[HIN-14-009]
status

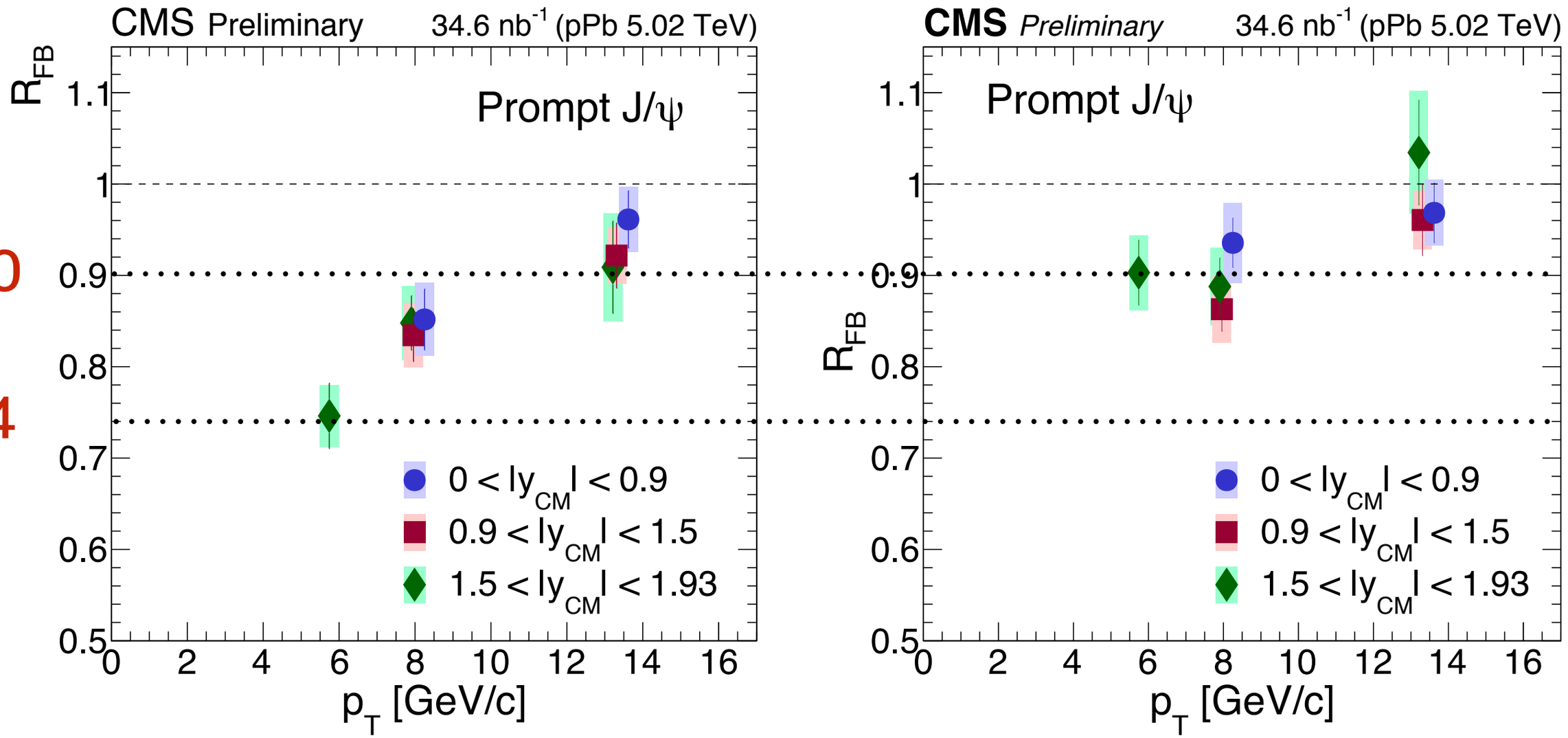
Songkyo Lee*, Yongsun Kim, Kisoo Lee

KUNPL CMS meeting
29th January 2016

R_{FB} results

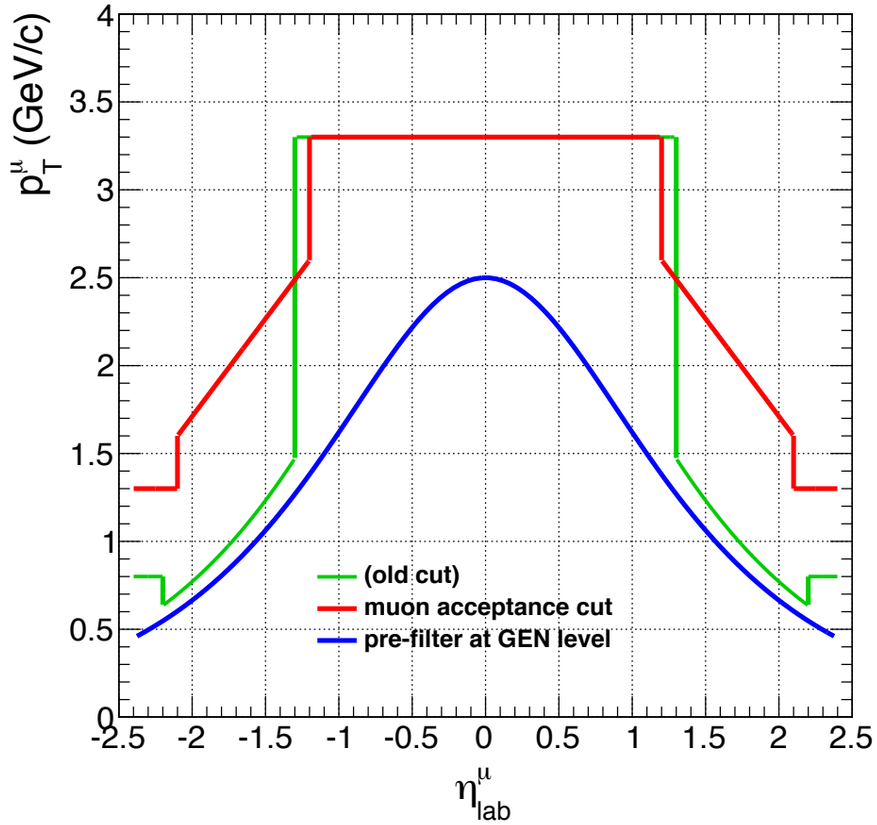
PAS

NEW



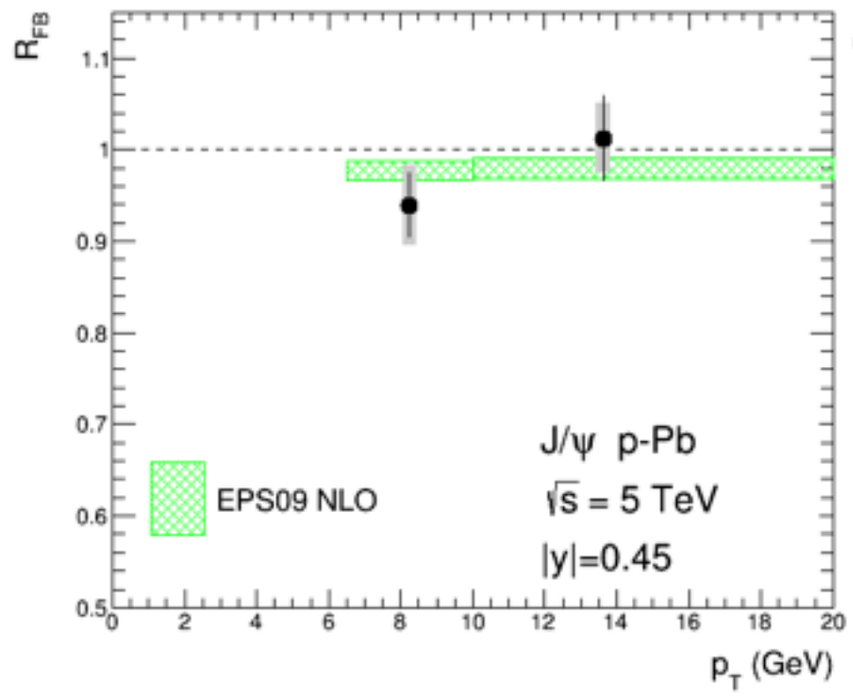
What has been changed?

- private MC -> official MC
  - affects acceptance, efficiency, and raw yields (MC templates for 2D fits)
- tighter single muons acceptance cut
  - affects acceptance, efficiency, and raw yields
- new TNP results
  - efficiency



- Else
  - reweighting of MC p_T spectra
  - effect of Z vertex cuts on efficiency

