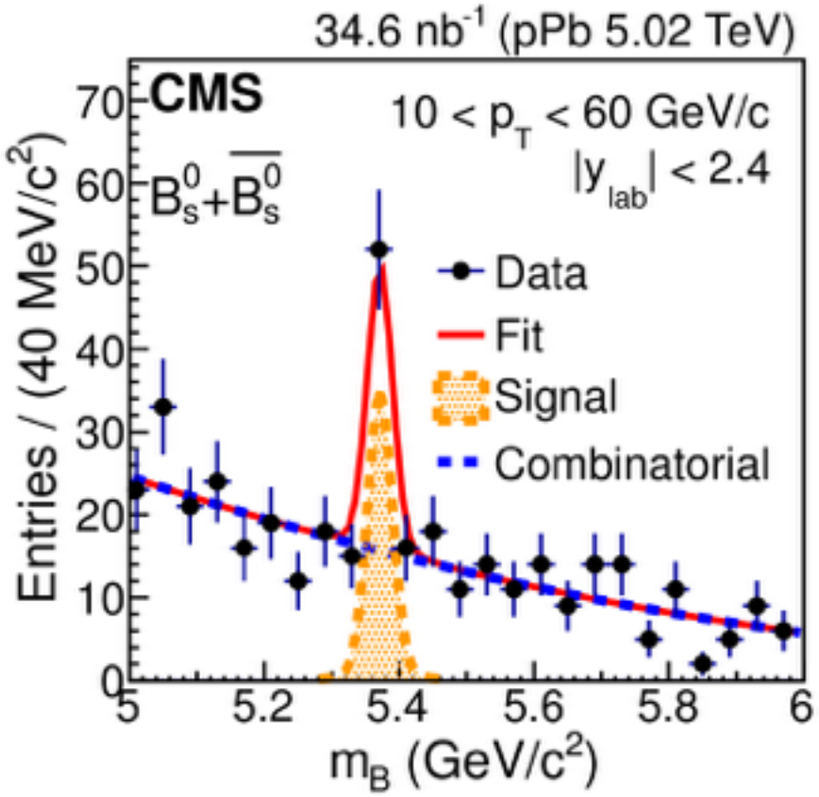
- For each meson, one decay channel is chosen
- Each B meson decays to one J/ψ and one or two track
- J/ψ decays to di-muon

B meson reconstruction

CMS Collaboration, PRL 116.032301







- B meson candidates are formed by combining J/ψ candidates from opposite charge di-muon with charged tracks
- World average masses of charged pion or kaon is assigned to the charged track

p_T differential cross section

$$\left.\frac{d\sigma(p_T)}{dp_T}\right|_{|y_{lab}|<2.4} = \frac{1}{2}\,\frac{1}{\Delta p_T}\,\frac{N(p_T)_{|y_{lab}|<2.4}}{(Acc\mathcal{E})_{|y_{lab}|<2.4} B \mathcal{L}}$$

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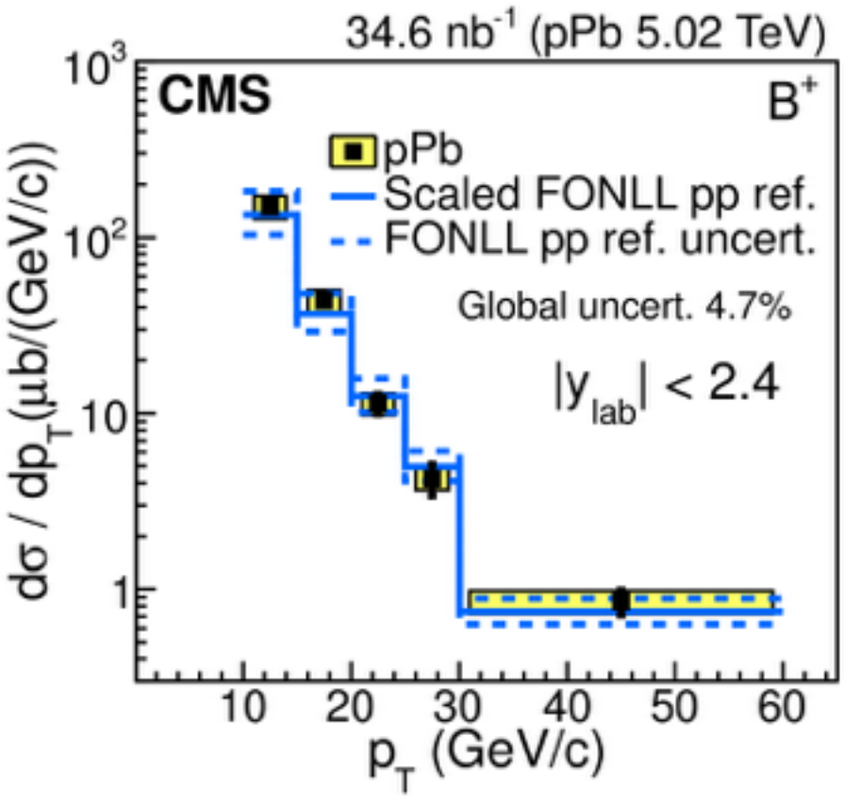

