J/ψ in pPb

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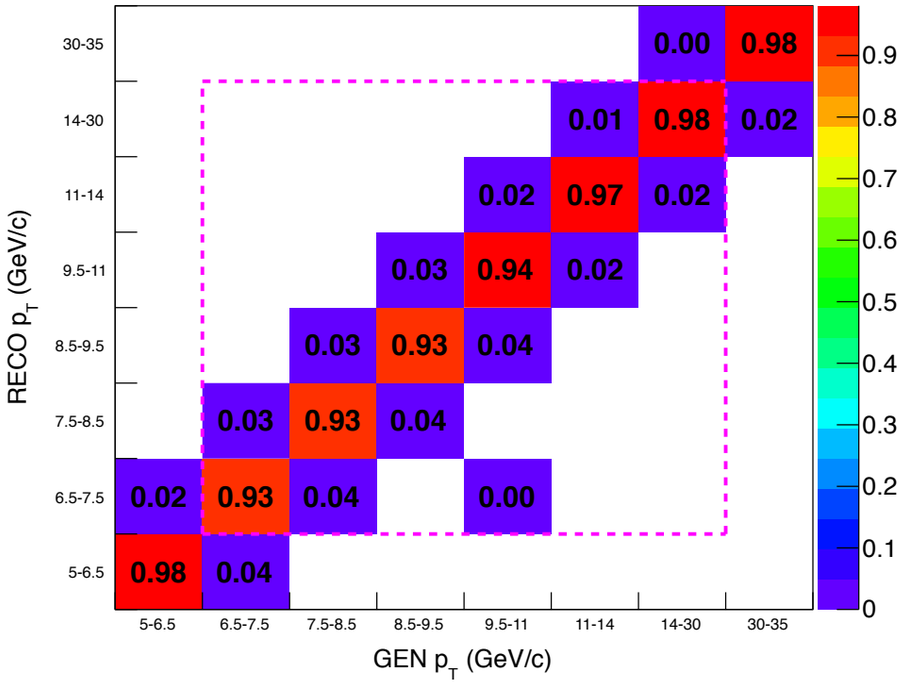
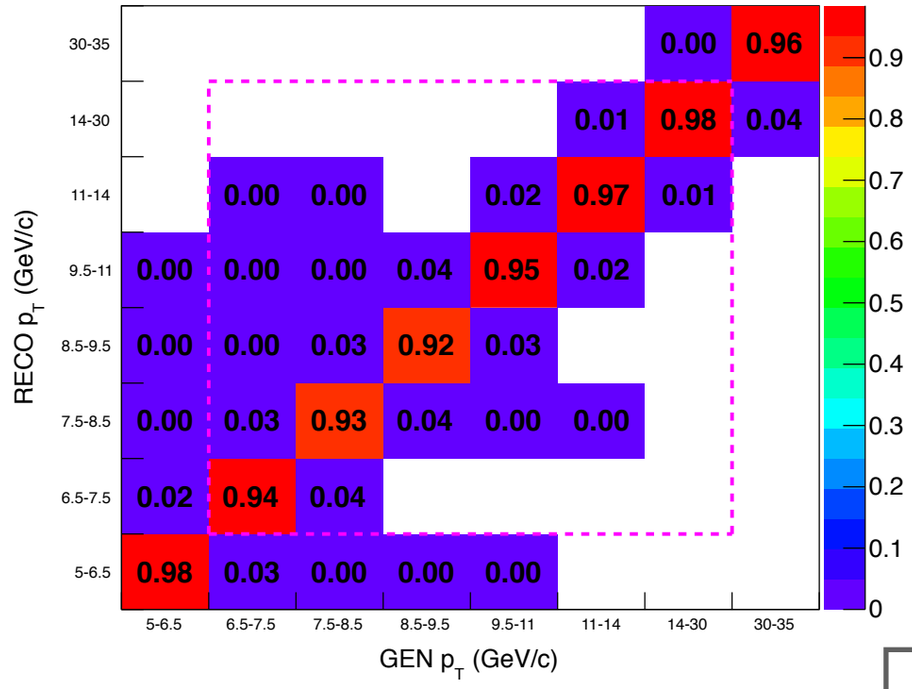
Reminder

- 17th Jan 2014 : update on HIN meeting
- 7th Feb. 2014 : additional update on HIN meeting
  - Unfolding
  - 2D correction for acceptance & efficiency
  - Multiplicity dependence
- CADI : HIN-14-009

Unfolding

- **Matrix of the reconstructed vs generated p_T**
  - Prompt J/ψ
  - Non-prompt J/ψ



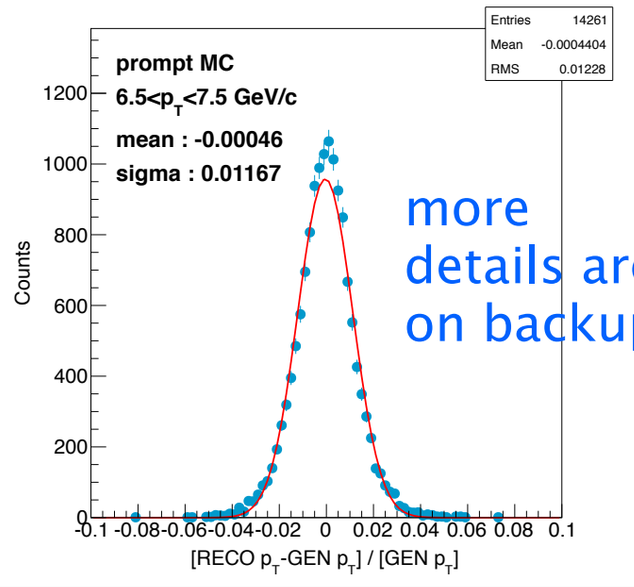


dashed boxes are analysis regions

- Check the amount of resolution effects (bin migration)
- e.g.) Prompt J/ψ generated in 6.5-7.5 GeV/c bin
  - 4% of them are reconstructed in 5.0-6.5 GeV/c
  - 93% of them are correctly reconstructed in 6.5-7.5 GeV/c
  - 3% of them are reconstructed in 7.5-8.5 GeV/c

- RECO p_T and GEN p_T show a strong correlation.
  -> Unfolding will not be used in this analysis

$\frac{\mathrm{RECO}p_T - \mathrm{GEN}p_T}{\mathrm{GEN}p_T}$ distribution

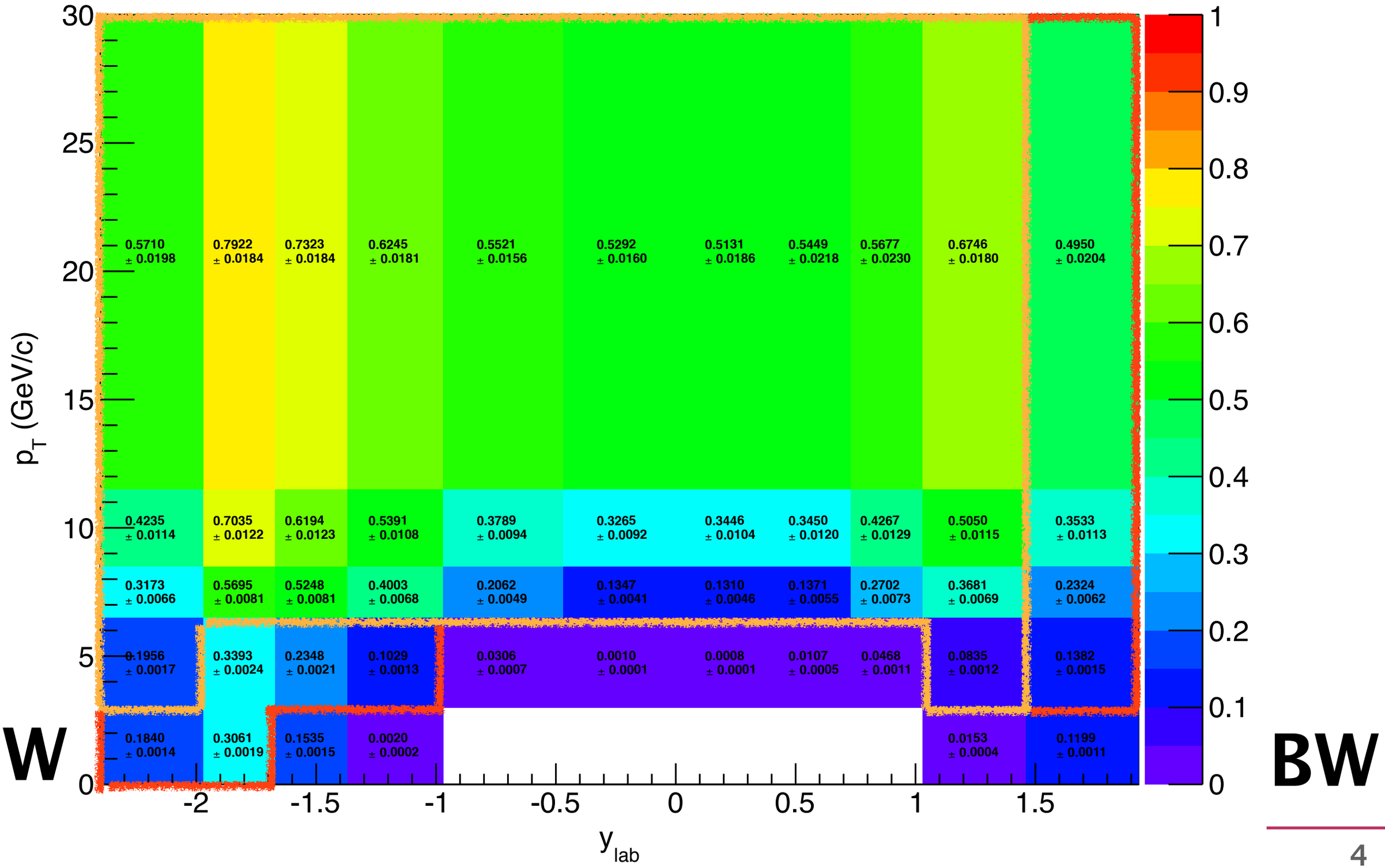


more details are on backup

2D Acceptance & Efficiency

- **Acceptance (prompt)**

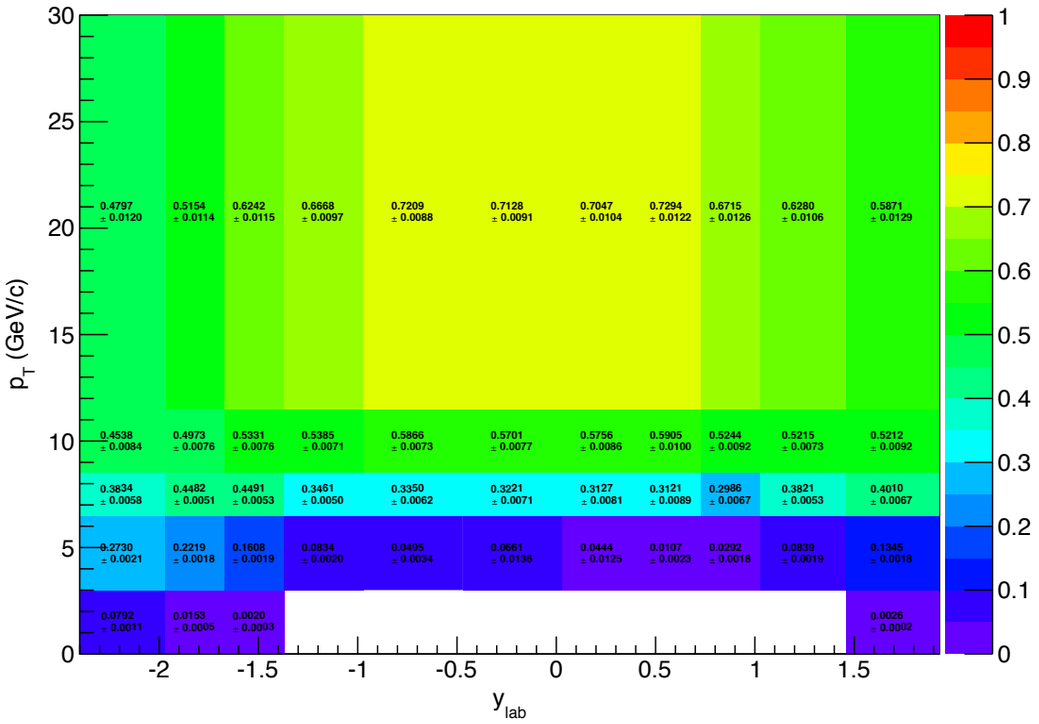
: For R_{FB} : For cross-section



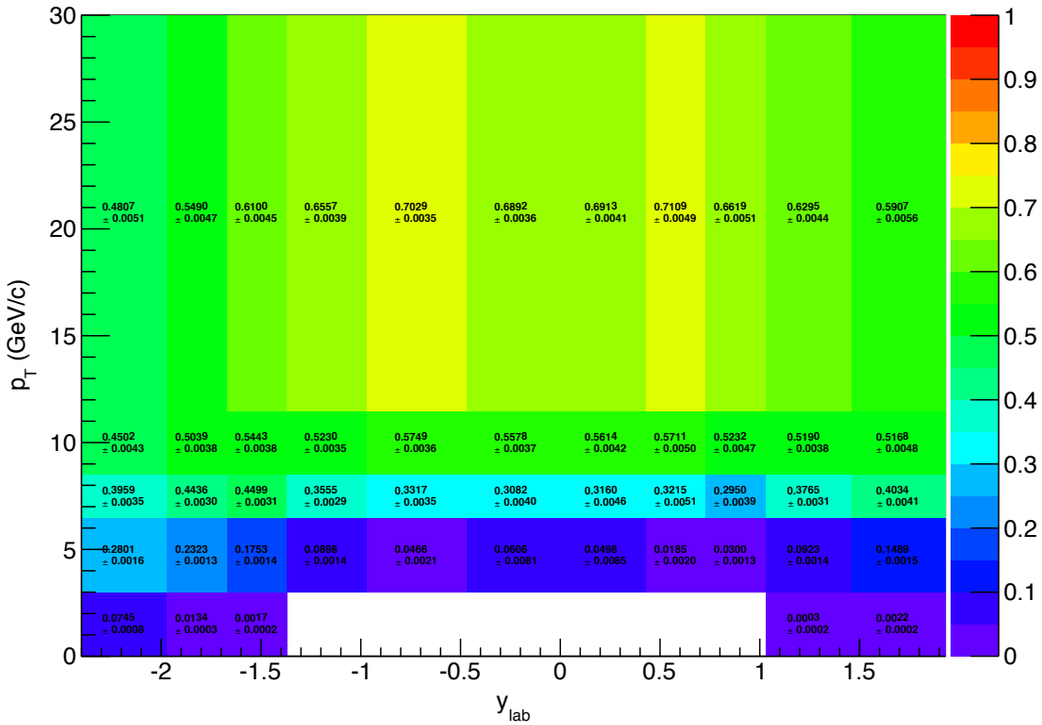
FW **BW**

2D Acceptance & Efficiency

Efficiency (prompt)



Efficiency (non-prompt)



Double differential binning

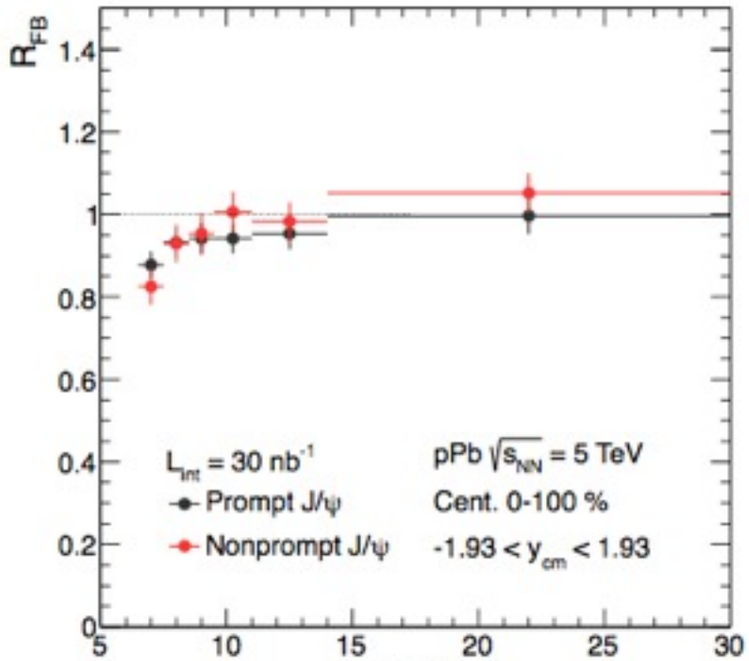
- 5 $|y_{CM}|$ bins : 0, 0.5, 0.9, 1.2, 1.5, 1.93
- 4 p_T bins : (3), 6.5, 8.5, 11.5, 30 GeV/c

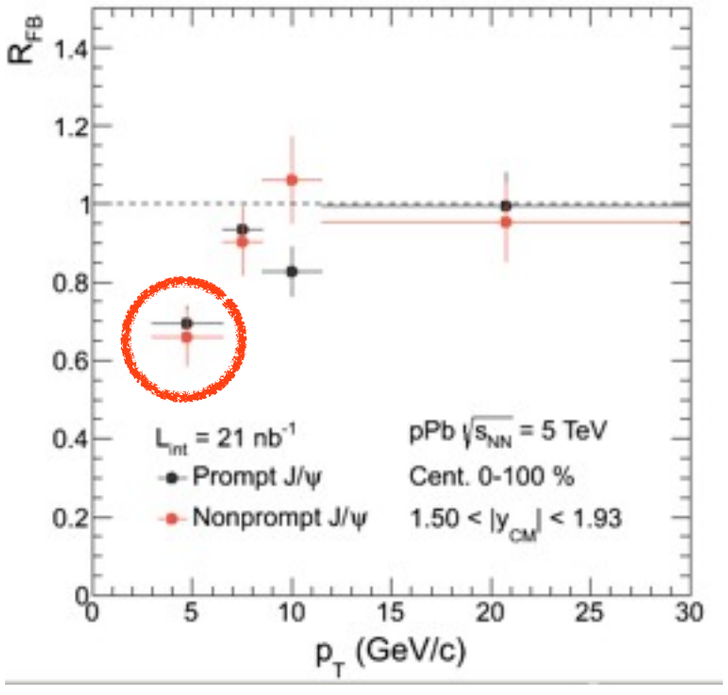
y_{CM}	[1st run] y_{lab}	[2nd run] y_{lab}
1.93	-2.4	2.4
1.5	-1.97	1.97
1.2	-1.67	1.67
0.9	-1.37	1.37
0.5	-0.97	0.97
0.0	-0.47	0.47
-0.5	0.03	-0.03
-0.9	0.43	-0.43
-1.2	0.73	-0.73
-1.5	1.03	-1.03
-1.93	1.46	-1.46

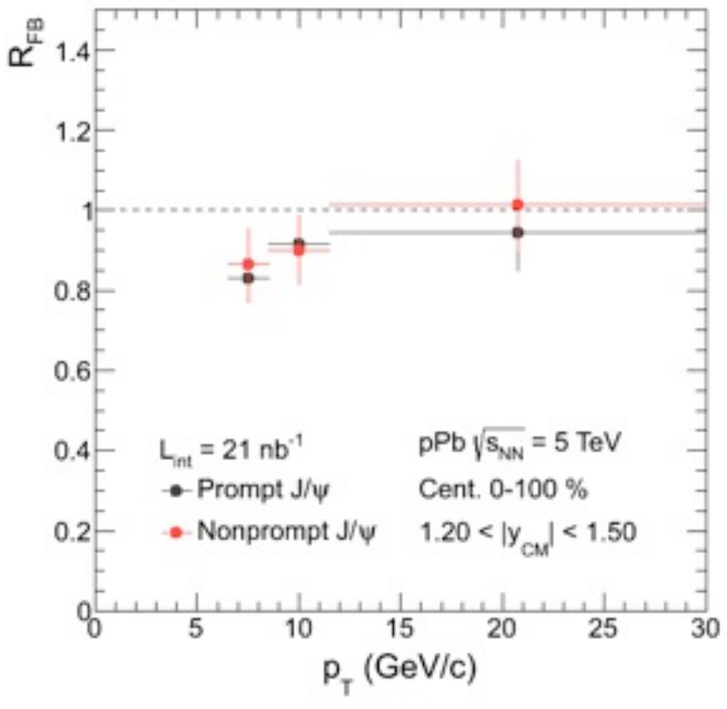
R_{FB} vs p_T

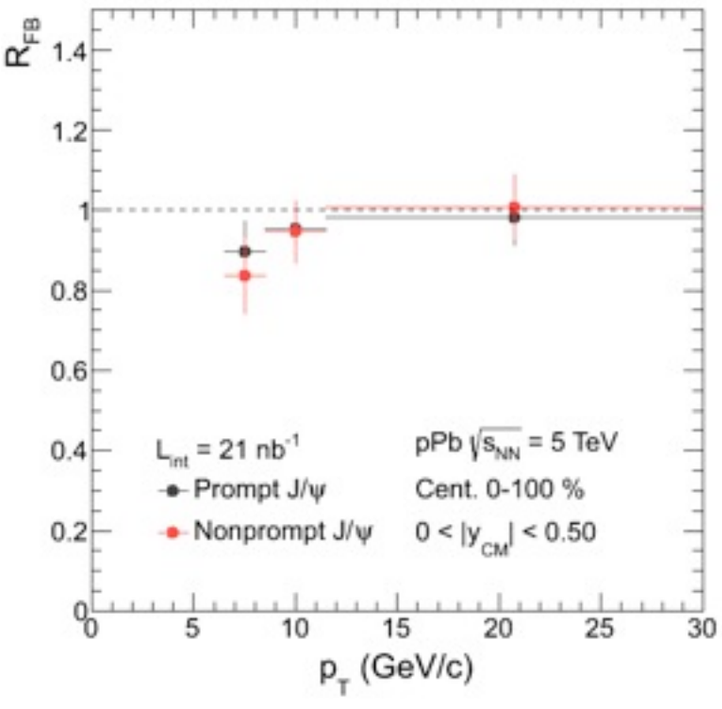
- **R_{FB} vs p_T**
  - **R_{FB} smaller for lower p_T**
  - Fitting & binning is still going on.

- previous plots



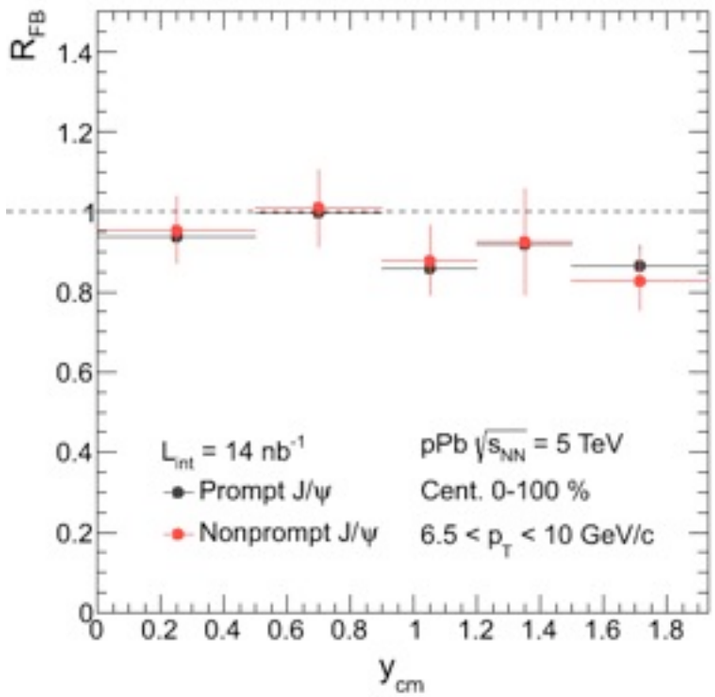


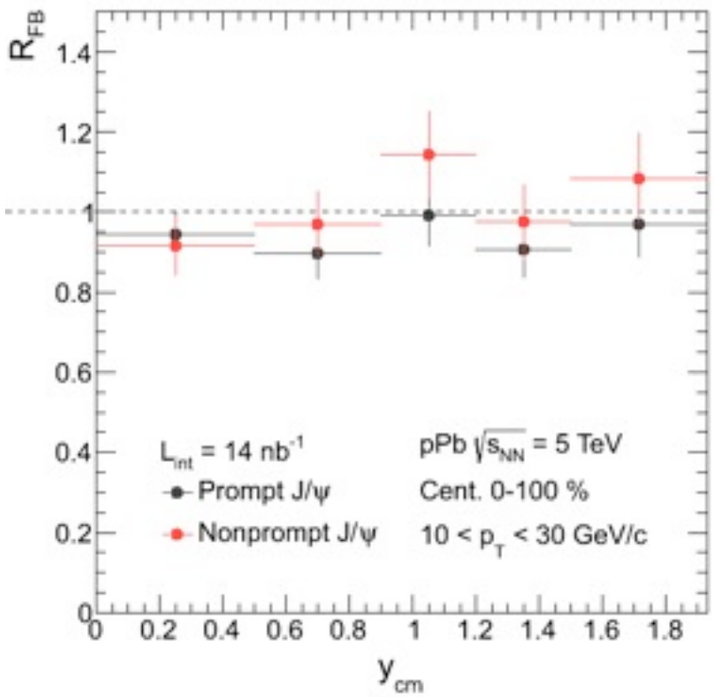




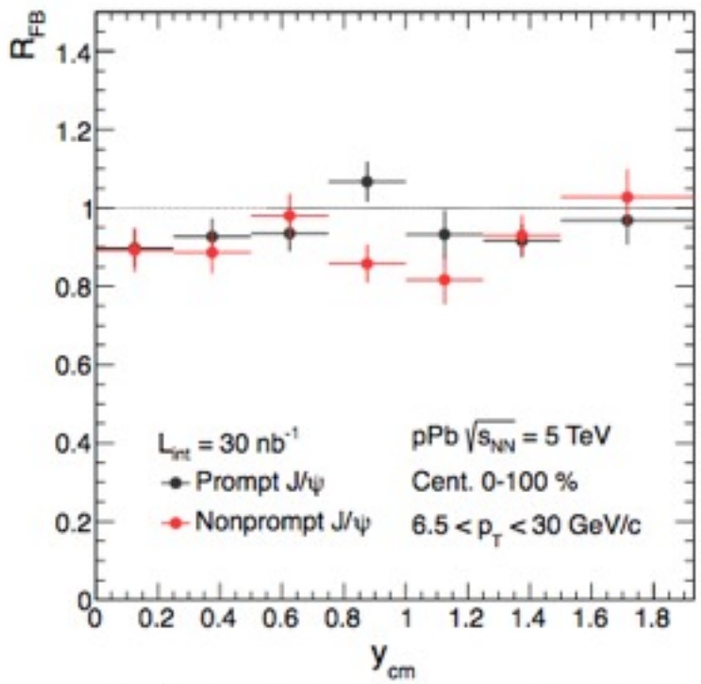
Binning 1(pAJpsi_double)

- **R_{FB} vs $|y_{CM}|$**





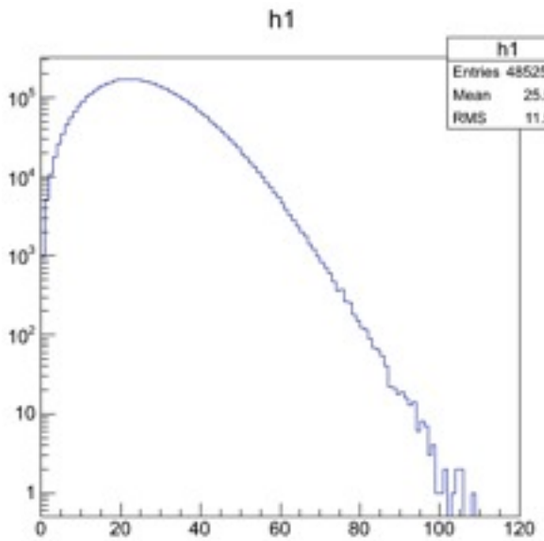
- previous plots

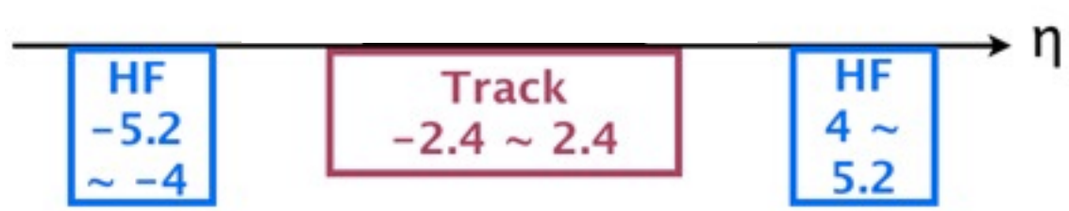


- No strong dependence
- Fitting & binning is still going on.