theory prediction

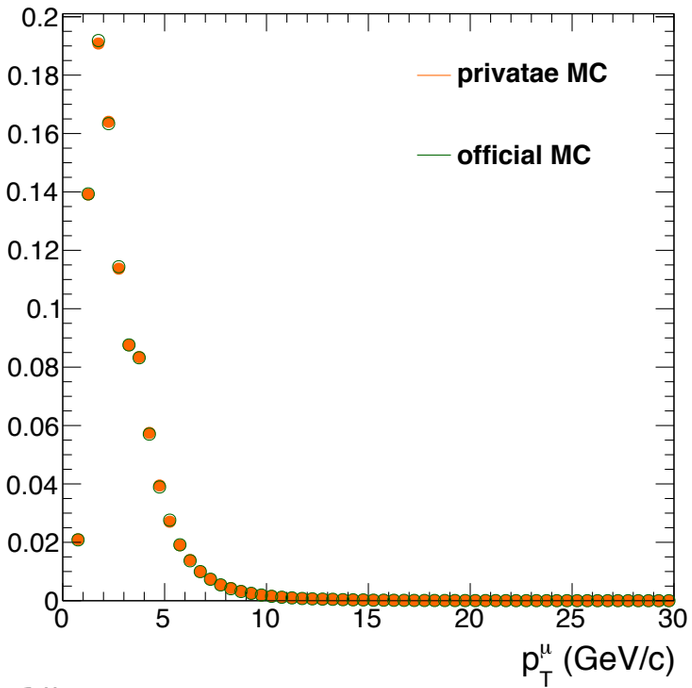


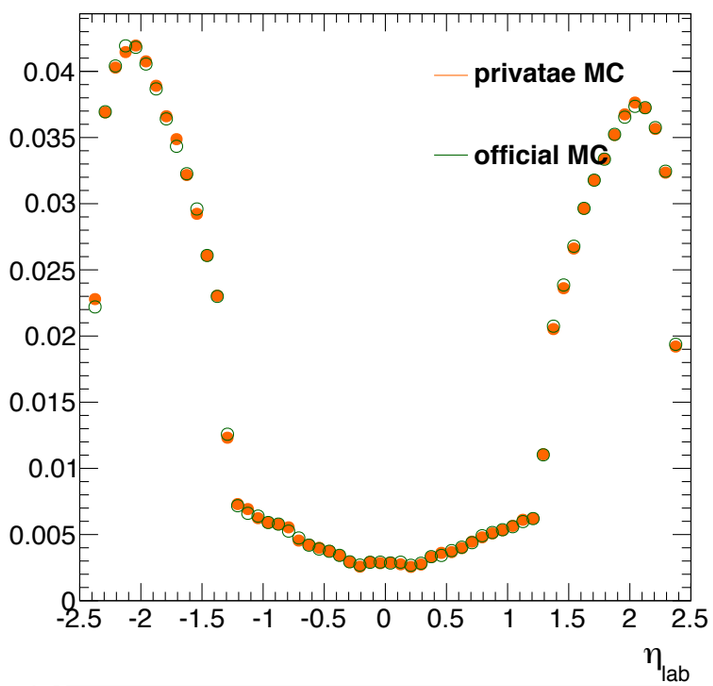
Back ups

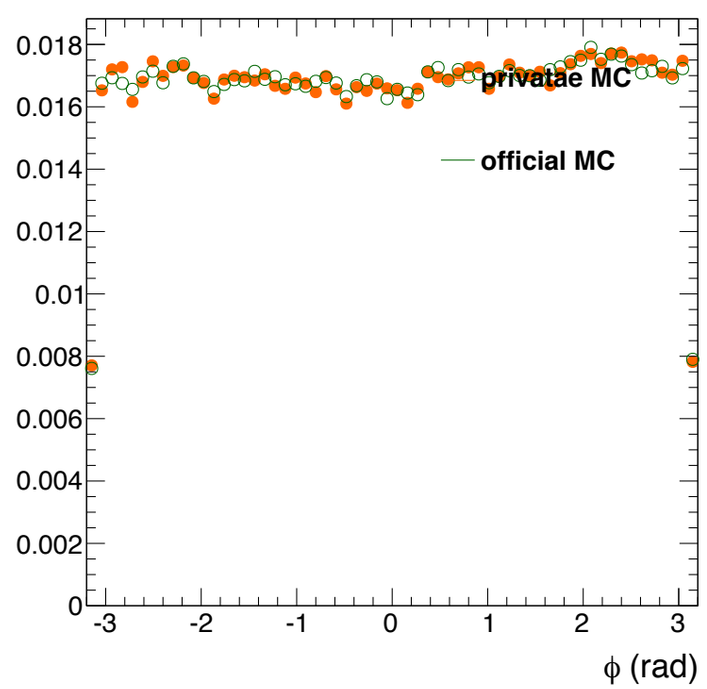
new R_{FB} with various TNP SF

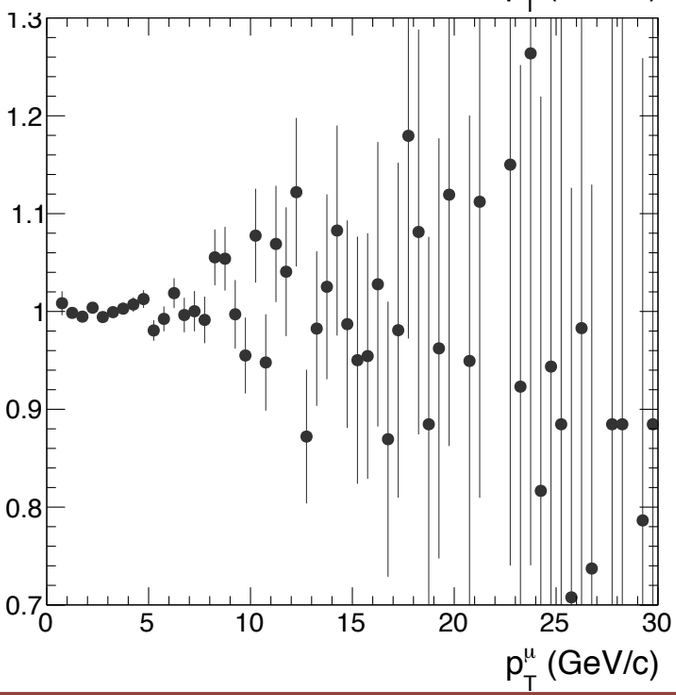
- **reconstructed single muons distributions**
  - old acceptance cut
  - muon ID cut

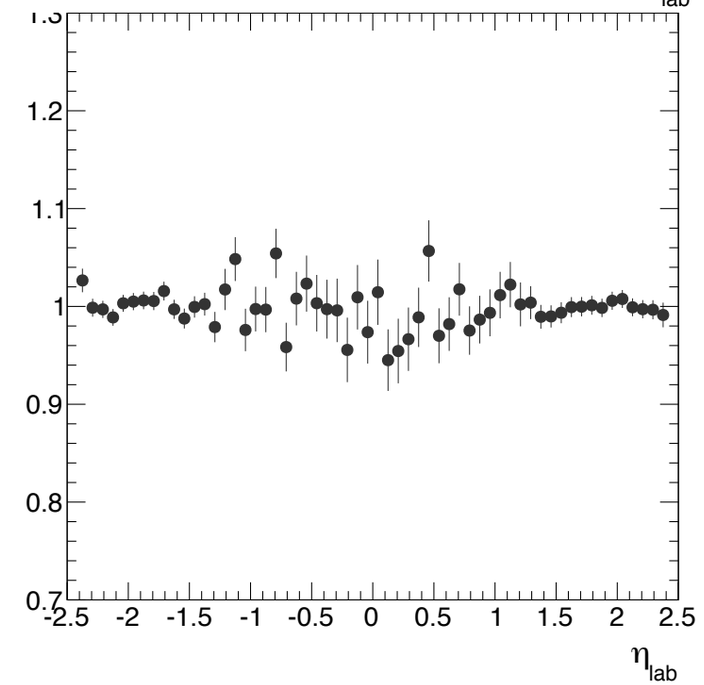
Gen, Reco, Sgl, Dbl muons all agree well (backup)

