[HIN-14-009]

- status of R_{FB}

-status of R_{pPb}

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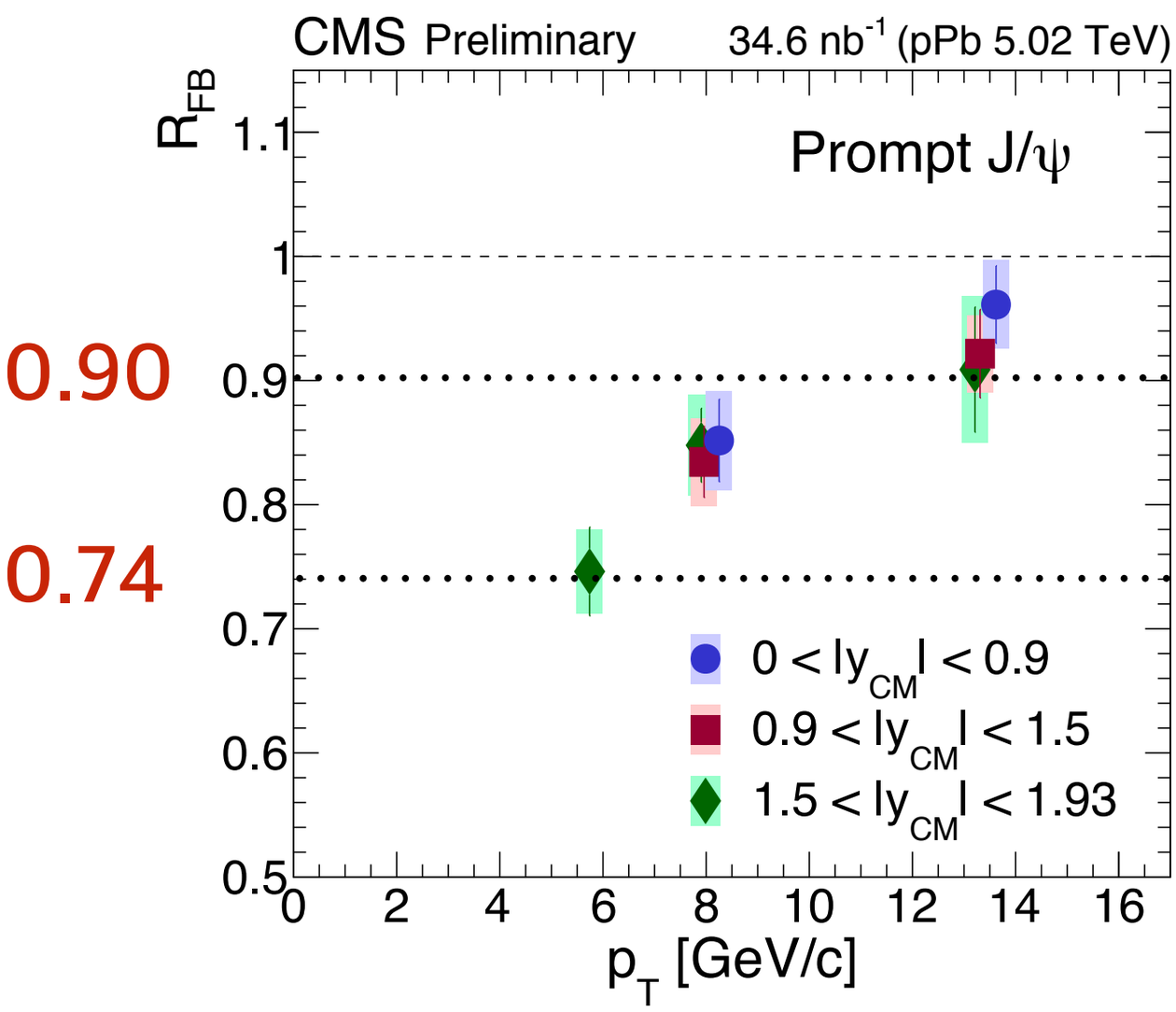
lab meeting
18th March 2016

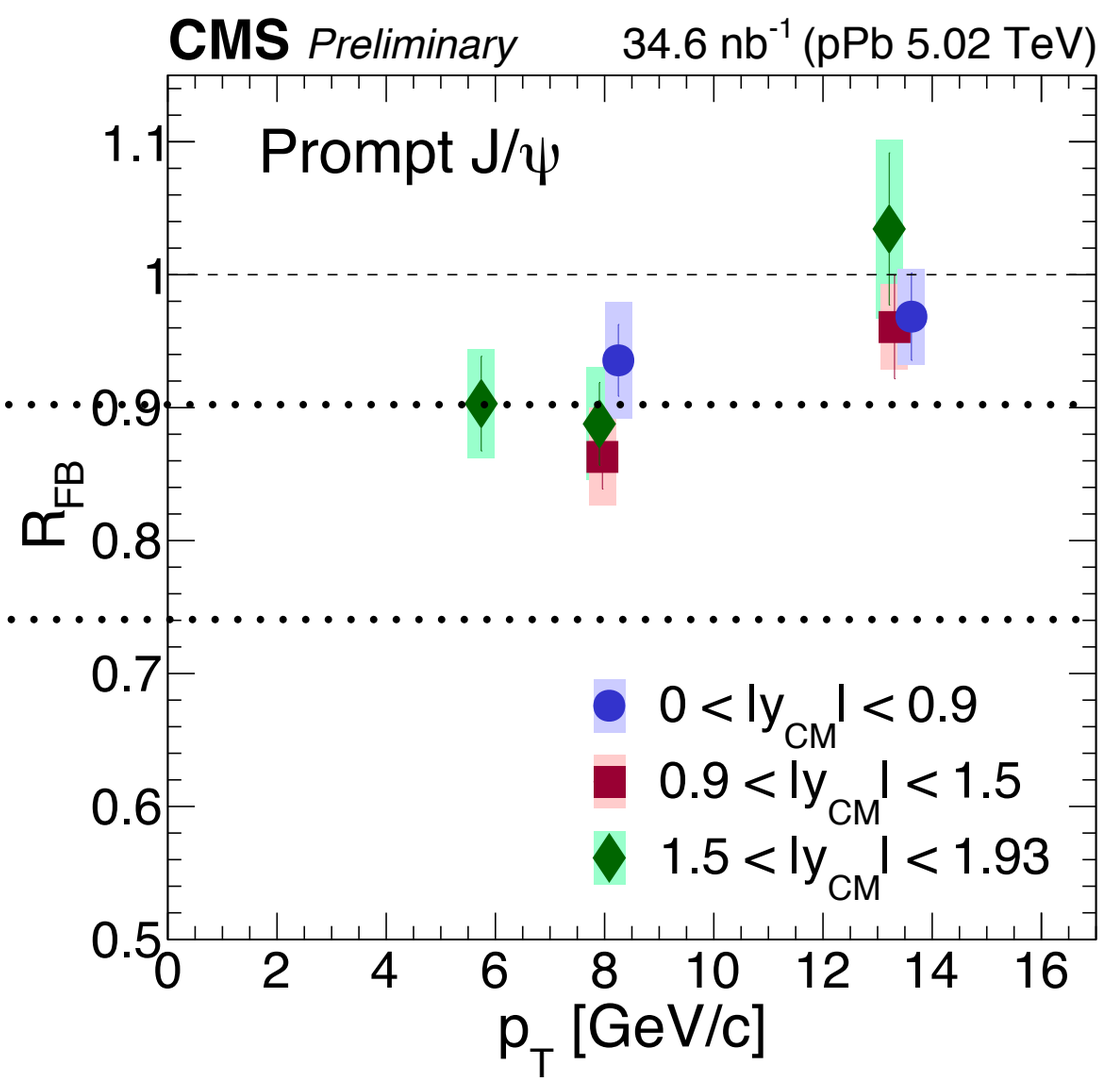
status of R_{FB}

Reminder

PAS

NEW





- investigating the differences
  - private MC -> official MC
  - tighter single muon cuts & new TNP, etc.

old acc cut

- Efficiency values (old acceptance cut)

private MC		pure MC	+ Zvtx correction	+ TNP SF
FORWARD y_{CM} = [1.5, 1.93] p_T = [5, 6.5] GeV	Pbp (1st run)	0.375 +- 0.006	0.395 +-0.007	0.435 +-0.007
	pPb (2nd run)	0.372 +- 0.006	0.394 +-0.007	0.432 +-0.007
BACKWARD y_{CM} = [-1.93, -1.5] p_T = [5, 6.5] GeV	Pbp (1st run)	0.143 +- 0.004	0.147 +-0.005	0.190 +-0.006
	pPb (2nd run)	0.144 +-0.004	0.148 +-0.005	0.192 +-0.006
R_{FB}		0.67	0.65	PAS : 0.76

official MC		pure MC	+ Zvtx correction	+ TNP SF
FORWARD y_{CM} = [1.5, 1.93] p_T = [5, 6.5] GeV	Pbp (1st run)	0.363 +-0.004	0.382 +-0.005	0.418 +-0.005
	pPb (2nd run)	0.368 +-0.004	0.389 +-0.005	0.428 +-0.005
BACKWARD y_{CM} = [-1.93, -1.5] p_T = [5, 6.5] GeV	Pbp (1st run)	0.144 +-0.003	0.155 +-0.003	0.200 +-0.004
	pPb (2nd run)	0.150 +-0.003	0.158 +-0.004	0.204 +-0.004
R_{FB}		0.70	0.70	0.83

- TOP vs BOTTOM : only difference is MC samples
- Difference comes from pure MC already!
- even larger after Z vtx correction