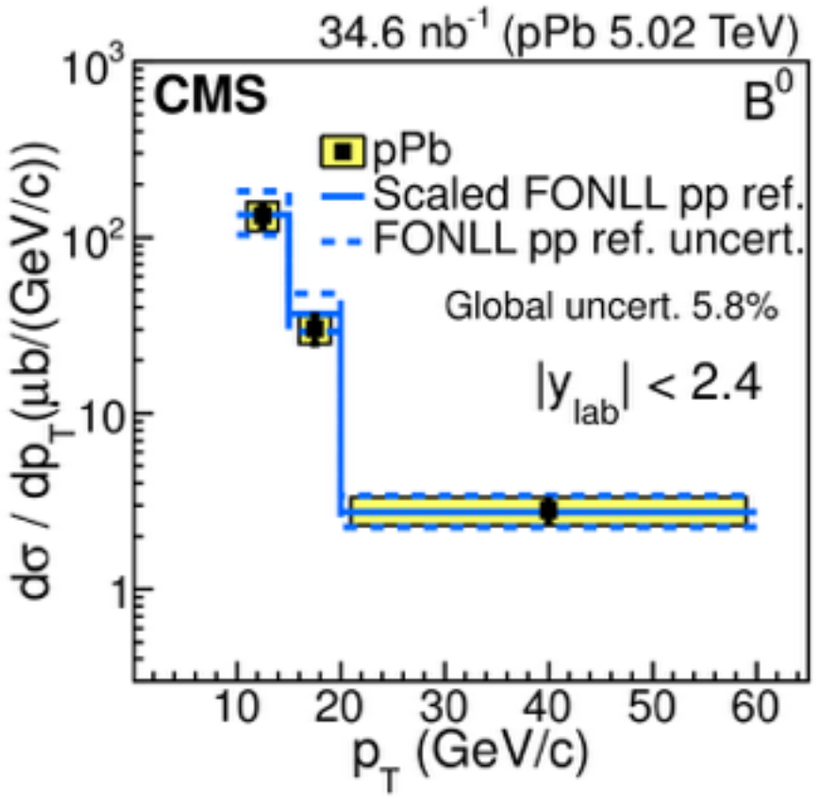

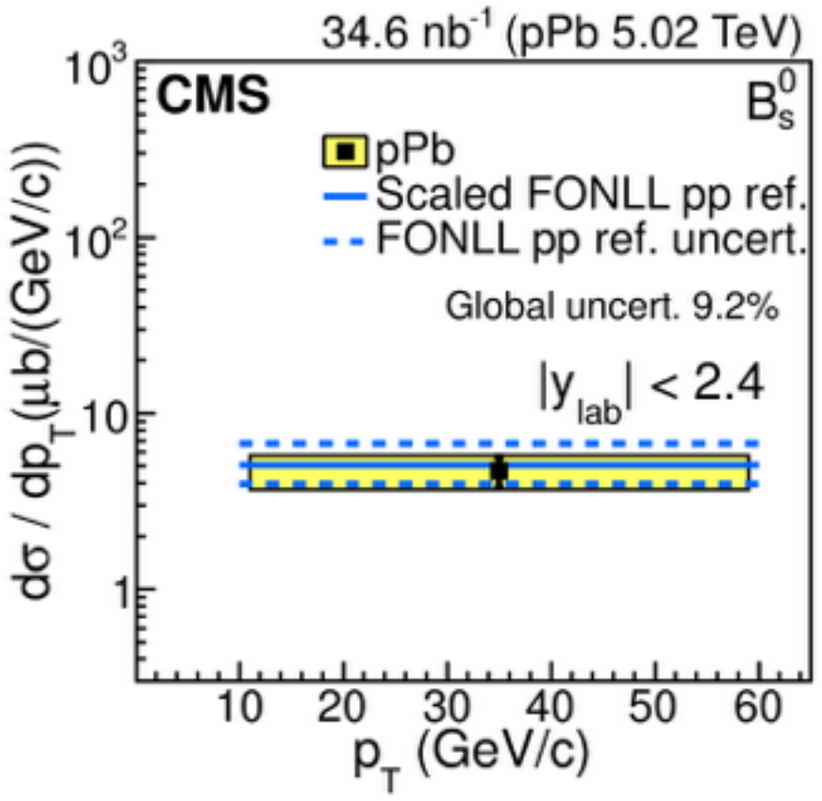

- FONLL provides B meson cross section in pp
- FONLL is validated in pp 7 TeV results at CMS and ATLAS

Nuclear modification factor

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