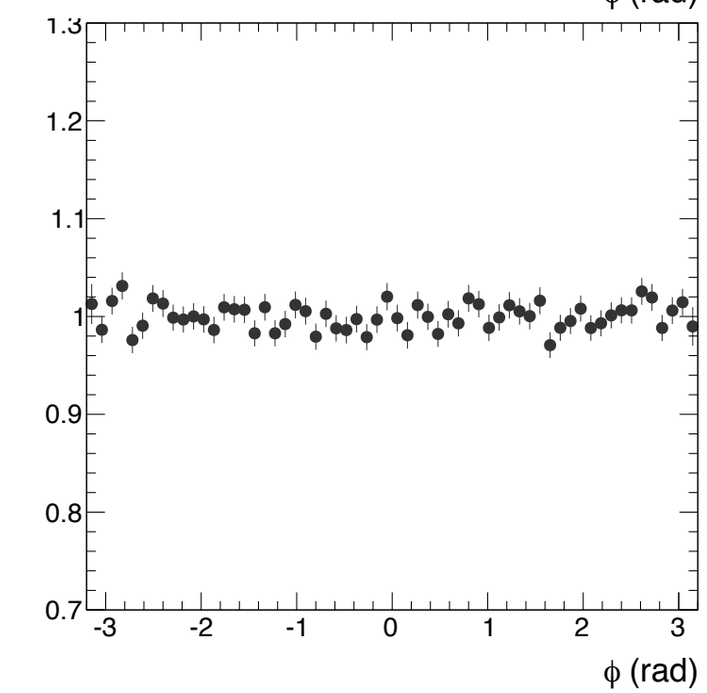






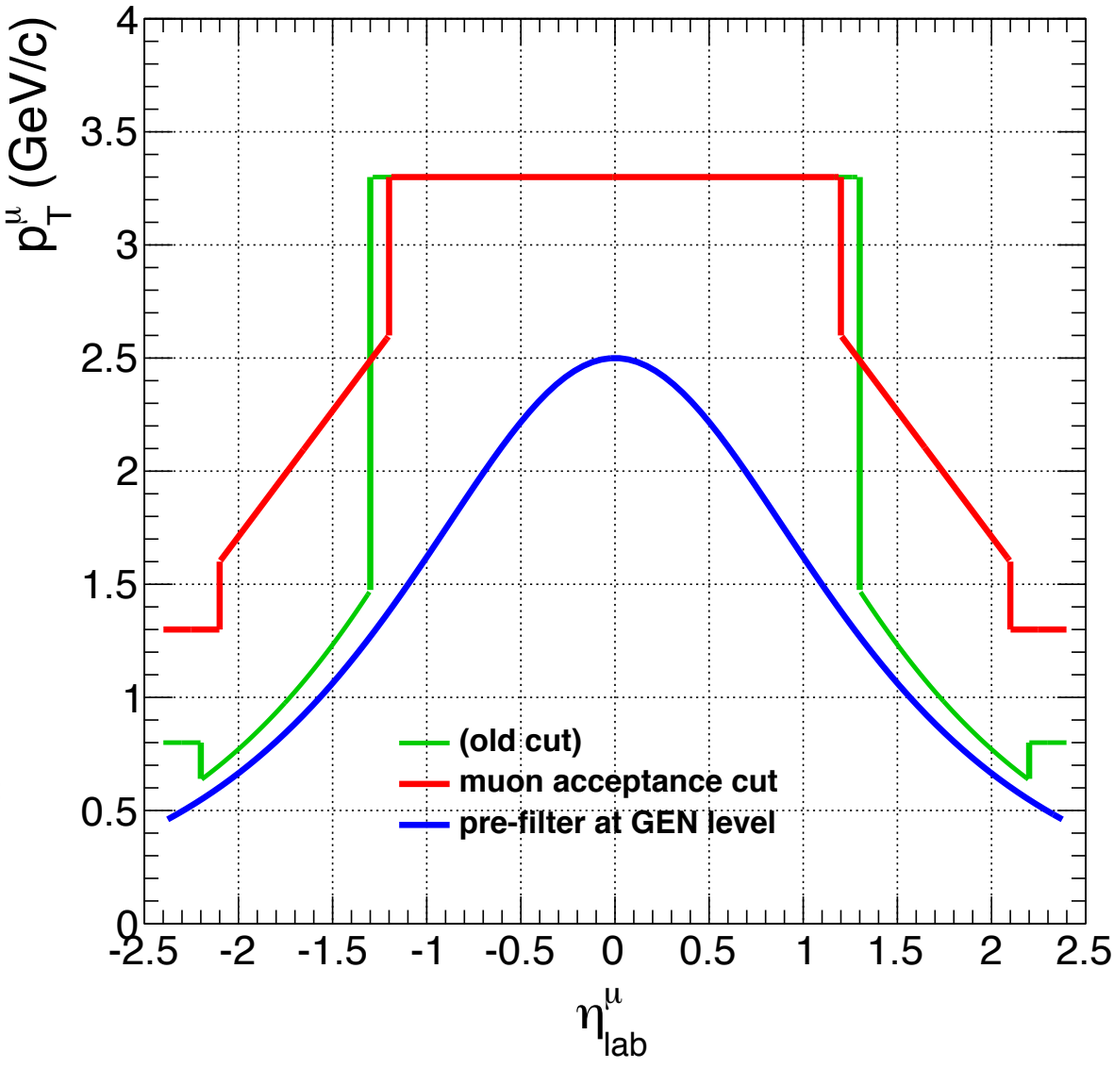




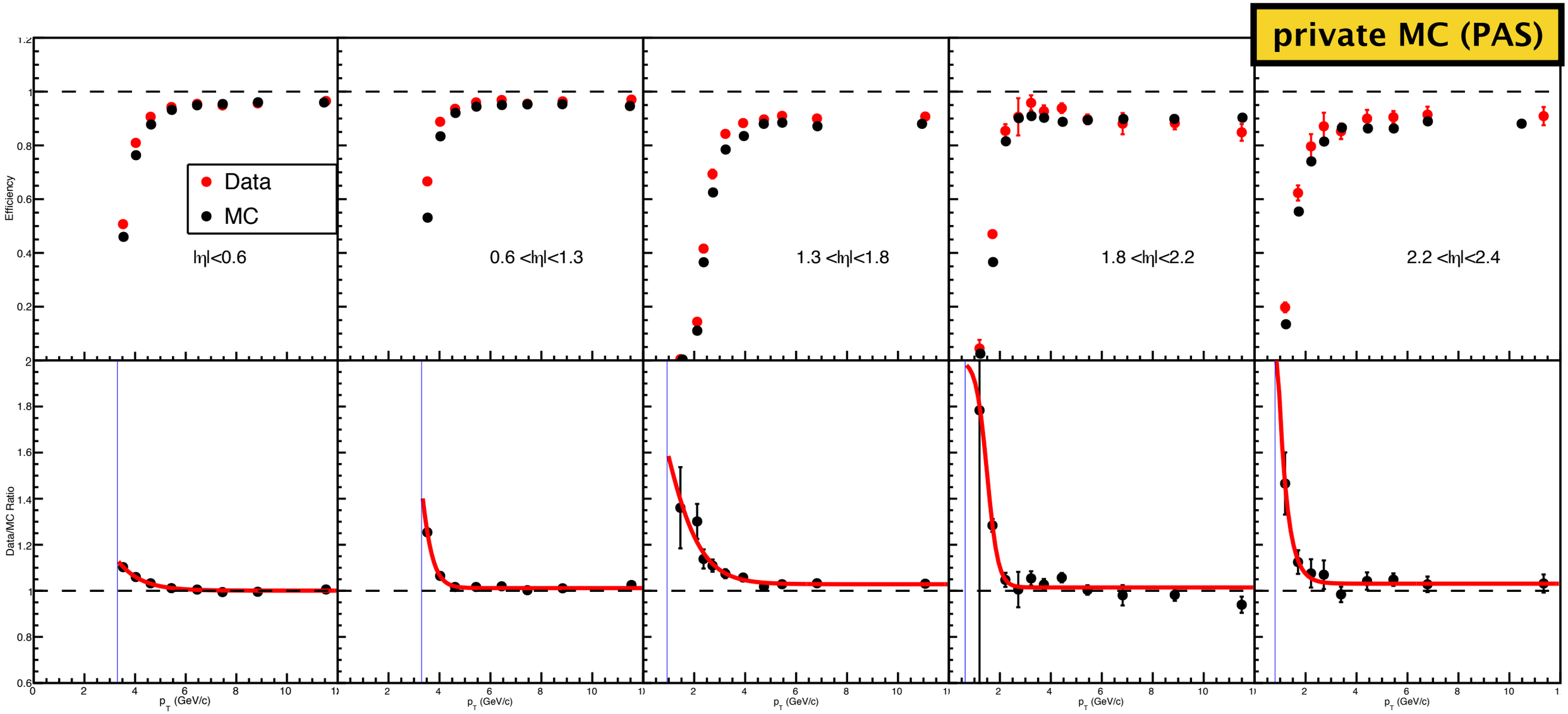


pre-filter at GEN level (after boost)

- 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
  - $1.2 < |\eta^{\mu}| < 2.1$ → $p_T > -1.11 \times \mathrm{abs}(\eta^{\mu}) + 3.93$ 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