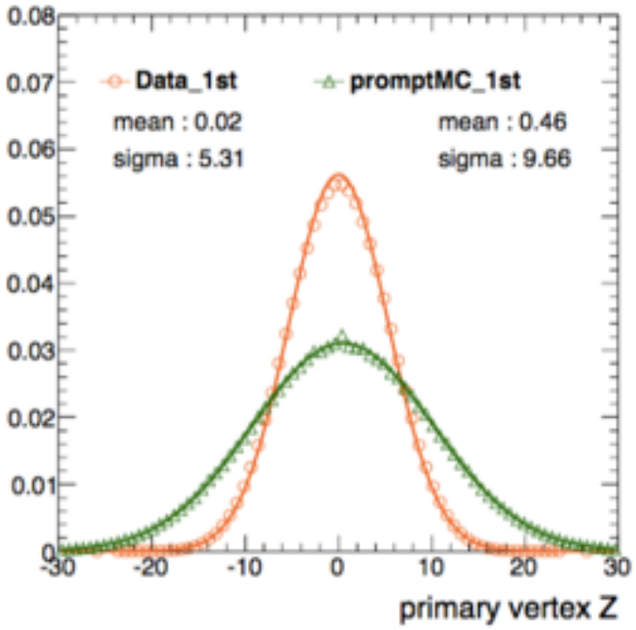
new acc cut

- Efficiency values (new acceptance cut)

private MC		pure MC	+ Zvtx correction	+ TNP SF
FORWARD y_{CM} = [1.5, 1.93] p_T = [5, 6.5] GeV	Pbp (1st run)	0.566 +- 0.007	0.599 +-0.008	0.654 +-0.008
	pPb (2nd run)	0.564 +- 0.008	0.604 +-0.009	0.656 +-0.008
BACKWARD y_{CM} = [-1.93, -1.5] p_T = [5, 6.5] GeV	Pbp (1st run)	0.302 +- 0.007	0.310 +-0.009	0.416 +-0.010
	pPb (2nd run)	0.310 +-0.008	0.320 +-0.010	0.432 +-0.011
R_{FB}		0.71	0.69	0.85

official MC		pure MC	+ Zvtx correction	+ TNP SF
FORWARD y_{CM} = [1.5, 1.93] p_T = [5, 6.5] GeV	Pbp (1st run)	0.557 +-0.005	0.585 +-0.006	0.636 +-0.006
	pPb (2nd run)	0.554 +-0.006	0.587 +-0.006	0.638 +-0.006
BACKWARD y_{CM} = [-1.93, -1.5] p_T = [5, 6.5] GeV	Pbp (1st run)	0.306 +-0.006	0.330 +-0.007	0.441 +-0.007
	pPb (2nd run)	0.313 +-0.006	0.331 +-0.007	0.443 +-0.008
R_{FB}		0.73	0.74	NOW : 0.91

z vertex correction



- some fluctuation in backward for Pbp private MC

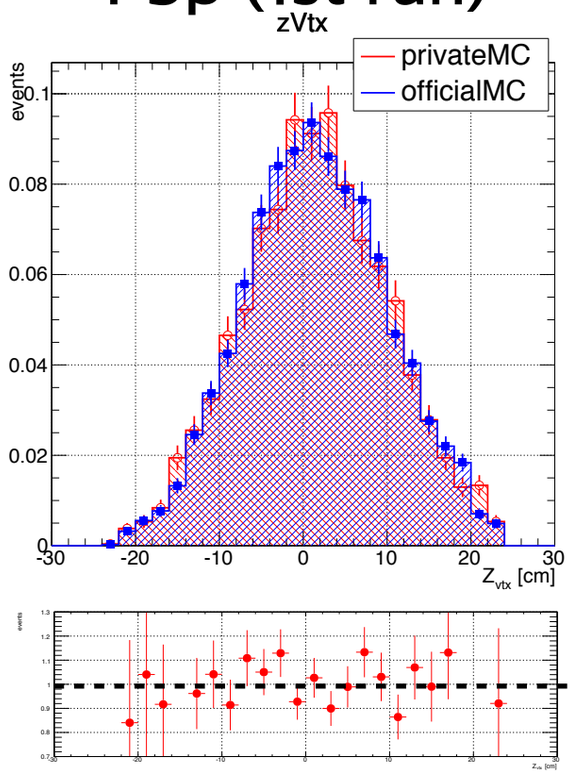
FORWARD

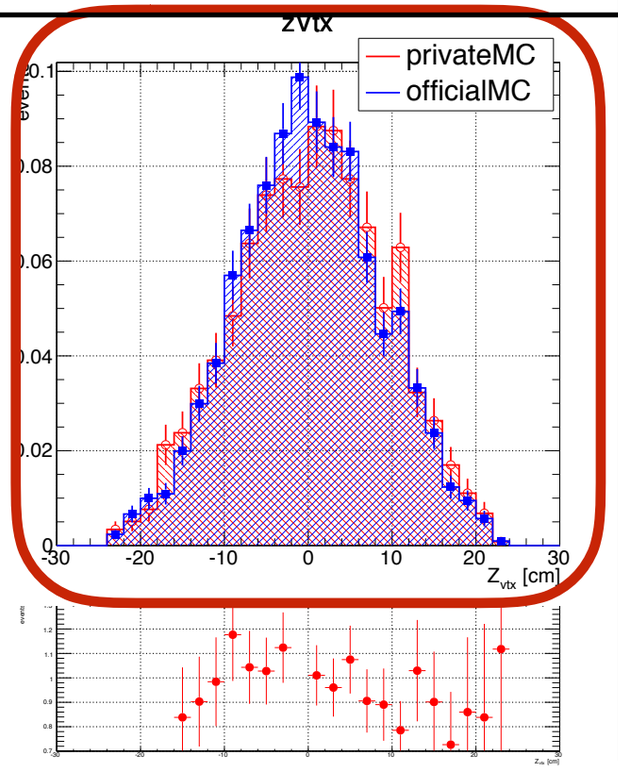
- y_{CM} = [1.5, 1.93]
- p_T = [5, 6.5] GeV

BACKWARD

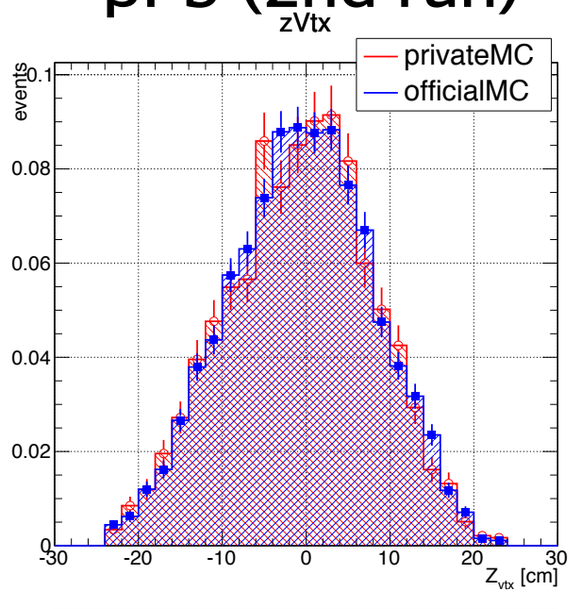
- y_{CM} = [-1.93, -1.5]
- p_T = [5, 6.5] GeV

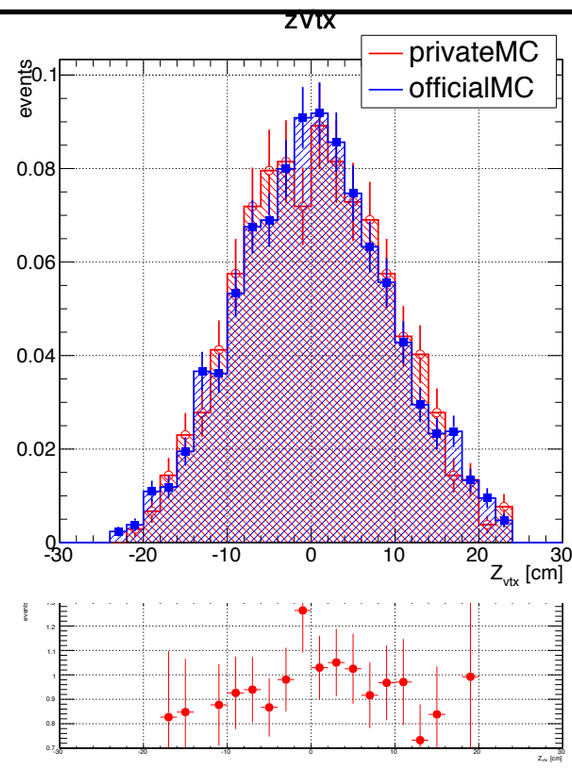
Pbp (1st run)





pPb (2nd run)





pAWinter13 MC status

- R_{FB} too sensitive : need more statistics in MC for precision

- official MC for Efficiency :
  - additional x4 statistics requested in Feb.
  - 4 on GEN-SIM, 2 on DIGI-RECO

- official MC for Acceptance :
  - so far, there was no official samples
  - production not started yet, but it will be faster because only GEN is needed