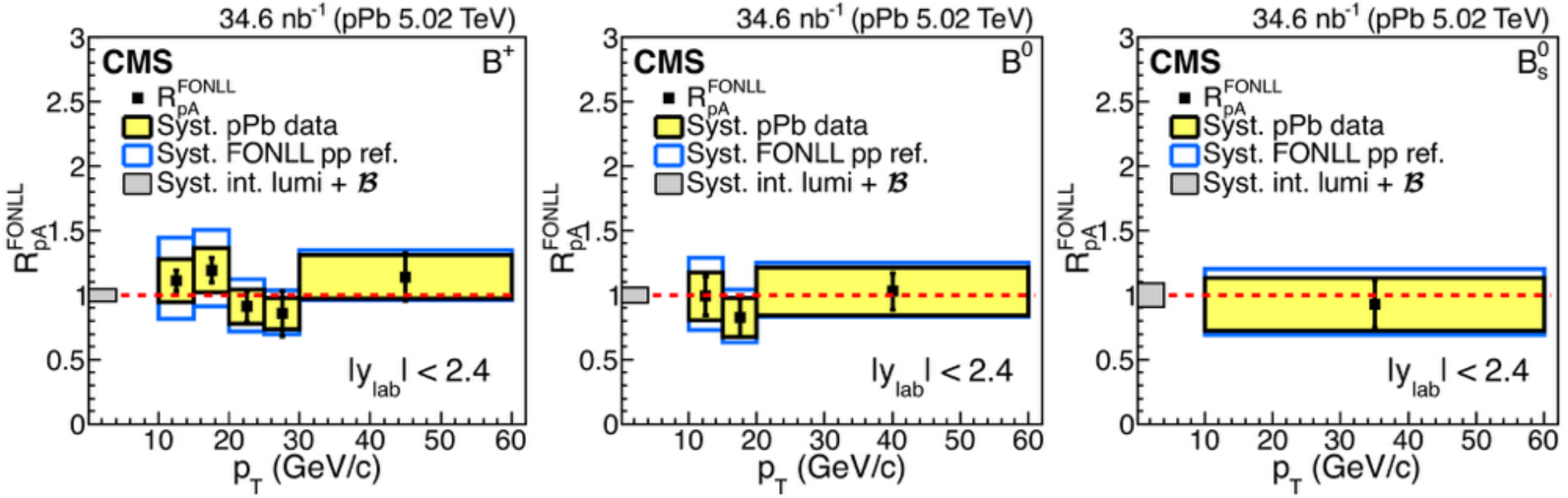

- The nuclear modification factor of the tree B mesons does not show evidence for modification of pPb data compared to the FONLL reference
- No significant difference is observed among the tree B meson species