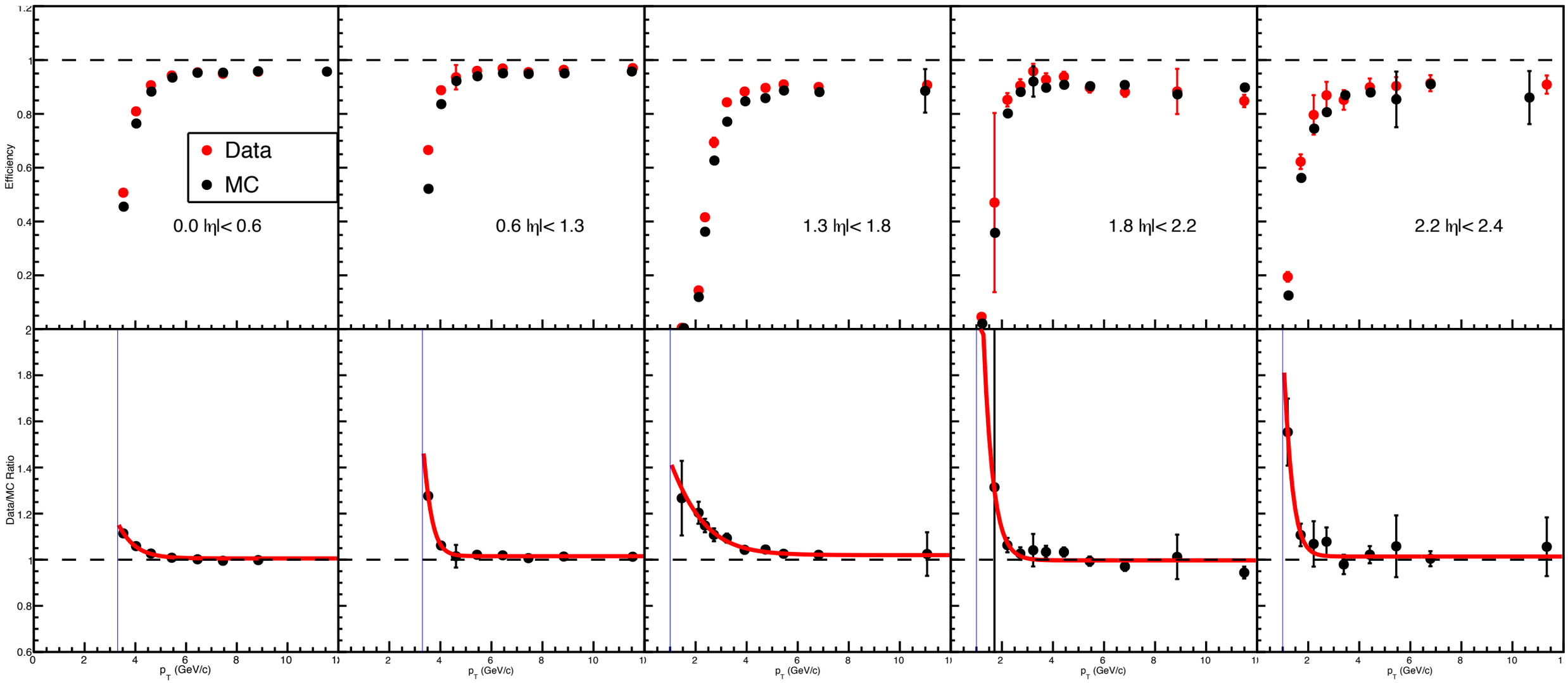


old.acc old. eta private + FW tag 5



- low p_T limit for each eta bin : 3.3 / 3.3 / 0.93 / 0.63 / 0.8 GeV

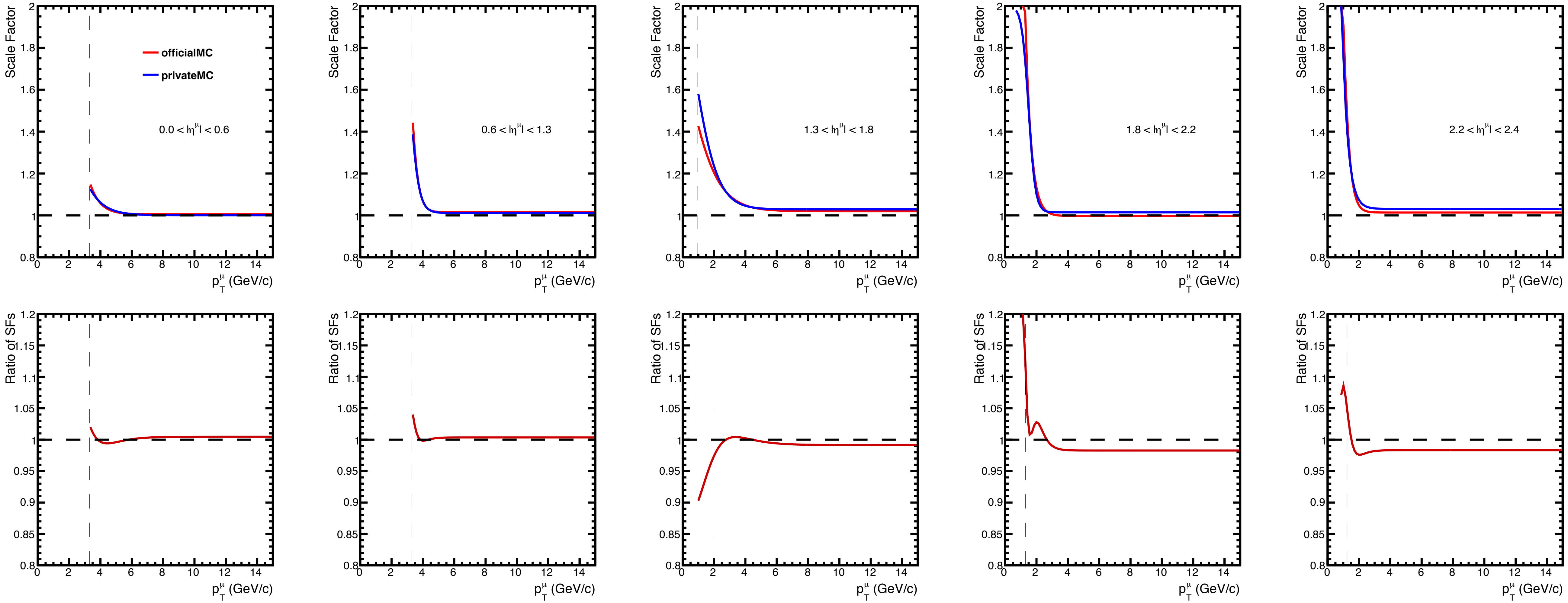
old.acc old. eta official + FW tag 5



- **official samples applying the same condition with PAS**

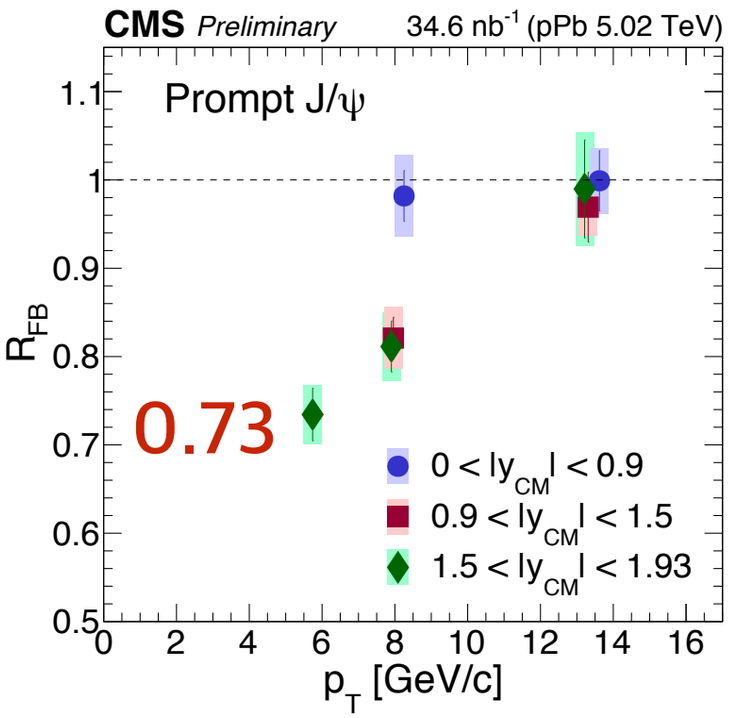
  - low p_T limit for each eta bin : 3.3 / 3.3 / 0.93 / 0.63 / 0.8 GeV

5 vs 6

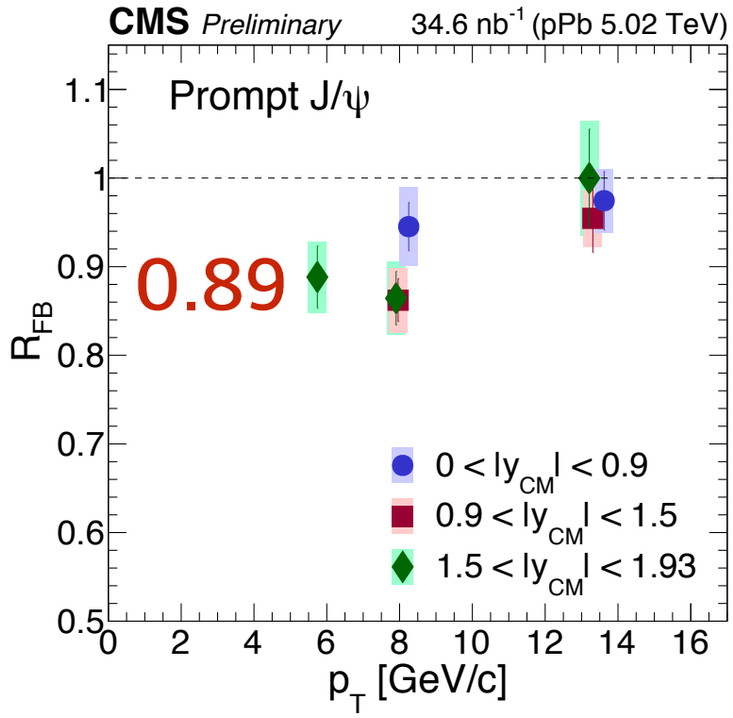

officialMC
privateMC
0.0 < |η^μ| < 0.6
0.6 < |η^μ| < 1.3
1.3 < |η^μ| < 1.8
1.8 < |η^μ| < 2.2
2.2 < |η^μ| < 2.4
Scale Factor
Ratio of SFs
p_T^μ (GeV/c)