status of R_{pPb}

pp samples

- official MC for Acceptance : Trees ready

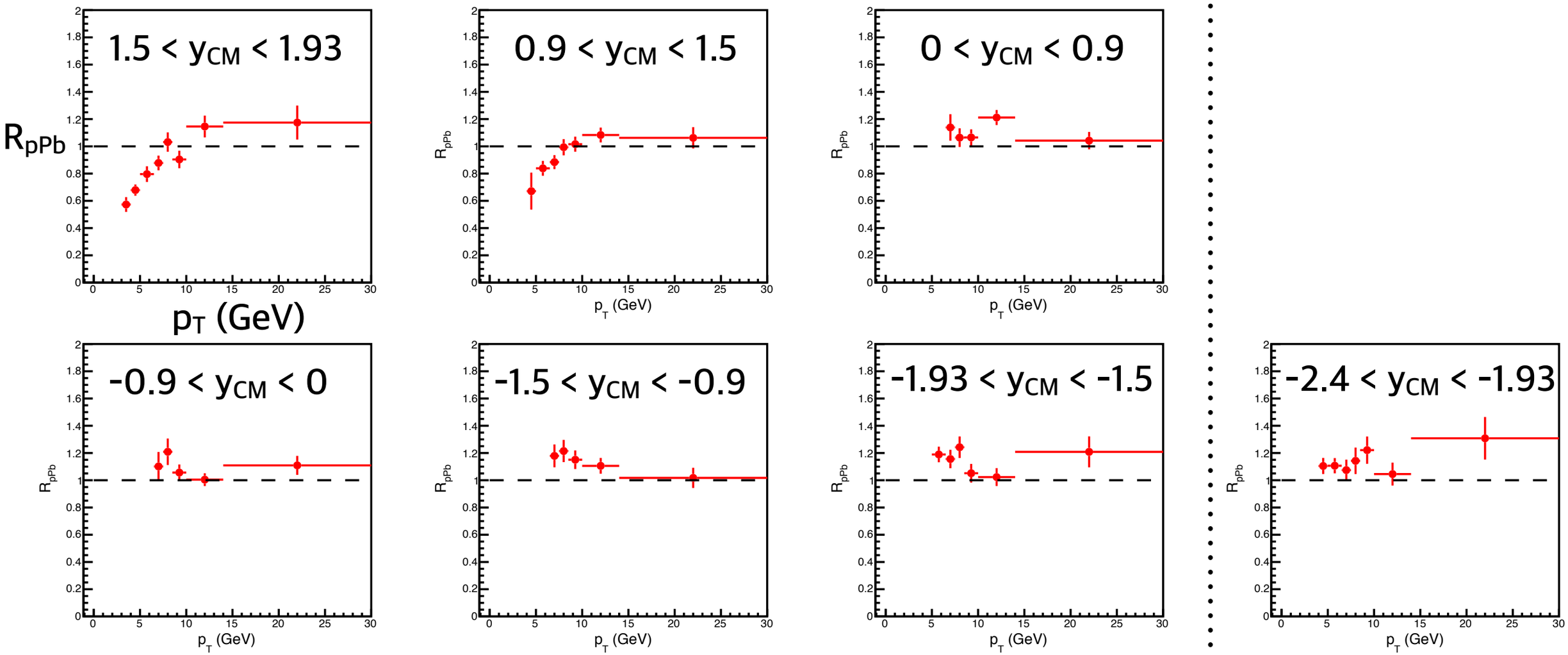
- official MC for Efficiency :
  - RECO done yesterday! -> making onia Trees
  - quick check with private onia Trees

Quick check on R_{pPb}

$$R_{\mathrm{pPb}}(y, p_{\mathrm{T}}) = \frac{\mathrm{d}^2\sigma^{\mathrm{J}/\psi}_{\mathrm{pPb}}/\mathrm{d}y\mathrm{d}p_{\mathrm{T}}}{A_{\mathrm{Pb}} \cdot \mathrm{d}^2\sigma^{\mathrm{J}/\psi}_{\mathrm{pp}}/\mathrm{d}y\mathrm{d}p_{\mathrm{T}}}$$

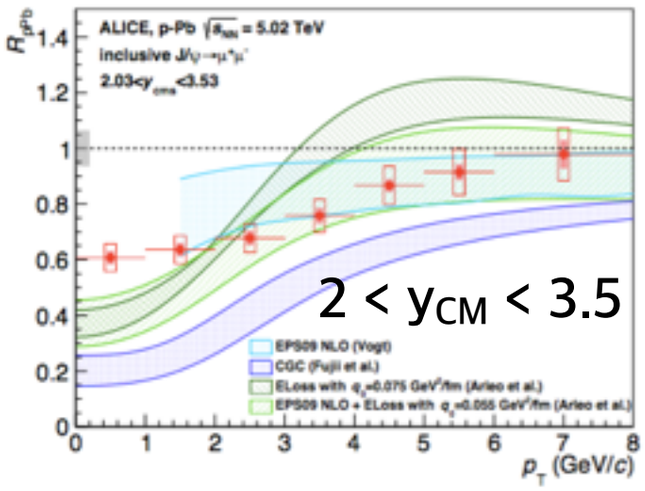
pp L_{int} = 26.3 pb^{-1}
pPb L_{int} = 34.6 nb^{-1}

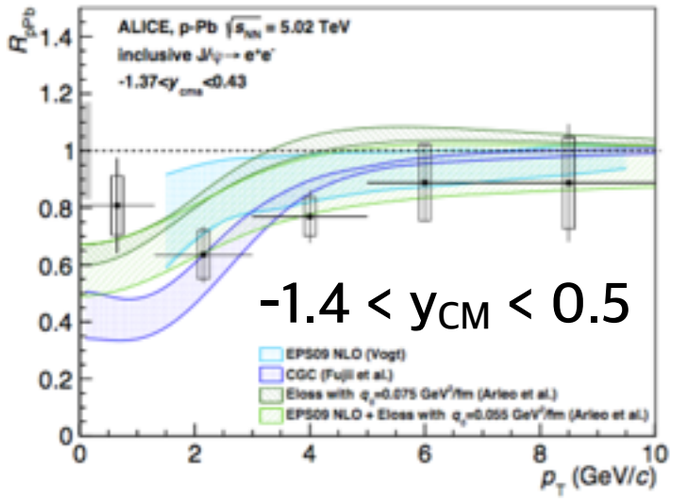
- prompt J/psi
  - No z vertex weight, No tnp SF, fitting results NOT tuned
  - R_{pPb} < 1 at low pT, forward?

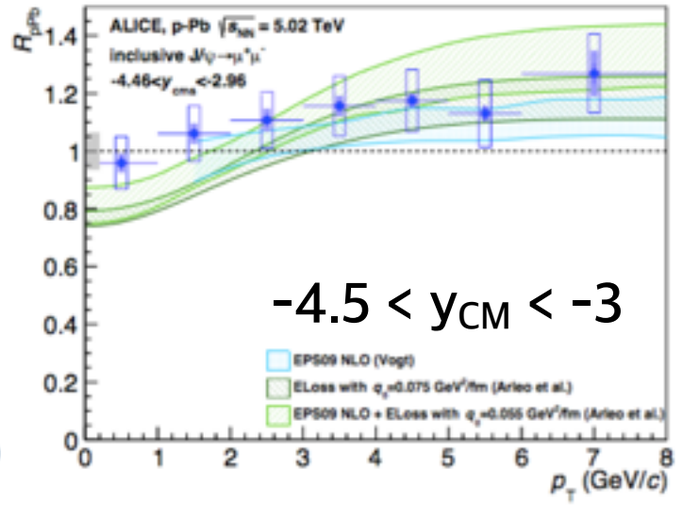


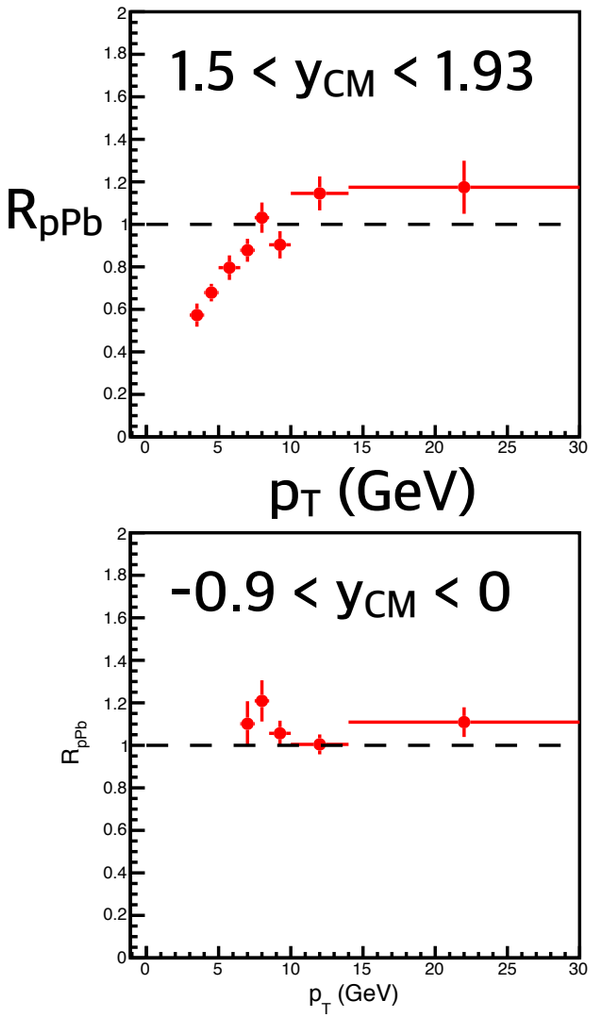
Quick check on R_{pPb}

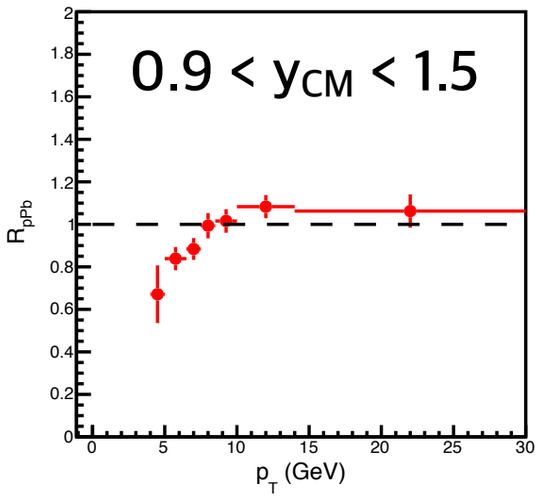
- ALICE
- inclusive J/psi
- $0 < p_T < 8$ GeV
- R_{pPb} <1 at low pT, fowrad