Future plan

- Fix the binning and work for the fitting
- Ctau Error range should be considered in efficiency calculation
- Multiplicity (Ntracks & E_T^{HF}) dependence - with Yongsun





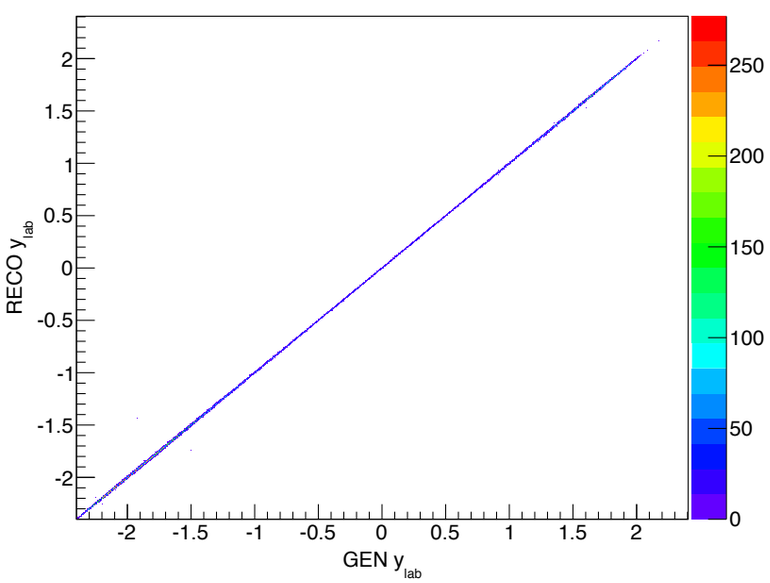
- checking muon ID variables - Lamia
- MC weighting from T&P - Kisoo
- Systematic uncertainties

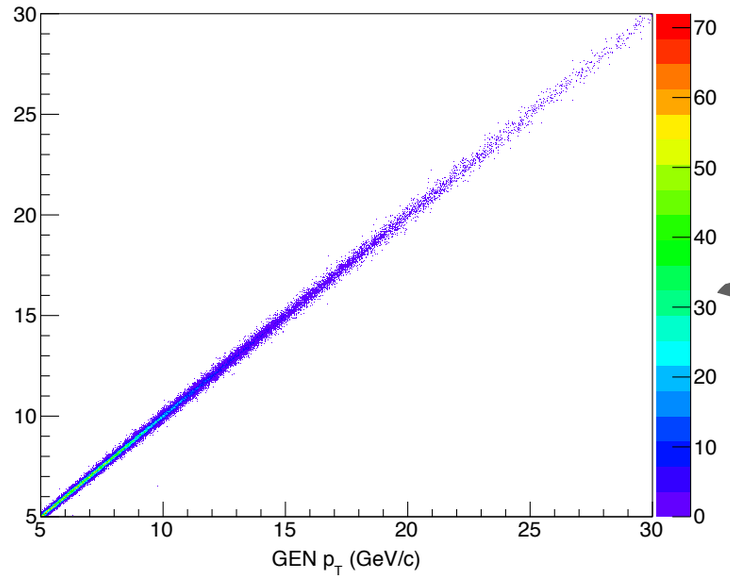
Double53

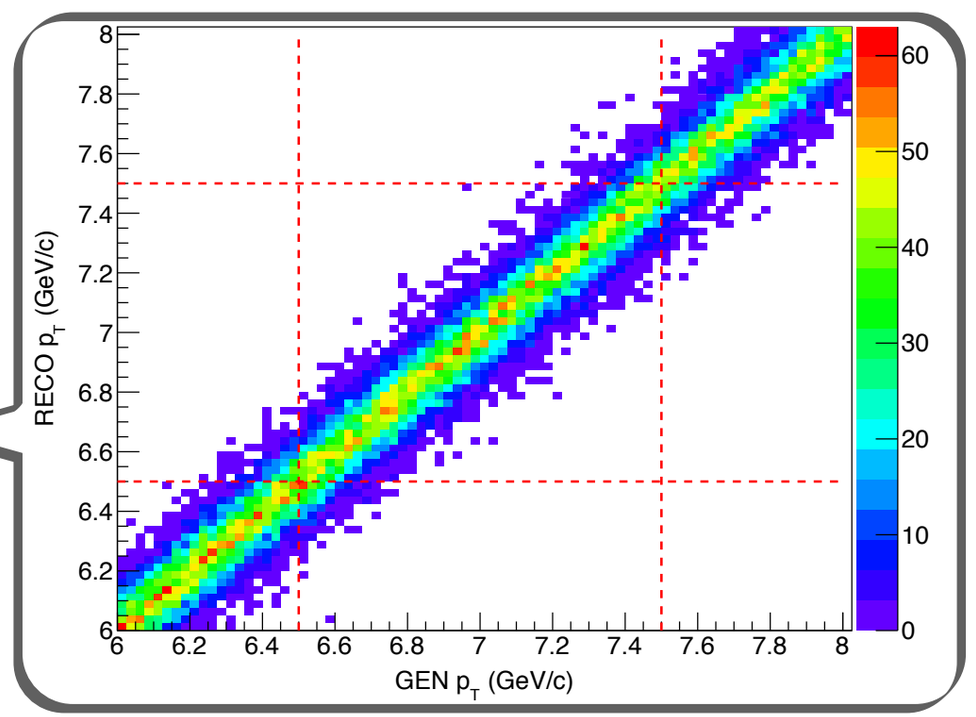
Unfolding

2D plots for RECO vs GEN

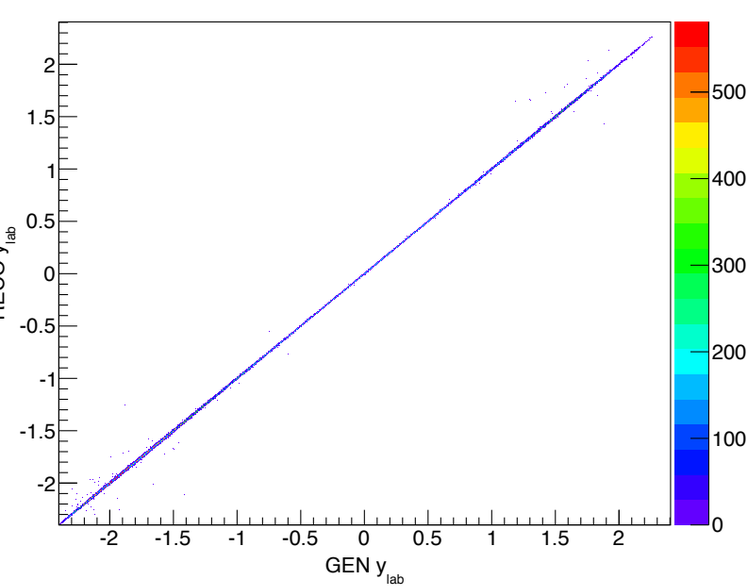
- Prompt

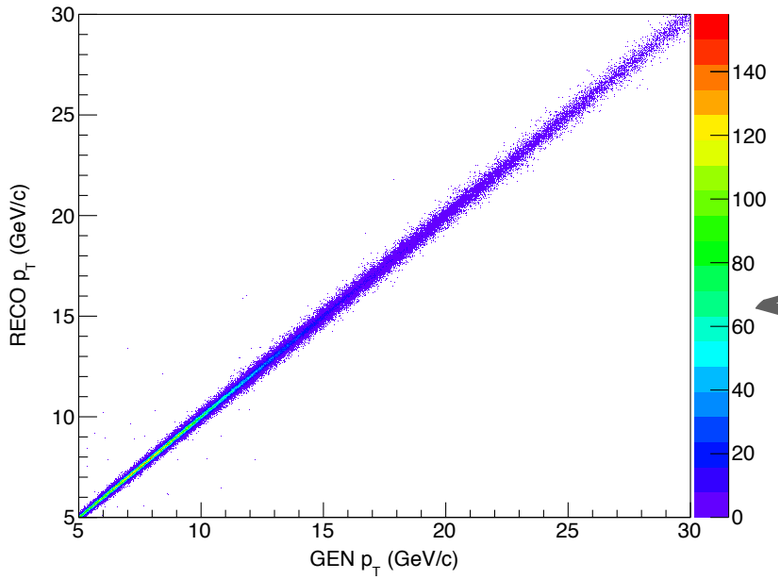


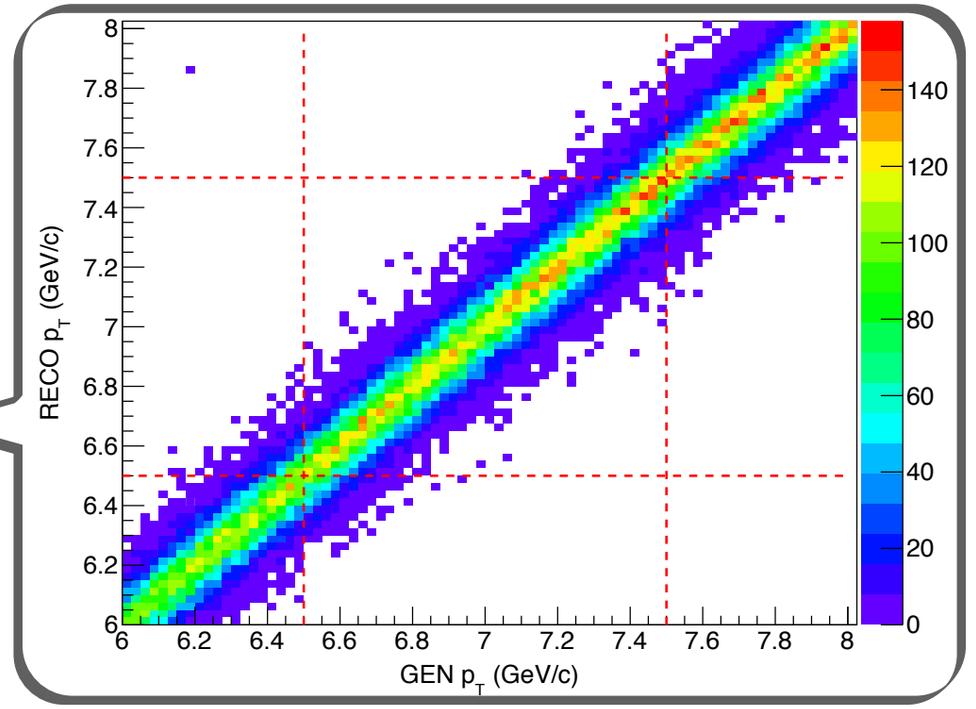




- Non-prompt

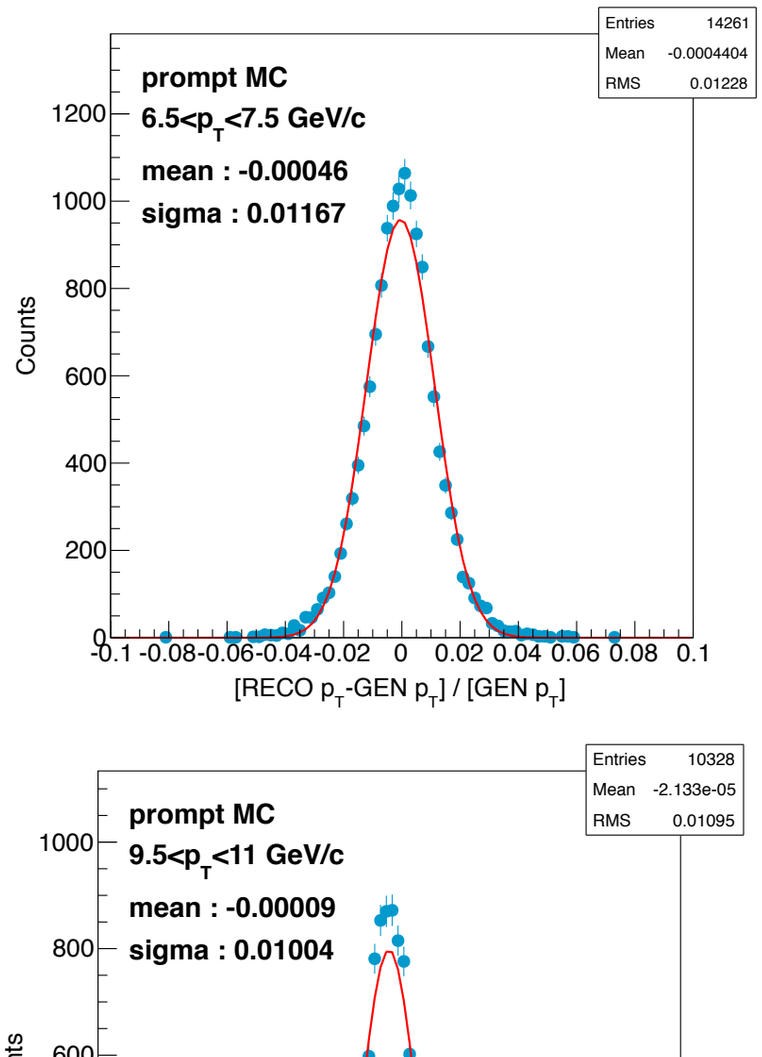


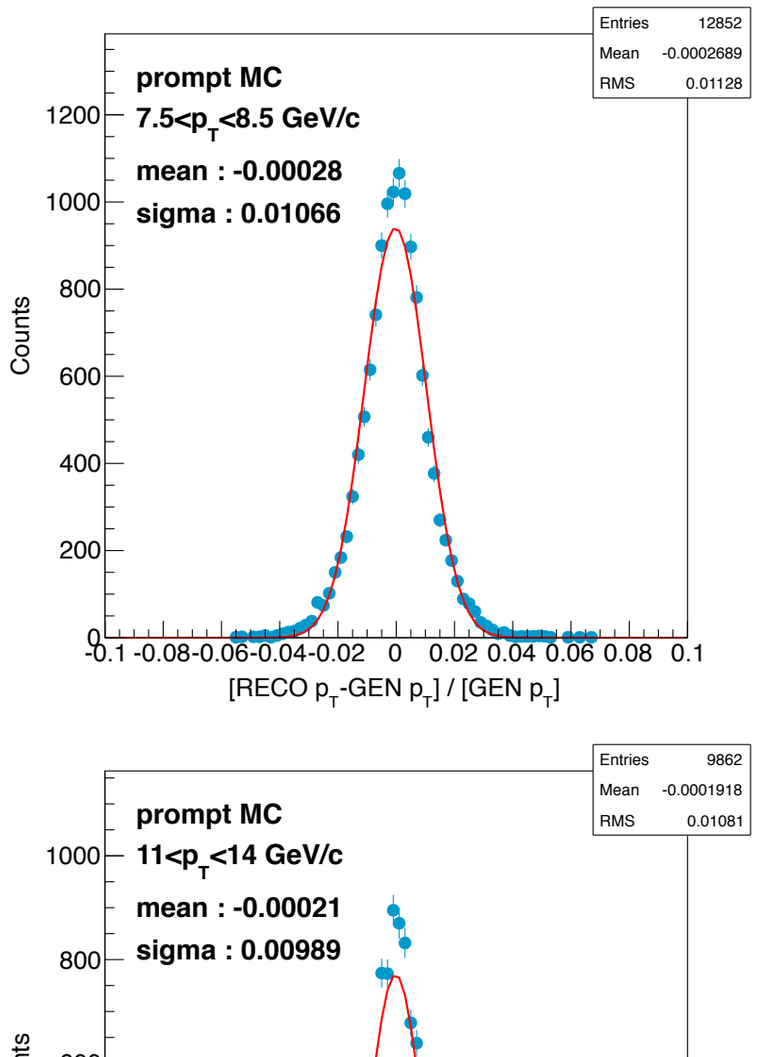


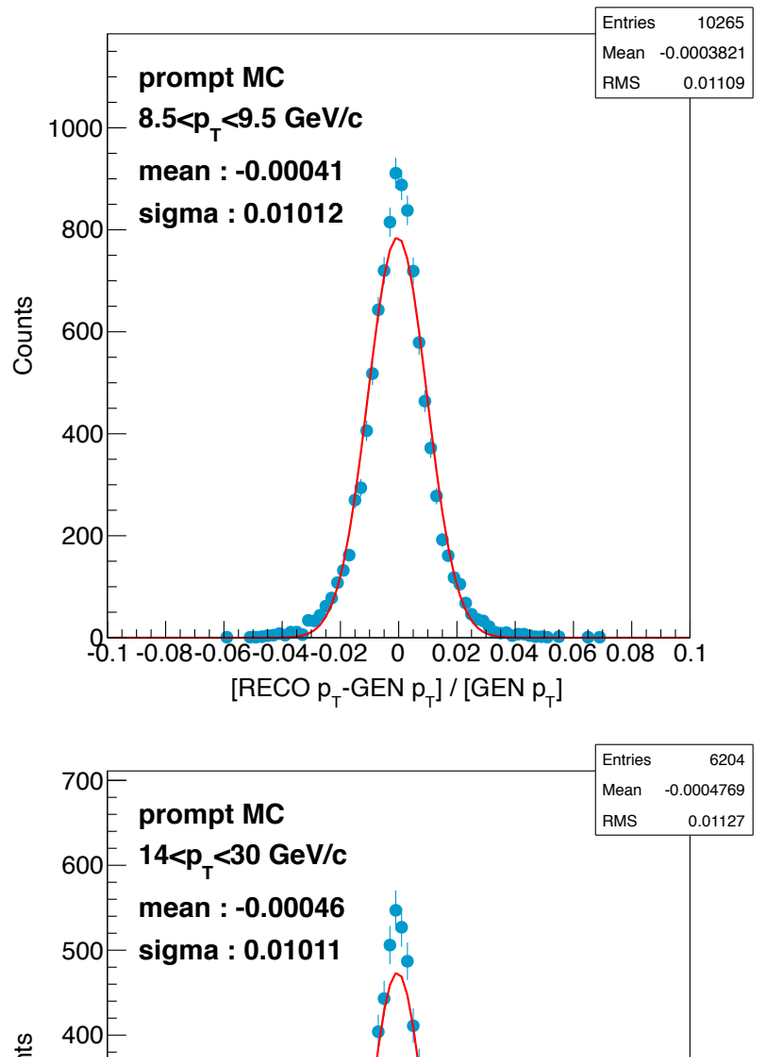


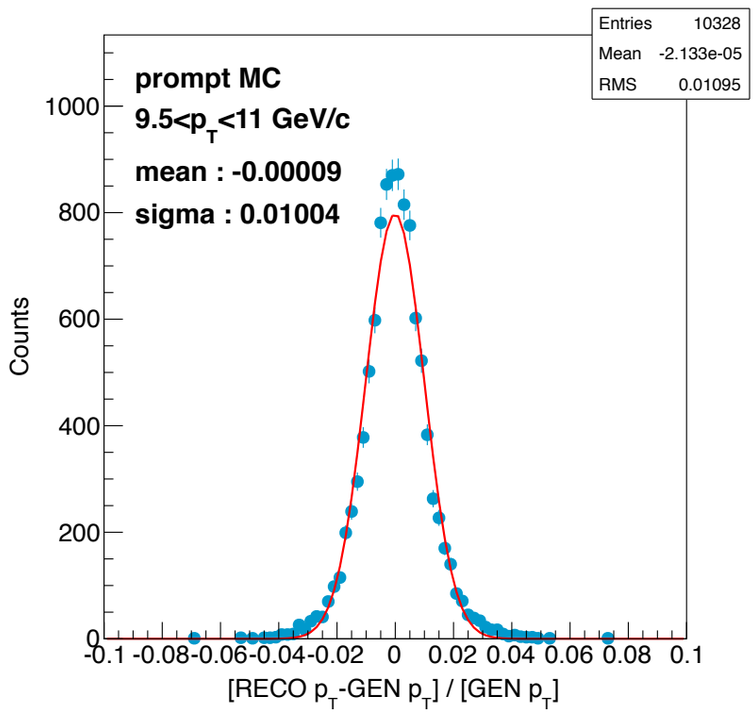
Unfolding

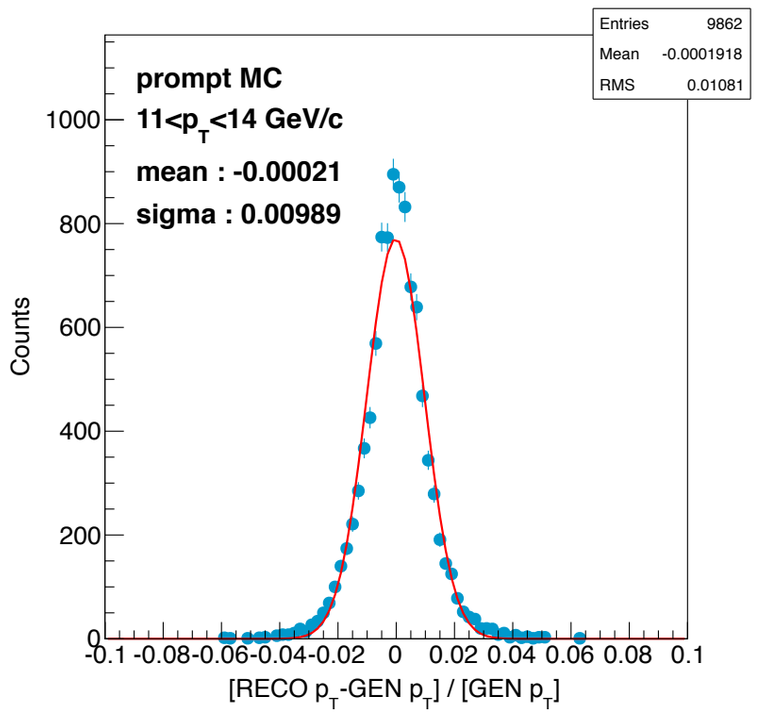
- [RECO p_T – GEN p_T] / [GEN p_T] for prompt J/ψ

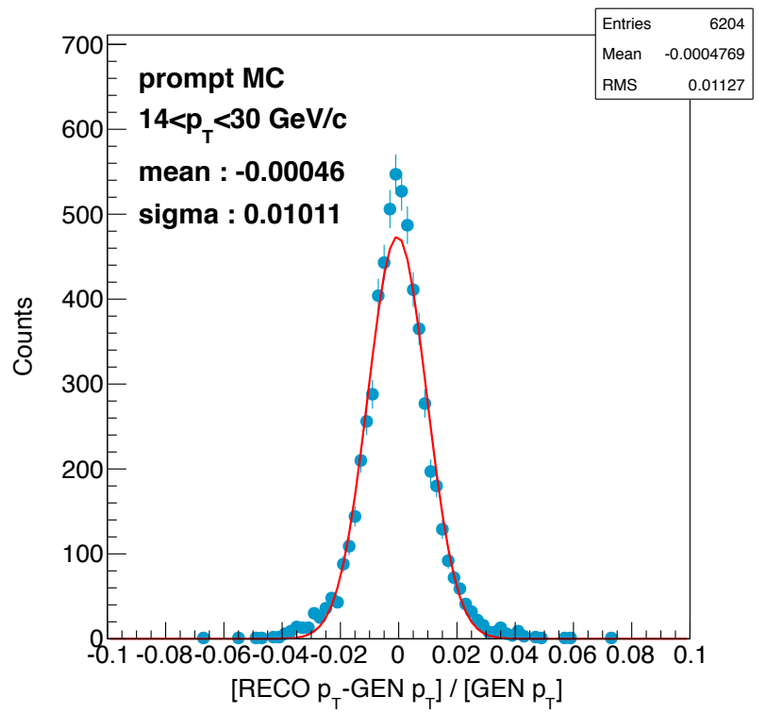






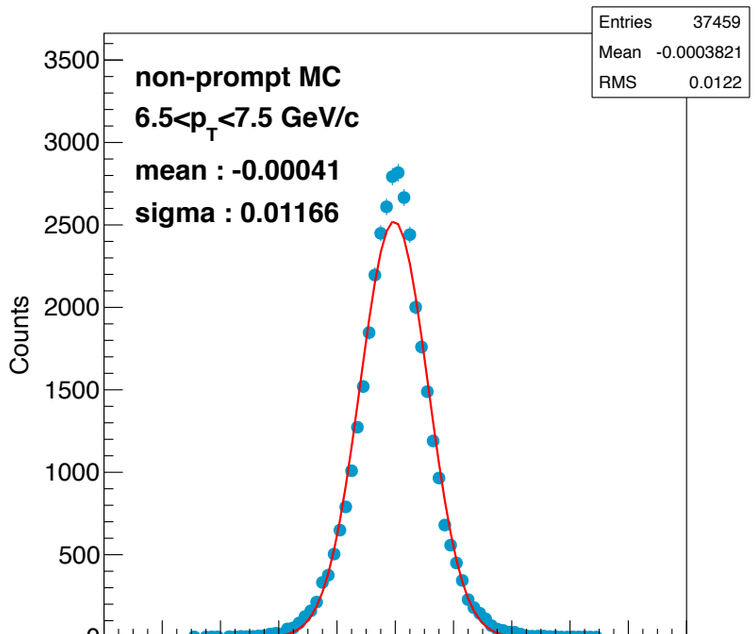


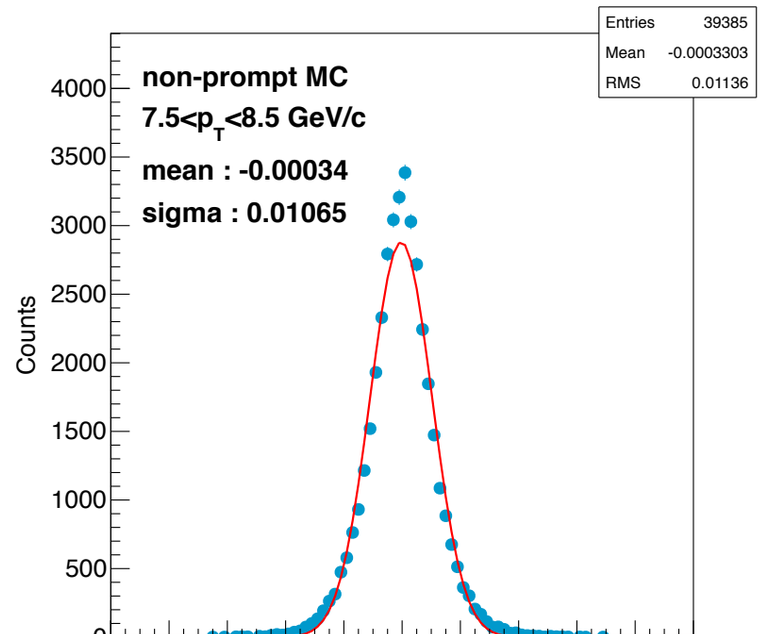


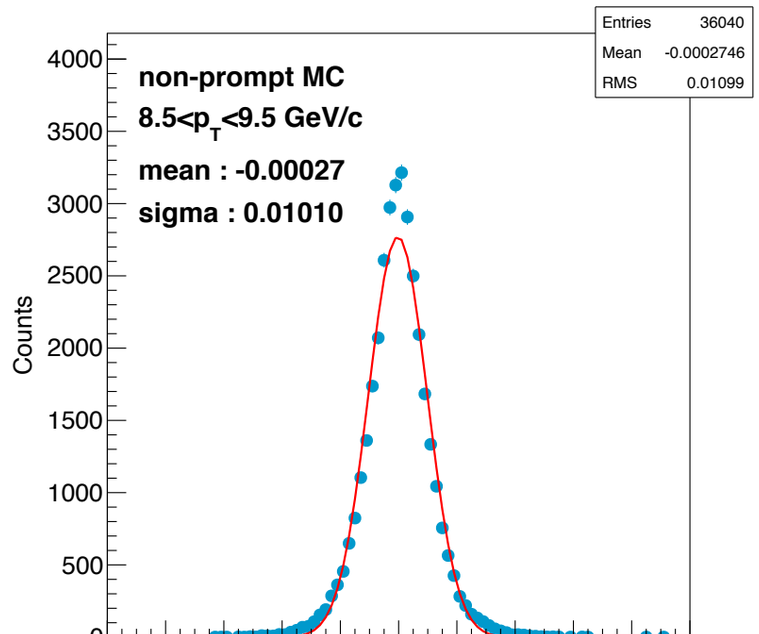


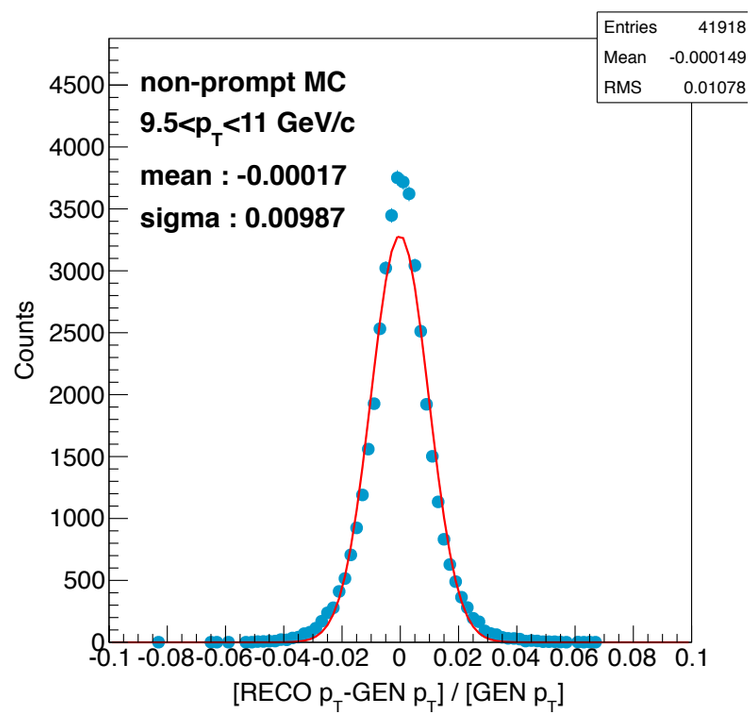
Unfolding

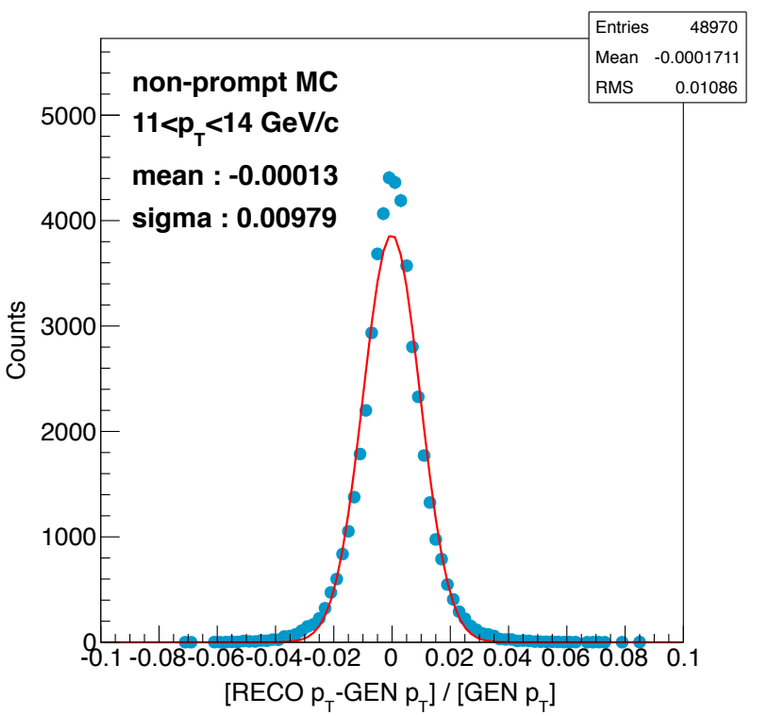
- [RECO p_T - GEN p_T] / [GEN p_T] for non-prompt J/ψ