new R_{FB} with various TNP SF

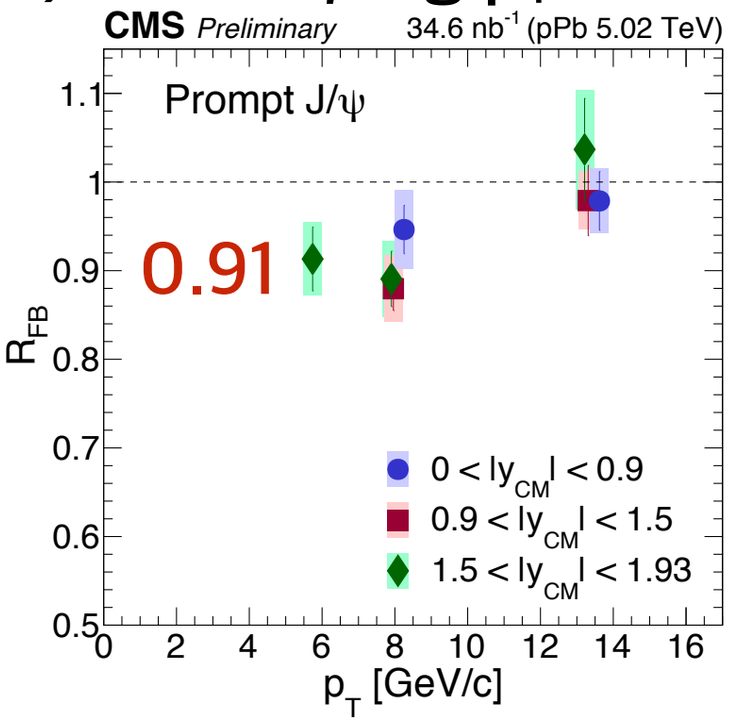
1) No SF



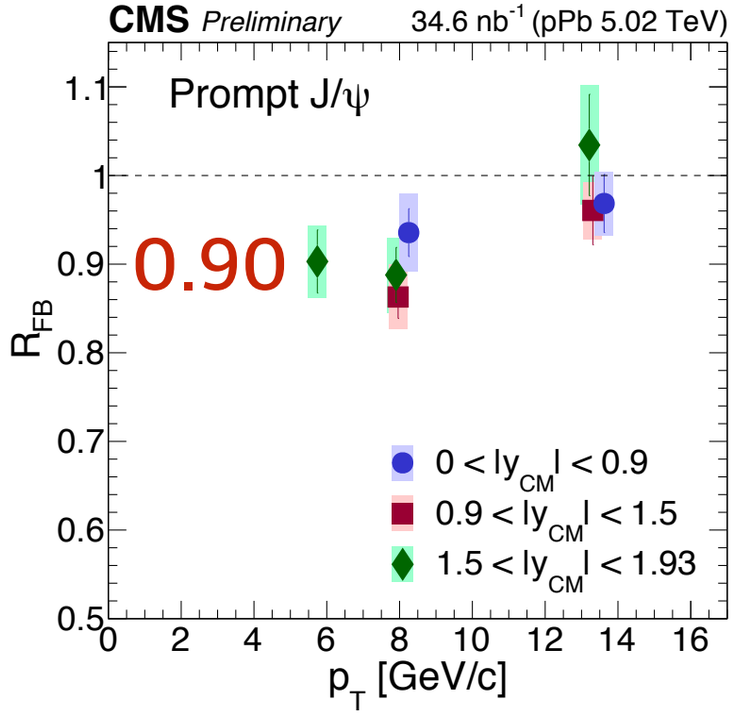
2) old SF



3) new SF, tag p_T 3 GeV



4) new SF, tag p_T 5 GeV



- Various SF result in similar R_{FB} values

single muons p_T vs eta

- Reco muons (+) with all ID and trigger condition

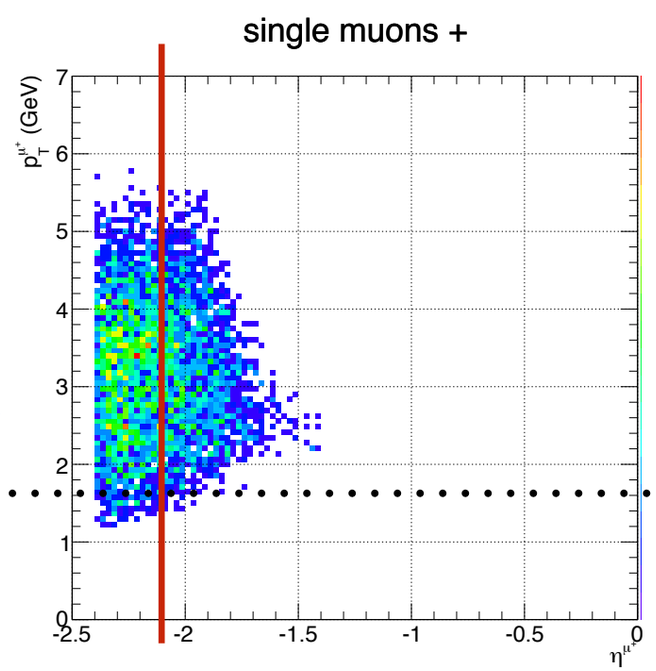
FORWARD

J/psi

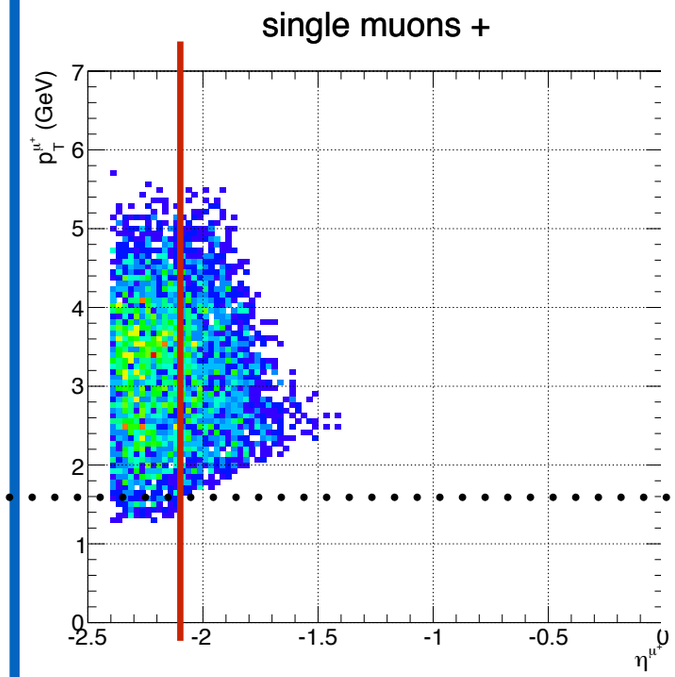
y_{CM} = 1.5, 1.93

p_T = 5-6.5 GeV

old acc cut



new acc cut

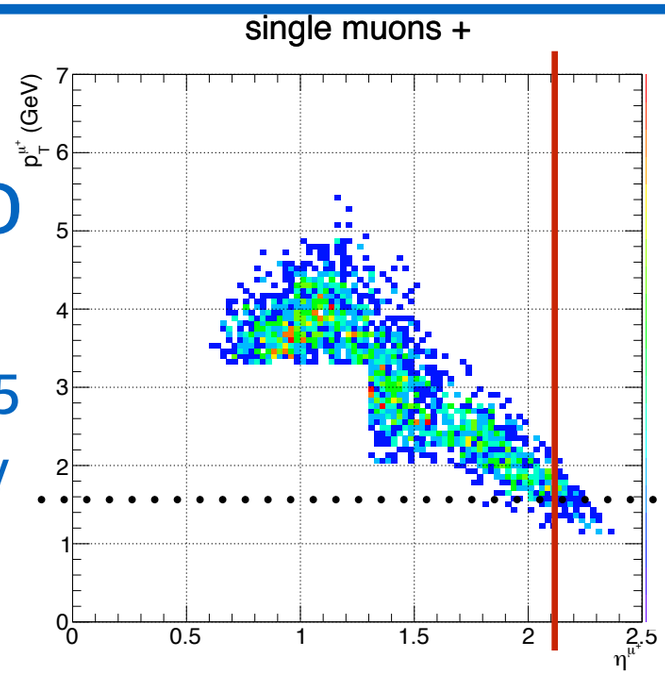


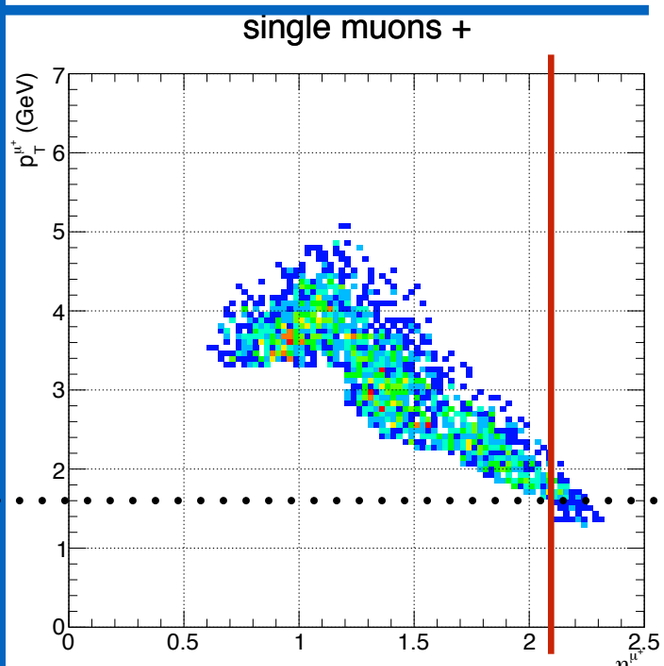
BACKWARD

J/psi

y_{CM} = -1.93, -1.5

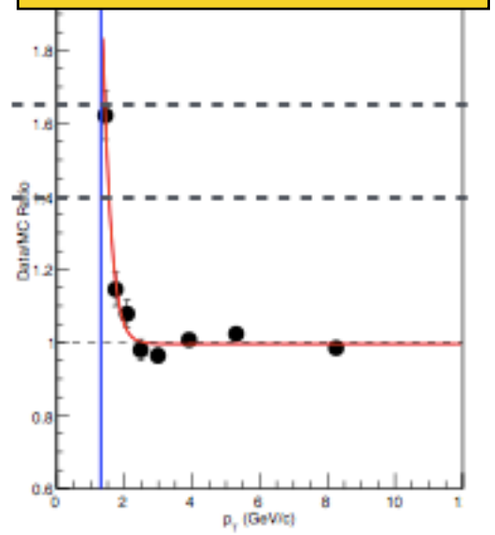
p_T = 5-6.5 GeV



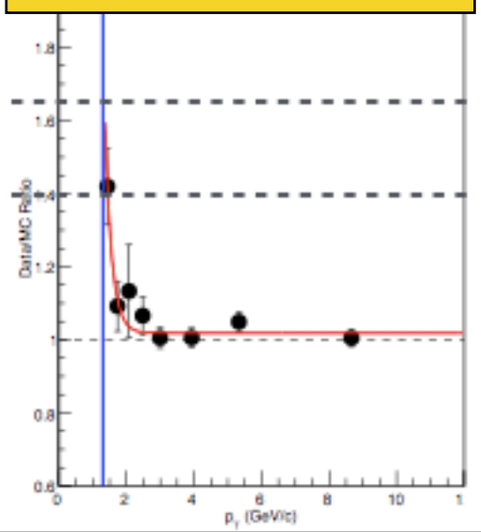


2.1 < |eta| < 2.4

tag p_T > 3 GeV



tag p_T > 5 GeV



- SF in very low p_T less important

Double muons efficiency

- Ratio of Double muon efficiency vs p_T : [with SF] / [no SF]

FORWARD

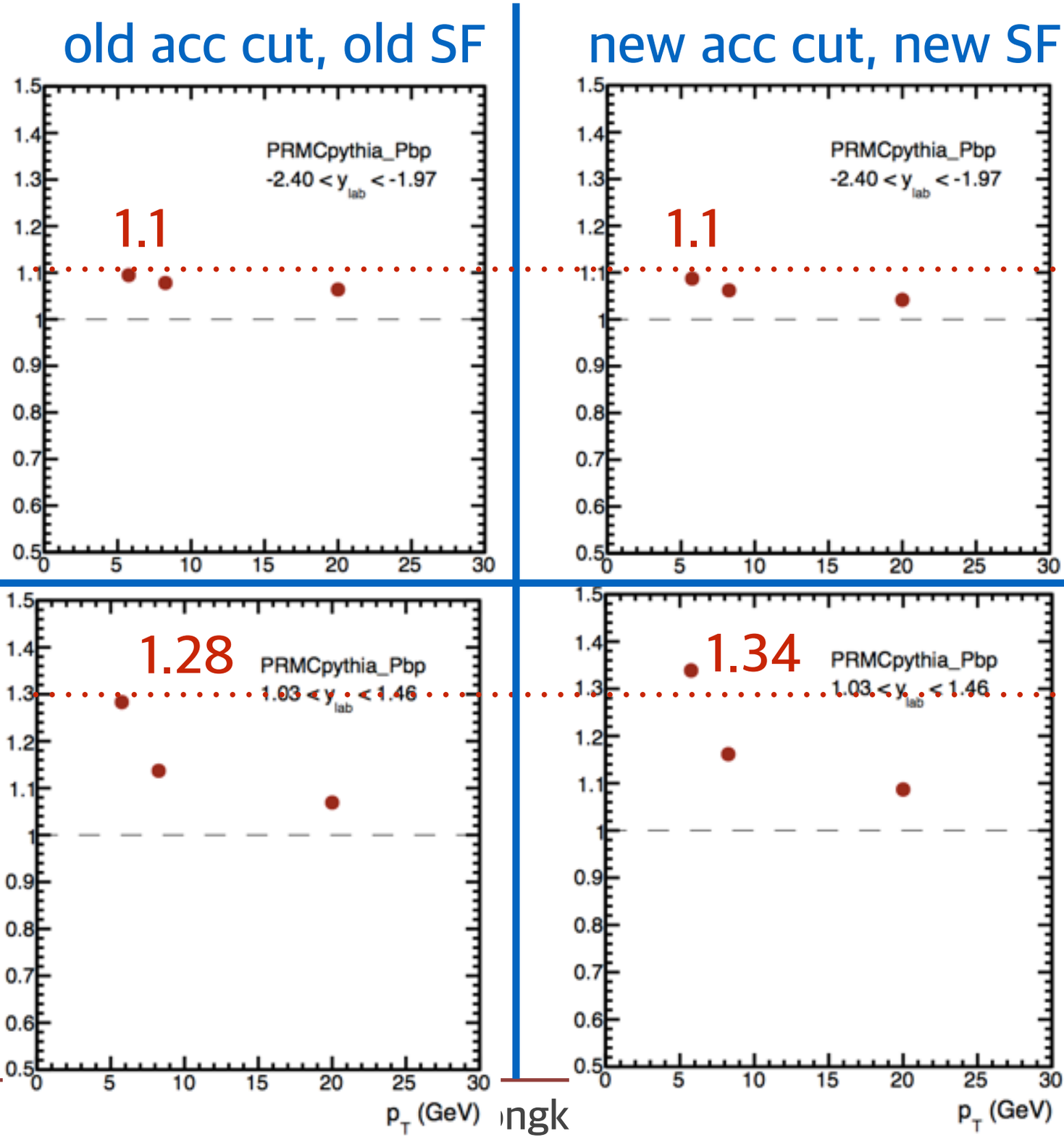
J/psi

y_{CM} = 1.5, 1.93

BACKWARD

J/psi

y_{CM} = -1.93, -1.5



~ 4% difference

R_{FB} values with and without SF

	R_{FB} w/o SF	R_{FB} w/ SF	Ratio
old	0.64	0.76	1.19
new	0.73	0.90	1.23

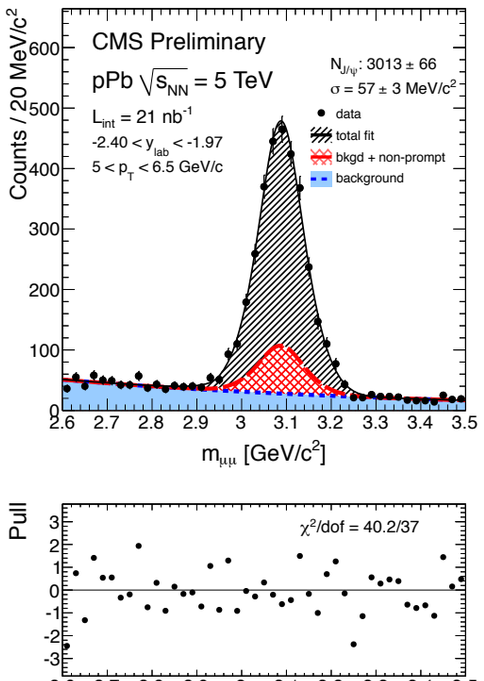
- Bigger Difference in the raw R_{FB} without SF