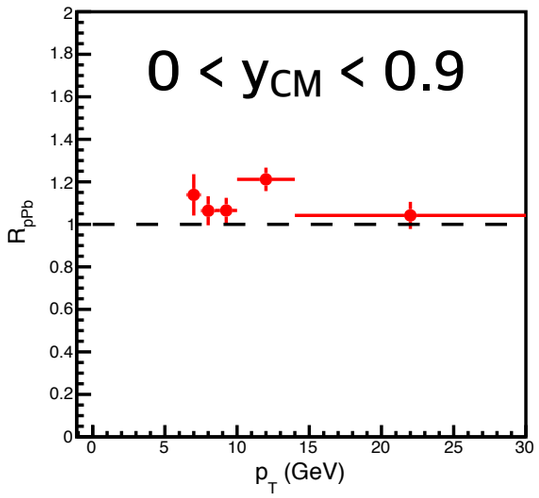


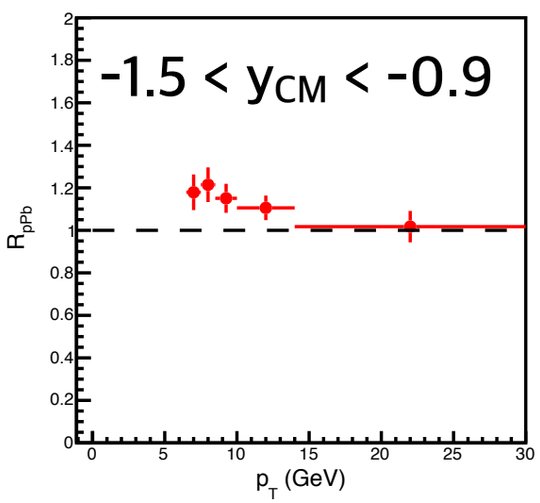


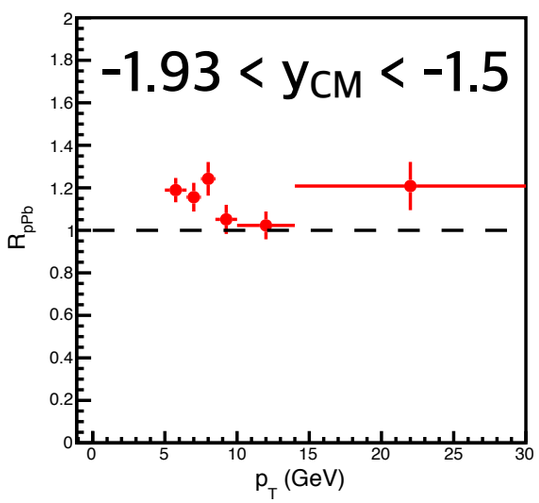


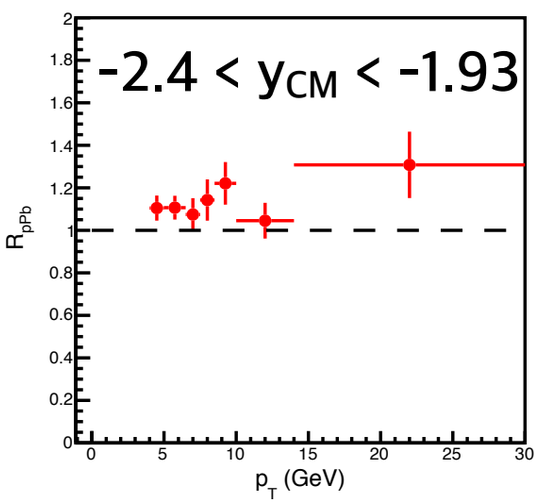






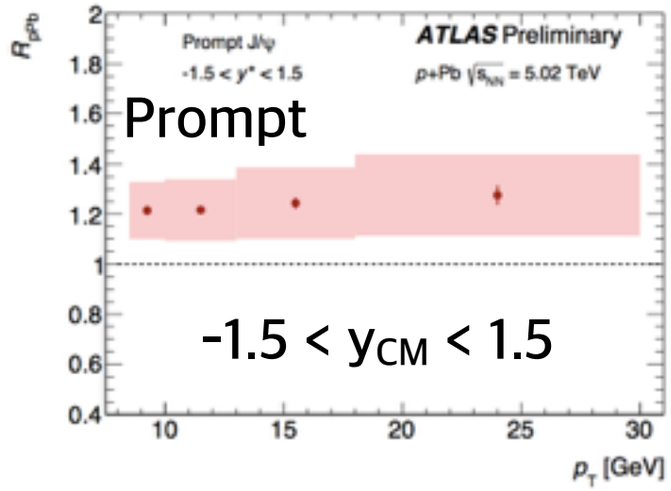


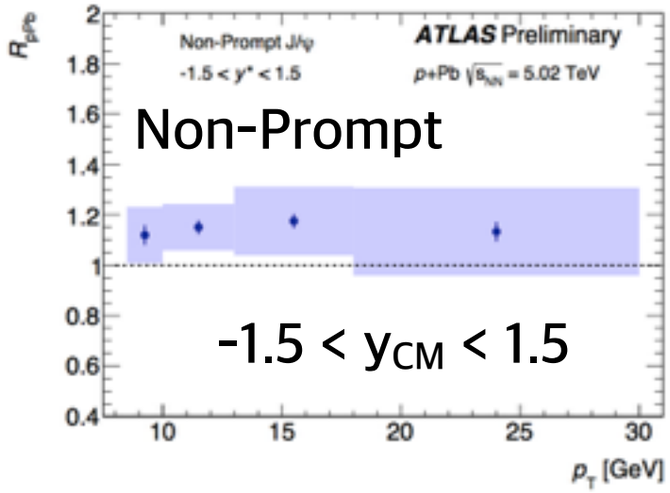


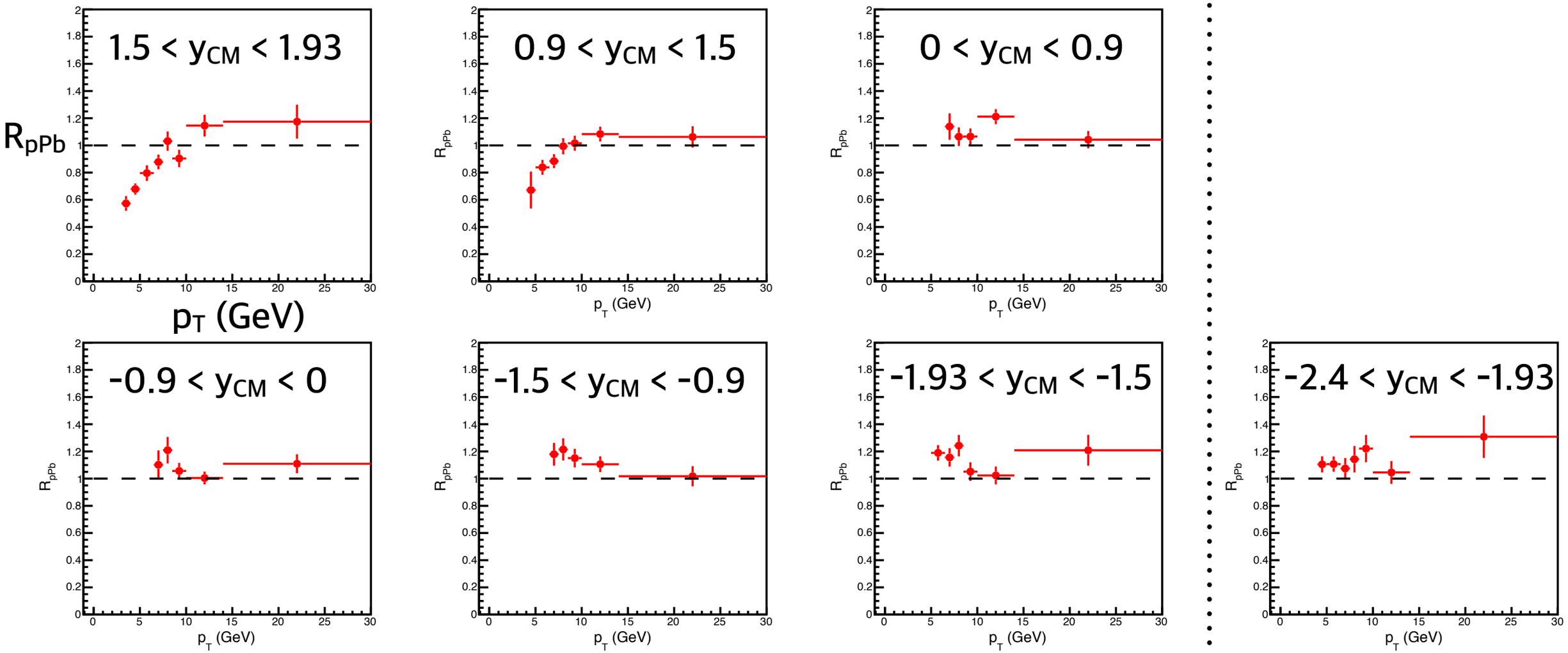


Quick check on R_{pPb}

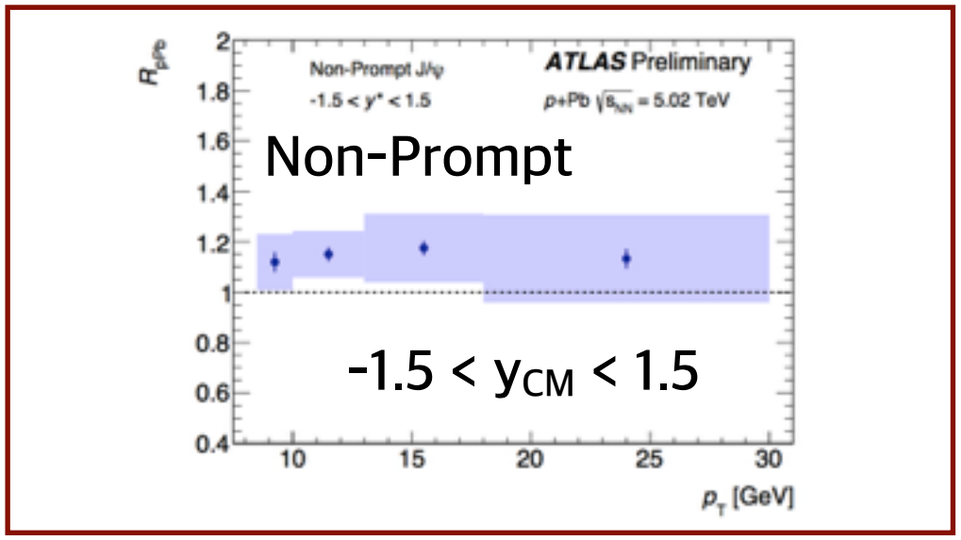
- ATLAS
- prompt & non-prompt
- $8.5 < p_T < 30$ GeV
- $R_{pPb} \sim 1.2$