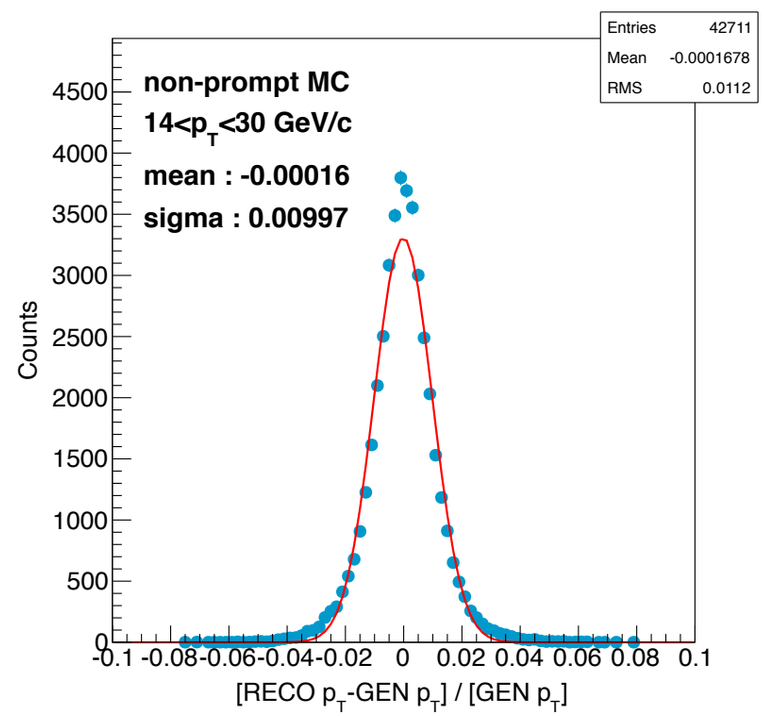






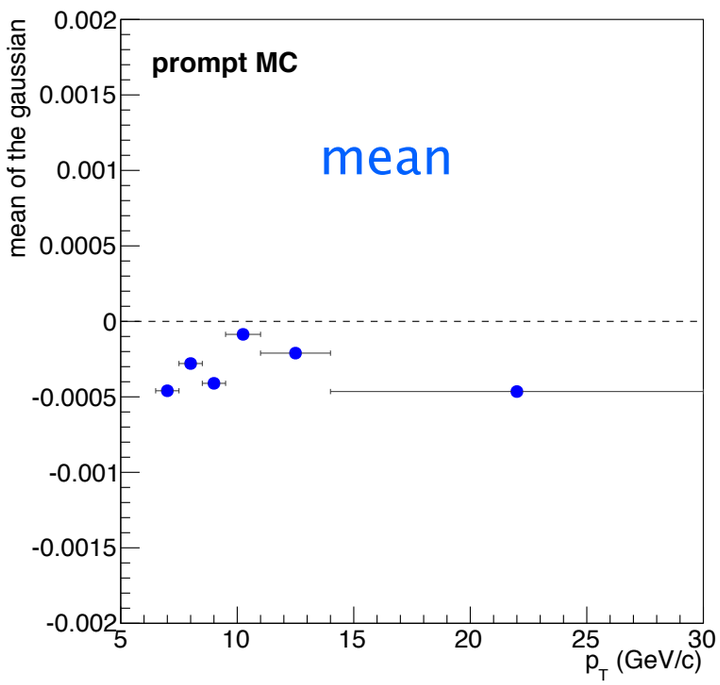


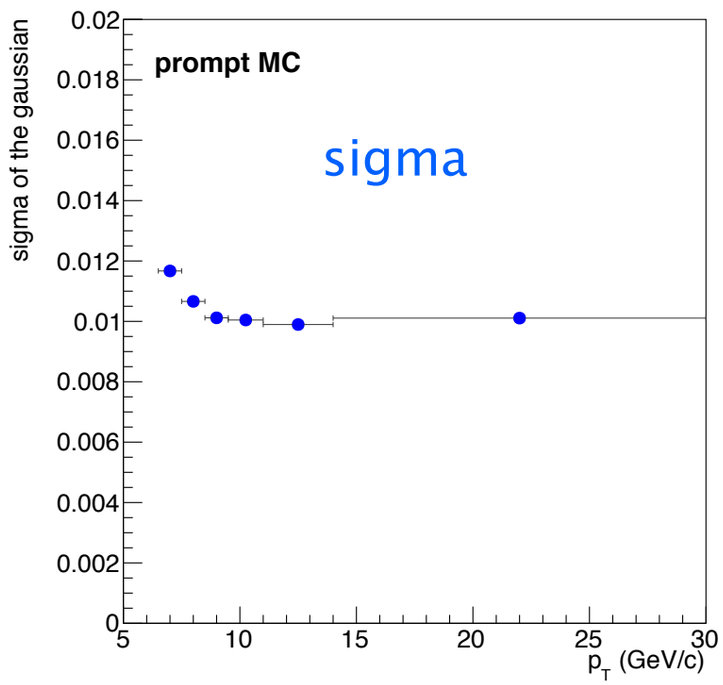


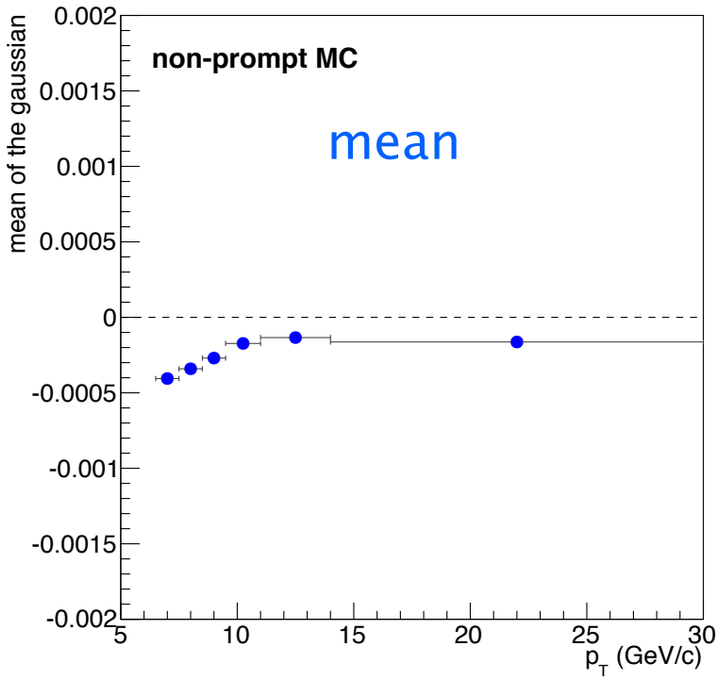


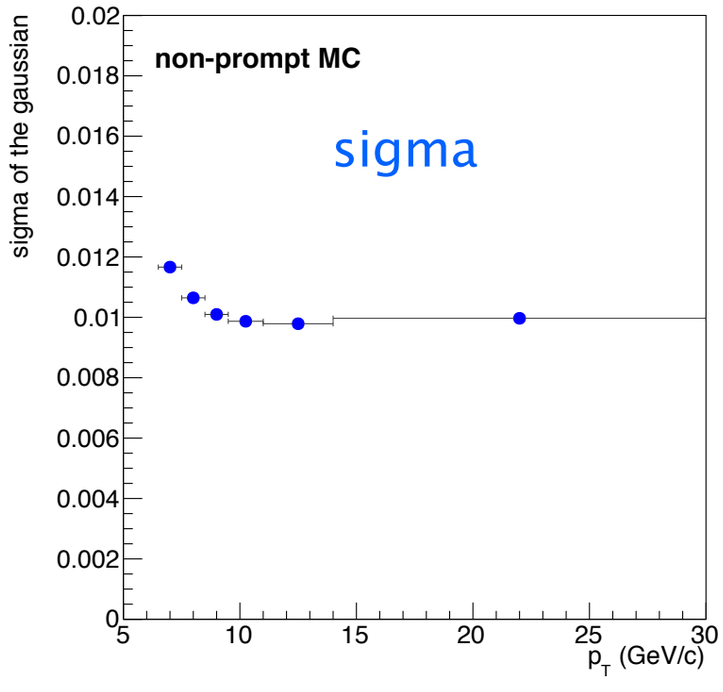
Unfolding

- **[RECO p_T - GEN p_T] / [GEN p_T] for non-prompt J/ψ**





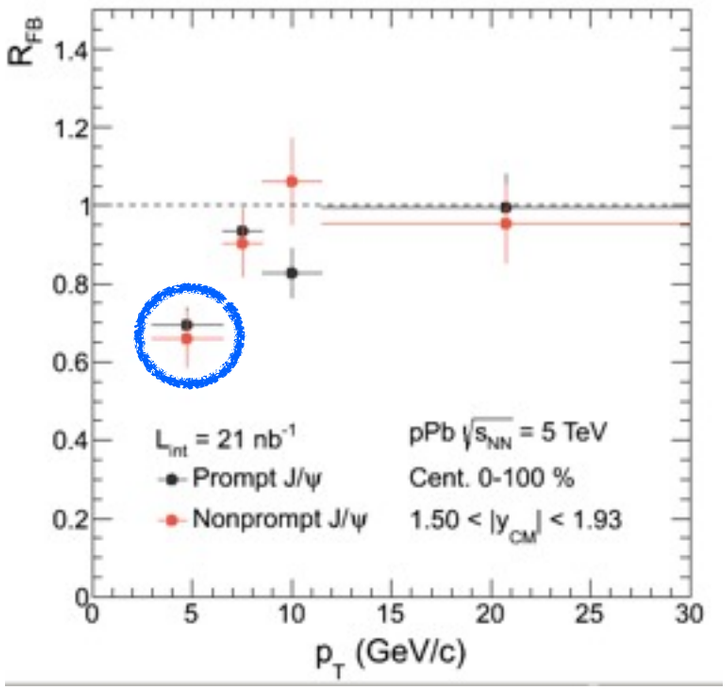


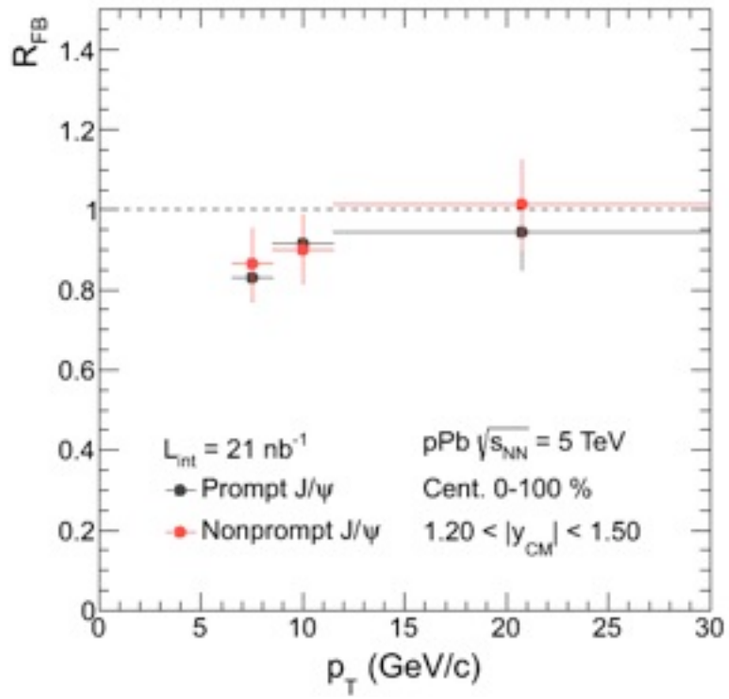


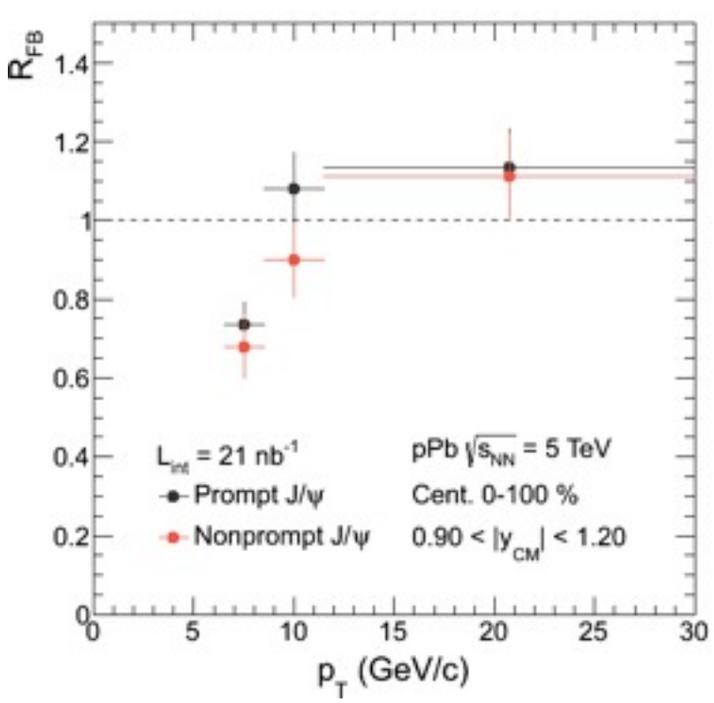
- p_T dependence of the mean and sigma values from the simple gaussian fit of previous two slides :

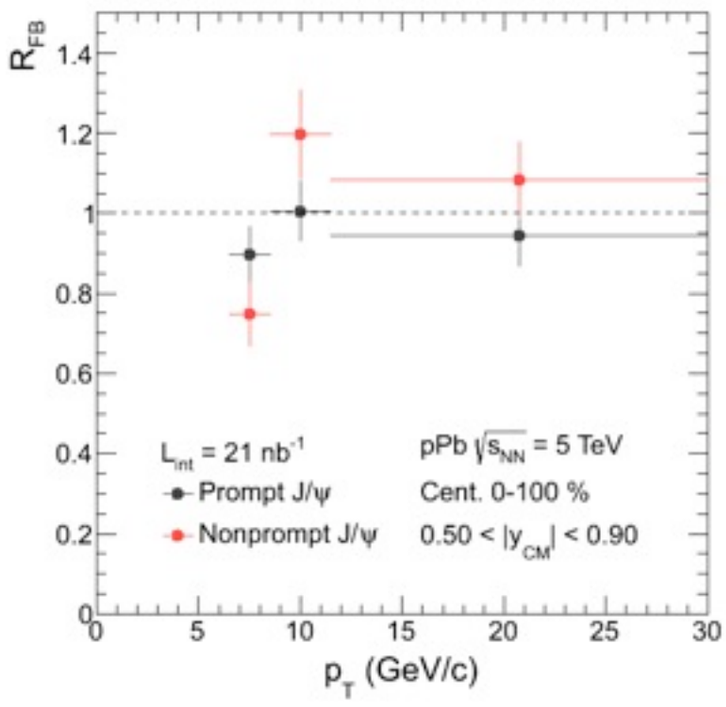
$$\frac{\mathrm{RECO}p_\mathrm{T} - \mathrm{GEN}p_\mathrm{T}}{\mathrm{GEN}p_\mathrm{T}}$$

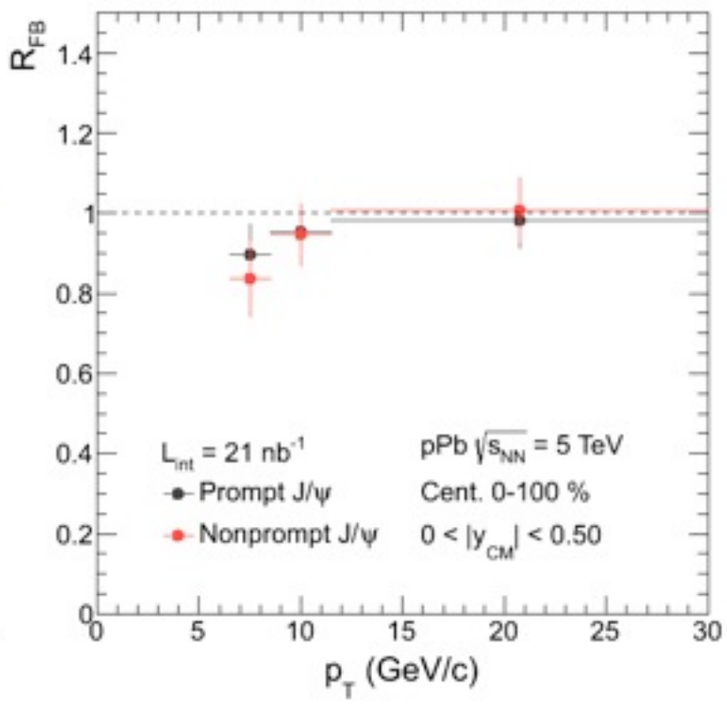
Binning 1(pAJpsi_double)





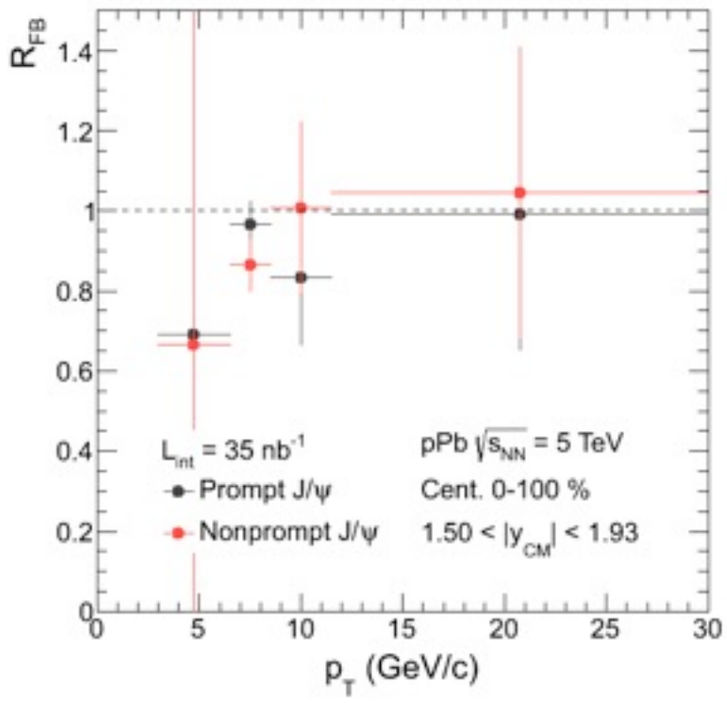


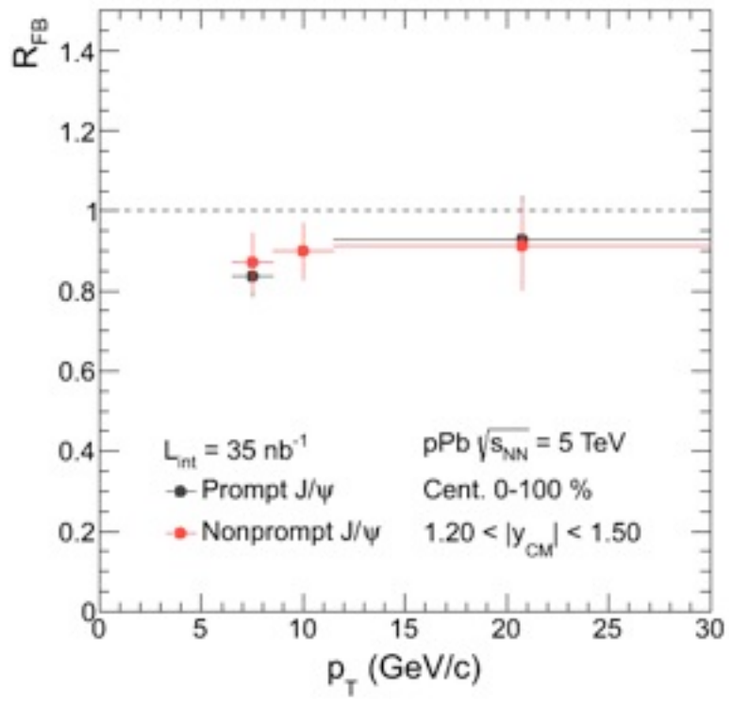


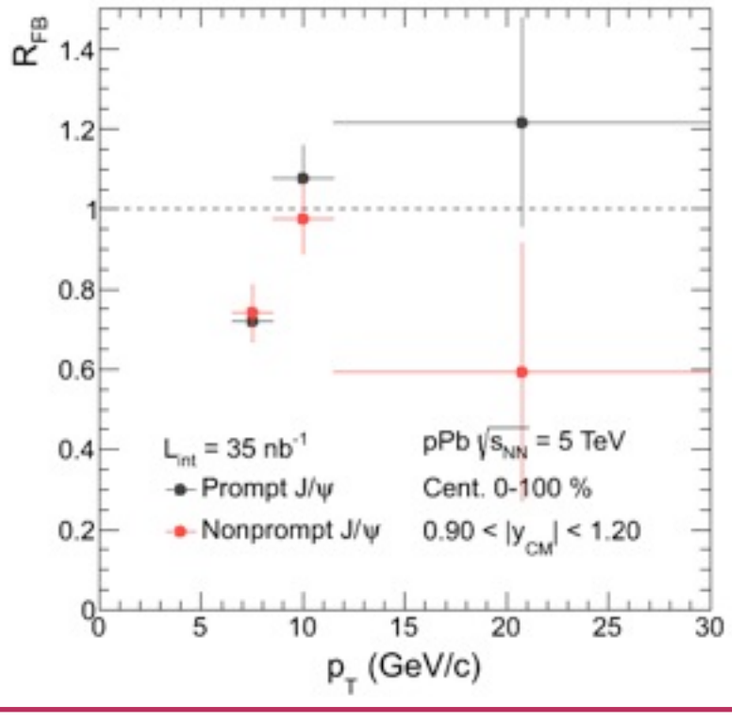


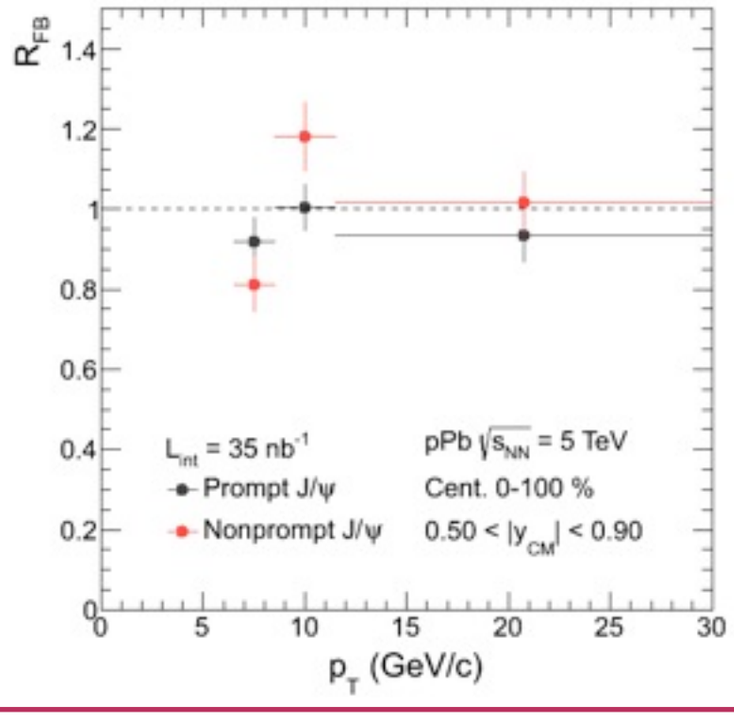
Binning 1 (pAJpsi_double)

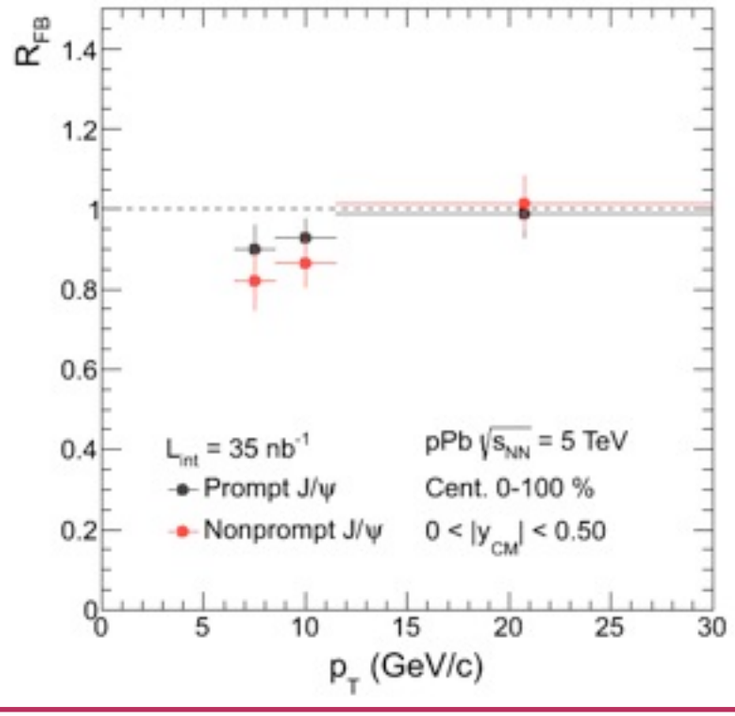
- **pPb fit results – pt dep**





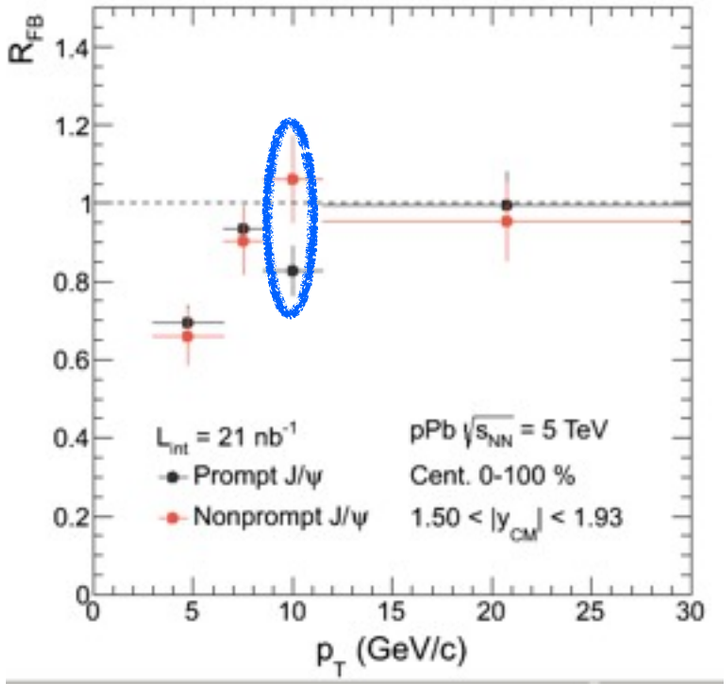


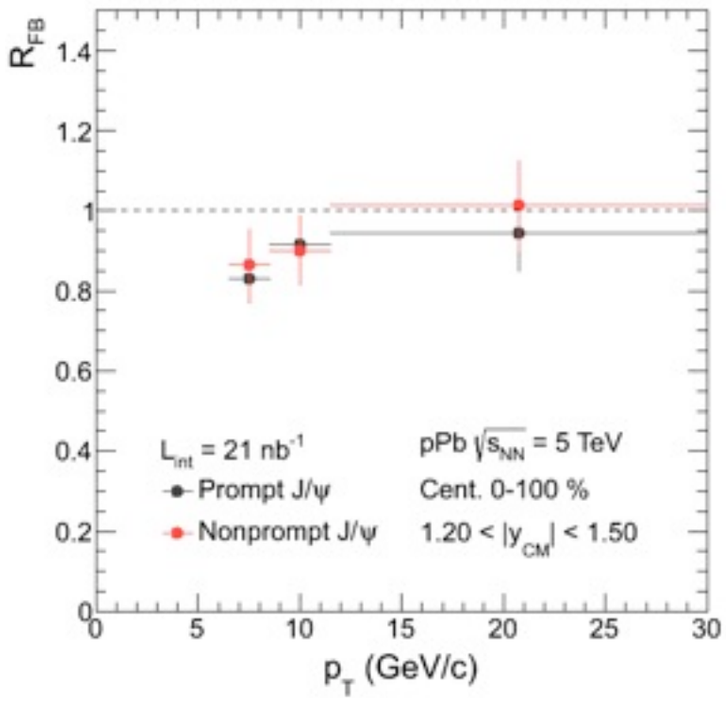


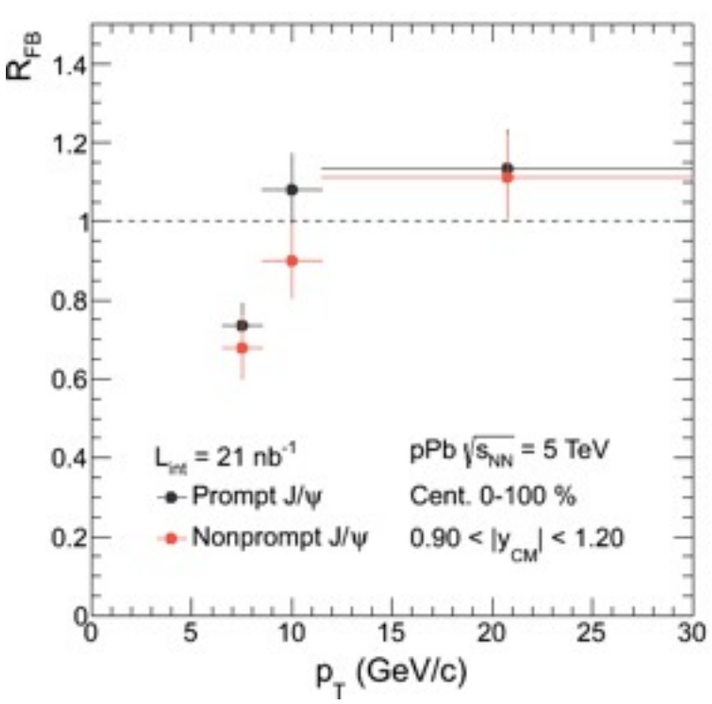


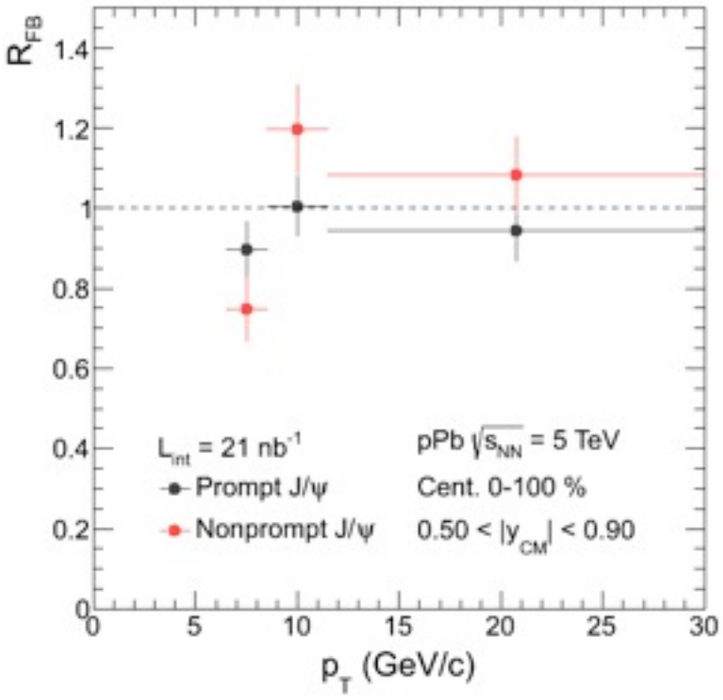
Binning 1 (pAJpsi_double)

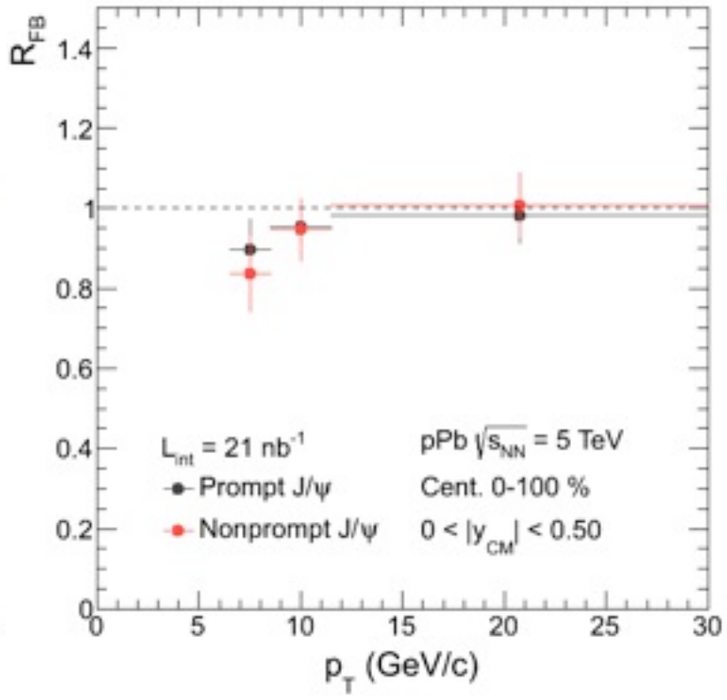
- **Pbp fit results – pt dep**





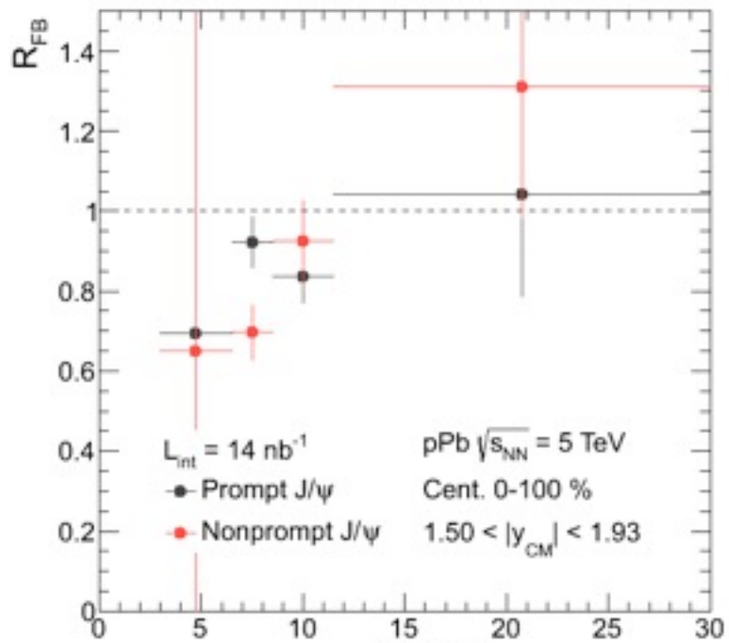


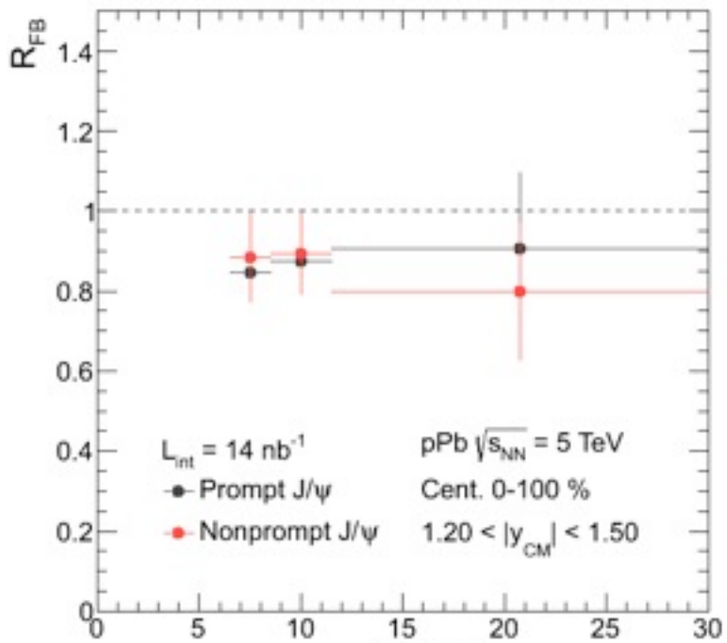


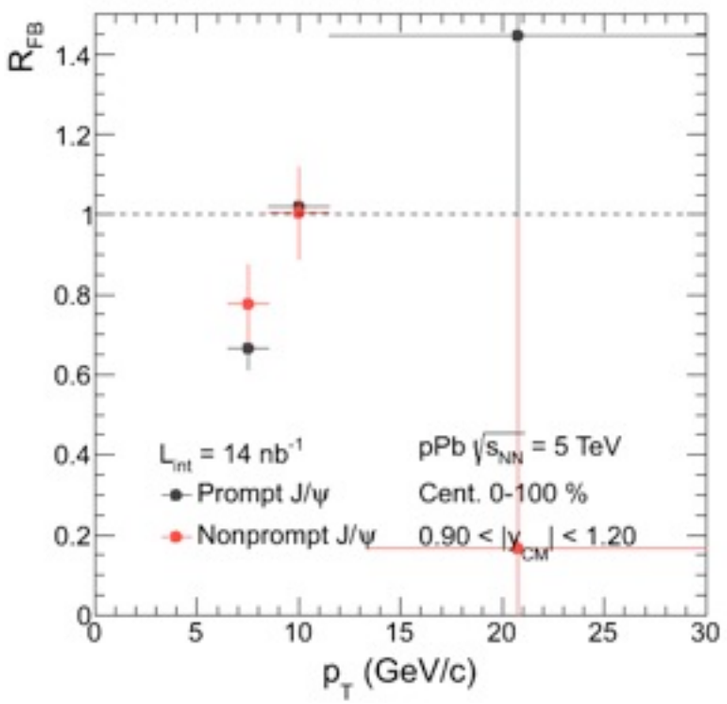


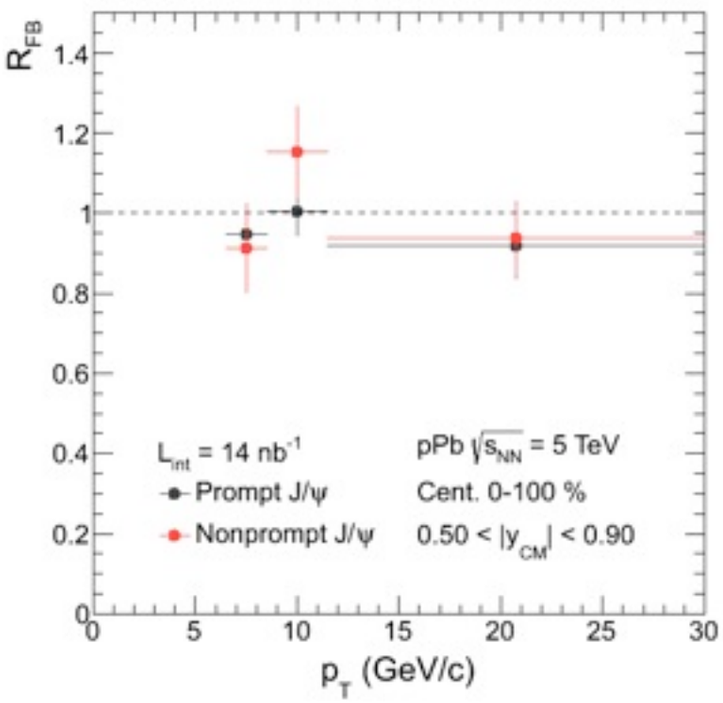
Binning 1 (pAJpsi_double)