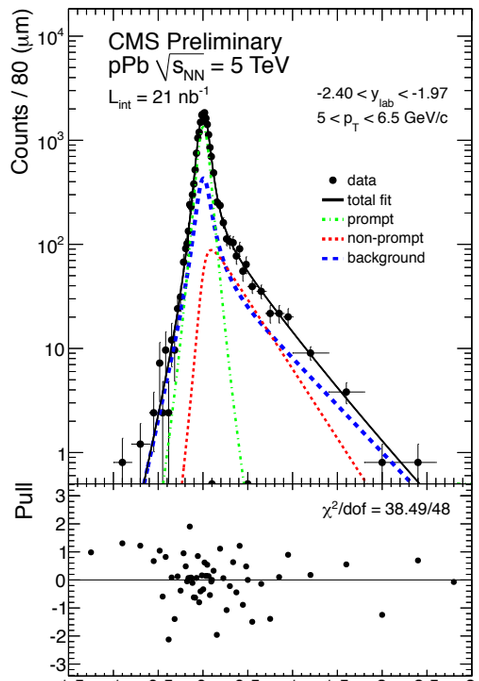
fits – old results

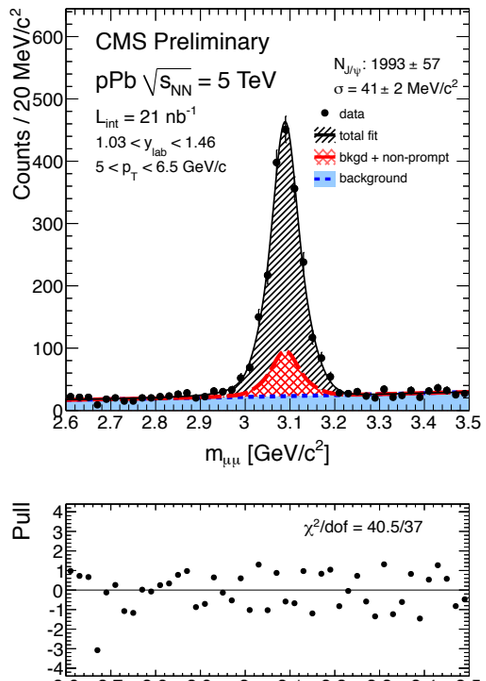
FORWARD

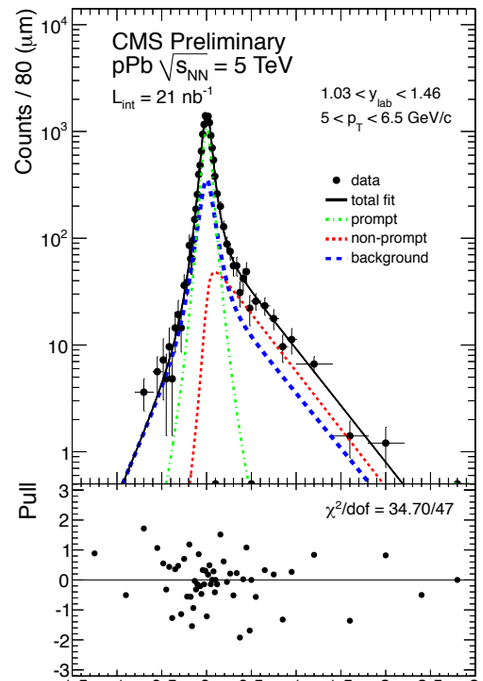
BACKWARD

1st run (Pb-p)

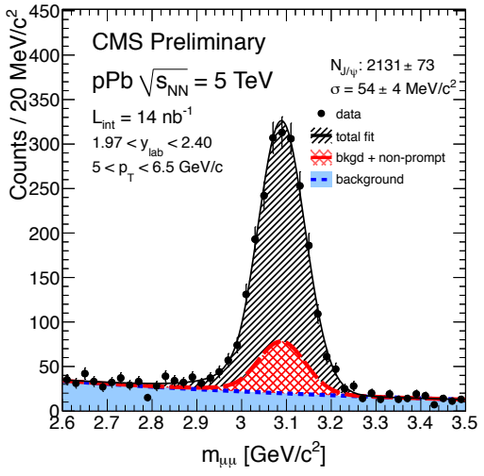


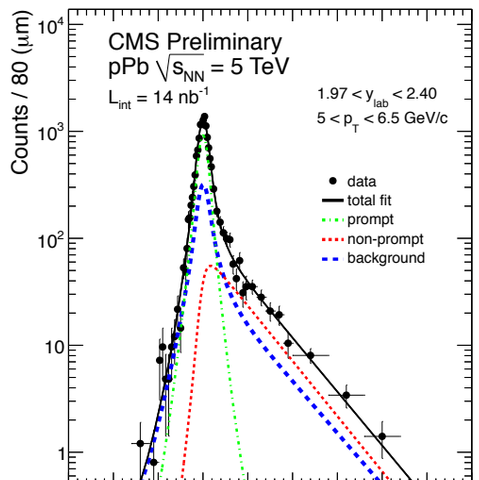


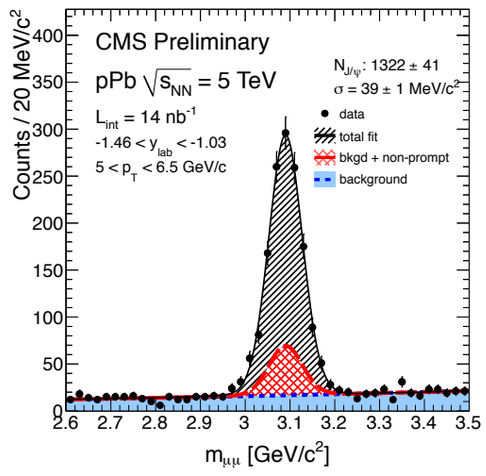


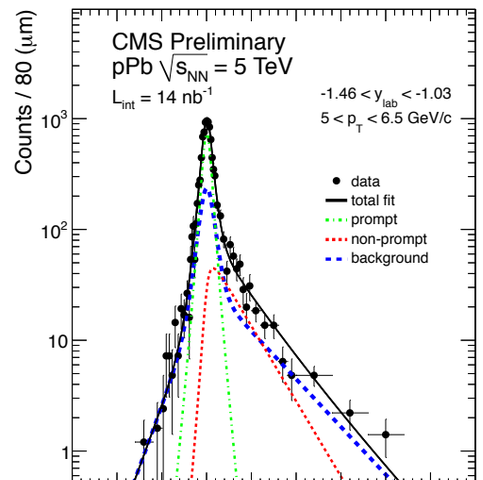


2nd run (p-Pb)







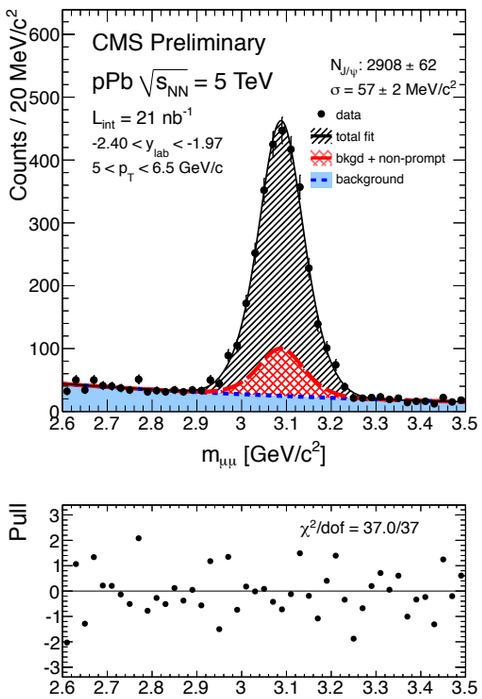


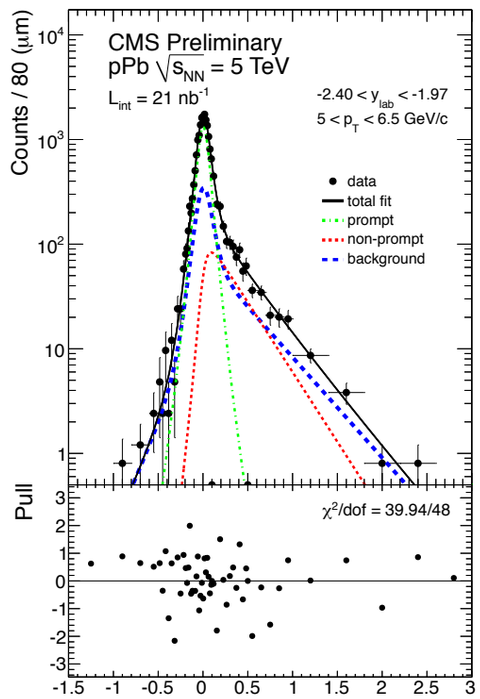
fits – new results

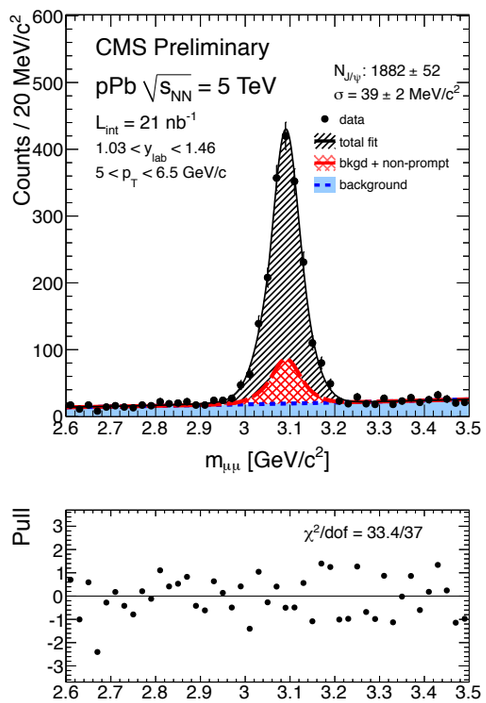
FORWARD

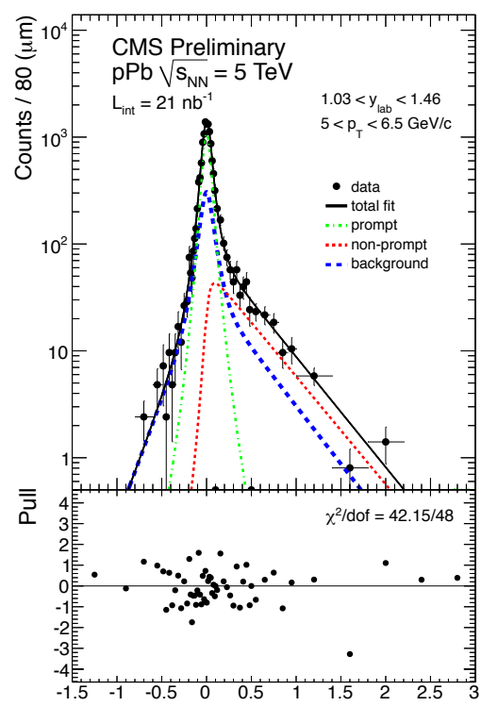
BACKWARD

1st run (Pb-p)