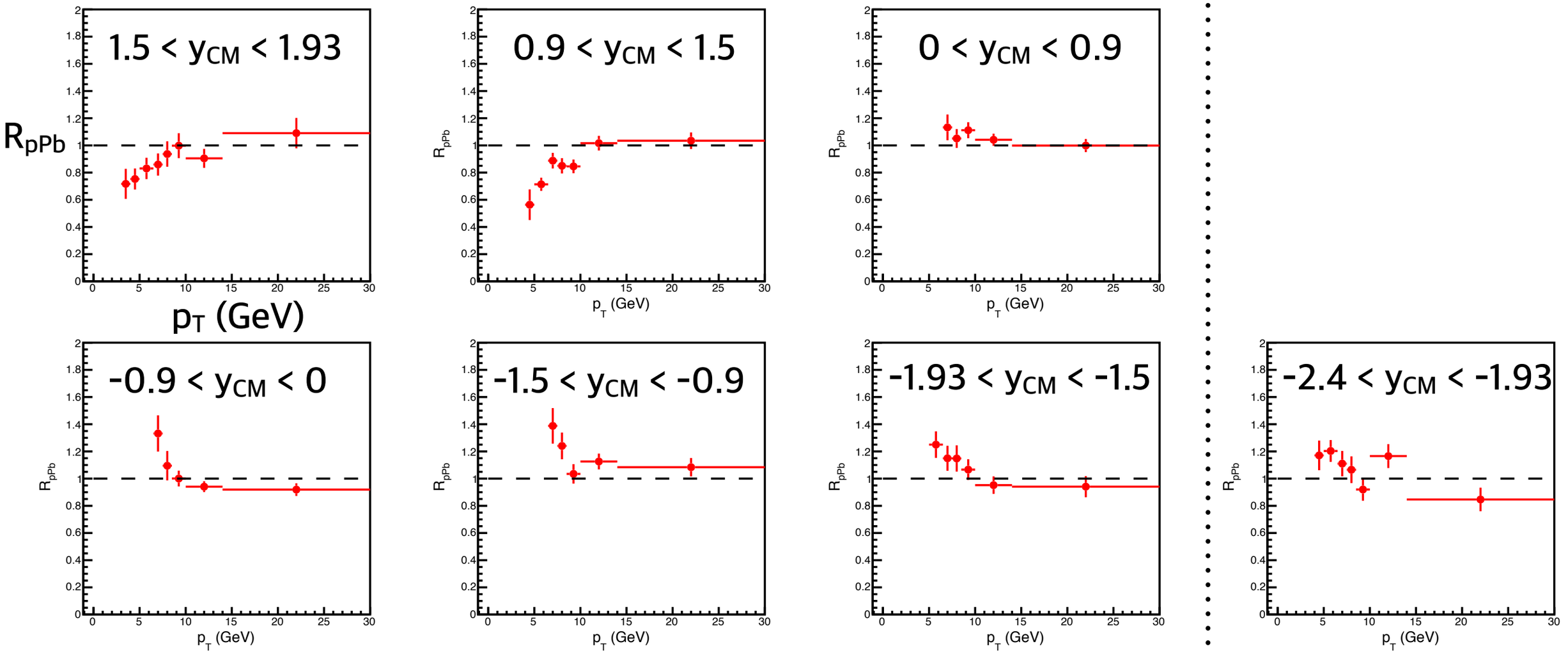




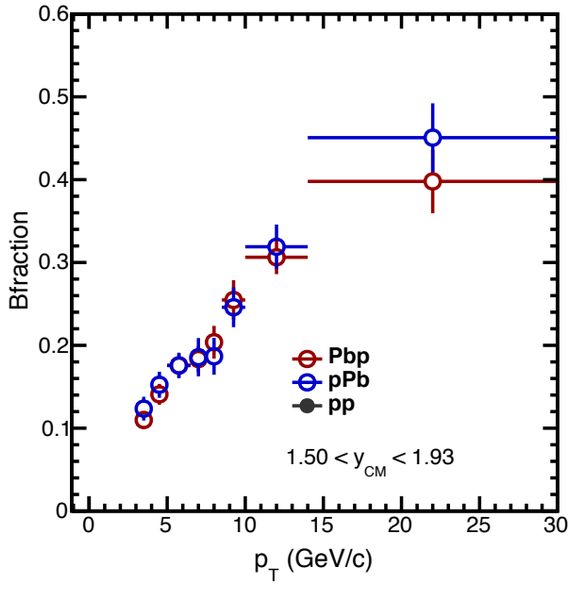
Quick check on R_{pPb}

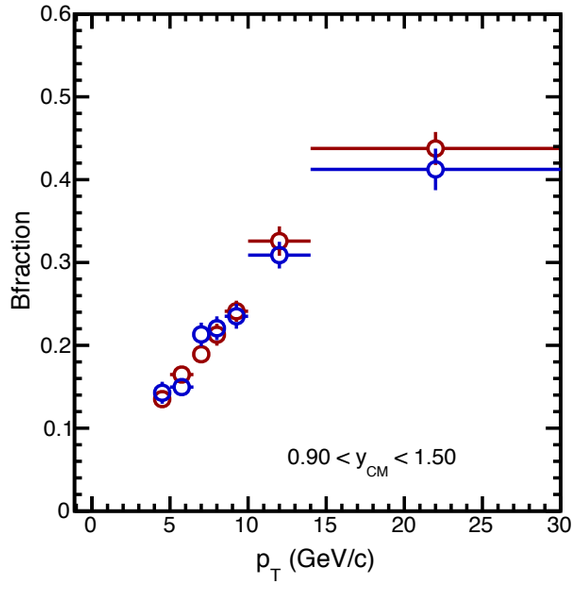


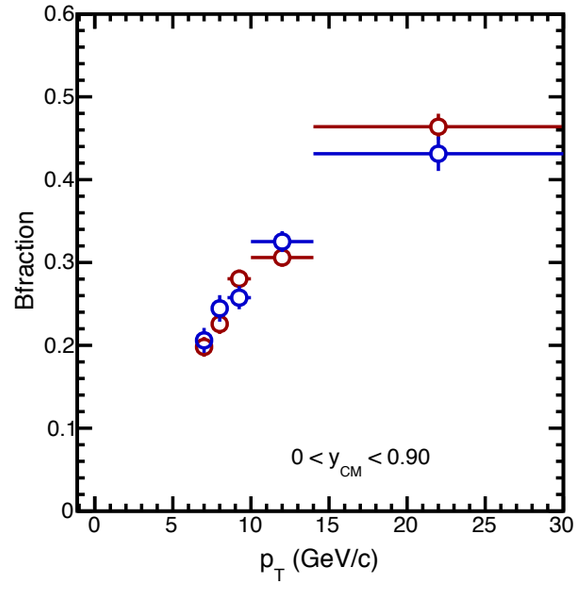
- Non-prompt J/psi
  - Less suppression at low pT, forward?
  - What is going on at low pT backward (R_{pPb} > 1)?