※ Study of PbPb B^+ nuclear modification factor at 5.02 TeV is ongoing with Run2 ~400 μb data in CMS

Summary

- First measurement of B-meson R_{pPb} is achieved and it is unity within error bar
- B-meson R_{pPb} is consistent with b-jet R_{pRb}
- Complementary measurement with B to J/ψ

back up

y_{CM} differential cross section and R_{pA}

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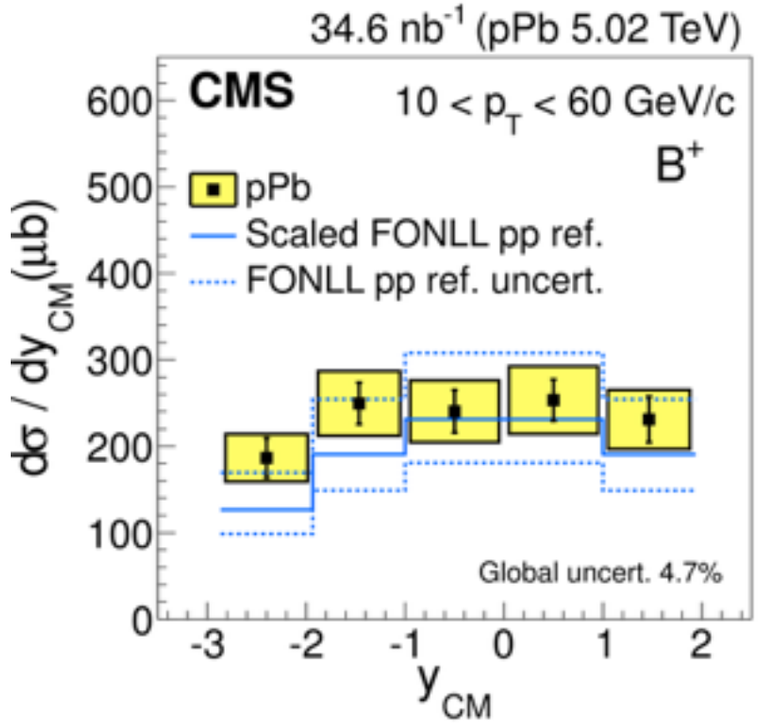

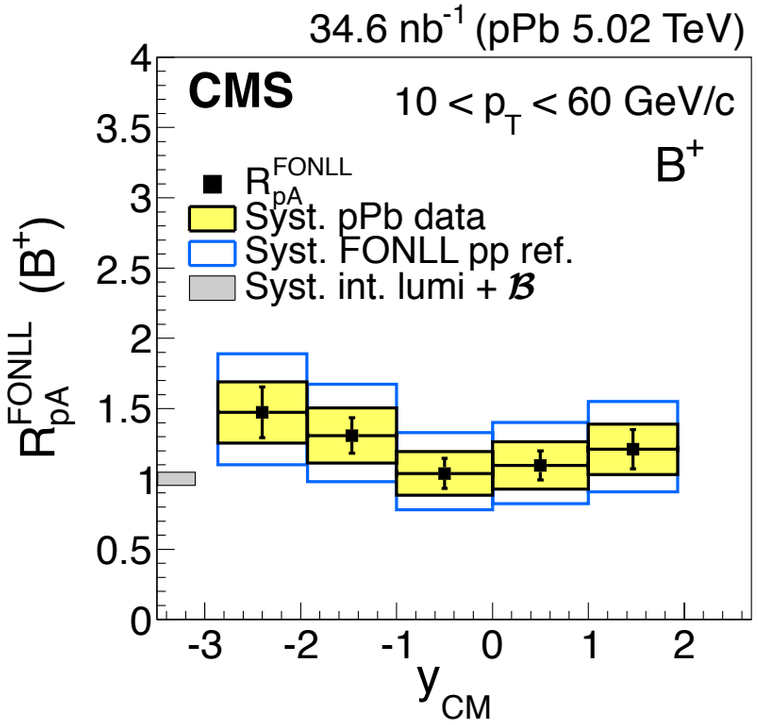

- B+ is studied as a function of its rapidity in the center-of-mass frame
- No strong evidence of rapidity dependence within the uncertainties