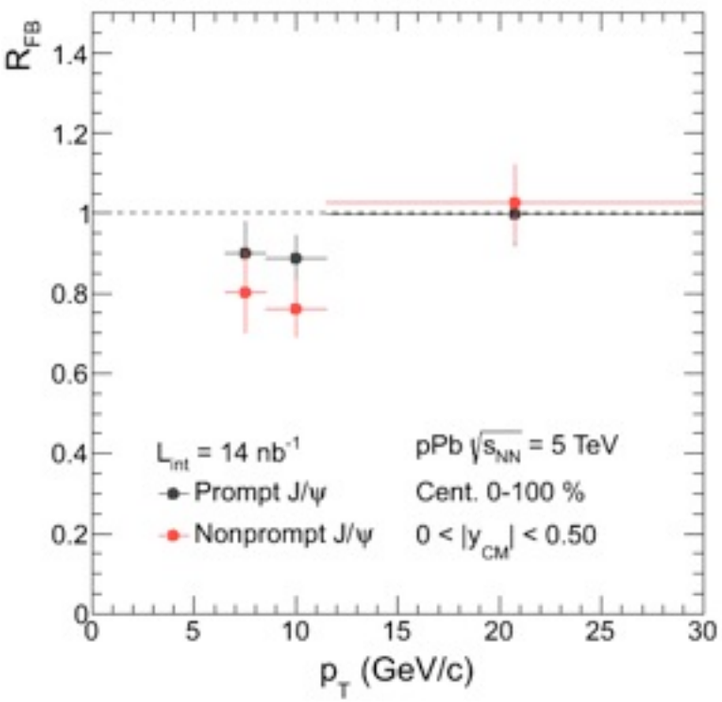
- **pPb fit results – pt dep**







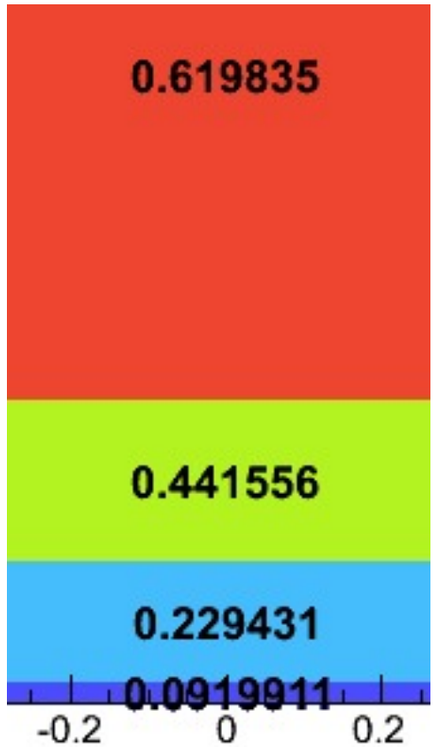


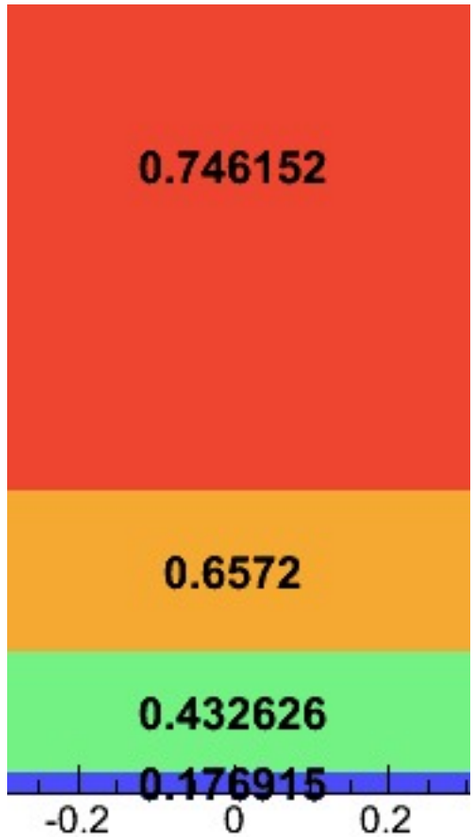


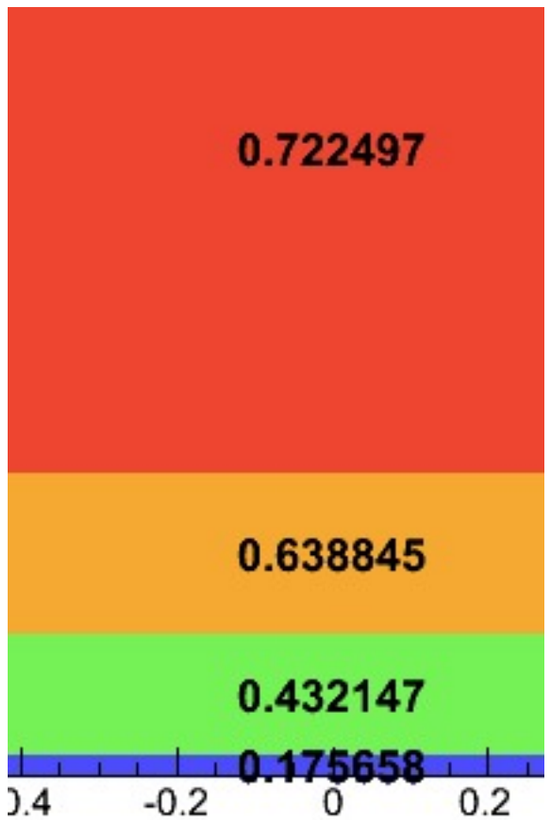
backup

ALICE

- **Double differential cross-section comparison**
  - $|y_{CM}|$ bins : -1.37, 0.43
  - p_T bins : 6.5, 7, 10, 14, 30 GeV/c

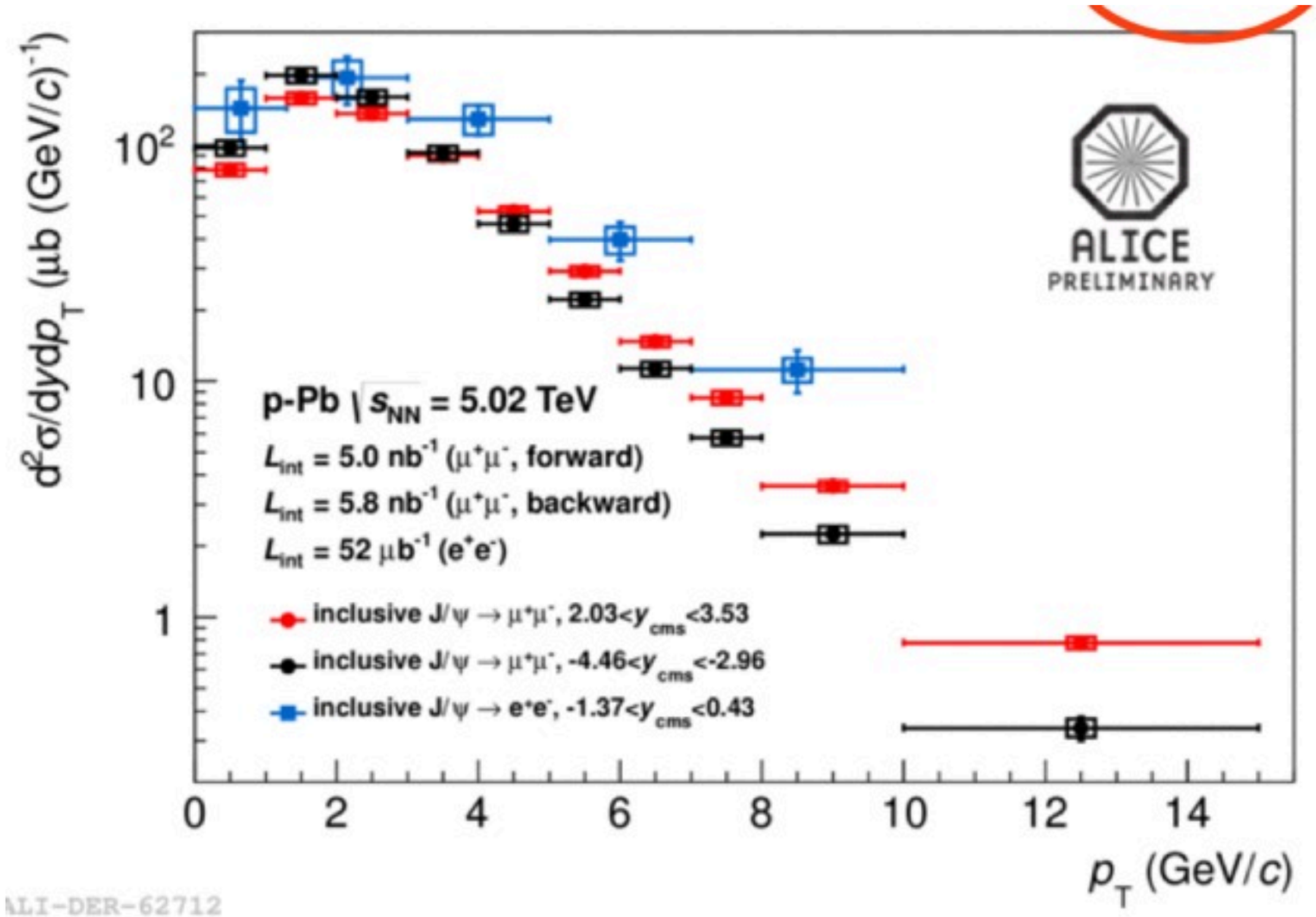






ALICE

- **Double differential cross-section comparison**
  - $|y_{CM}|$ bins : -1.37, 0.43
  - p_T bins : 6.5, 7, 10, 14, 30 GeV/c



Binning 1

- **Pbp fit results**

103) 10.0–13.0 GeV/c

```
ry/fit_table fit_table_RFB_Pbp_yDep_103.out
-2.4--1.97      10.0-13.0       0.0-100.0       806.368 85.1057 552.726 61.0698 253.642 32.2966
-1.97--1.67     10.0-13.0       0.0-100.0       1012.35 37.8264 677.744 31.9593 334.607 23.1605
-1.67--1.37     10.0-13.0       0.0-100.0       1147.07 36.1837 782.183 31.75   364.888 23.0601
-1.37--0.97     10.0-13.0       0.0-100.0       1413.17 56.4724 1310    517.568 103.171 514.93
-0.97--0.47     10.0-13.0       0.0-100.0       1519.45 42.2068 1082.51 37.0173 436.944 24.7674
-0.47-0.03      10.0-13.0       0.0-100.0       1390.84 49.4551 961.776 39.9111 429.061 25.6147
0.03-0.43       10.0-13.0       0.0-100.0       1001.89 36.732  691.411 31.2101 310.476 21.4724
0.43-0.73       10.0-13.0       0.0-100.0       856.252 31.4928 564.019 26.6332 292.233 19.8625
0.73-1.03       10.0-13.0       0.0-100.0       822.475 35.7274 544.767 28.8401 277.707 20.4276
1.03-1.46       10.0-13.0       0.0-100.0       1196.58 41.6147 870.539 35.5627 326.043 21.8328
```

104) 13.0–30.0 GeV/c

```
ry/fit_table fit_table_RFB_Pbp_yDep_104.out
-2.4--1.97      13.0-30.0       0.0-100.0       458.457 23.574  277.864 19.4778 180.593 16.1702
-1.97--1.67     13.0-30.0       0.0-100.0       547.709 25.7329 295.38  19.8163 252.329 18.4563
-1.67--1.37     13.0-30.0       0.0-100.0       676.083 27.7548 375.404 21.772  300.679 19.72
-1.37--0.97     13.0-30.0       0.0-100.0       862.868 30.8026 479.375 24.4666 383.493 22.2078
-0.97--0.47     13.0-30.0       0.0-100.0       1029.01 33.2141 583.024 26.4766 445.988 23.5393
-0.47-0.03      13.0-30.0       0.0-100.0       1003.25 37.2273 585.533 28.651  417.713 24.2704
0.03-0.43       13.0-30.0       0.0-100.0       795.974 37.8735 462.913 27.3409 333.06  22.661
0.43-0.73       13.0-30.0       0.0-100.0       560.056 40.3991 294.76  25.2767 265.296 23.517
0.73-1.03       13.0-30.0       0.0-100.0       562.698 25.222  334.351 20.3067 228.347 17.1032
1.03-1.46       13.0-30.0       0.0-100.0       739.716 28.8836 443.474 23.2802 296.242 19.3886
```

Binning 1

- **pPb fit results**

100) 3.0–6.5 GeV/c

```
ry/fit_table fit_table_RFB_pPb_yDep_100.out
1.97-2.4        3.0-6.5         0.0-100.0       5696.25 98.9119 4697.01 73382.2 999.247 73382.2
-1.46--1.03     3.0-6.5         0.0-100.0       1102.59 10.8634 886.486 20.7656 216.099 18.9593
```

101) 6.5–8.0 GeV/c

```
ry/fit_table fit_table_RFB_pPb_yDep_101.out
1.97-2.4        6.5-8.0         0.0-100.0       1185.25 40.5308 954.861 38.4982 230.393 21.8633
1.67-1.97       6.5-8.0         0.0-100.0       2103.72 302.3   1629.11 235.67  474.606 73.4073
1.37-1.67       6.5-8.0         0.0-100.0       1804.77 46.2999 1353.58 34.725  451.193 11.575
0.97-1.37       6.5-8.0         0.0-100.0       1613.72 95.1083 1236.87 76.456  376.848 32.0114
0.47-0.97       6.5-8.0         0.0-100.0       768.056 44.3066 583.729 36.7645 184.328 18.188
-0.03-0.47      6.5-8.0         0.0-100.0       561.355 37.8688 415.367 30.7016 145.987 15.9508
-0.43--0.03     6.5-8.0         0.0-100.0       422.766 25.1402 320.01  22.1868 102.756 12.9408
-0.73--0.43     6.5-8.0         0.0-100.0       388.684 20.8092 310.227 19.4798 78.4573 11.0117
-1.03--0.73     6.5-8.0         0.0-100.0       638.215 31.6001 504.724 28.3906 133.491 15.0062
-1.46--1.03     6.5-8.0         0.0-100.0       1658.97 153.452 1244.23 115.089 414.742 38.3629
```

102) 8.0–10.0 GeV/c

```
[lxplus444] /afs/cern.ch/work/k/kyolee/private/cms442/src/pAJpsi_double > ./a.out Results/tmp_pPb_d
ry/fit_table fit_table_RFB_pPb_yDep_102.out
1.97-2.4        8.0-10.0        0.0-100.0       911.039 46.3686 679.047 38.9126 231.991 21.4276
1.67-1.97       8.0-10.0        0.0-100.0       1254.54 69.7595 961.559 57.1262 292.98  25.8838
1.37-1.67       8.0-10.0        0.0-100.0       1259.13 41.5647 945.41  37.6864 313.722 23.5274
0.97-1.37       8.0-10.0        0.0-100.0       1495.32 84.49   1082.87 65.1145 412.448 32.2386
0.47-0.97       8.0-10.0        0.0-100.0       1274.63 69.8836 902.379 53.4527 372.248 28.7402
-0.03-0.47      8.0-10.0        0.0-100.0       955.909 32.0359 688.303 28.7787 267.605 19.4045
-0.43--0.03     8.0-10.0        0.0-100.0       822.577 29.8636 621.112 27.0073 201.466 16.5655
-0.73--0.43     8.0-10.0        0.0-100.0       627.92  26.1956 459.61  23.4744 168.31  15.2547
-1.03--0.73     8.0-10.0        0.0-100.0       775.383 38.7396 586.43  32.8972 188.953 17.6892
-1.46--1.03     8.0-10.0        0.0-100.0       1402.22 71.7089 1036.28 56.9572 365.937 28.0332
```

Binning 1

- **pPb fit results**

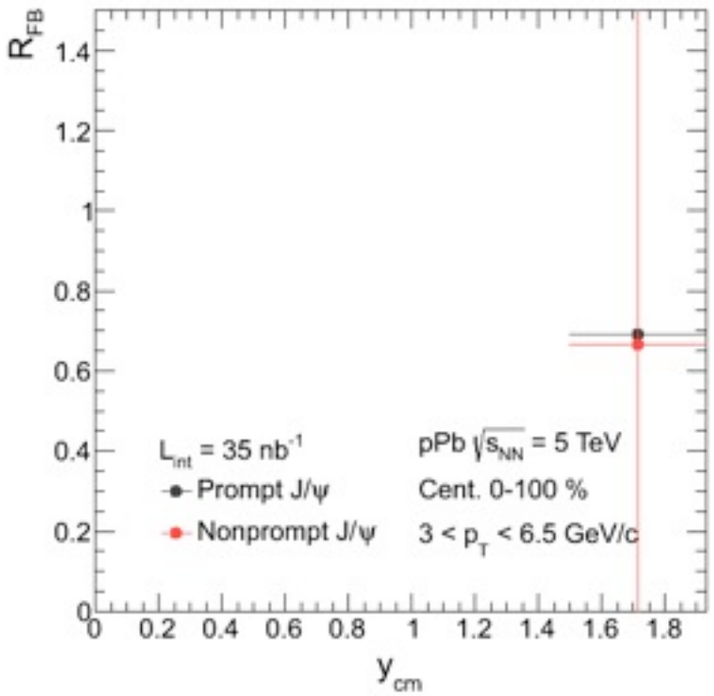
103) 10.0–13.0 GeV/c

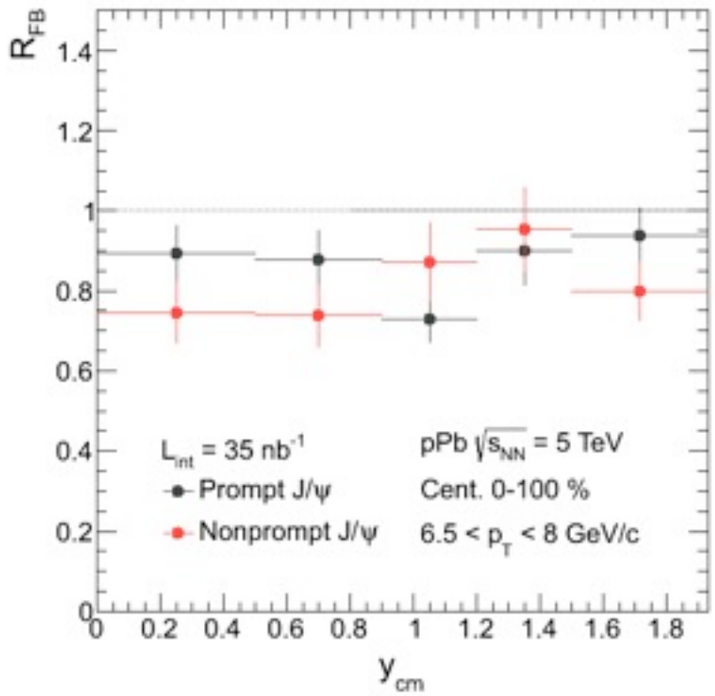
빈 하나 fit results 없다. 왜저럼?
(–1.03–-0.73, 10–13 GeV/c)

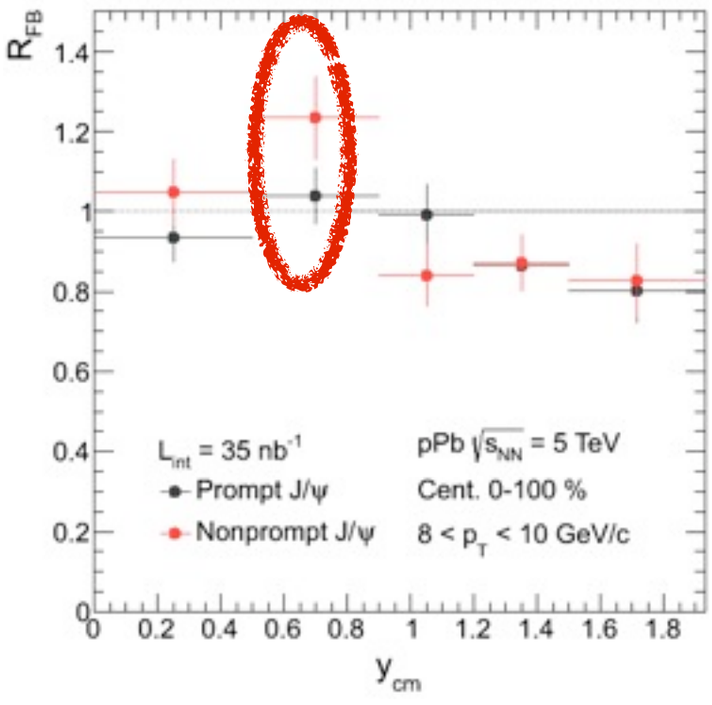
104) 13.0–30.0 GeV/c

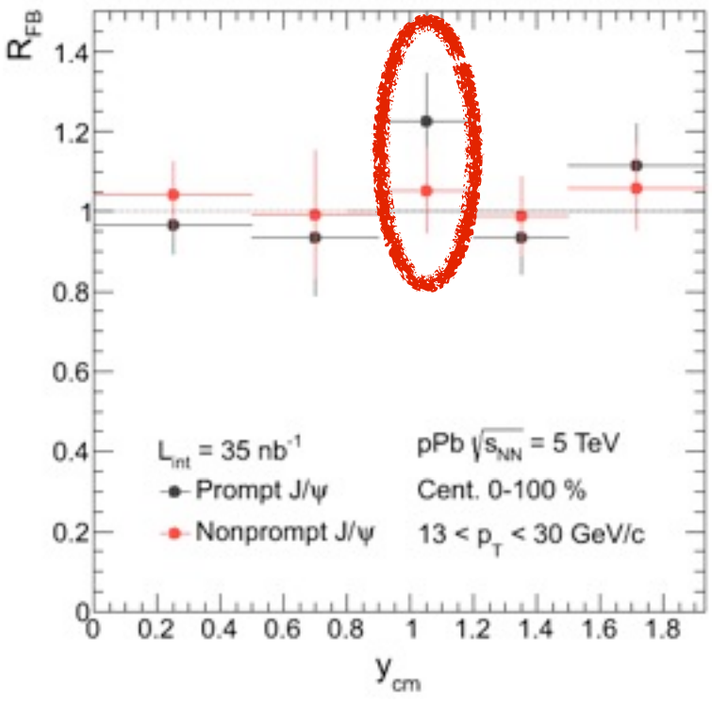
```
ry/fit_table fit_table_RFB_pPb_yDep_104.out
1.97-2.4        13.0-30.0       0.0-100.0       358.028 11.2339 207.235 13.328  150.793 12.5595
1.67-1.97       13.0-30.0       0.0-100.0       388.789 21.1902 223.564 16.911  165.225 14.7852
1.37-1.67       13.0-30.0       0.0-100.0       463.742 22.6801 289.546 18.9374 174.196 15.1882
0.97-1.37       13.0-30.0       0.0-100.0       615.882 200.486 337.25  110.774 278.632 91.8983
0.47-0.97       13.0-30.0       0.0-100.0       750.667 41.0077 449.466 29.3314 301.201 22.9824
-0.03-0.47      13.0-30.0       0.0-100.0       689.12  28.1803 419.055 22.9404 270.064 18.83
-0.43--0.03     13.0-30.0       0.0-100.0       523.621 23.5387 283.072 18.3482 240.549 17.0781
-0.73--0.43     13.0-30.0       0.0-100.0       401.547 21.1083 230.05  16.5078 171.497 14.4061
-1.03--0.73     13.0-30.0       0.0-100.0       406.681 21.2752 236.005 16.893  170.677 14.583
-1.46--1.03     13.0-30.0       0.0-100.0       460.776 22.4795 271.585 17.9556 189.191 15.2329
```

Binning 1 (pAJpsi_double)

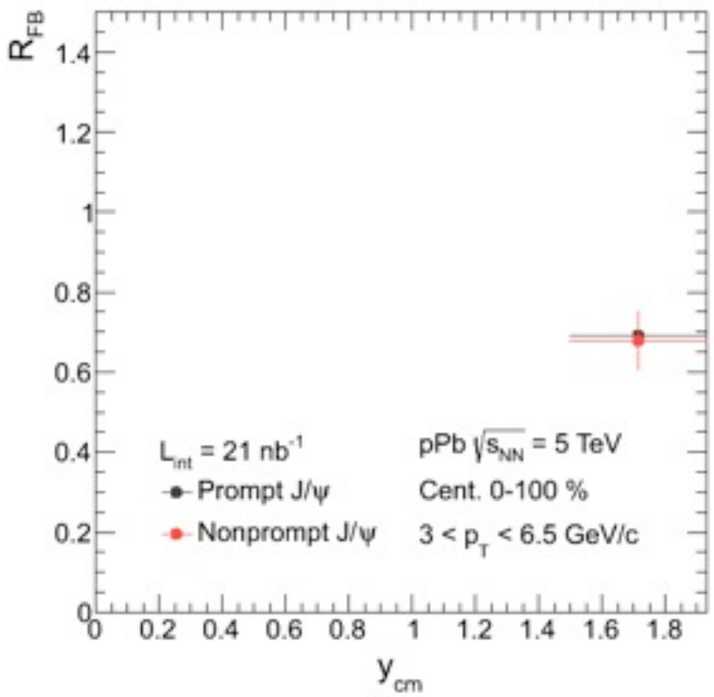


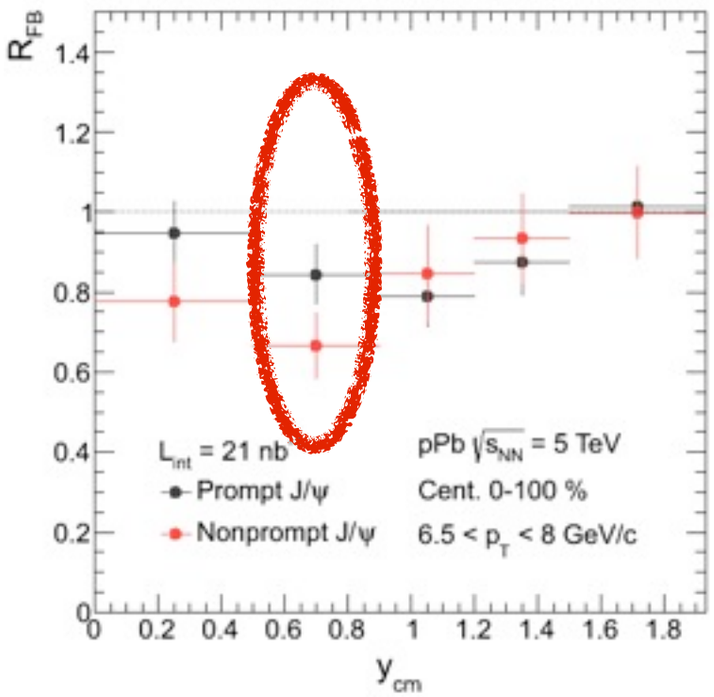


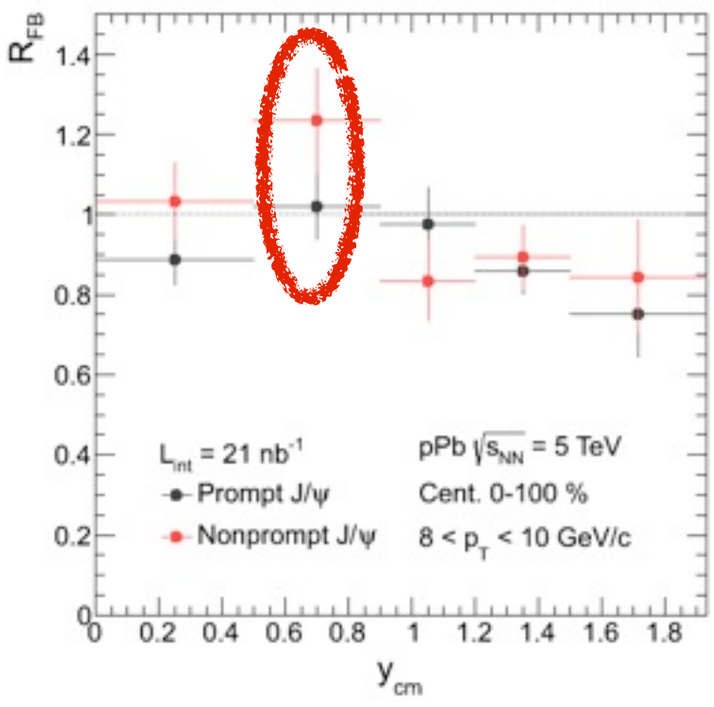


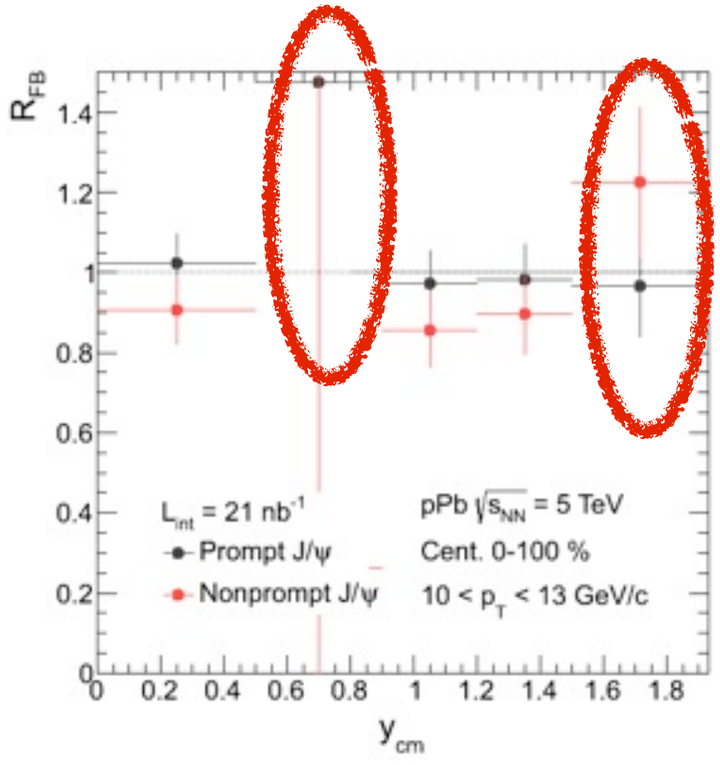


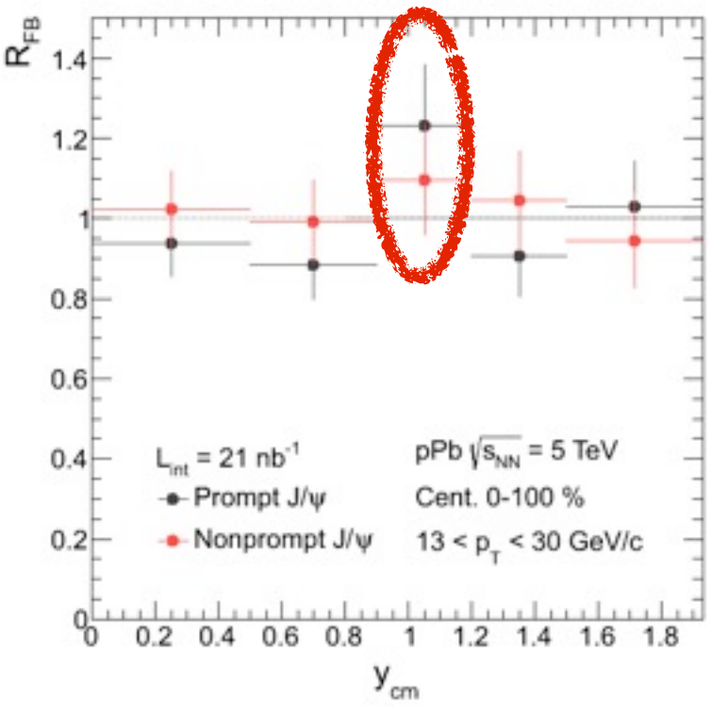
Binning 1 (pAJpsi_double)