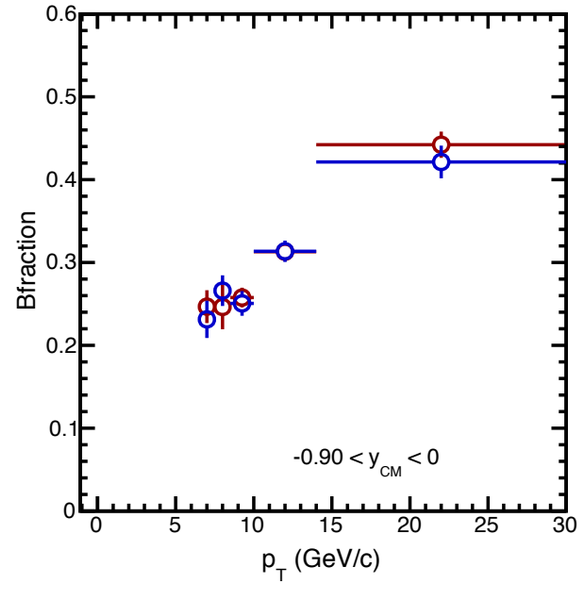


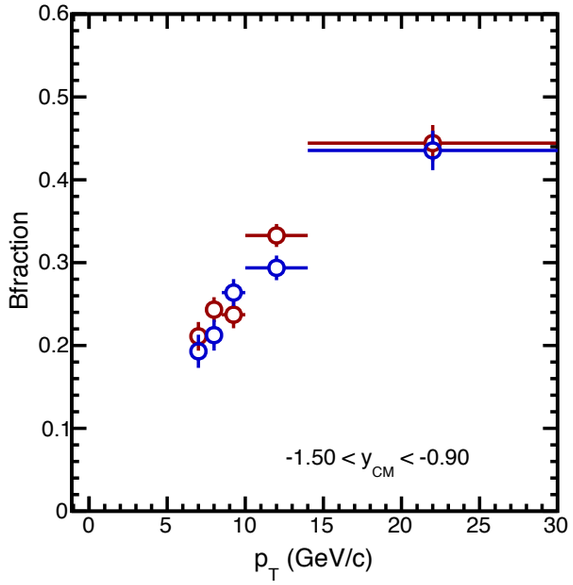
B-fraction

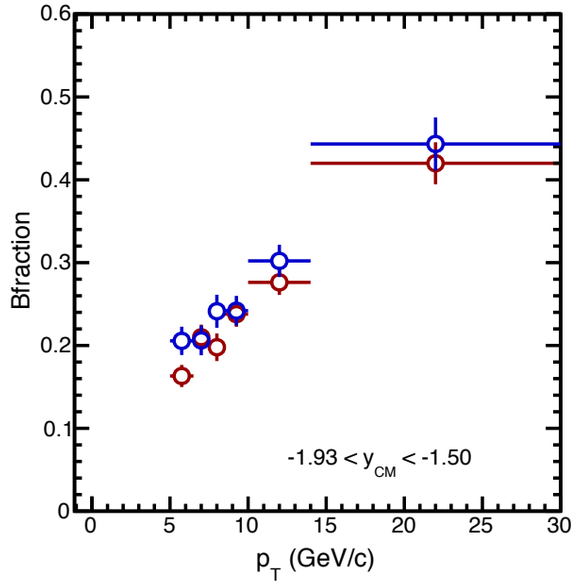


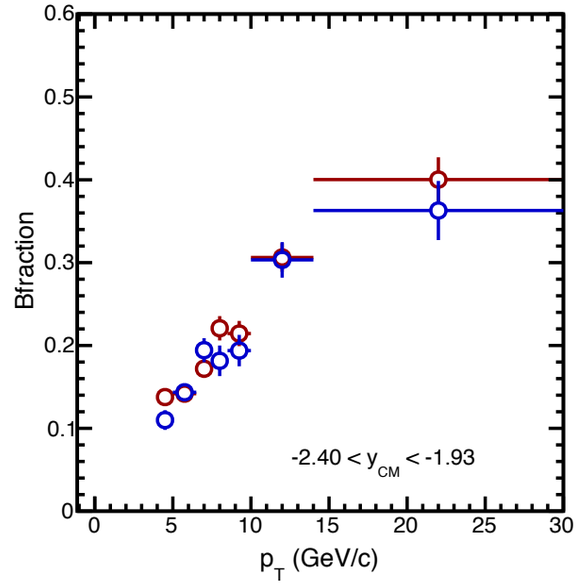


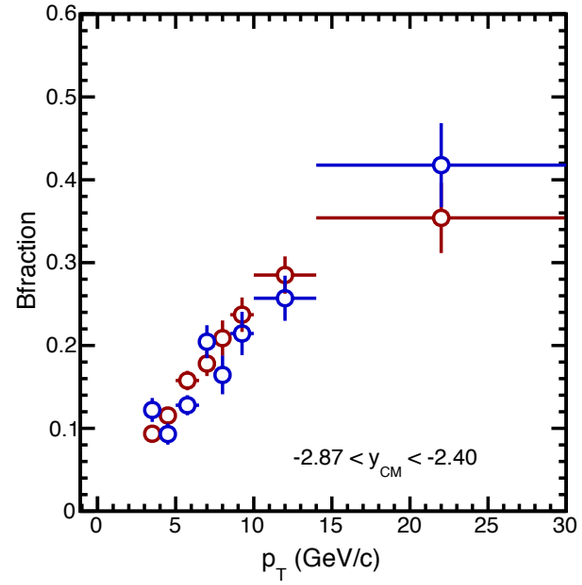






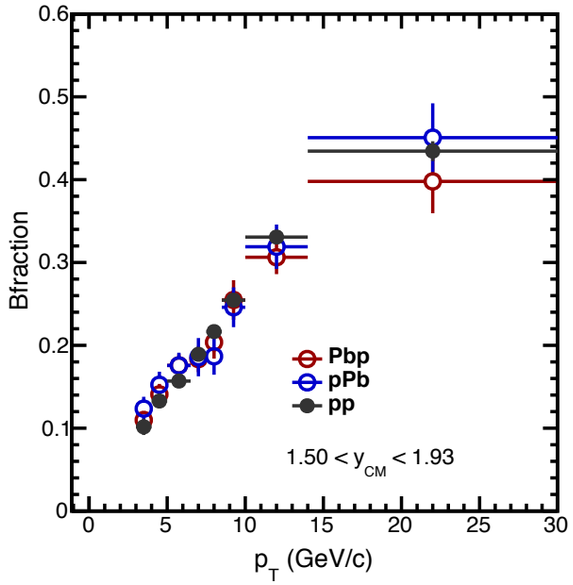


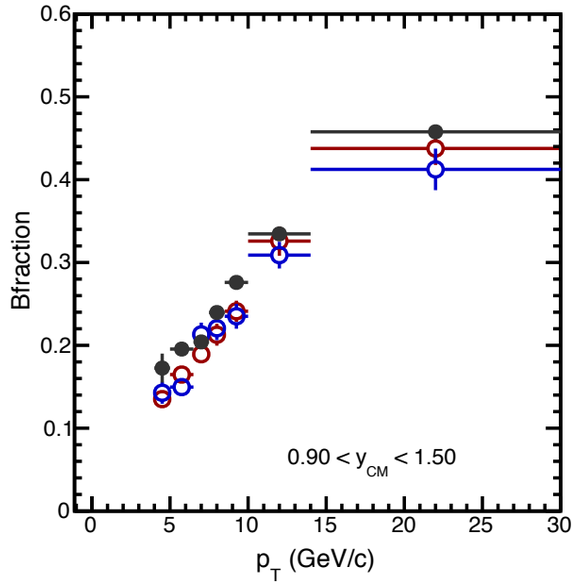


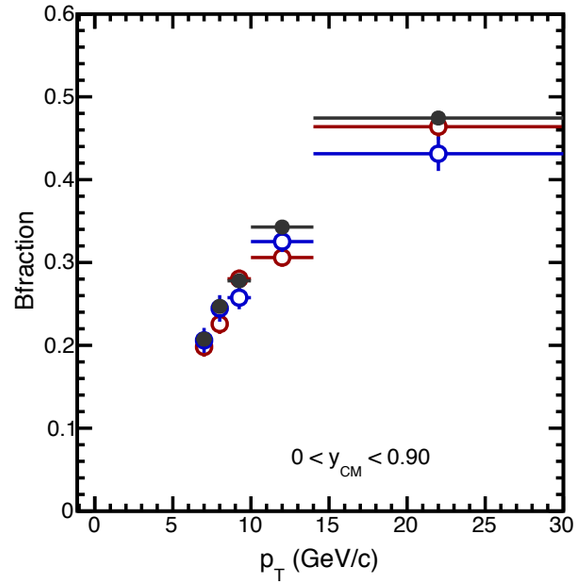


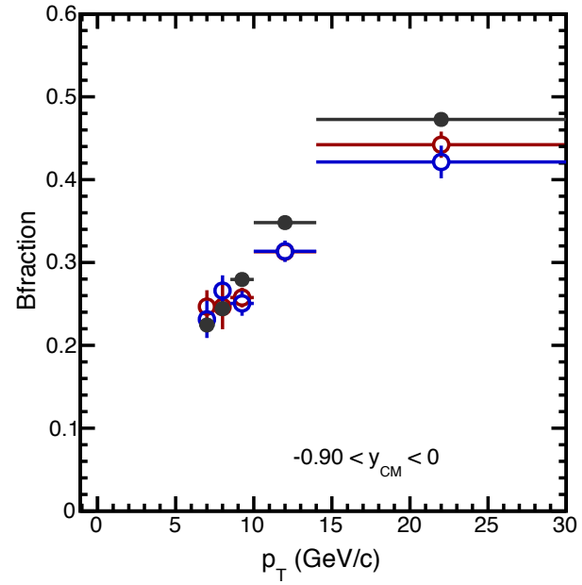
- discrepancy b/w Pbp and pPb
- p_T dependence fluctuates