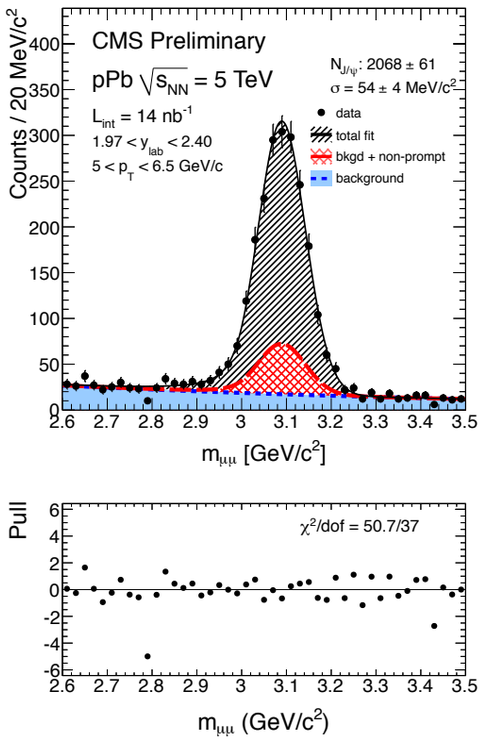


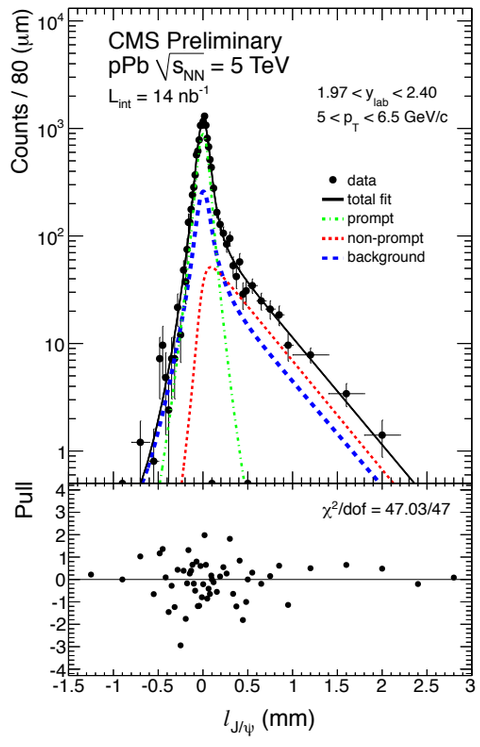


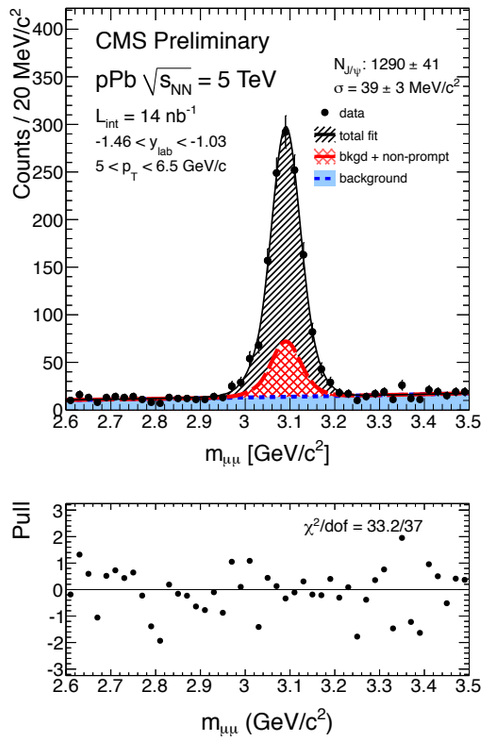


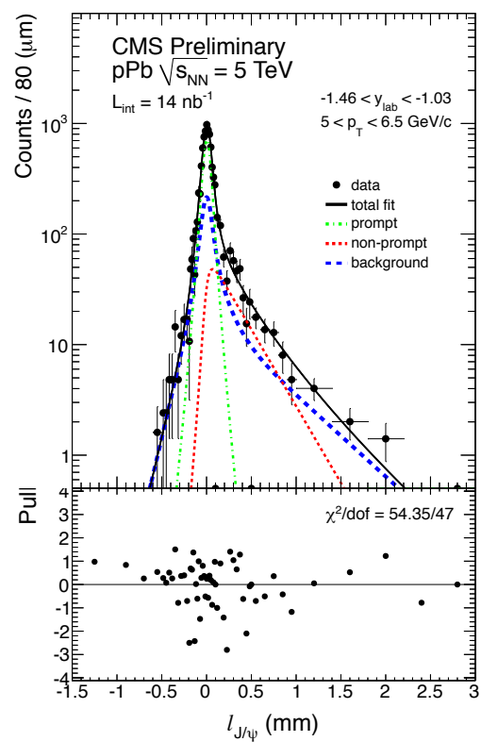


2nd run (p-Pb)