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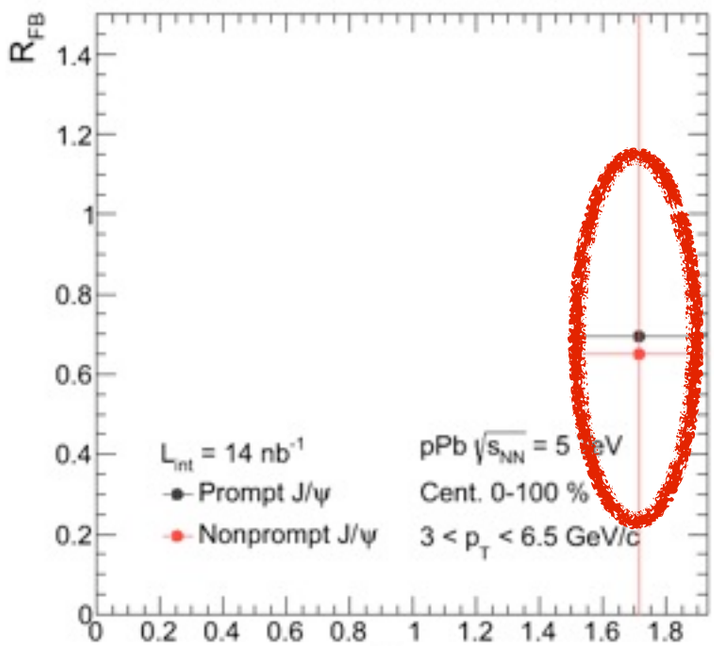
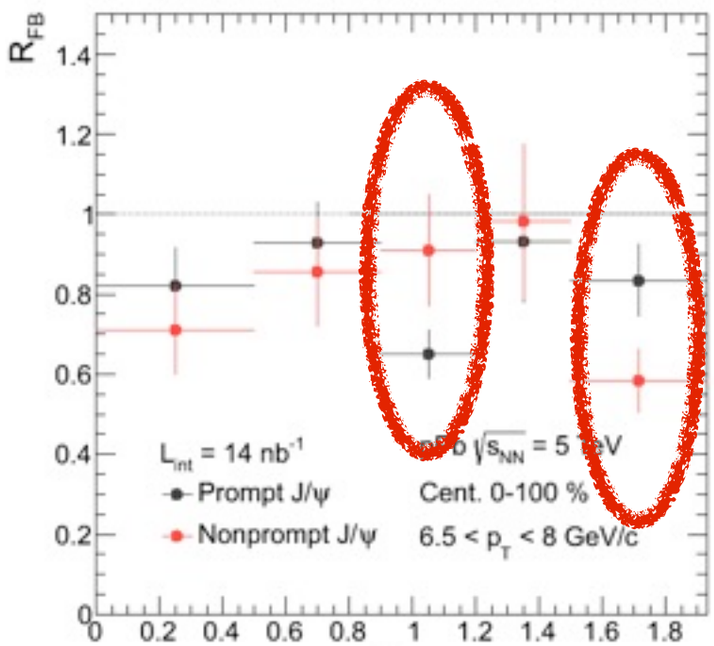
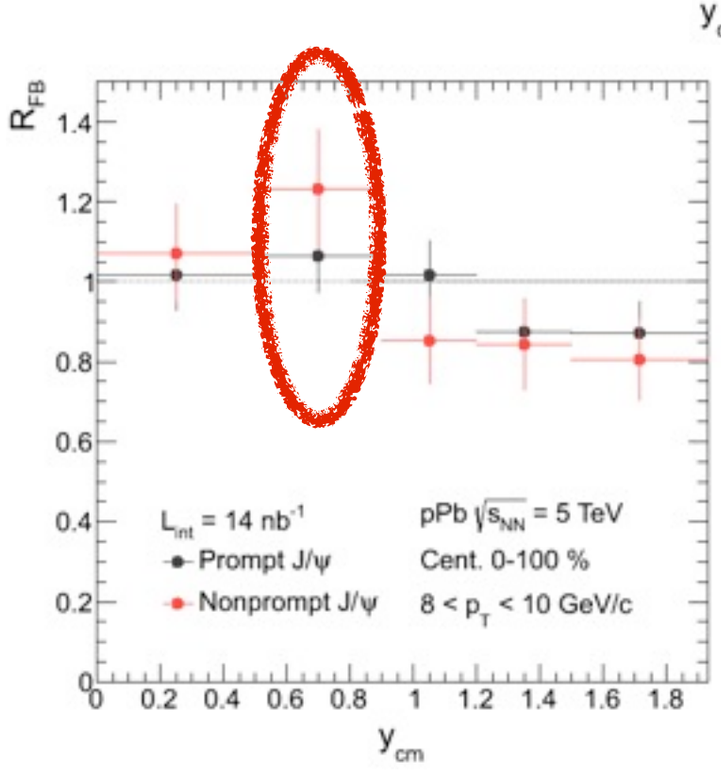
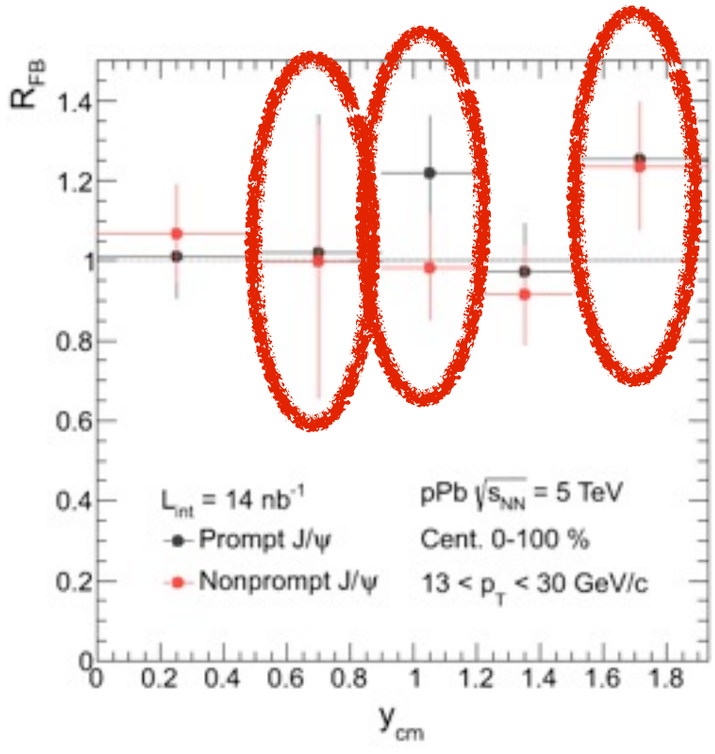
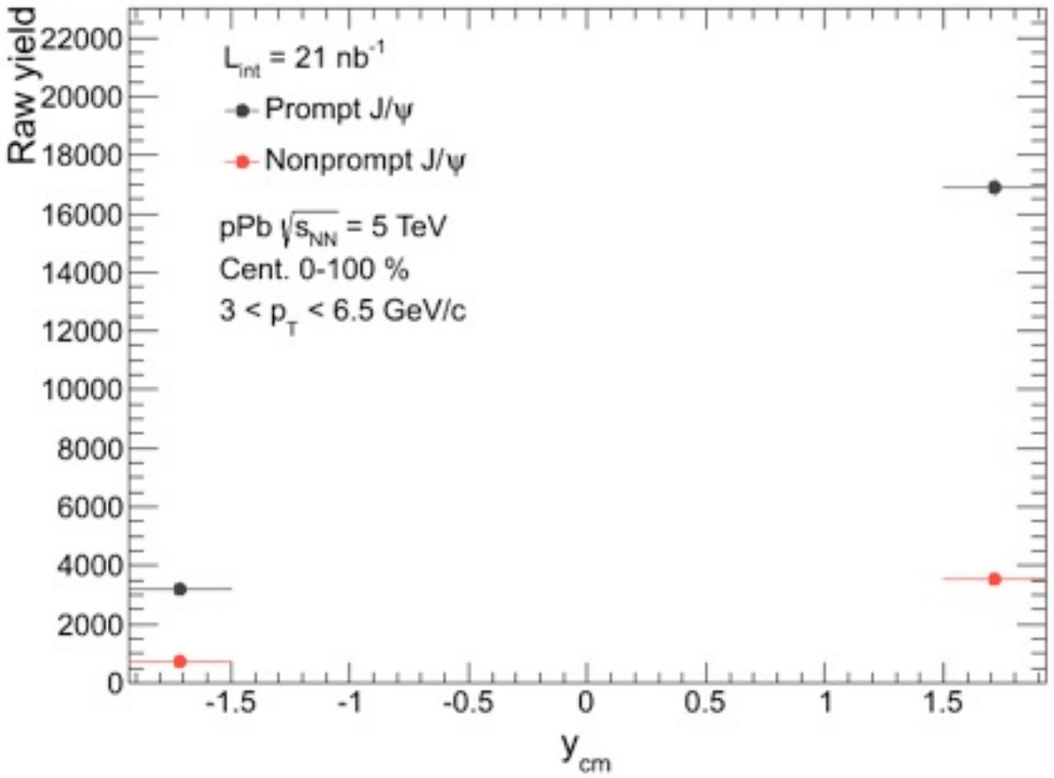


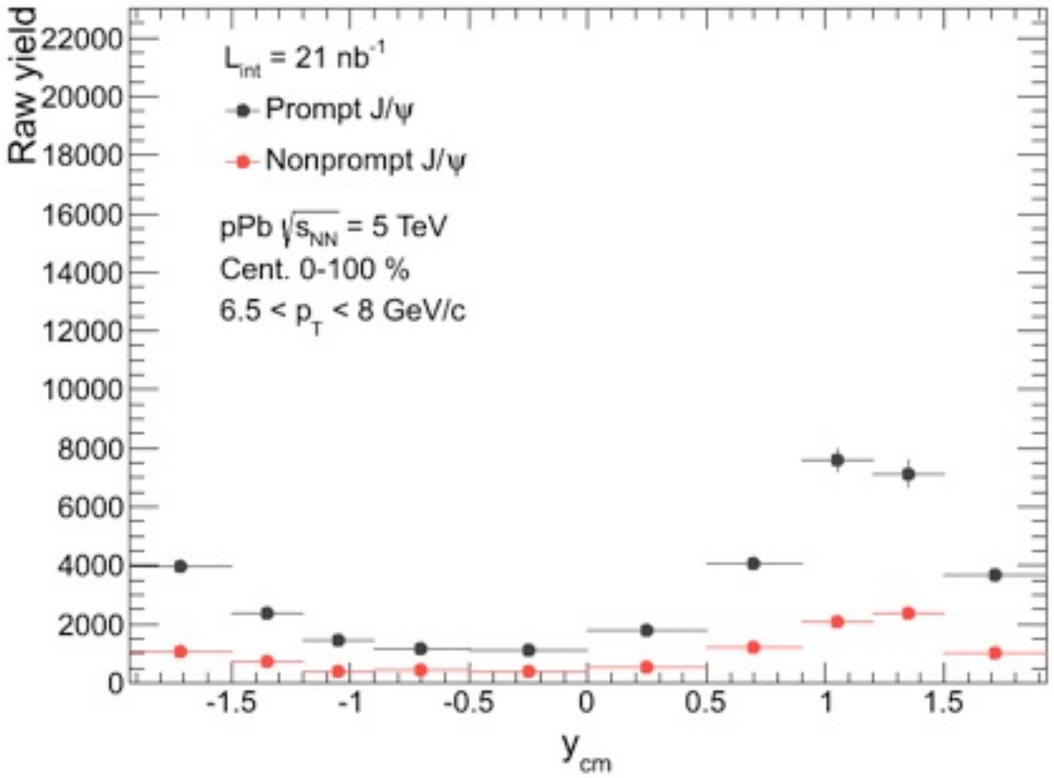


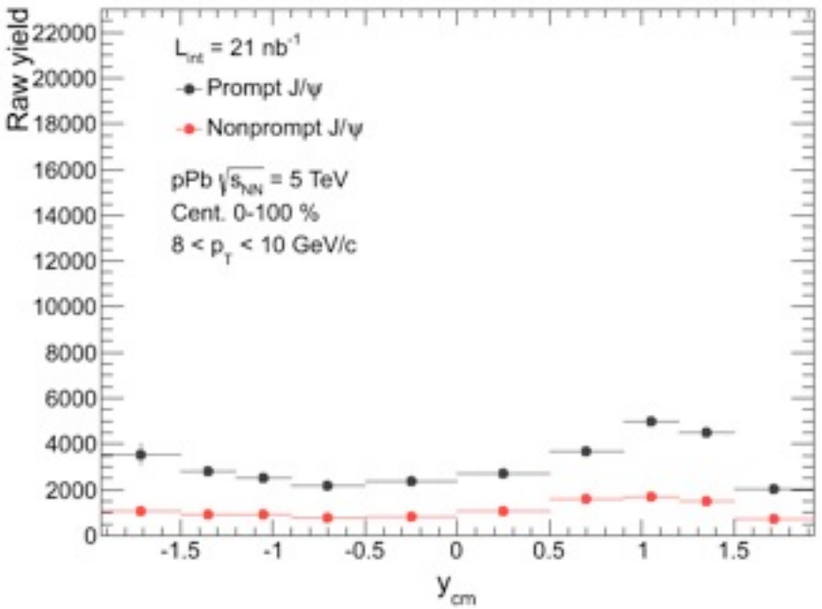


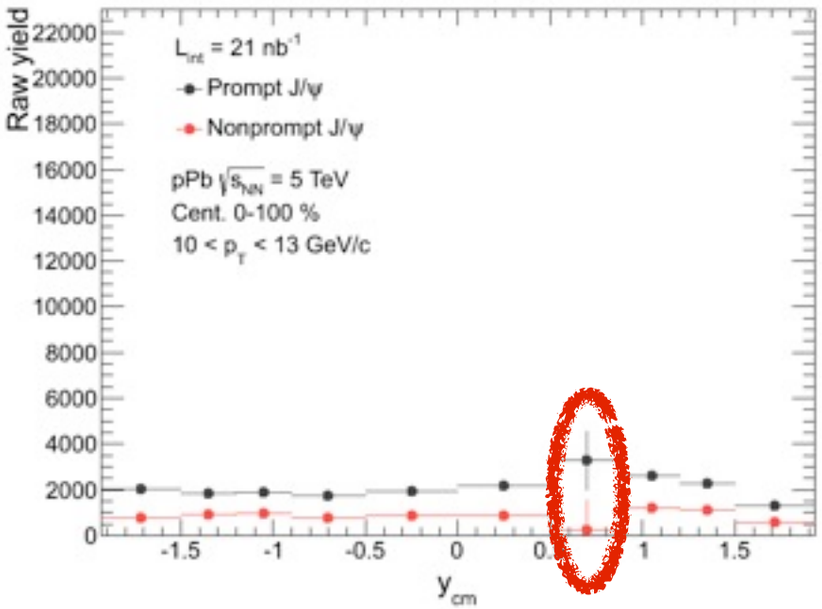


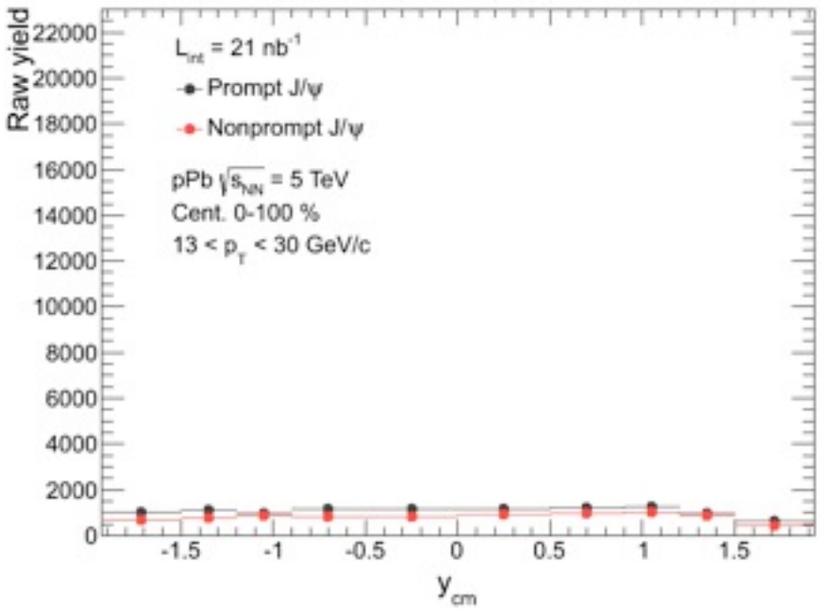
Binning 1 (pAJpsi_double)



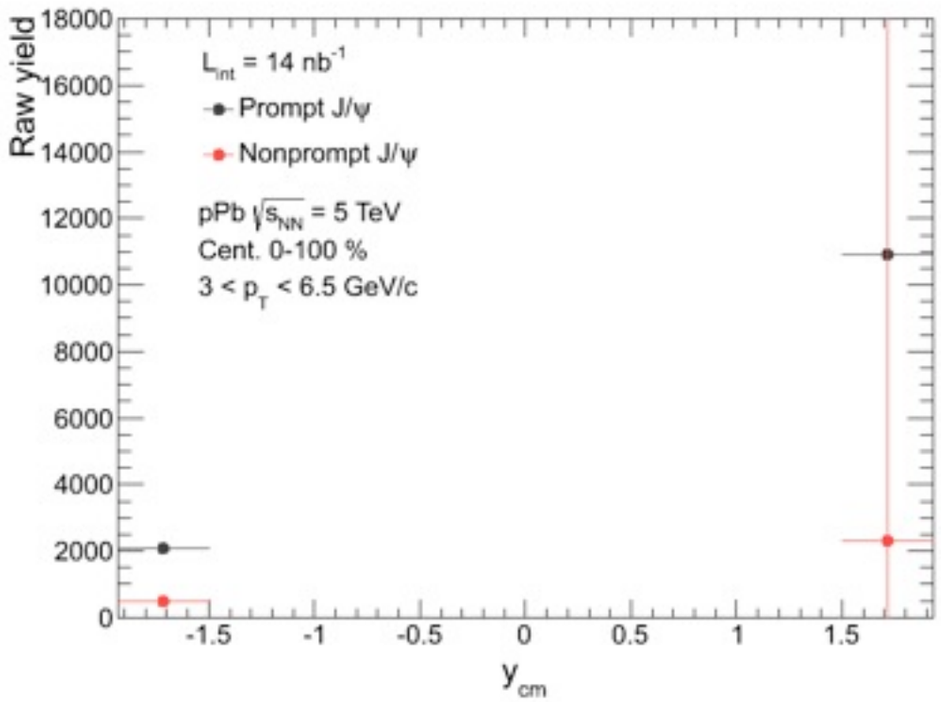


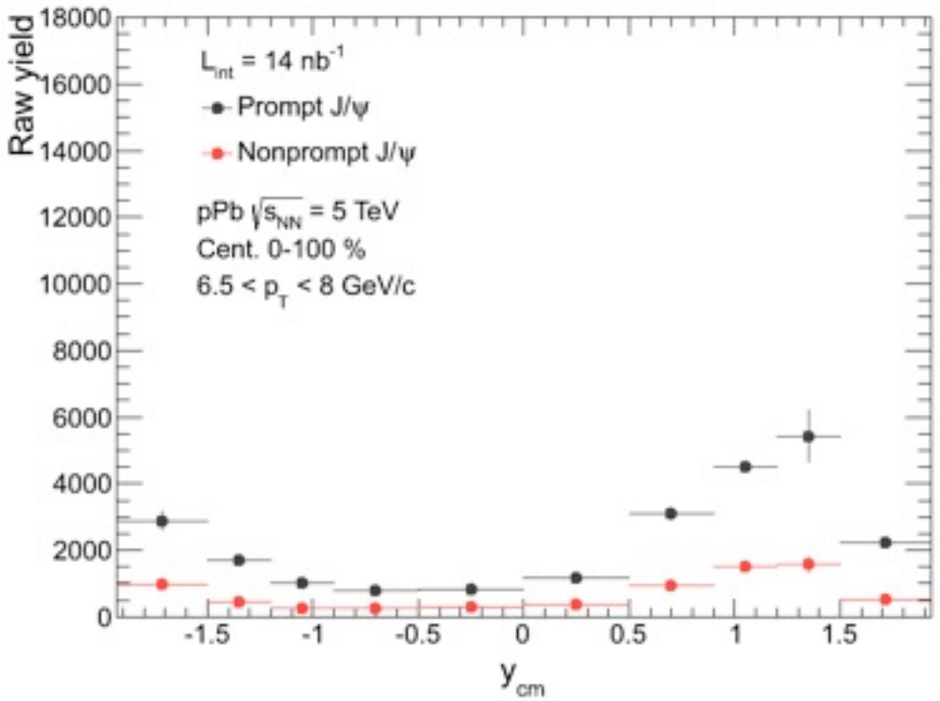


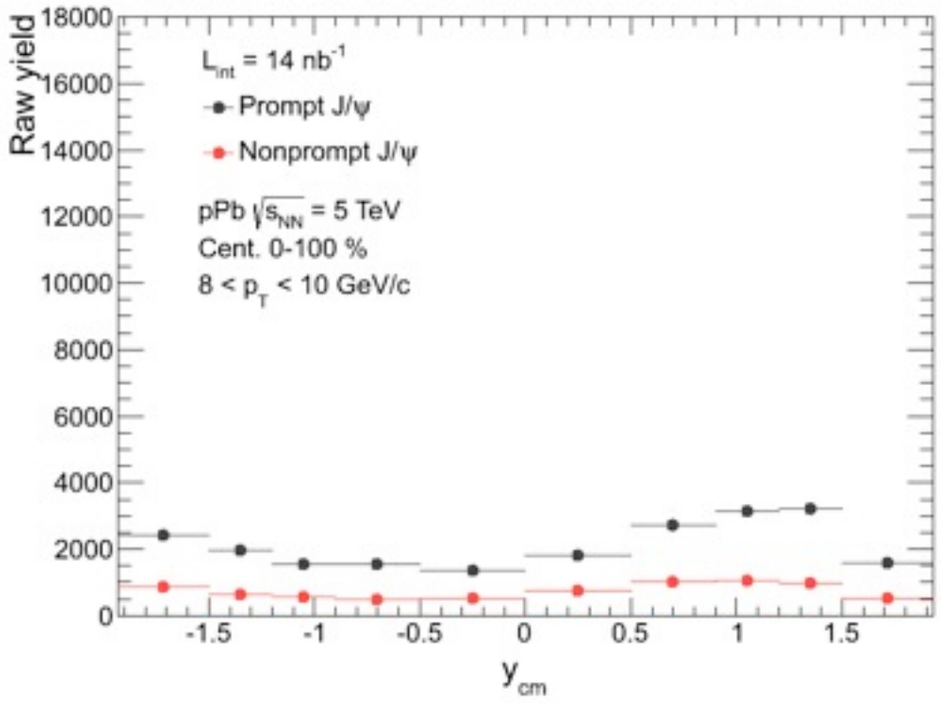


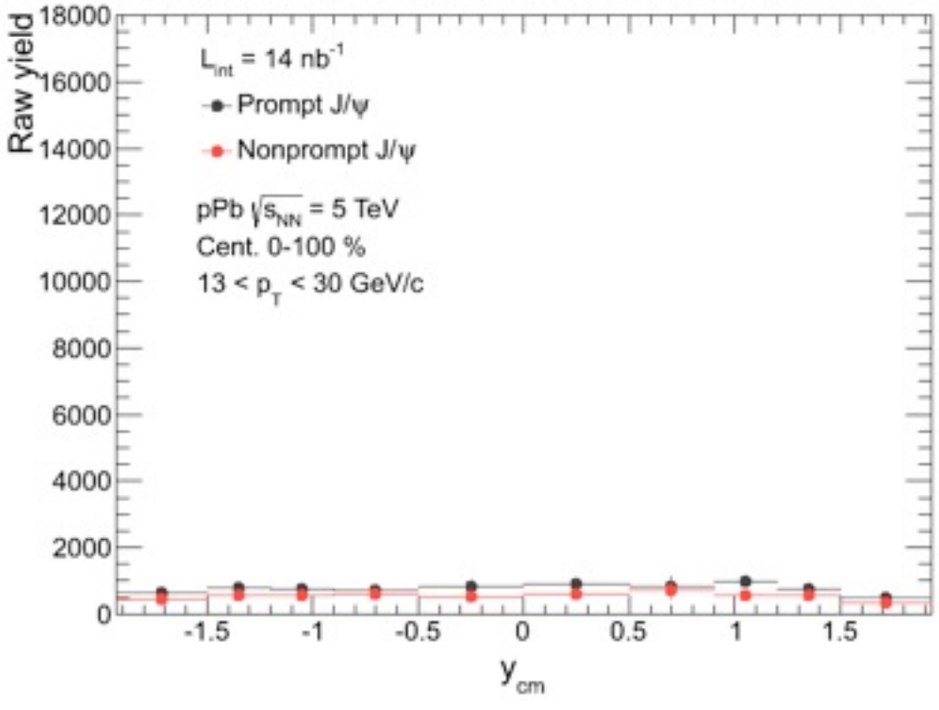


Binning 1 (pAJpsi_double)

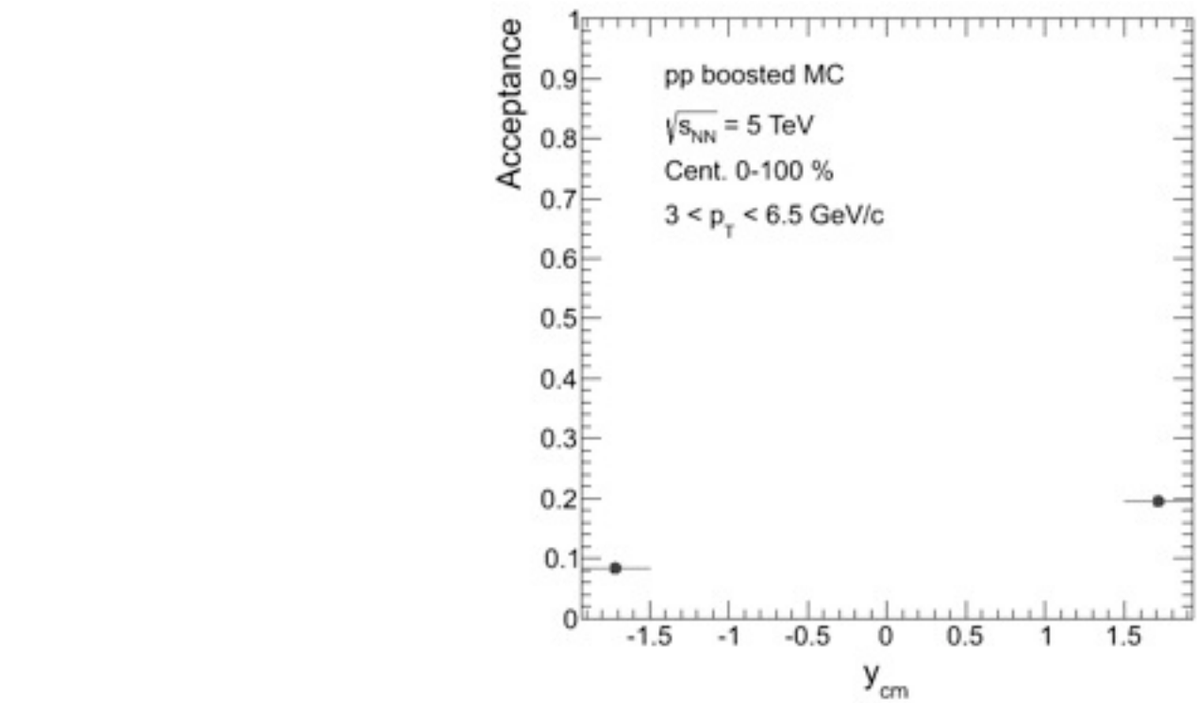


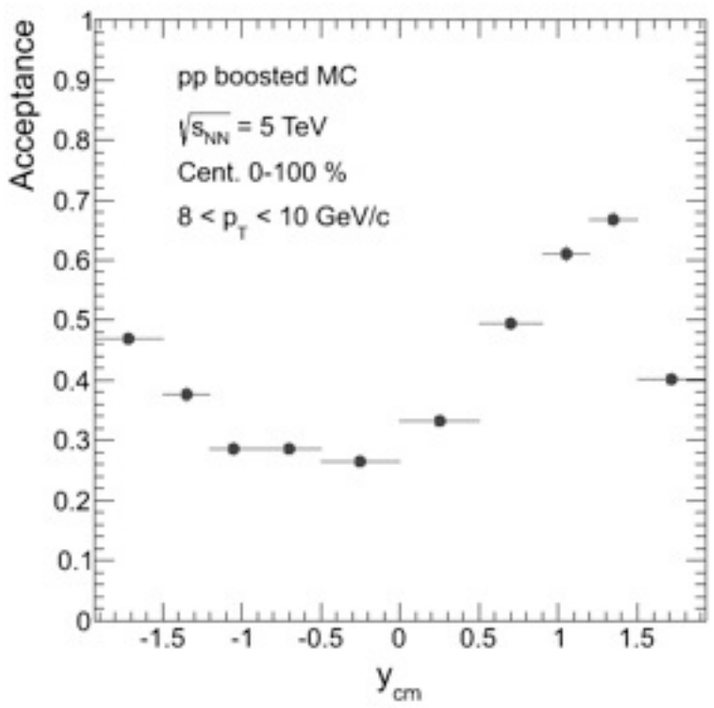


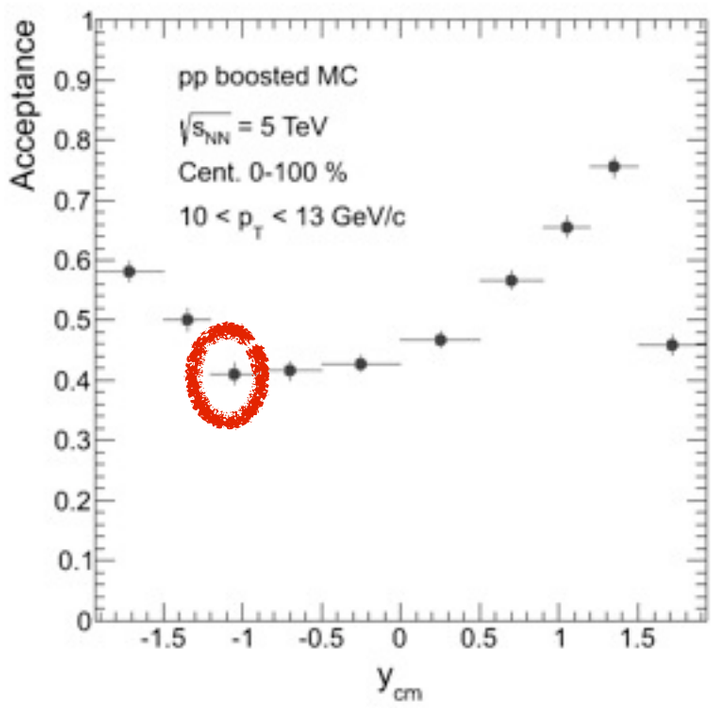


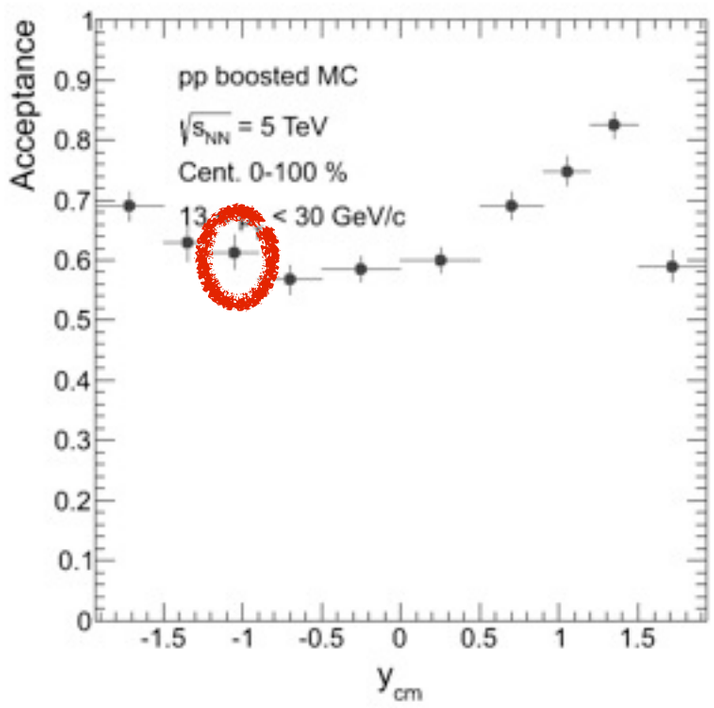


Binning 1 (pAJpsi_double)