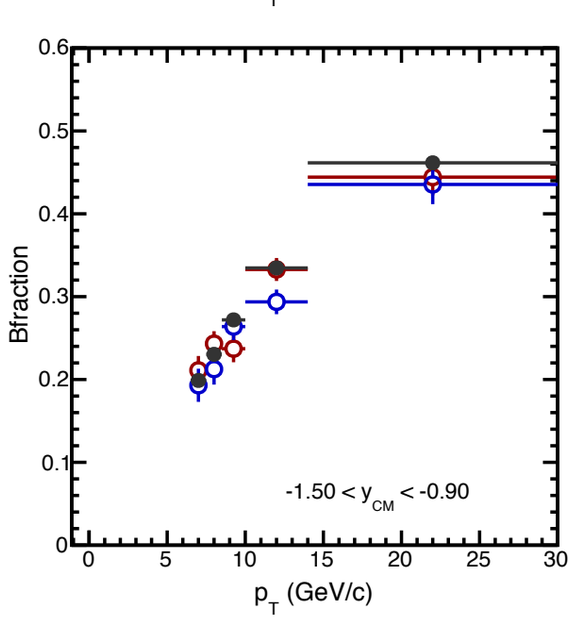
B-fraction

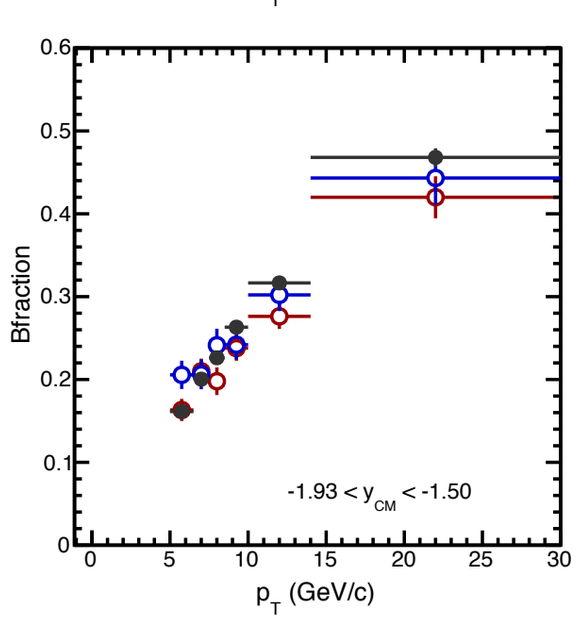


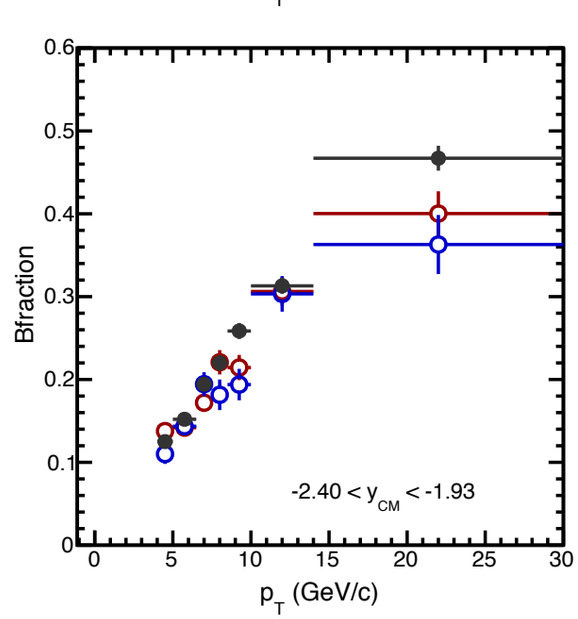


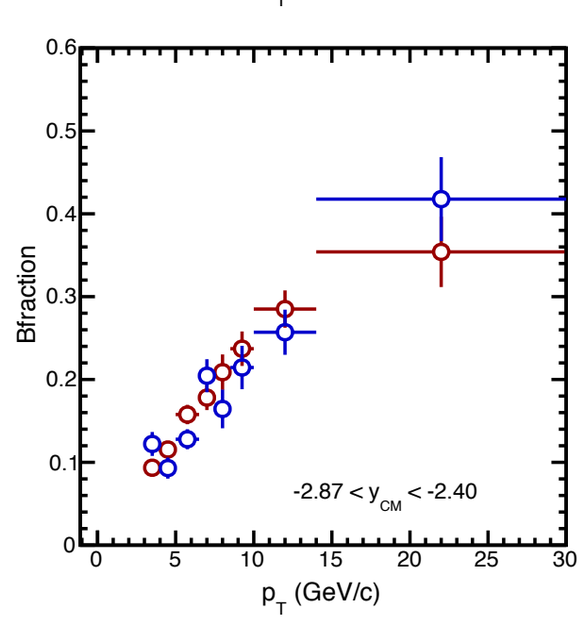












- pp rather stable

to-do

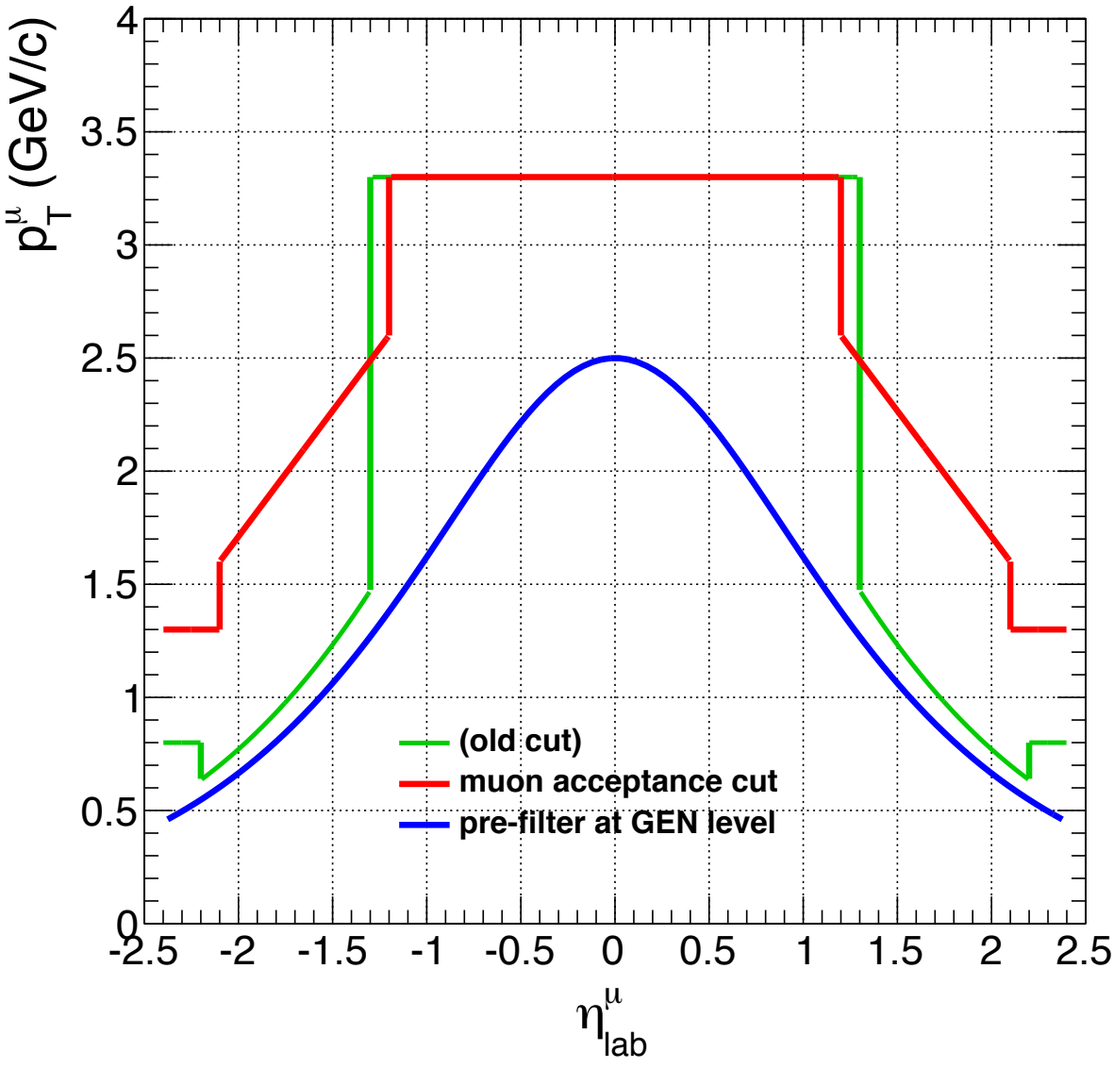
- R_{pPb}
  - merge Pbp and pPb and check the fit results, especially B-fraction
  - make pT binning coarser if needed

- more check on acceptance and efficiency
  - also cross-checking with pPb psi(2S) crews

Back up

single muon acceptance cut

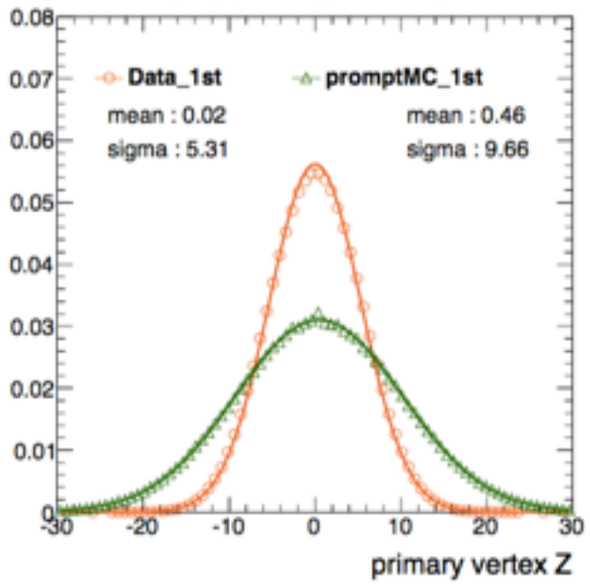
- GREEN : old acceptance cut
  - $|\eta^{\mu}| < 1.3$ → $p_T > 3.3$ GeV
  - $1.3 < |\eta^{\mu}| < 2.2$ → $p > 2.9$ GeV
  - $2.2 < |\eta^{\mu}| < 2.4$ → $p_T > 0.8$ GeV
- RED : new acceptance cut
  - $|\eta^{\mu}| < 1.2$ → $p_T > 3.3$ GeV/c
  - $1.2 < |\eta^{\mu}| < 2.1$ → $p_T > -1.11 \times \text{abs}(\eta^{\mu}) + 3.93$ GeV
  - $2.1 < |\eta^{\mu}| < 2.4$ → $p_T > 1.3$ GeV/c
- Blue : mumugen filter (at GEN level)
  - $-2.5 < |\eta^{\mu}| < 2.5$
  - $p > 2.5$ GeV