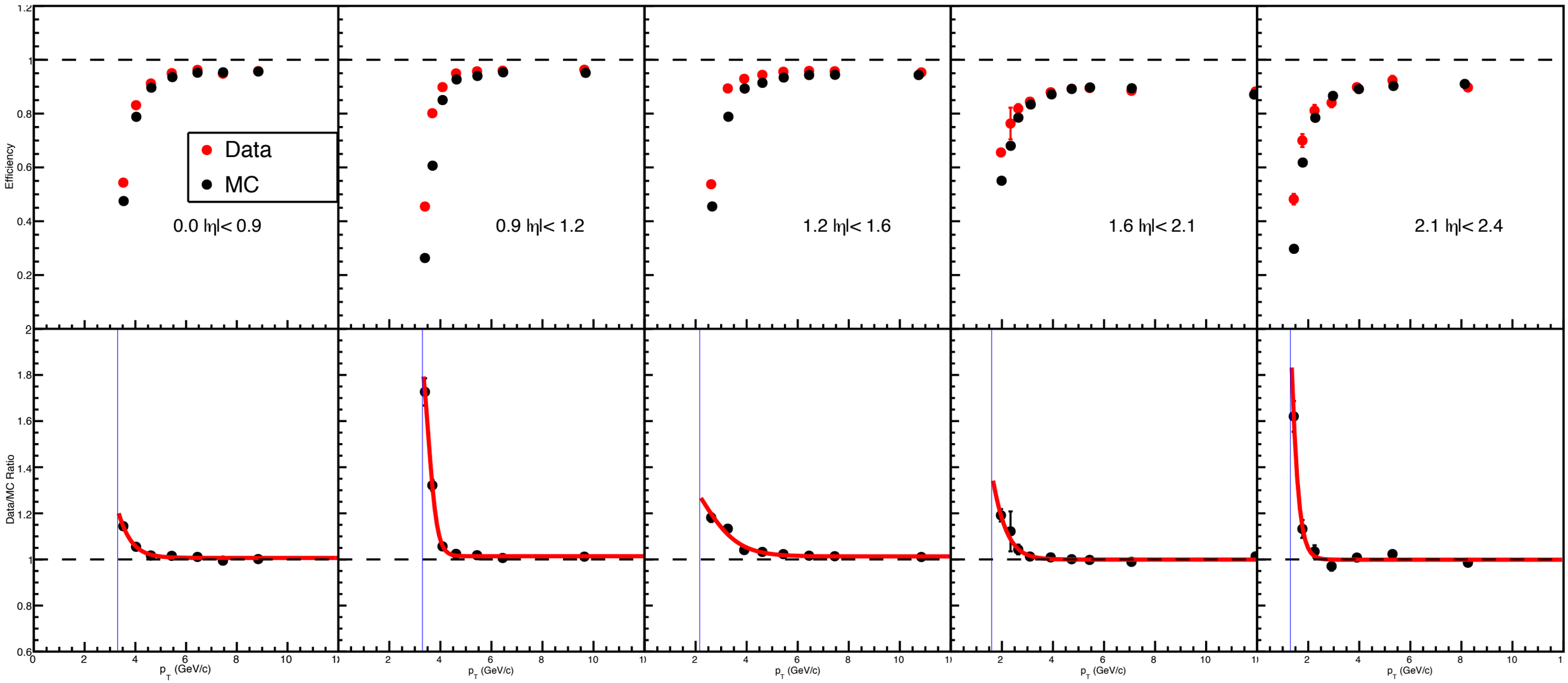




TNP with different tag p_T cut

- new eta new acc official

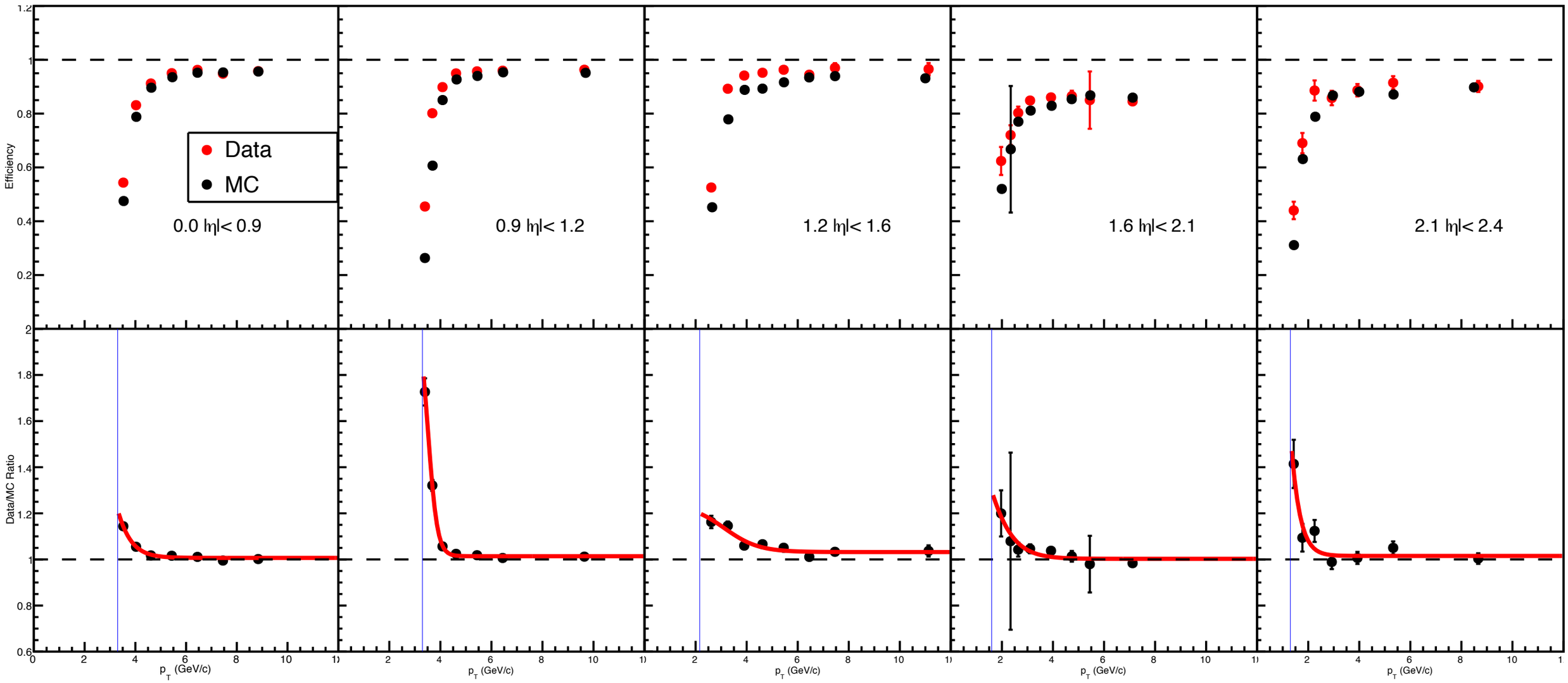
tag p_T > 3 GeV



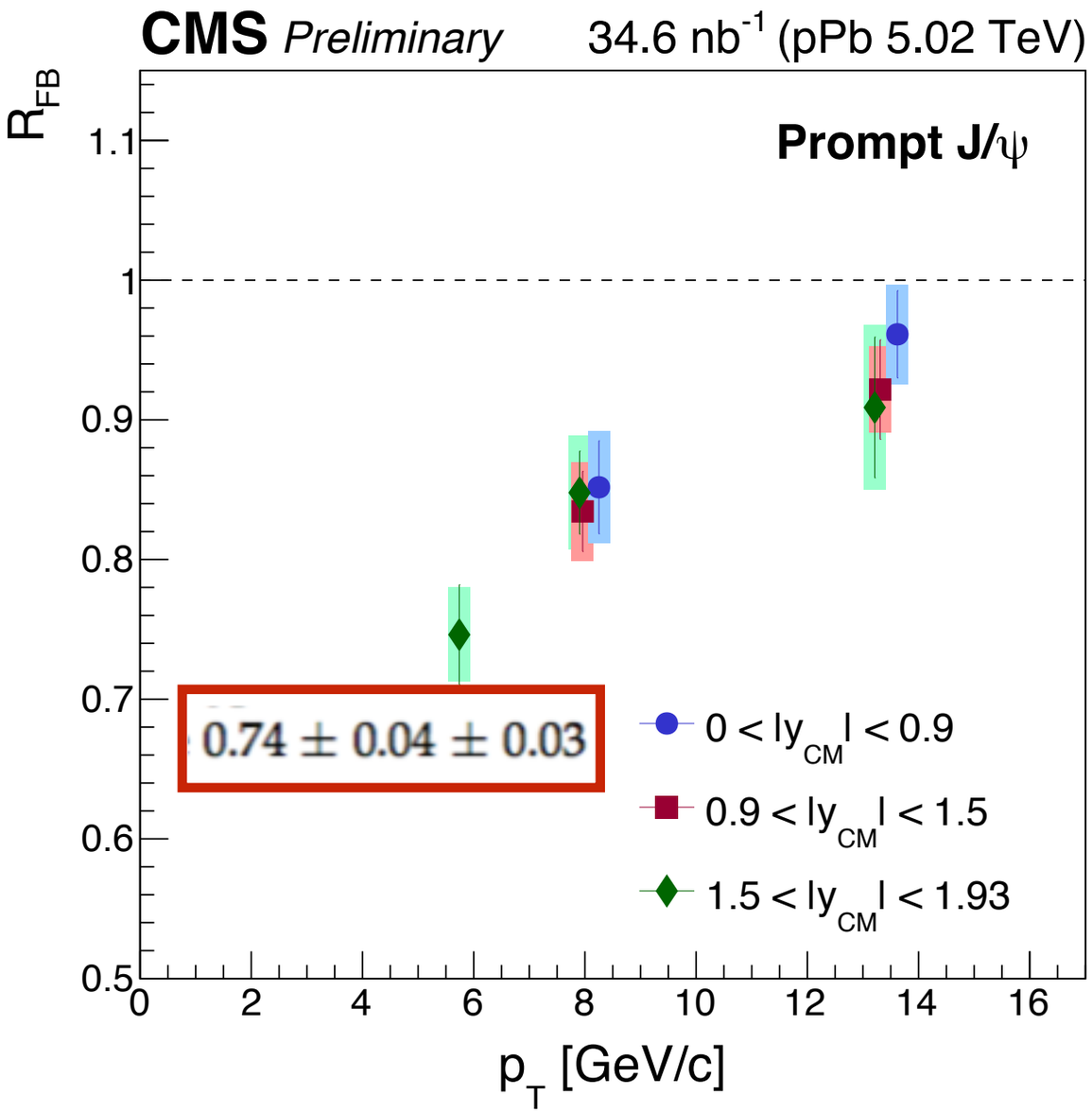
TNP with different tag p_T cut

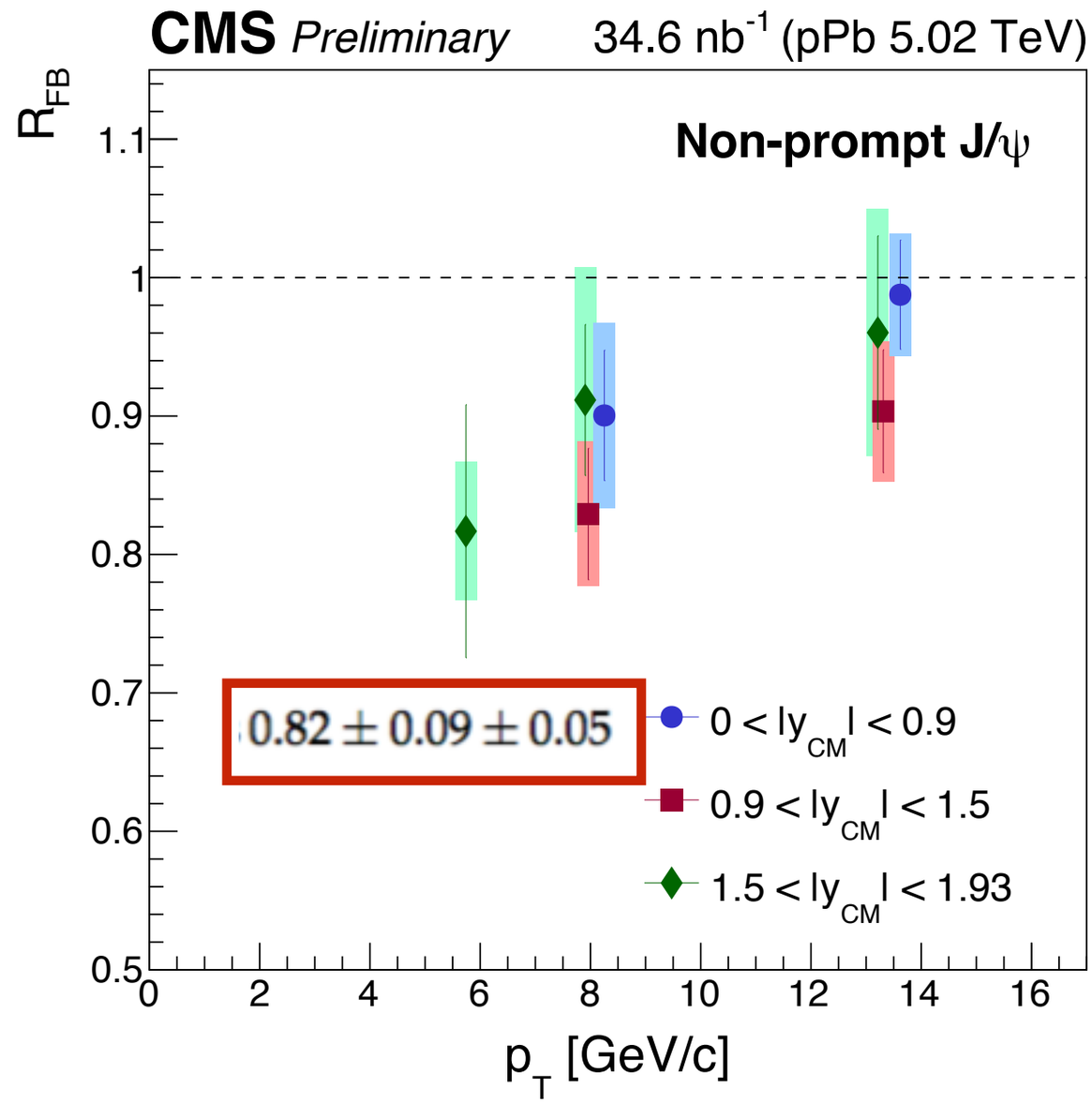
- new eta new acc official

tag p_T > 5 GeV



PAS


CMS Preliminary
34.6 nb-1 (pPb 5.02 TeV)
Prompt J/ψ
RFB
0.74 ± 0.04 ± 0.03
0 < |yCM| < 0.9
0.9 < |yCM| < 1.5
1.5 < |yCM| < 1.93
pT [GeV/c]


CMS Preliminary
34.6 nb-1 (pPb 5.02 TeV)
Non-prompt J/ψ
RFB
0.82 ± 0.09 ± 0.05
0 < |yCM| < 0.9
0.9 < |yCM| < 1.5
1.5 < |yCM| < 1.93
pT [GeV/c]