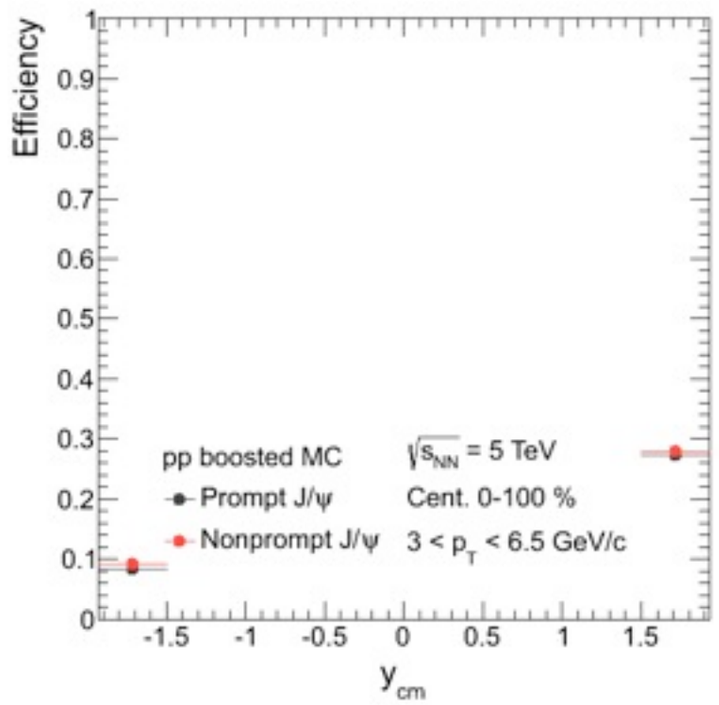


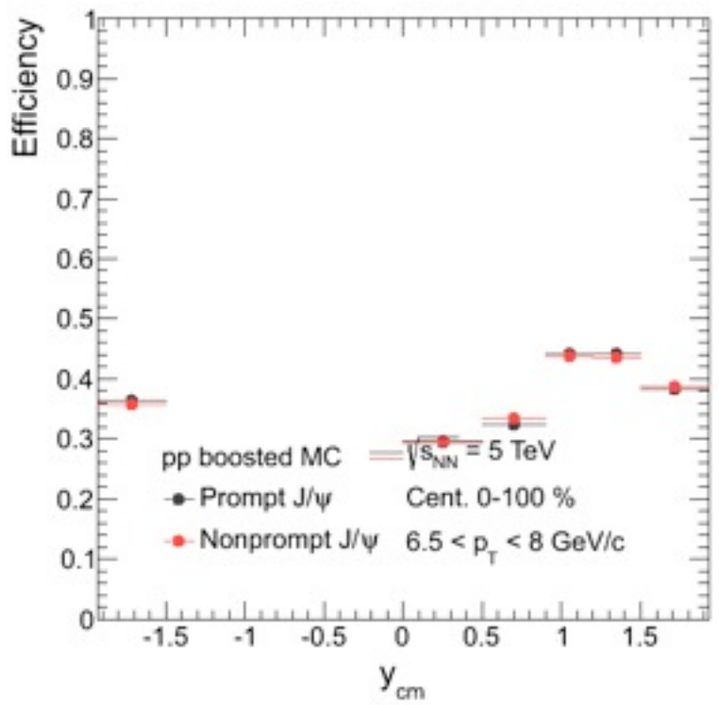


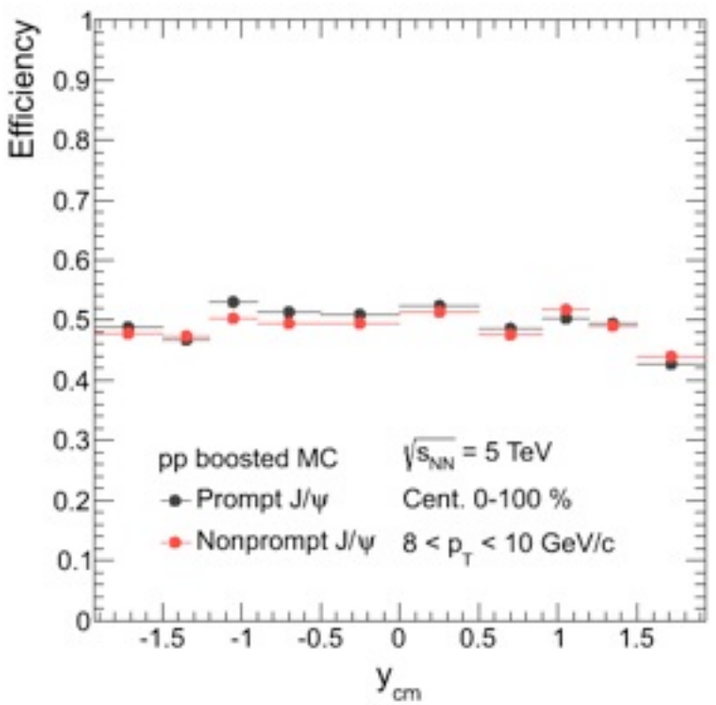


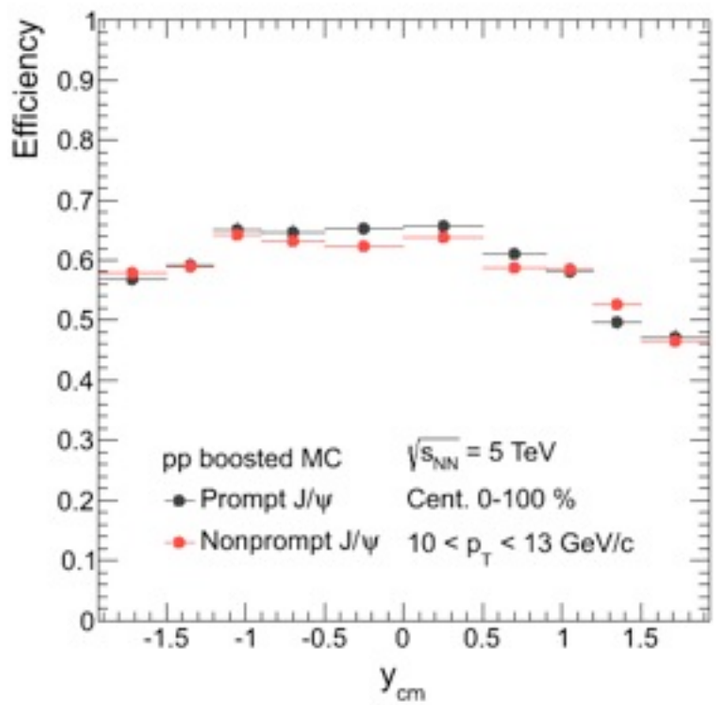


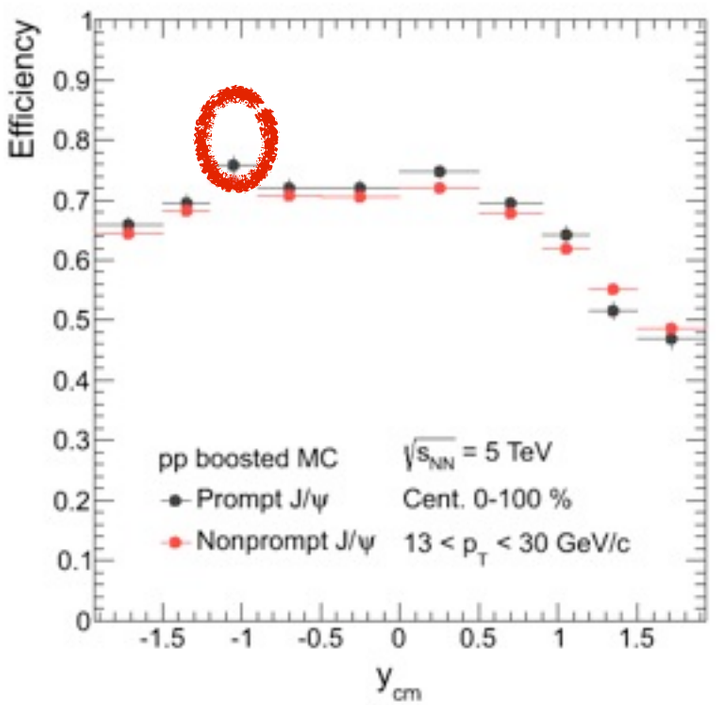
Binning 1 (pAJpsi_double)



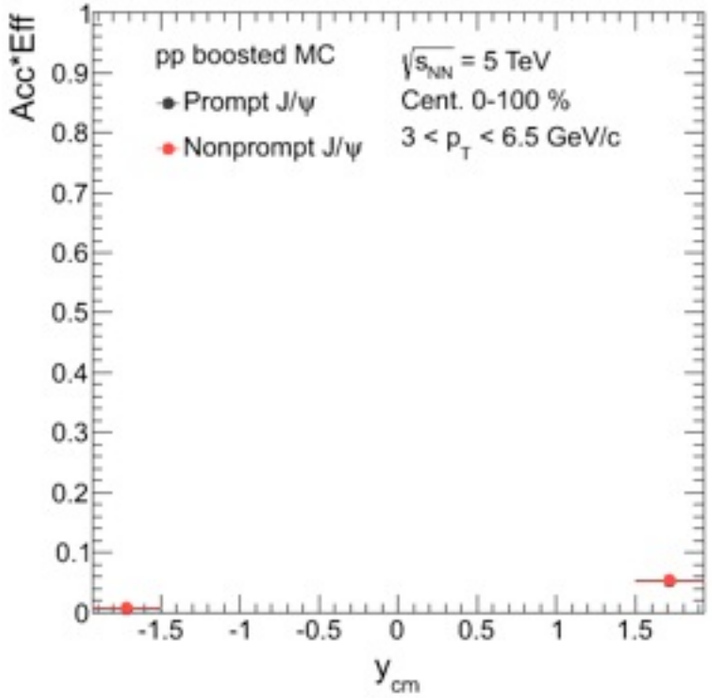


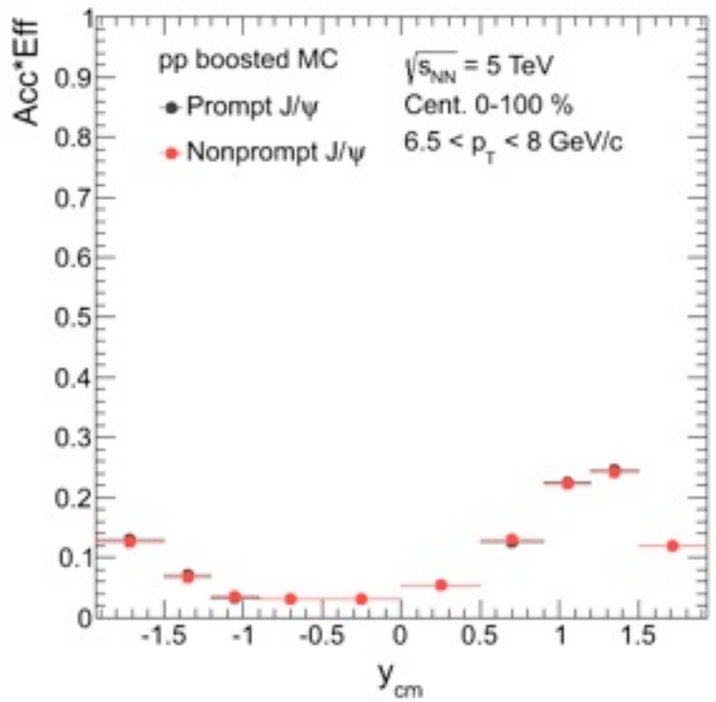


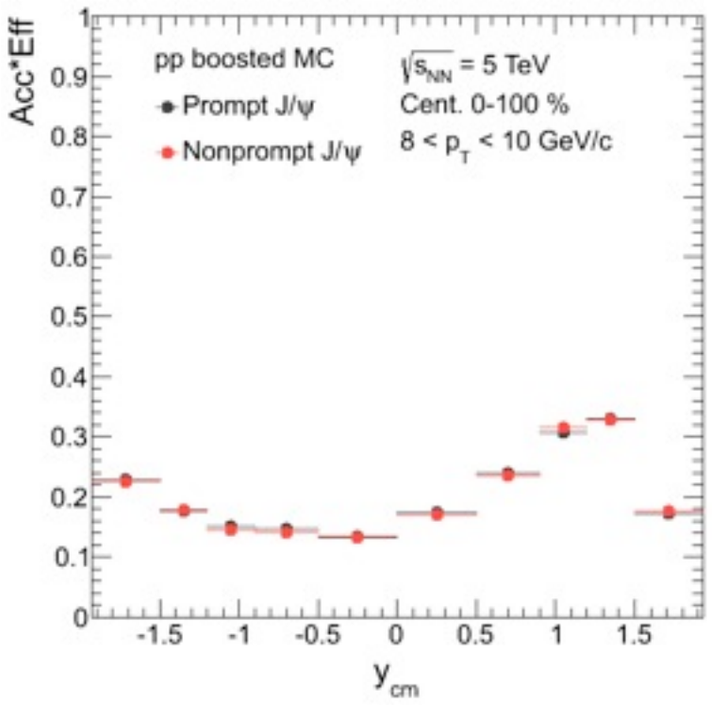


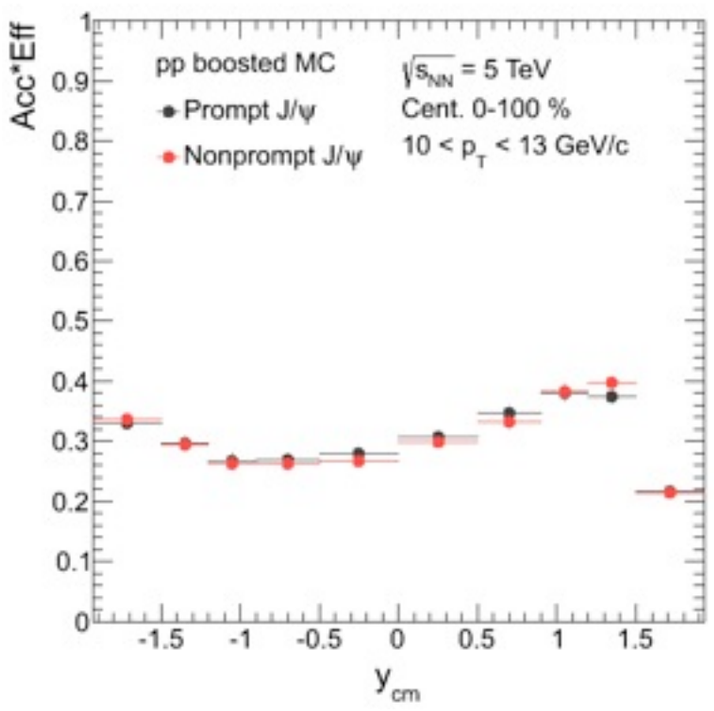


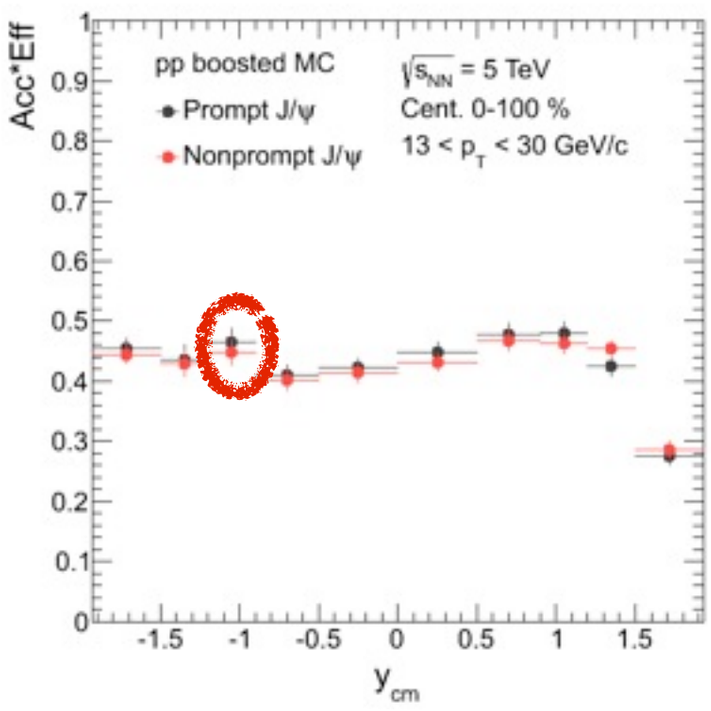
Binning 1 (pAJpsi_double)



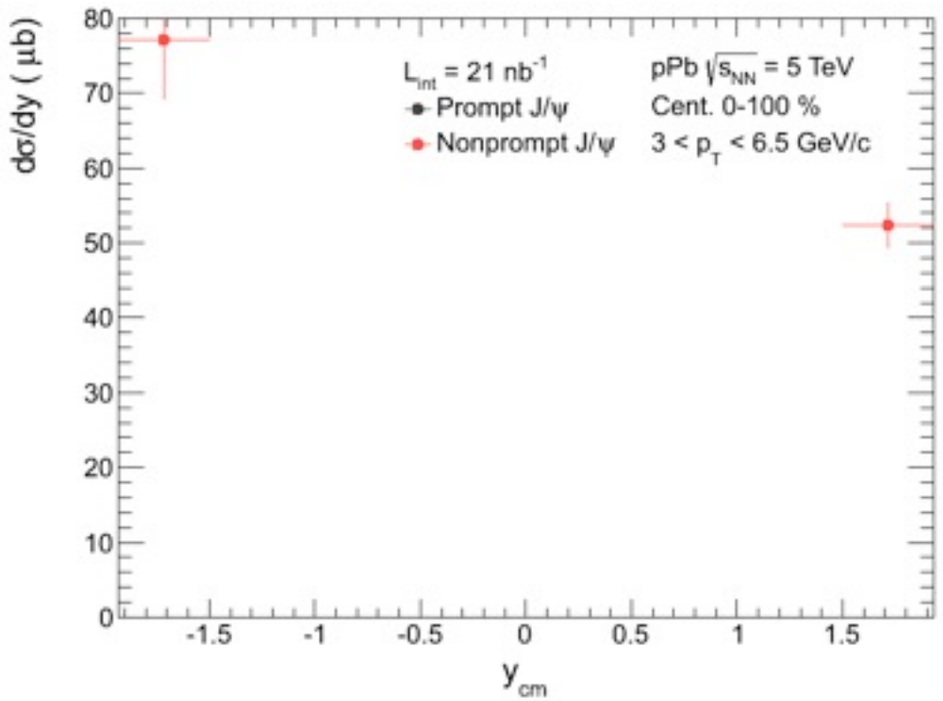


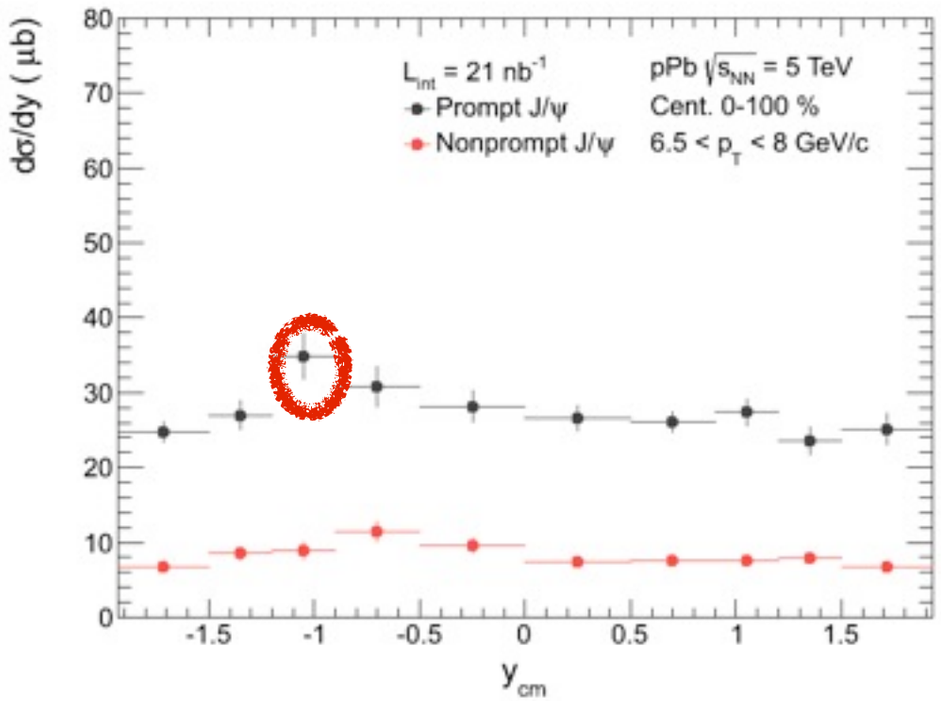


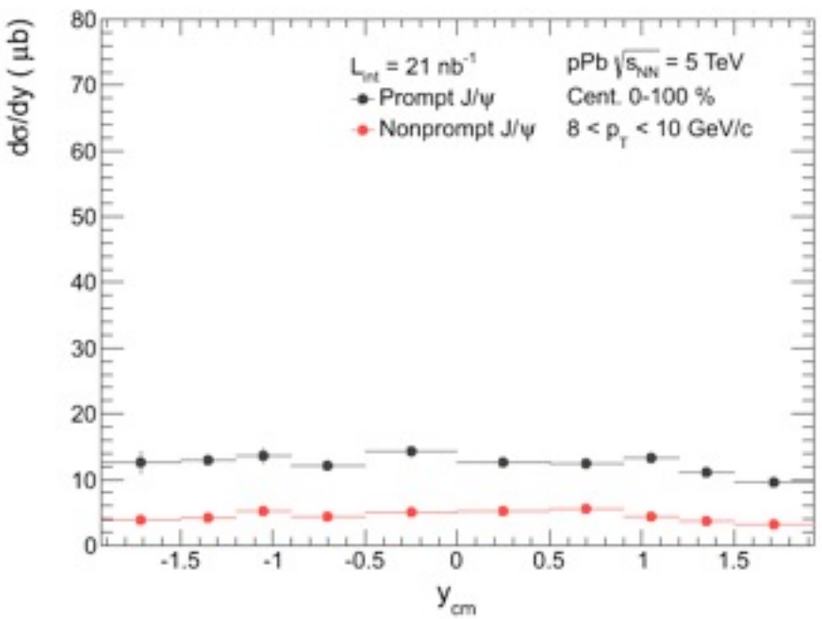


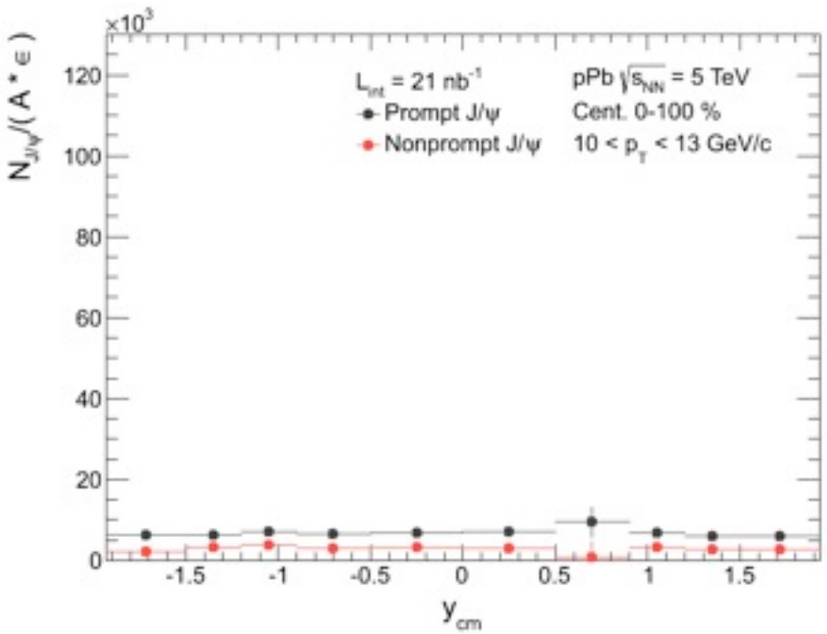


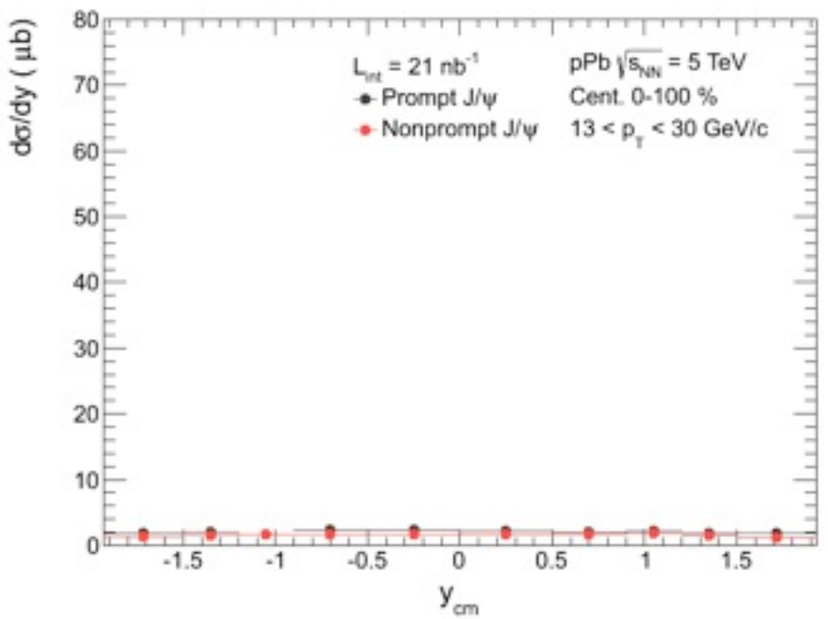
Binning 1 (pAJpsi_double)



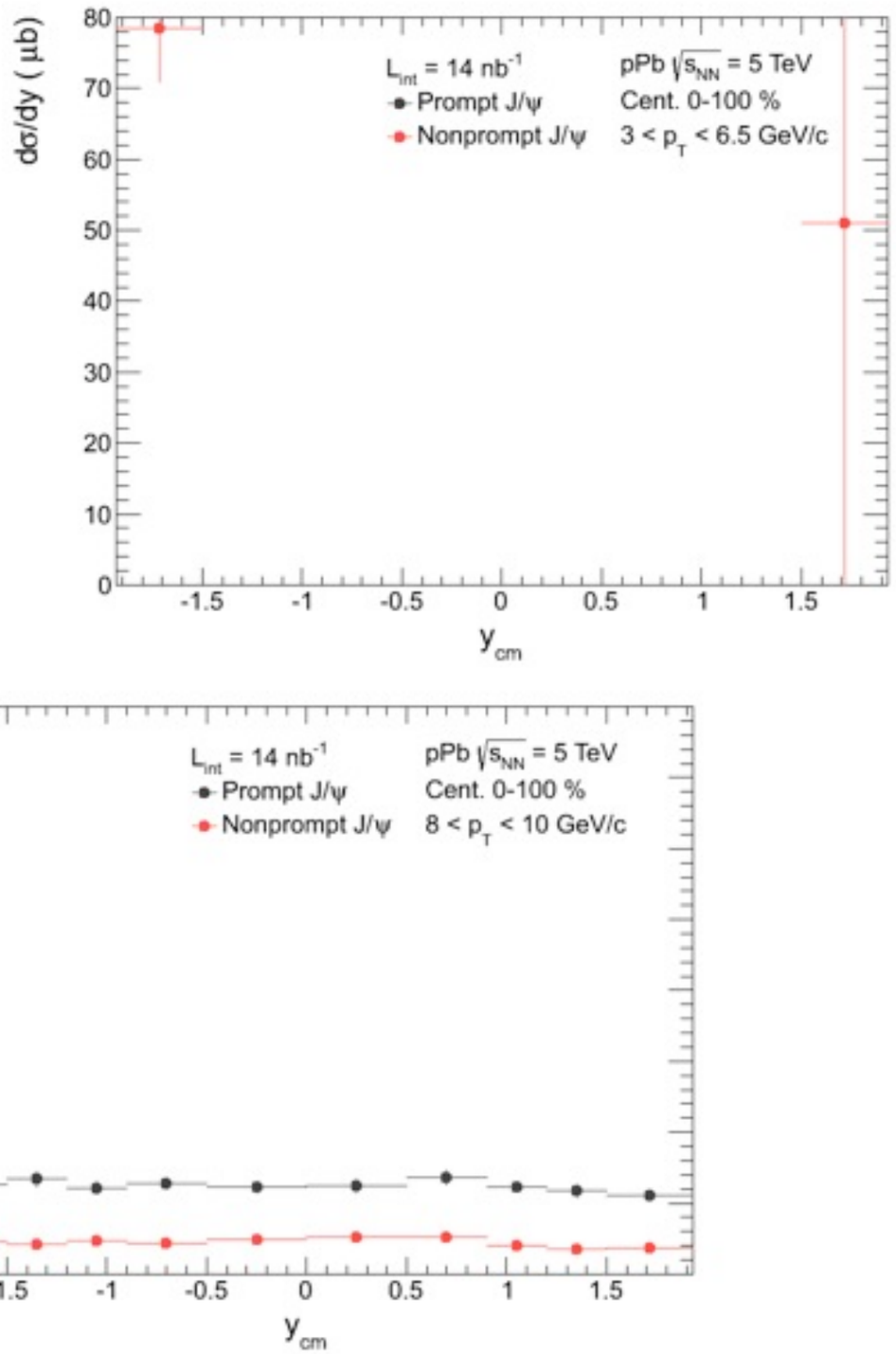


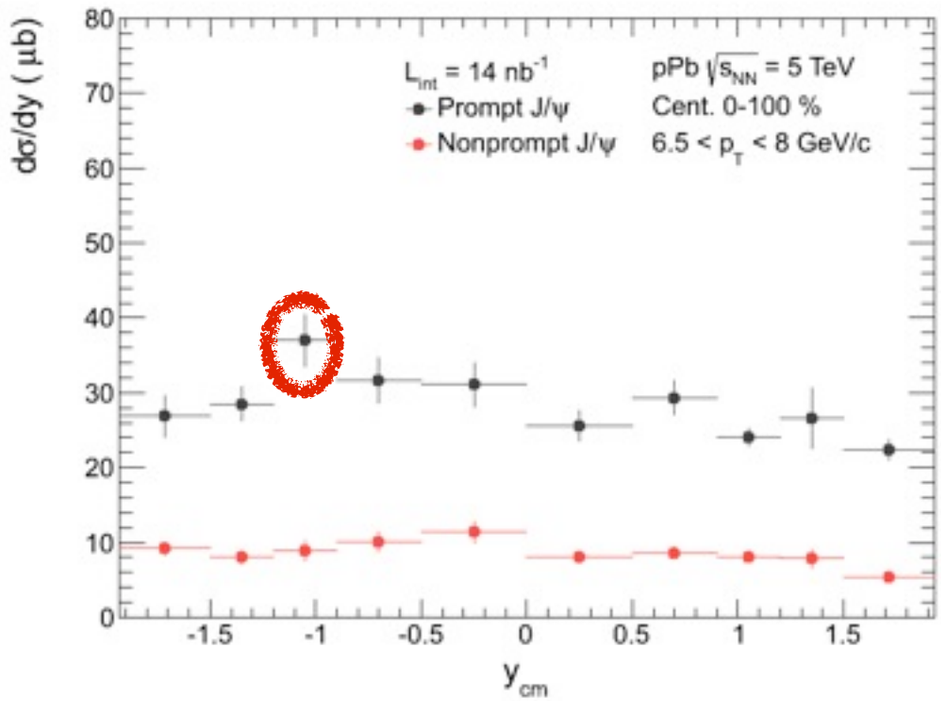


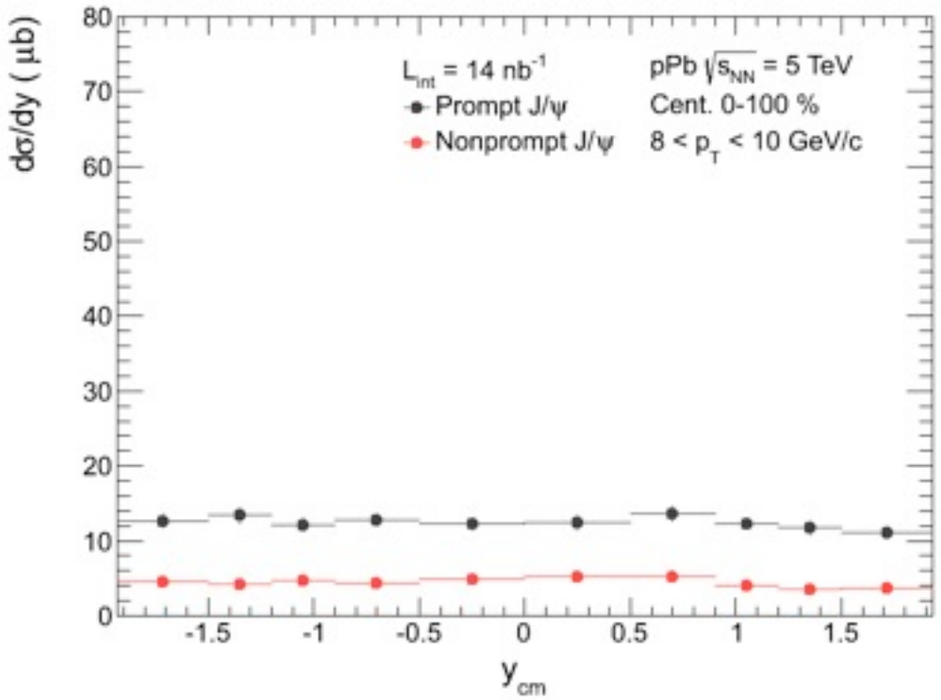


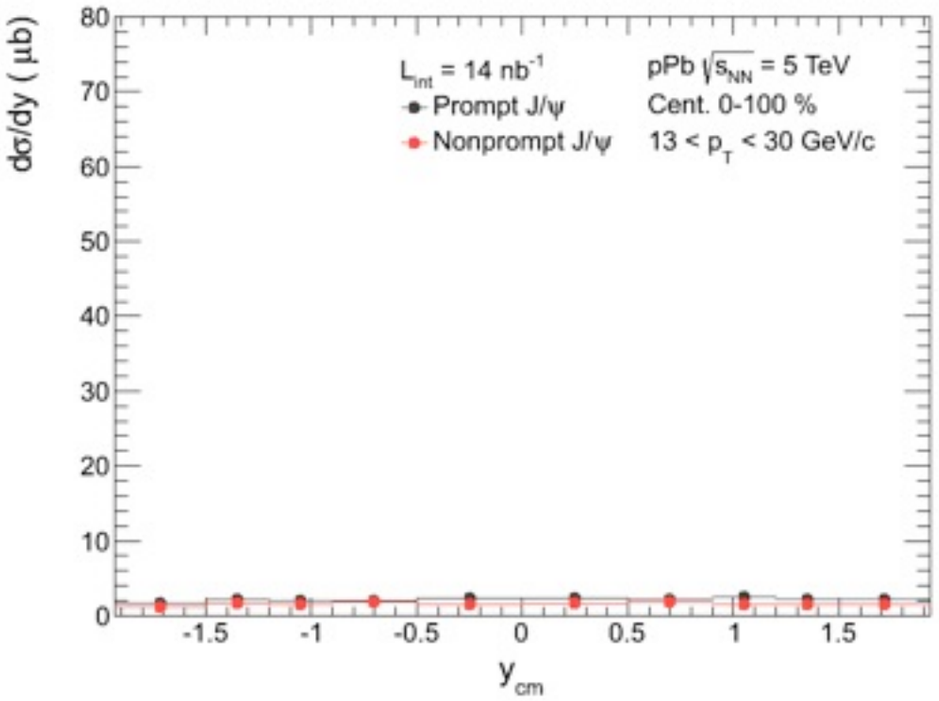


Binning 1 (pAJpsi_double)









Binning 1 (pAJpsi_double)

- **Pbp fit results – pt dep**

100) 1.5-1.93

```
ry/fit_table fit_table_RFB_Pbp_ptDep_100.out
-2.4--1.97      3.0-6.5         0.0-100.0       8777.98 134.427 7264.01 127.718 1513.98 66.8936
-2.4--1.97      6.5-8.0         0.0-100.0       2009.99 134.859 1583.39 109.479 426.598 38.9697
-2.4--1.97      8.0-10.0        0.0-100.0       1165.15 50.5114 863.971 42.8933 301.175 24.6464
-2.4--1.97      10.0-13.0       0.0-100.0       806.368 85.1057 552.726 61.0698 253.642 32.2966
-2.4--1.97      13.0-30.0       0.0-100.0       458.457 23.574  277.864 19.4778 180.593 16.1702
1.03-1.46       3.0-6.5         0.0-100.0       1693.33 95.2416 1379.25 81.2832 314.077 30.0158
1.03-1.46       6.5-8.0         0.0-100.0       2145.09 57.217  1696.13 51.4695 448.959 27.3076
1.03-1.46       8.0-10.0        0.0-100.0       1979.2  250.494 1526.22 194.741 452.978 62.4394
1.03-1.46       10.0-13.0       0.0-100.0       1196.58 41.6147 870.539 35.5627 326.043 21.8328
1.03-1.46       13.0-30.0       0.0-100.0       739.716 28.8836 443.474 23.2802 296.242 19.3886
```