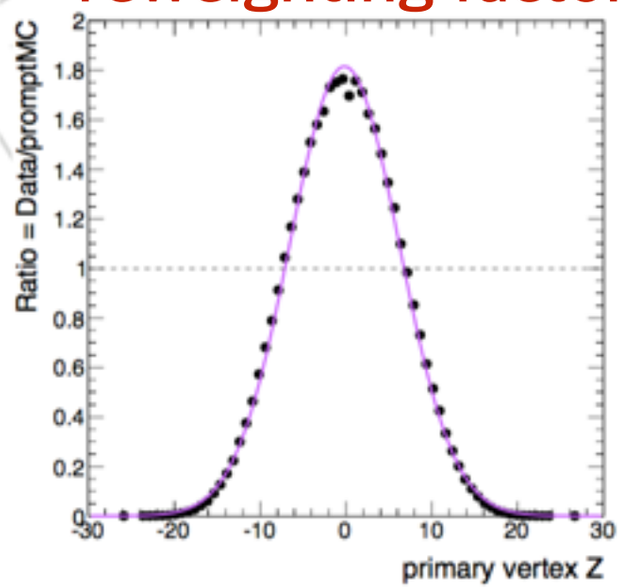
z vertex correction

- 1) Reweight Z vertex distributions of MC by Data/MC ratio

Data vs MC

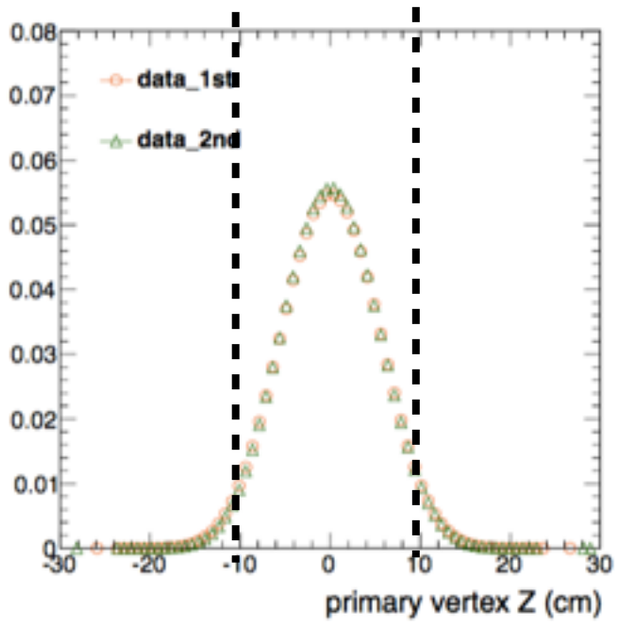


reweighting factor

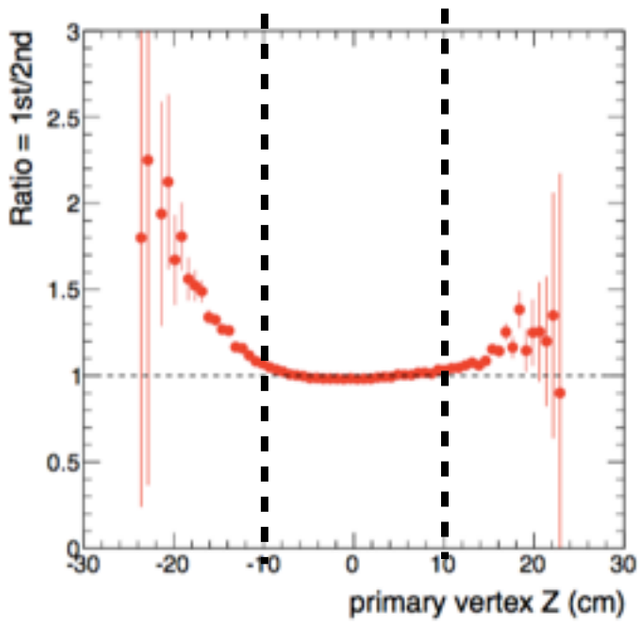


- Z vertex cut < 10 cm : 6% of events rejected both in MC and Data

Data 1st vs 2nd



Ratio

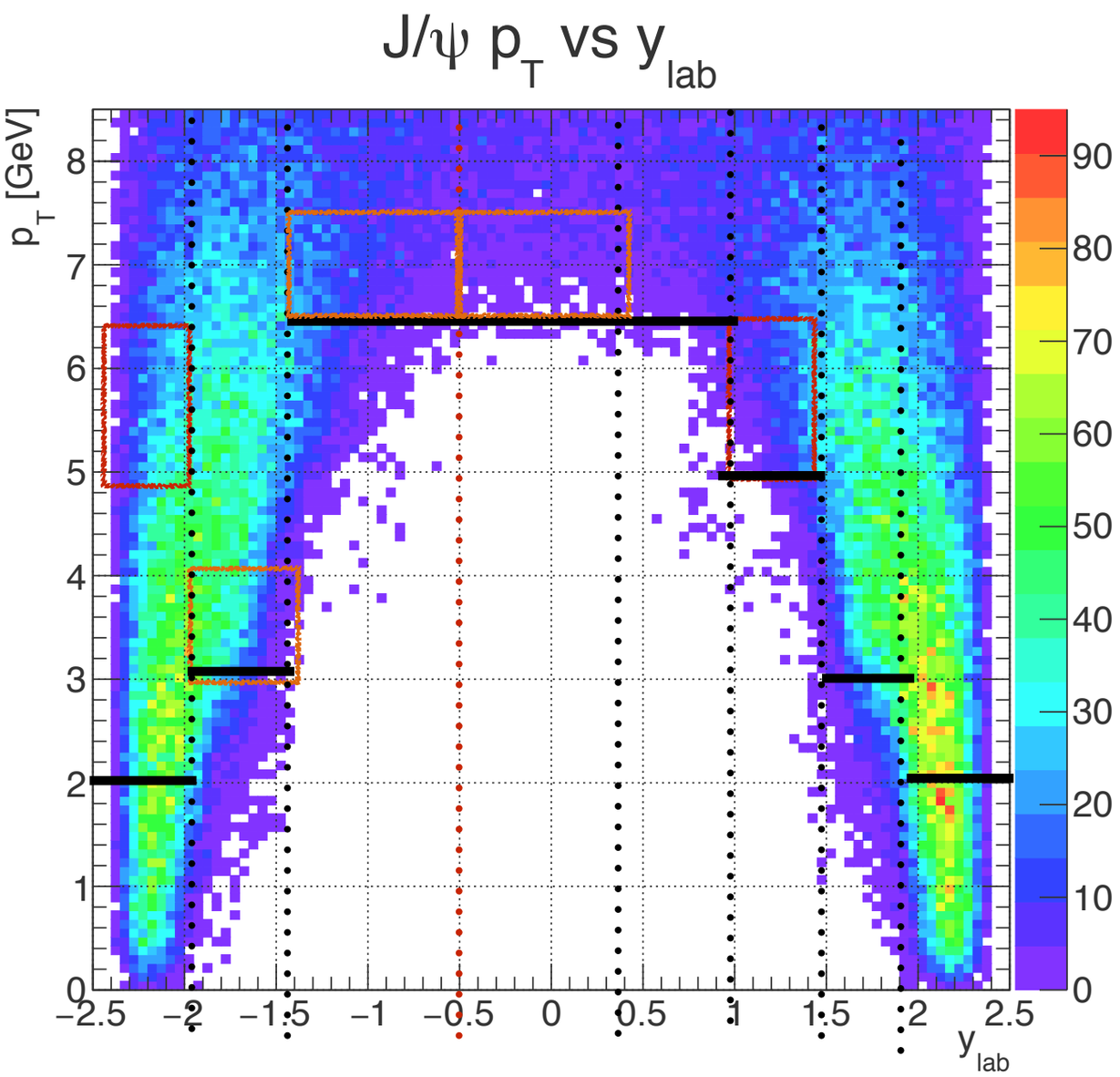


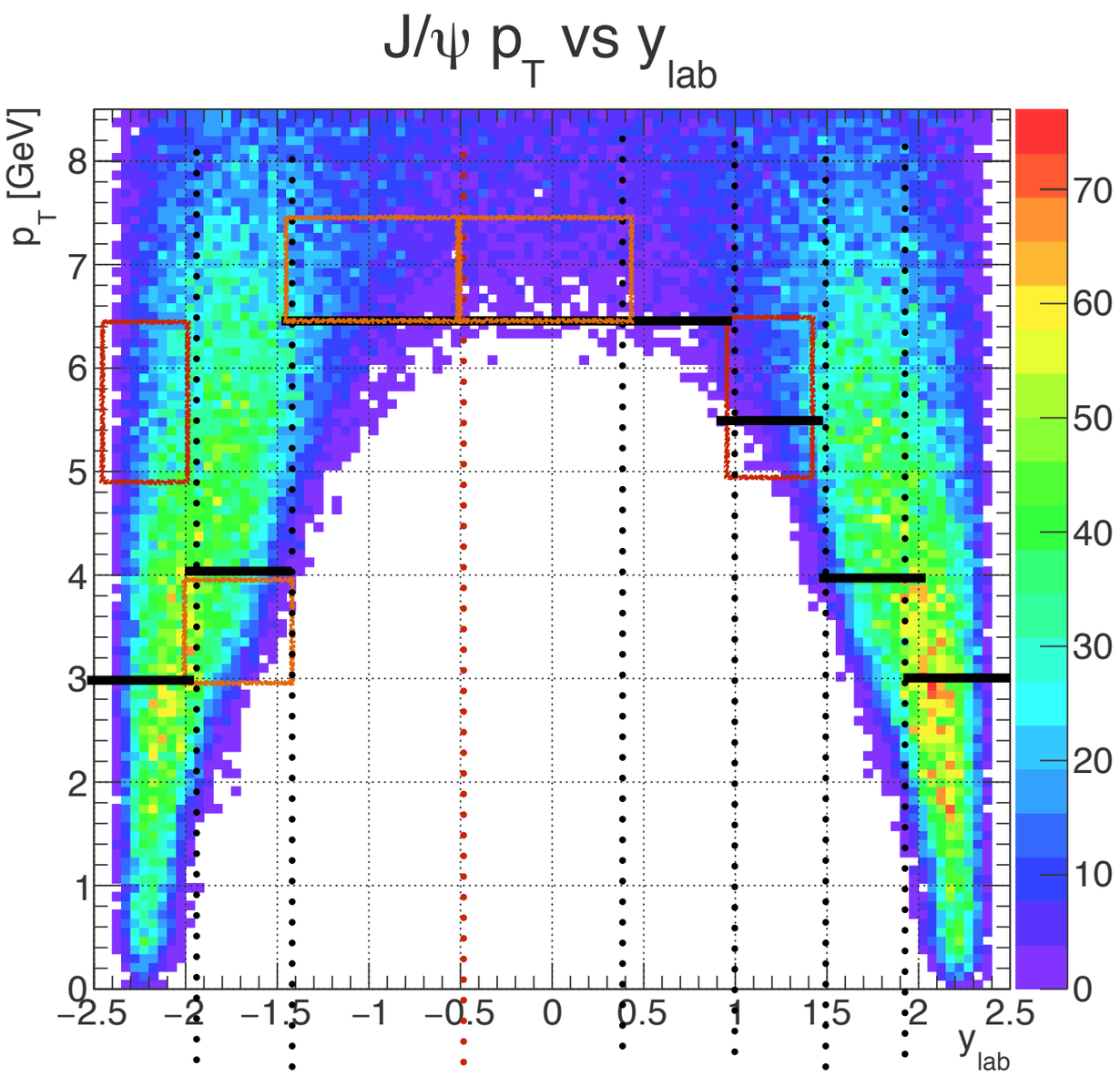
z vertex correction

	MC	FIT	pPb TNP	pp TNP
1st week	Onia Tree muon ID distributions Initial Acc. & Eff z vertex reweight		TNP SKIMMING (KISOO?)	co-work with Camelia & Anna
2nd week		nominal fits	SF calculation	
3rd week	Reco pT reweight			
4th week	Final Acc. & Eff Compare old and new single muon cut for Acc, Eff, fit, TNP		muon POG?	
5th week	: try to reproduce and finalize central points of results			
7th week	systematics finalize the results	systematics.	Toy MC	
8th week	: try to finalize AN and PAS and seek for GL			

- Total 2-3 months from new MC release to re-approval
- move to the paper publication right after re-approval

B-fraction





- check plots again (+pp)
  - also check dimuon acc*eff is larger than 10 %