101) 1.2-1.5

```
ry/fit_table fit_table_RFB_Pbp_ptDep_101.out
-1.97--1.67     6.5-8.0         0.0-100.0       2850.93 184.417 2138.2  138.313 712.732 46.1042
-1.97--1.67     8.0-10.0        0.0-100.0       1799.93 50.6638 1349.95 37.9978 449.982 12.6659
-1.97--1.67     10.0-13.0       0.0-100.0       1012.35 37.8264 677.744 31.9593 334.607 23.1605
-1.97--1.67     13.0-30.0       0.0-100.0       547.709 25.7329 295.38  19.8163 252.329 18.4563
0.73-1.03       6.5-8.0         0.0-100.0       916.56  39.6953 705.632 35.1876 210.928 19.69
0.73-1.03       8.0-10.0        0.0-100.0       1110.78 40.186  836.919 35.294  273.861 20.6655
0.73-1.03       10.0-13.0       0.0-100.0       822.475 35.7274 544.767 28.8401 277.707 20.4276
0.73-1.03       13.0-30.0       0.0-100.0       562.698 25.222  334.351 20.3067 228.347 17.1032
```

Binning 1 (pAJpsi_double)

- **Pbp fit results – pt dep**

102) 0.9–1.2

```
ry/fit_table fit_table_RFB_Pbp_ptDep_102.out
-1.67--1.37     6.5-8.0         0.0-100.0       2899.46 136.23  2282.08 111.652 617.38  42.556
-1.67--1.37     8.0-10.0        0.0-100.0       2003.88 84.4149 1502.13 68.2315 501.75  33.1384
-1.67--1.37     10.0-13.0       0.0-100.0       1147.07 36.1837 782.183 31.75   364.888 23.0601
-1.67--1.37     13.0-30.0       0.0-100.0       676.083 27.7548 375.404 21.772  300.679 19.72
0.43-0.73       6.5-8.0         0.0-100.0       547.32  25.8012 431.751 23.6217 115.569 13.1687
0.43-0.73       8.0-10.0        0.0-100.0       1034.77 61.9285 760.143 48.8059 274.626 24.1362
0.43-0.73       10.0-13.0       0.0-100.0       856.252 31.4928 564.019 26.6332 292.233 19.8625
0.43-0.73       13.0-30.0       0.0-100.0       560.056 40.3991 294.76  25.2767 265.296 23.517
```

103) 0.5–0.9

```
ry/fit_table fit_table_RFB_Pbp_ptDep_103.out
-1.37--0.97     6.5-8.0         0.0-100.0       2111.64 50.4937 1621.88 46.6257 489.757 28.4081
-1.37--0.97     8.0-10.0        0.0-100.0       2096.99 103.275 1463.52 77.3478 633.473 41.9635
-1.37--0.97     10.0-13.0       0.0-100.0       1413.17 56.4724 1310    517.568 103.171 514.93
-1.37--0.97     13.0-30.0       0.0-100.0       862.868 30.8026 479.375 24.4666 383.493 22.2078
0.03-0.43       6.5-8.0         0.0-100.0       632.624 32.738  461.144 27.7212 171.48  16.6651
0.03-0.43       8.0-10.0        0.0-100.0       1185.13 36.9301 876.266 33.1629 308.861 21.1381
0.03-0.43       10.0-13.0       0.0-100.0       1001.89 36.732  691.411 31.2101 310.476 21.4724
0.03-0.43       13.0-30.0       0.0-100.0       795.974 37.8735 462.913 27.3409 333.06  22.661
```

104) 0–0.5

```
ry/fit_table fit_table_RFB_Pbp_ptDep_104.out
-0.97--0.47     6.5-8.0         0.0-100.0       1151.11 36.0767 899.519 33.1991 251.587 19.2244
-0.97--0.47     8.0-10.0        0.0-100.0       1892.37 65.4134 1355.6  52.5858 536.772 30.2288
-0.97--0.47     10.0-13.0       0.0-100.0       1519.45 42.2068 1082.51 37.0173 436.944 24.7674
-0.97--0.47     13.0-30.0       0.0-100.0       1029.01 33.2141 583.024 26.4766 445.988 23.5393
-0.47-0.03      6.5-8.0         0.0-100.0       738.424 28.7103 555.951 26.1188 182.472 16.2876
-0.47-0.03      8.0-10.0        0.0-100.0       1584.02 49.2914 1183.87 42.5369 400.154 24.6434
-0.47-0.03      10.0-13.0       0.0-100.0       1390.84 49.4551 961.776 39.9111 429.061 25.6147
-0.47-0.03      13.0-30.0       0.0-100.0       1003.25 37.2273 585.533 28.651  417.713 24.2704
```

Binning 1 (pAJpsi_double)

- **pPb fit results – pt dep**

100) 1.5-1.93

ry/fit_table fit_table_RFB_pPb_ptDep_100.out

1.97-2.4	3.0-6.5	0.0-100.0	5696.25	98.9119	4697.01	73382.2	999.247	73382.2
1.97-2.4	6.5-8.0	0.0-100.0	1185.25	40.5308	954.861	38.4982	230.393	21.8633
1.97-2.4	8.0-10.0	0.0-100.0	911.039	46.3686	679.047	38.9126	231.991	21.4276
1.97-2.4	10.0-13.0	0.0-100.0	519.917	25.8935	342.575	22.2139	177.342	16.7445
1.97-2.4	13.0-30.0	0.0-100.0	358.028	11.2339	207.235	13.328	150.793	12.5595
-1.46--1.03	3.0-6.5	0.0-100.0	1102.59	10.8634	886.486	20.7656	216.099	18.9593
-1.46--1.03	6.5-8.0	0.0-100.0	1658.97	153.452	1244.23	115.089	414.742	38.3629
-1.46--1.03	8.0-10.0	0.0-100.0	1402.22	71.7089	1036.28	56.9572	365.937	28.0332
-1.46--1.03	10.0-13.0	0.0-100.0	881.821	118.539	612.892	84.1997	268.929	40.1088
-1.46--1.03	13.0-30.0	0.0-100.0	460.776	22.4795	271.585	17.9556	189.191	15.2329

101) 1.2-1.5

빈 하나 fit results 없다. 왜저럼?
(-1.03--0.73, 10-13 GeV/c)

Binning 1 (pAJpsi_double)

- **pPb fit results – pt dep**

102) 0.9–1.2

```
ry/fit_table fit_table_RFB_pPb_ptDep_102.out
1.37-1.67       6.5-8.0         0.0-100.0       1804.77 46.2999 1353.58 34.725  451.193 11.575
1.37-1.67       8.0-10.0        0.0-100.0       1259.13 41.5647 945.41  37.6864 313.722 23.5274
1.37-1.67       10.0-13.0       0.0-100.0       772.302 57.018  513.539 41.2183 258.763 25.029
1.37-1.67       13.0-30.0       0.0-100.0       463.742 22.6801 289.546 18.9374 174.196 15.1882
-0.73--0.43     6.5-8.0         0.0-100.0       388.684 20.8092 310.227 19.4798 78.4573 11.0117
-0.73--0.43     8.0-10.0        0.0-100.0       627.92  26.1956 459.61  23.4744 168.31  15.2547
-0.73--0.43     10.0-13.0       0.0-100.0       641.165 96.629  437.227 67.3308 203.938 33.7062
-0.73--0.43     13.0-30.0       0.0-100.0       401.547 21.1083 230.05  16.5078 171.497 14.4061
```

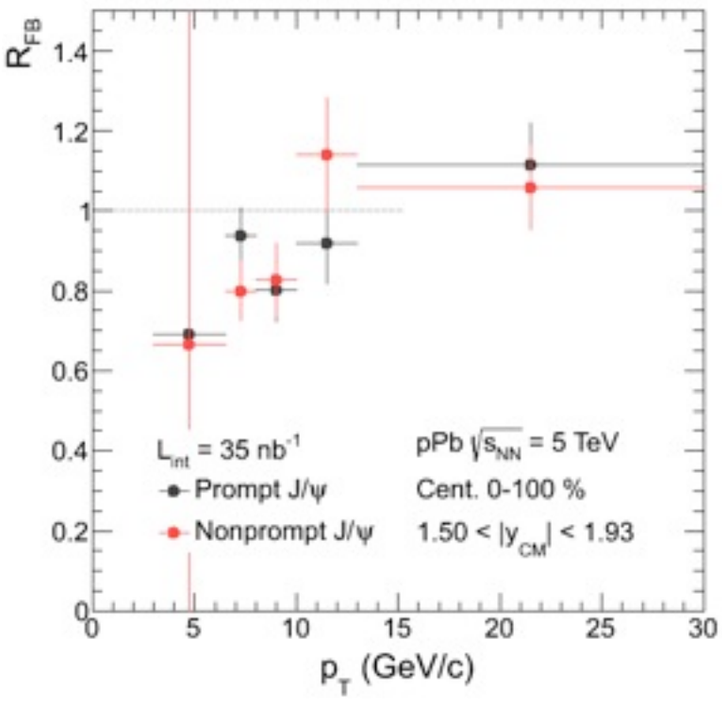
103) 0.5–0.9

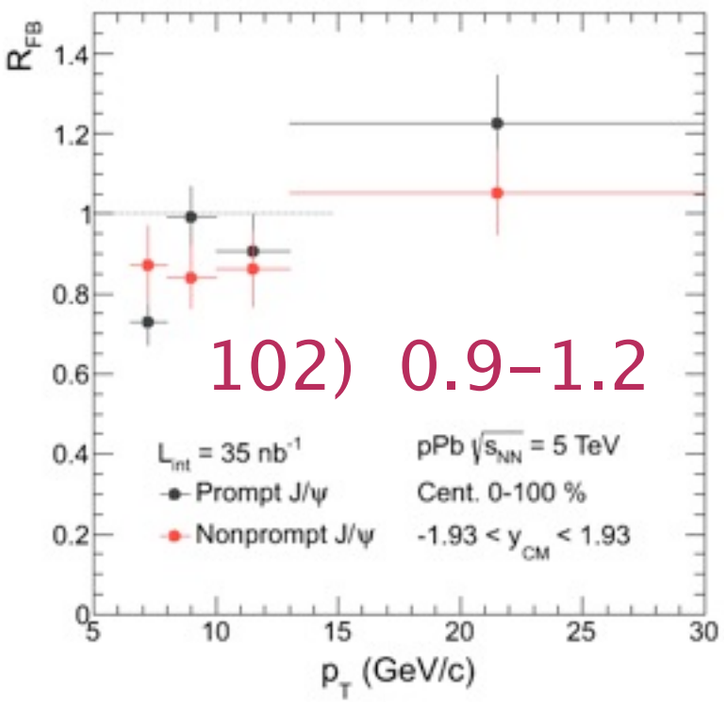
```
ry/fit_table fit_table_RFB_pPb_ptDep_103.out
0.97-1.37       6.5-8.0         0.0-100.0       1613.72 95.1083 1236.87 76.456  376.848 32.0114
0.97-1.37       8.0-10.0        0.0-100.0       1495.32 84.49   1082.87 65.1145 412.448 32.2386
0.97-1.37       10.0-13.0       0.0-100.0       824.994 30.7256 547.012 26.1714 277.981 19.4186
0.97-1.37       13.0-30.0       0.0-100.0       615.882 200.486 337.25  110.774 278.632 91.8983
-0.43--0.03     6.5-8.0         0.0-100.0       422.766 25.1402 320.01  22.1868 102.756 12.9408
-0.43--0.03     8.0-10.0        0.0-100.0       822.577 29.8636 621.112 27.0073 201.466 16.5655
-0.43--0.03     10.0-13.0       0.0-100.0       716.584 27.4945 500.201 24.0926 216.383 16.7644
-0.43--0.03     13.0-30.0       0.0-100.0       523.621 23.5387 283.072 18.3482 240.549 17.0781
```

104) 0–0.5

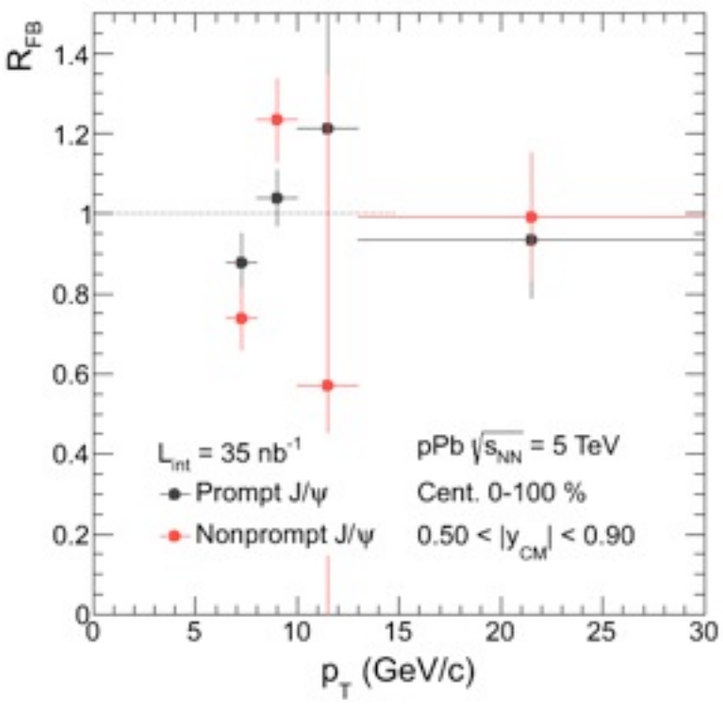
```
ry/fit_table fit_table_RFB_pPb_ptDep_104.out
0.47-0.97       6.5-8.0         0.0-100.0       768.056 44.3066 583.729 36.7645 184.328 18.188
0.47-0.97       8.0-10.0        0.0-100.0       1274.63 69.8836 902.379 53.4527 372.248 28.7402
0.47-0.97       10.0-13.0       0.0-100.0       894.444 31.3033 631.508 27.479  262.935 18.7433
0.47-0.97       13.0-30.0       0.0-100.0       750.667 41.0077 449.466 29.3314 301.201 22.9824
-0.03-0.47      6.5-8.0         0.0-100.0       561.355 37.8688 415.367 30.7016 145.987 15.9508
-0.03-0.47      8.0-10.0        0.0-100.0       955.909 32.0359 688.303 28.7787 267.605 19.4045
-0.03-0.47      10.0-13.0       0.0-100.0       926.139 35.6353 640.335 29.7285 285.804 19.9417
-0.03-0.47      13.0-30.0       0.0-100.0       689.12  28.1803 419.055 22.9404 270.064 18.83
```

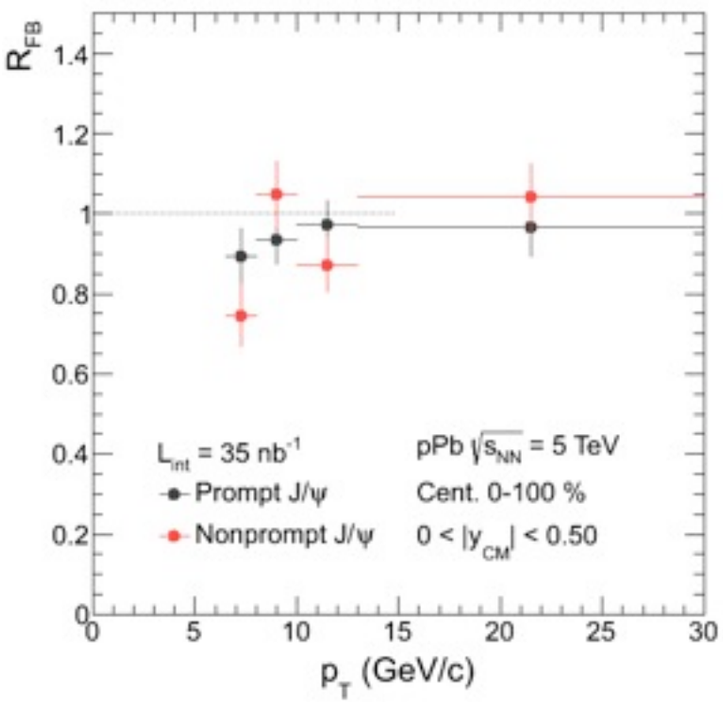
Binning 1 (pAJpsi_double)



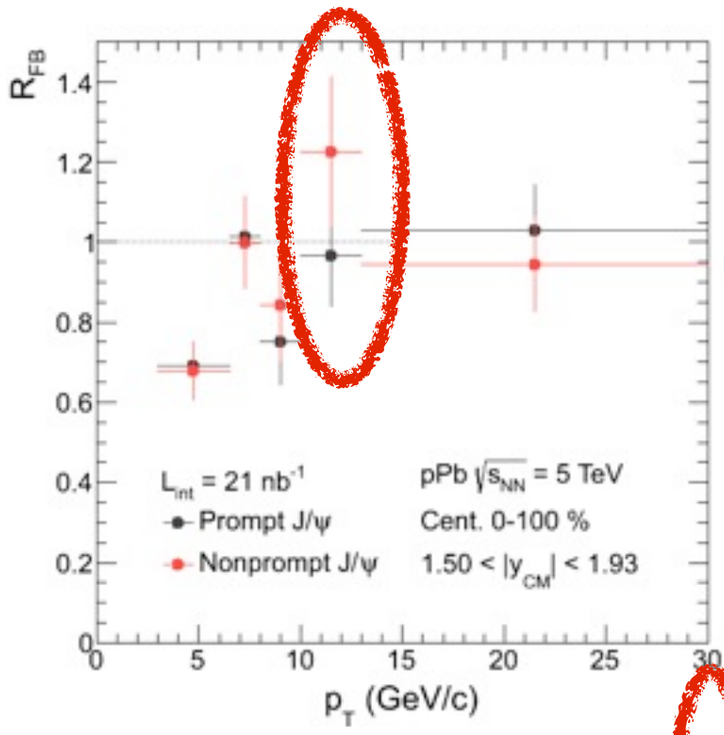


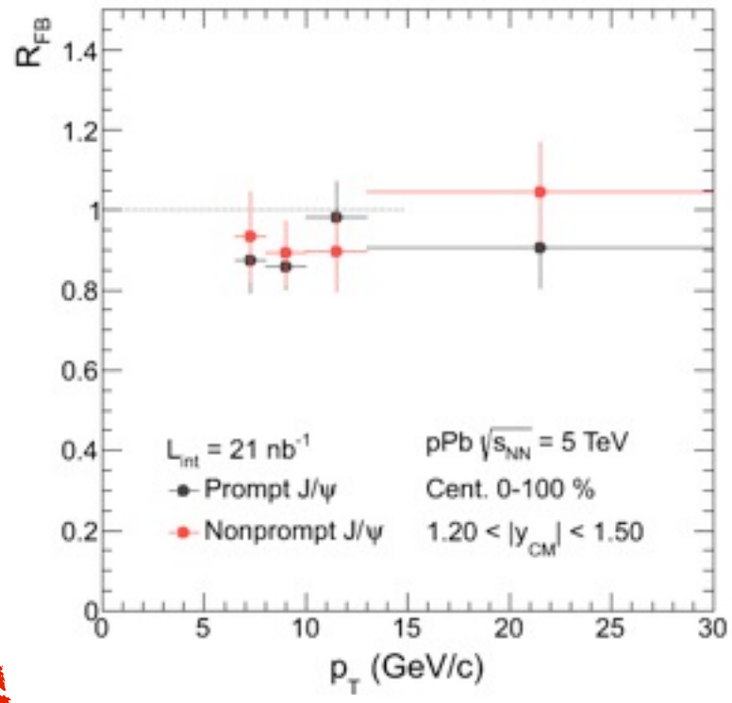
102) 0.9–1.2

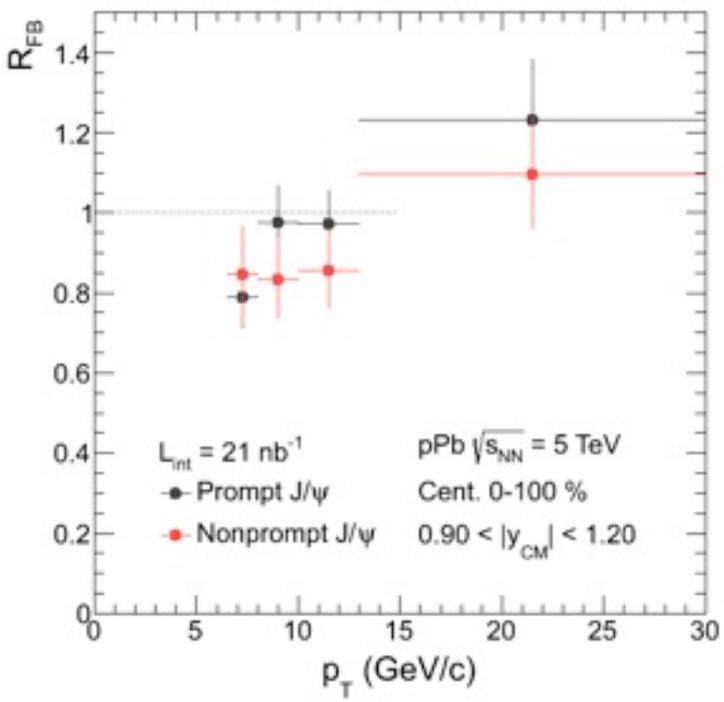


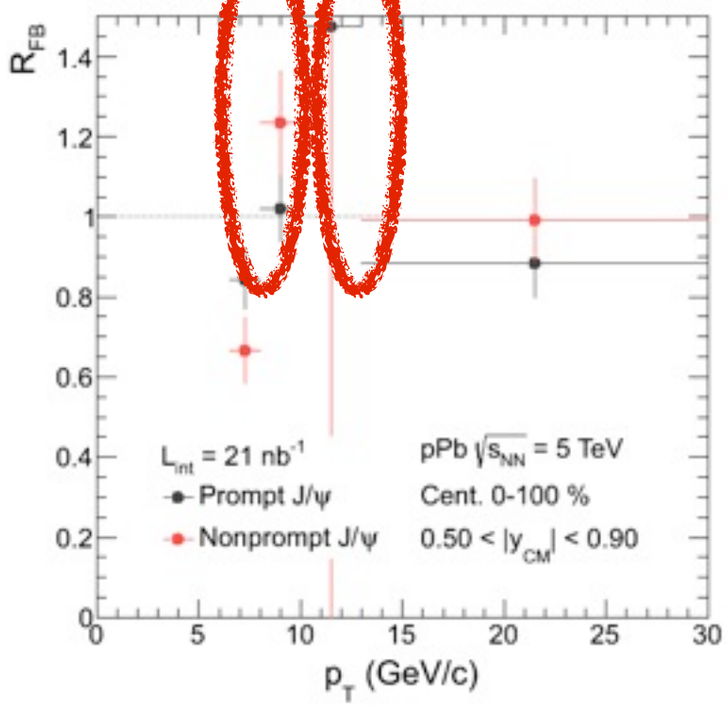


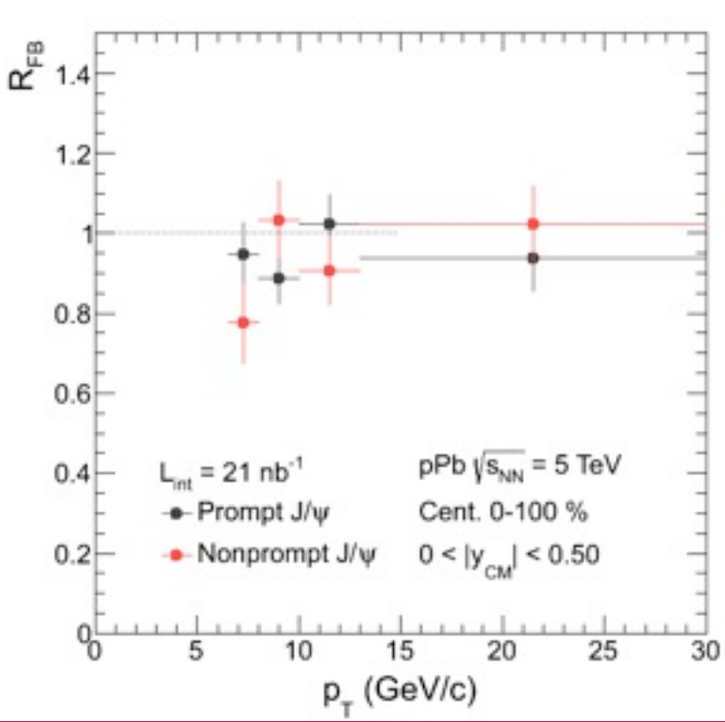
Binning 1 (pAJpsi_double)



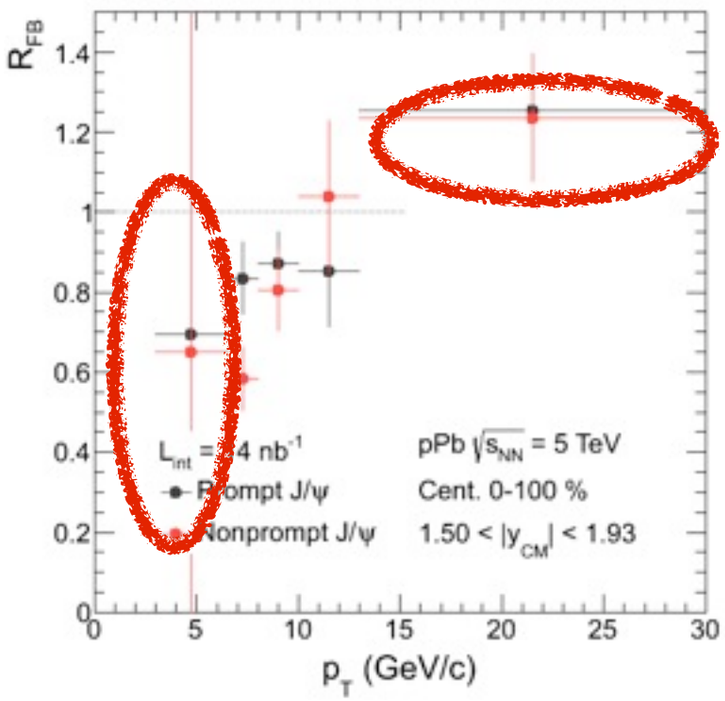


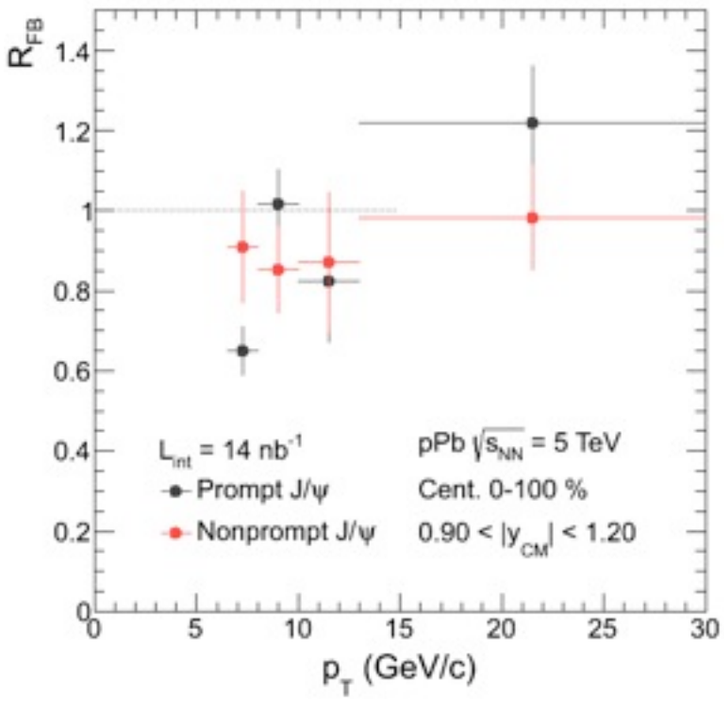


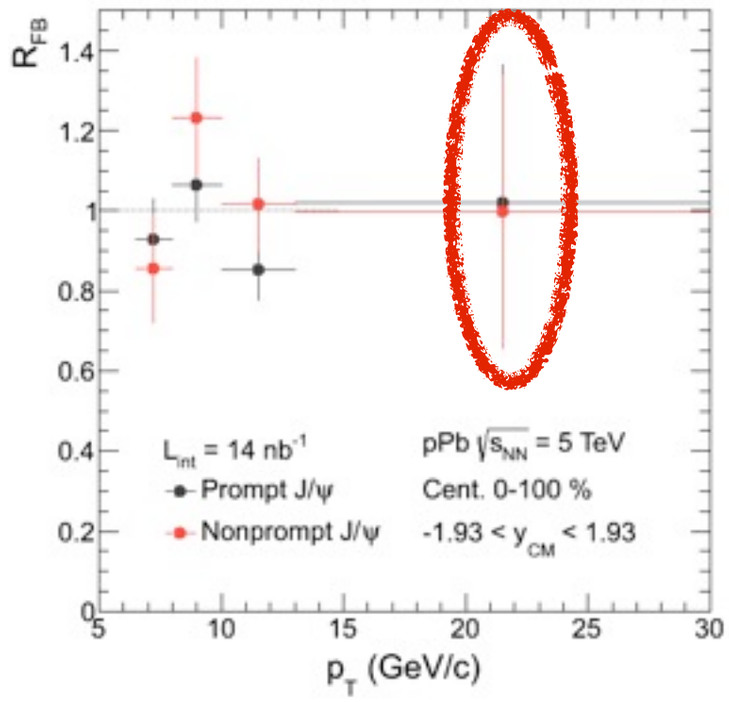


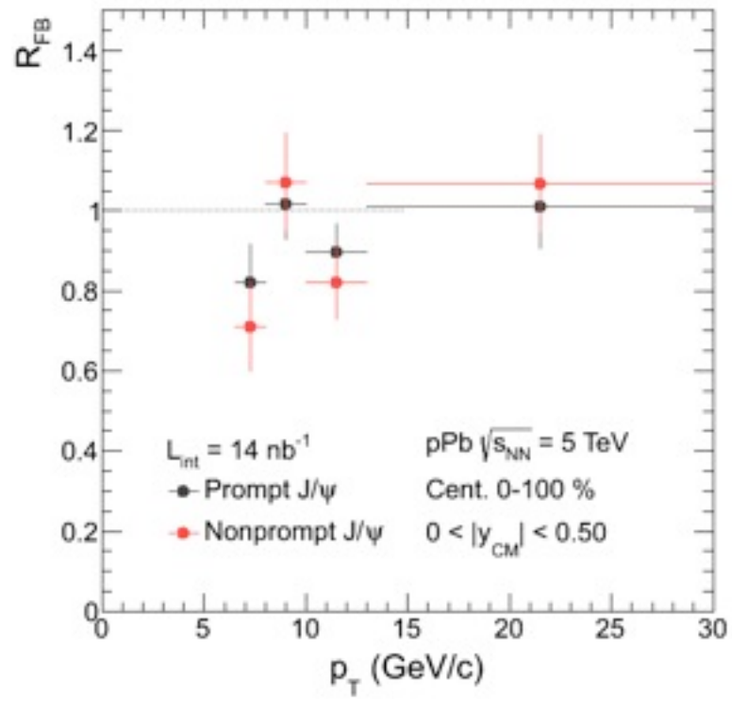


Binning 1 (pAJpsi_double)

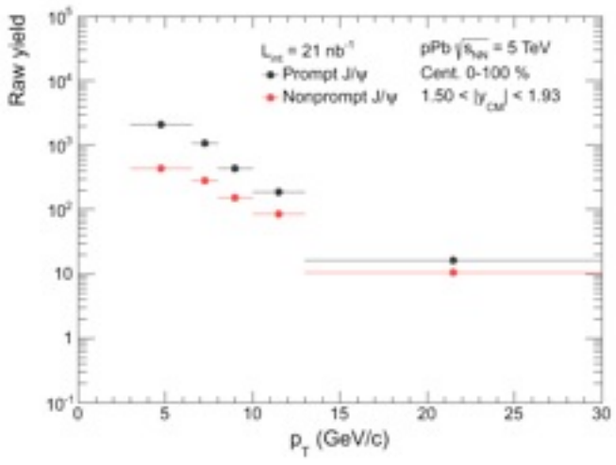


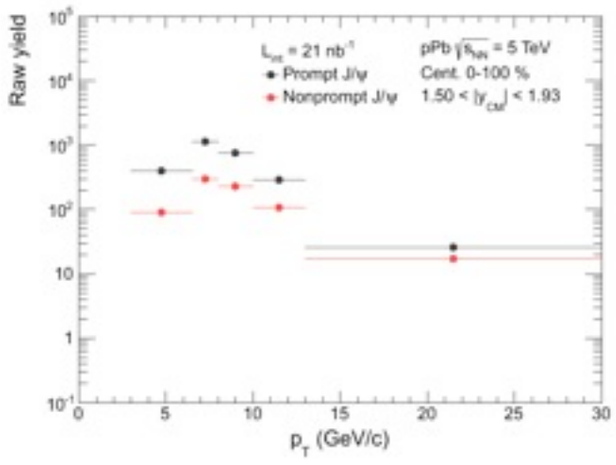






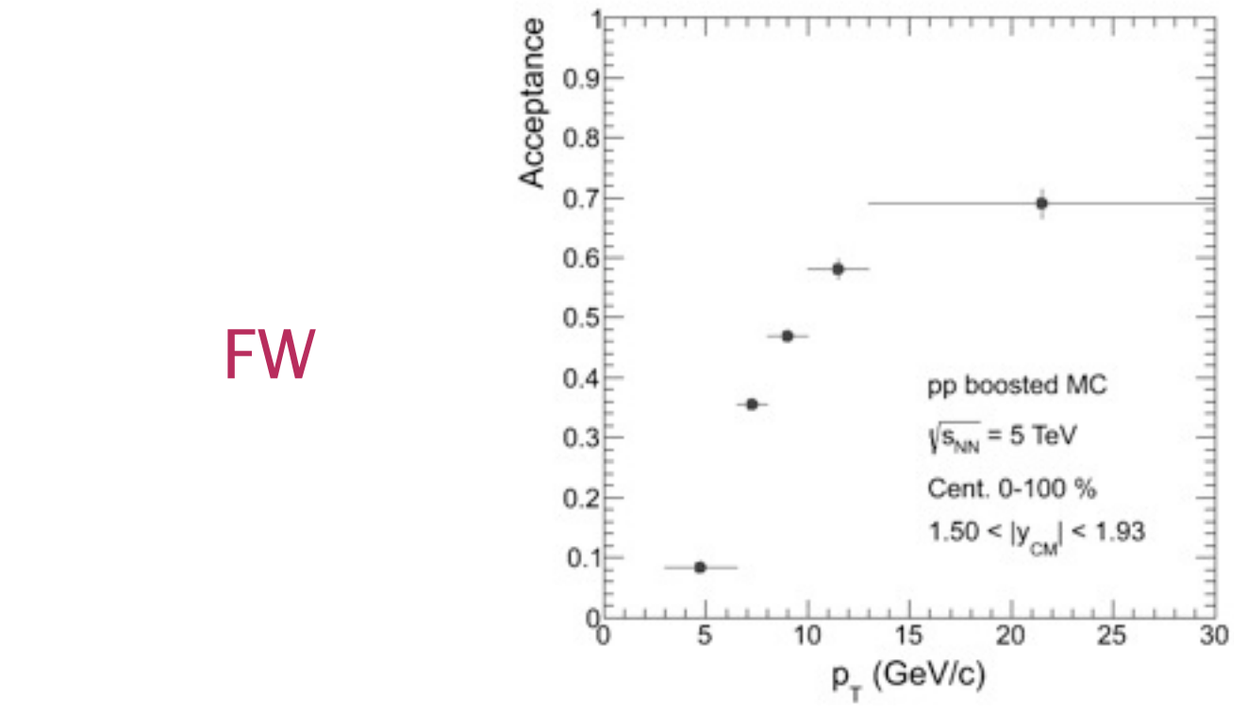
Binning 1 (pAJpsi_double)

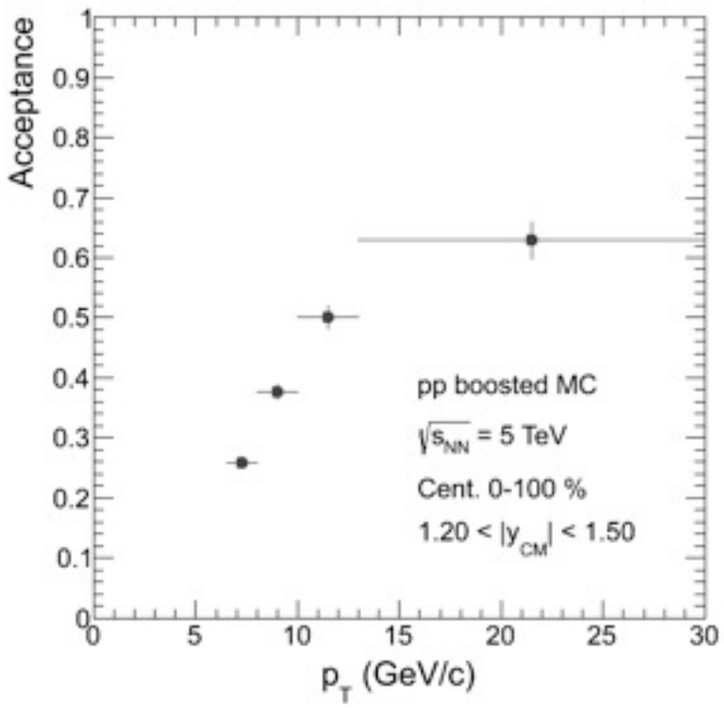


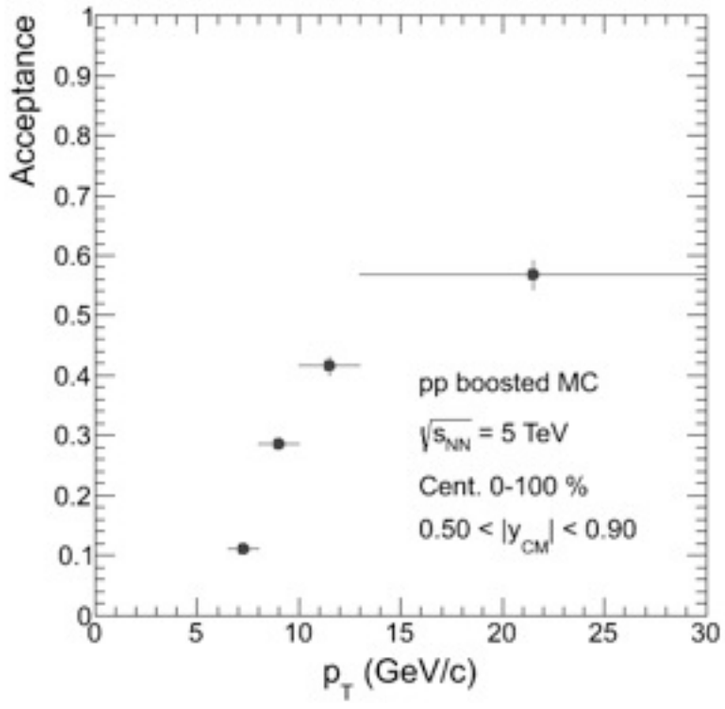


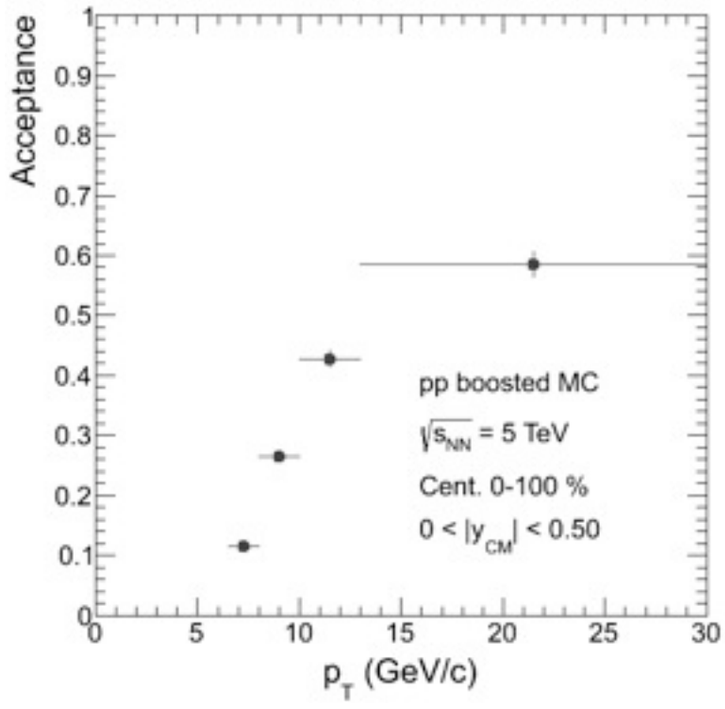
Binning 1 (pAJpsi_double)

FW



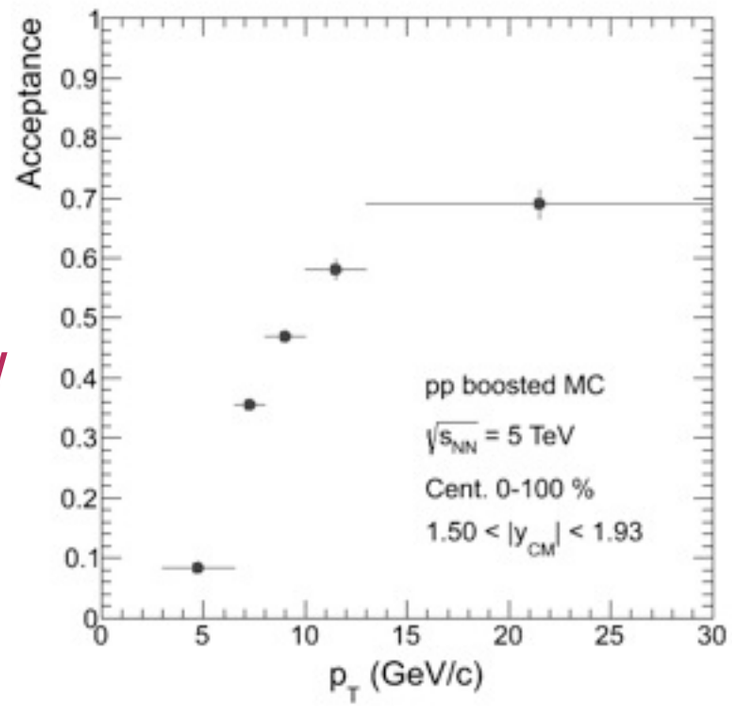


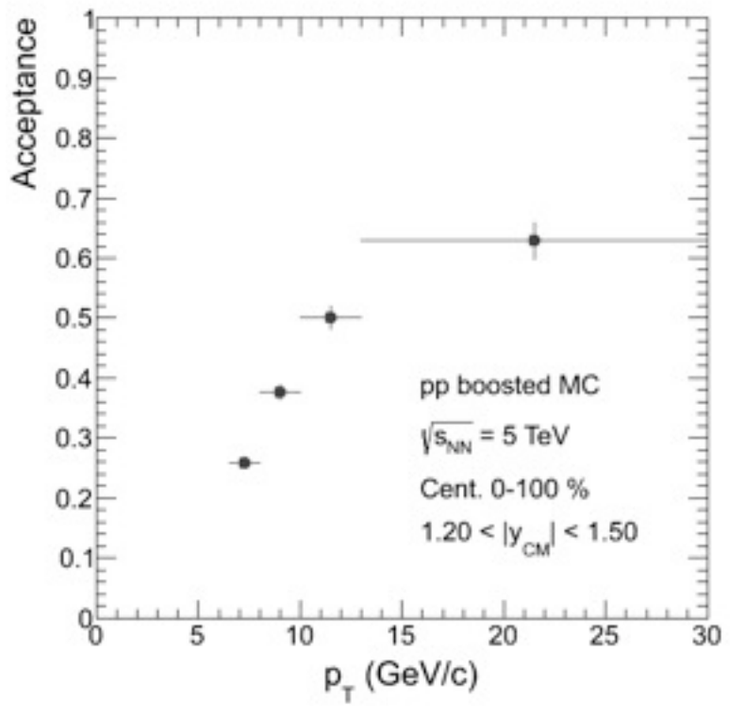


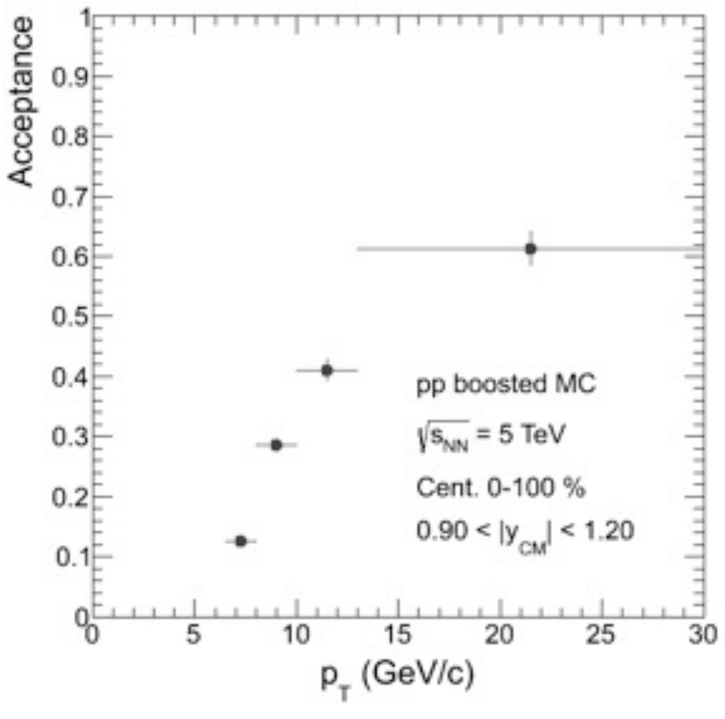


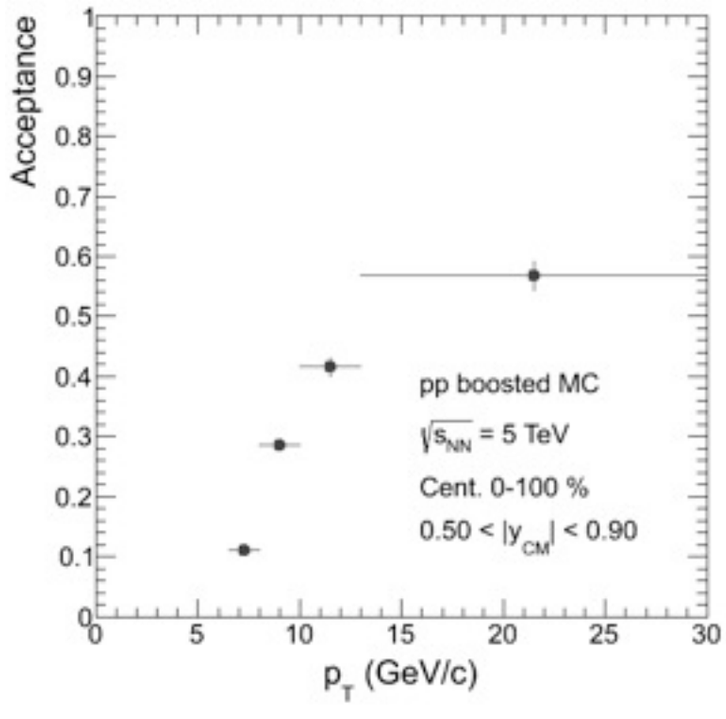
Binning 1 (pAJpsi_double)

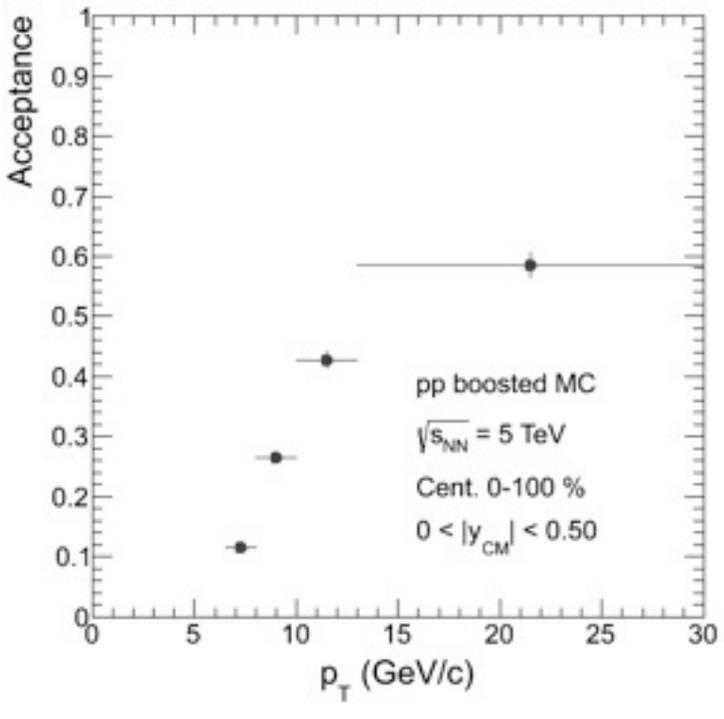
BW





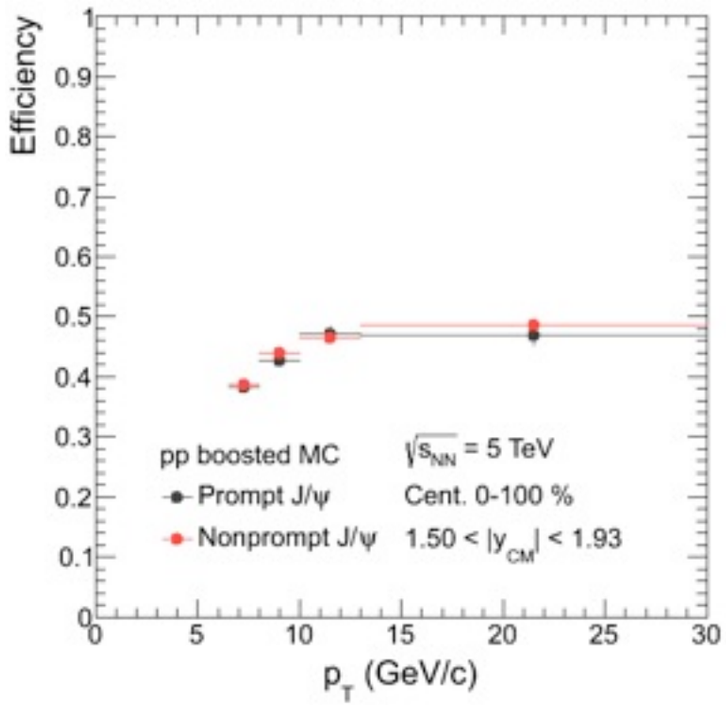


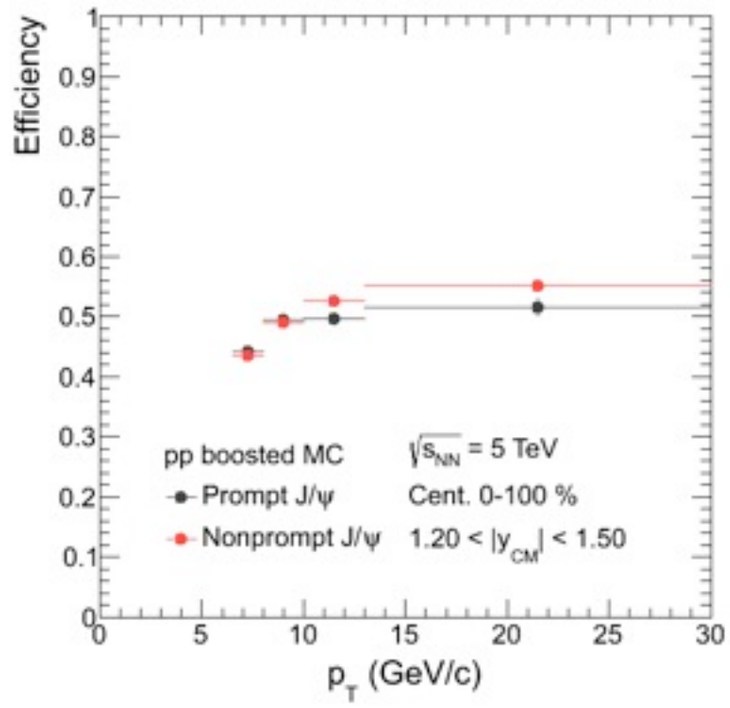


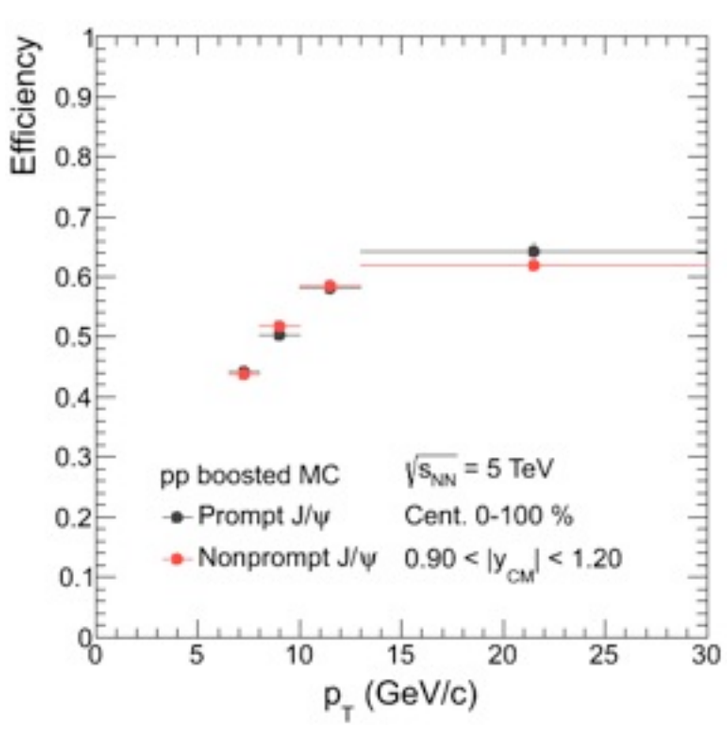


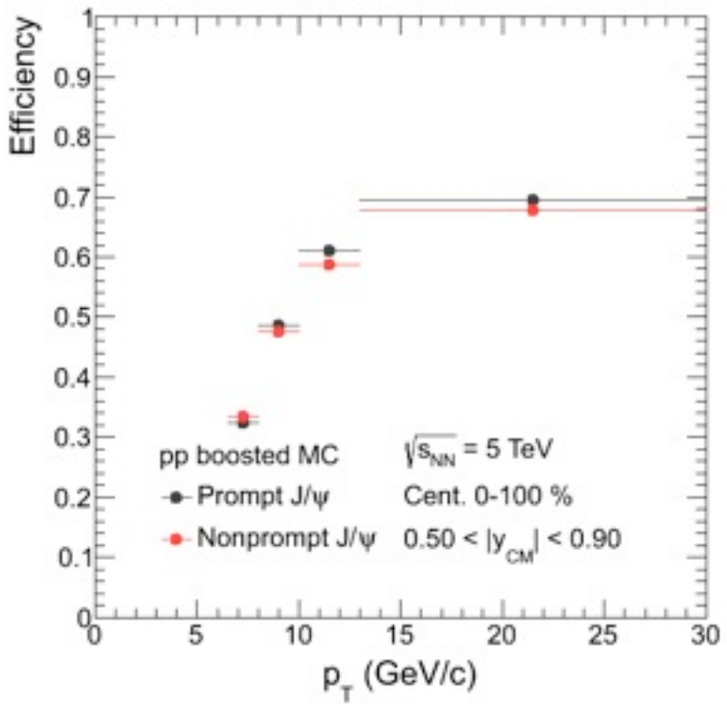
Binning 1 (pAJpsi_double)

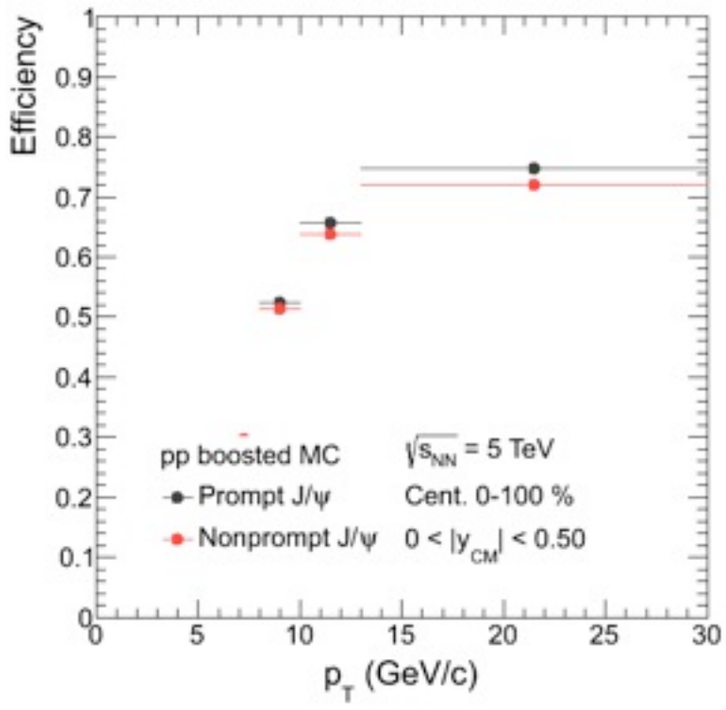
FW





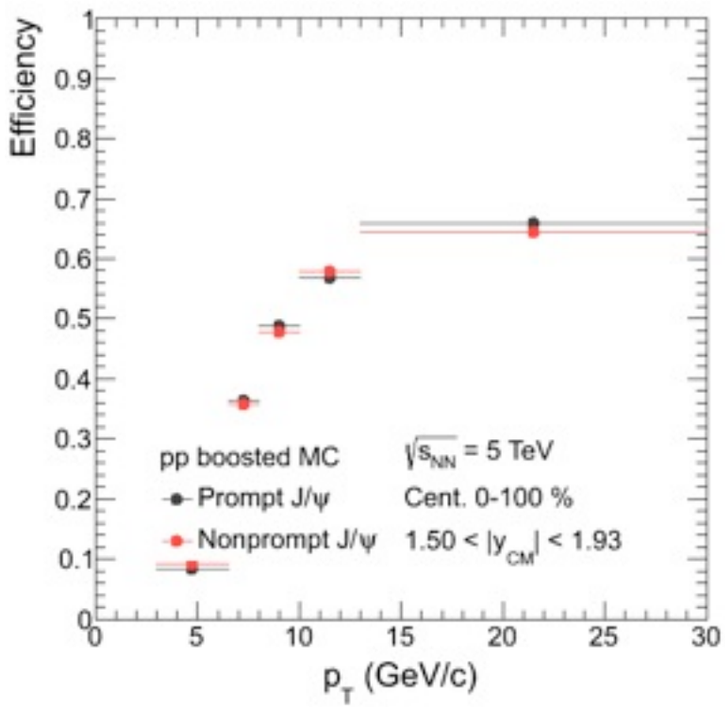


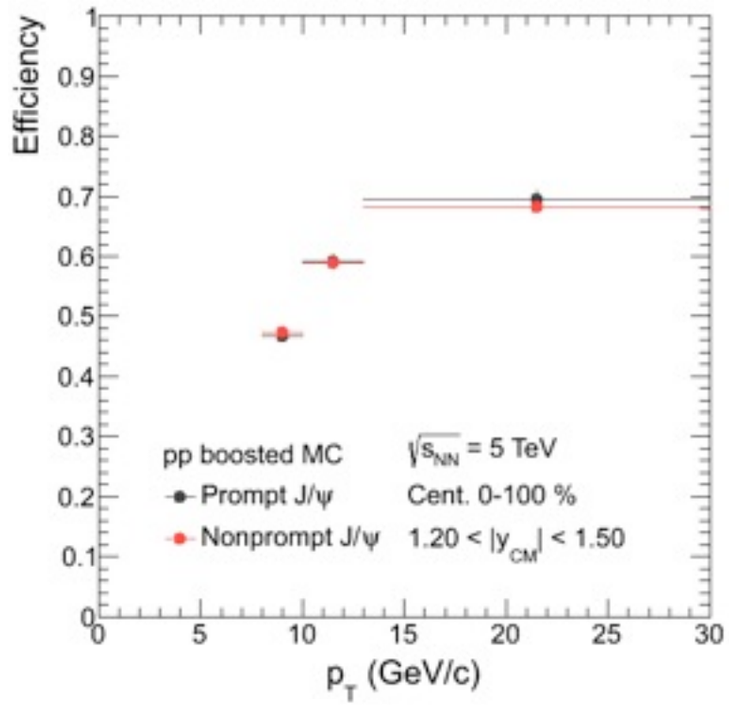


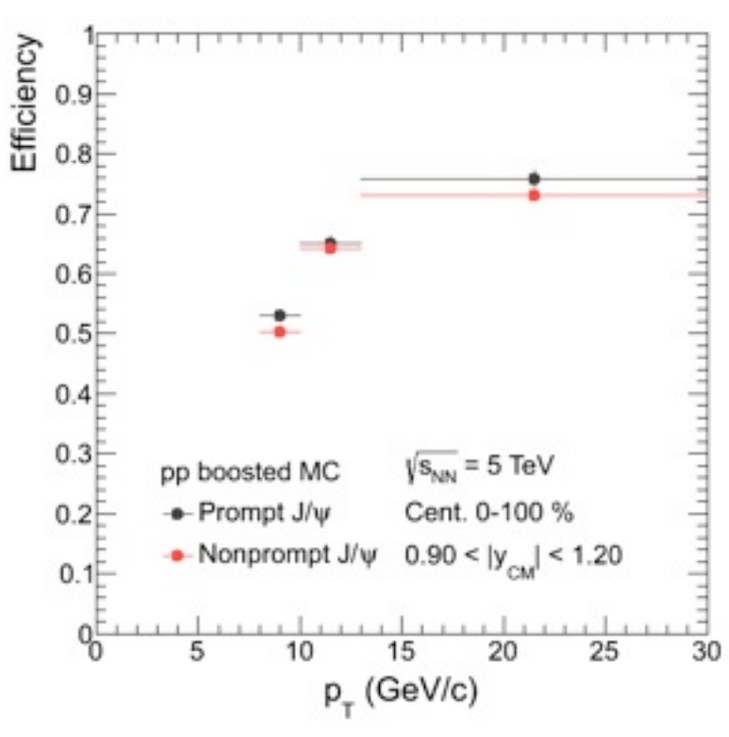


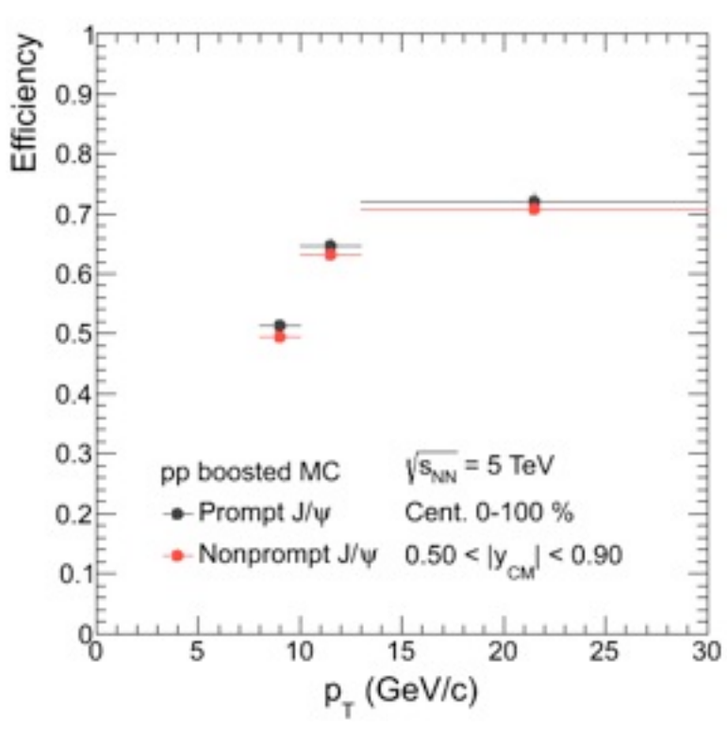
Binning 1 (pAJpsi_double)

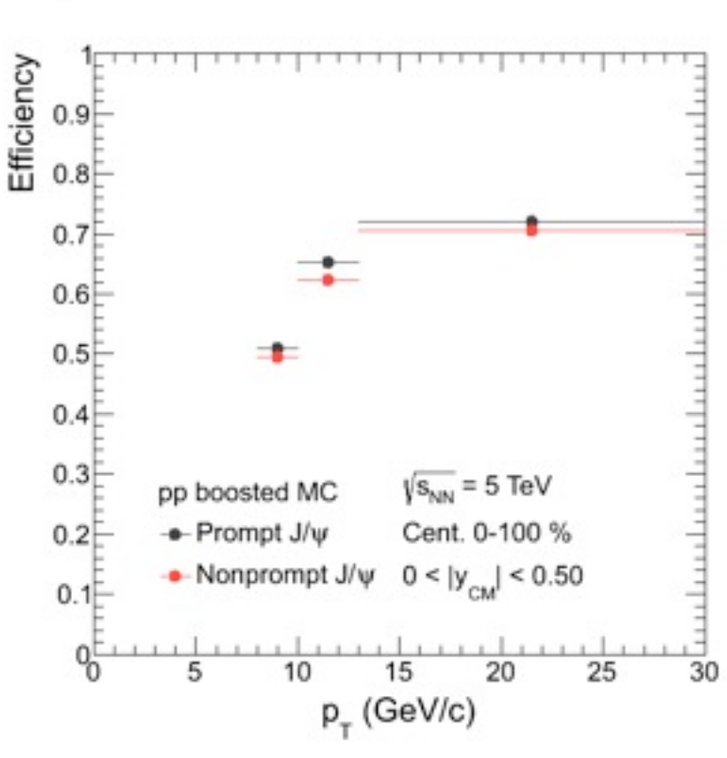
BW





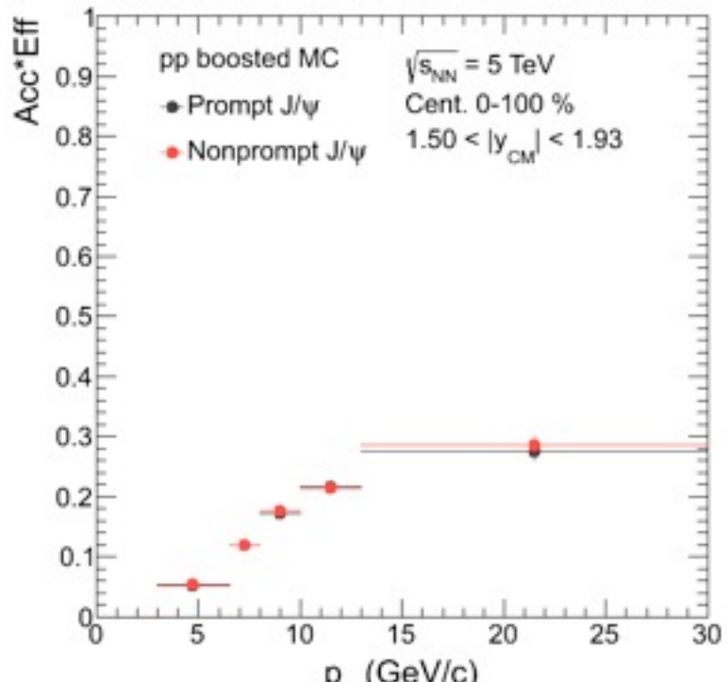


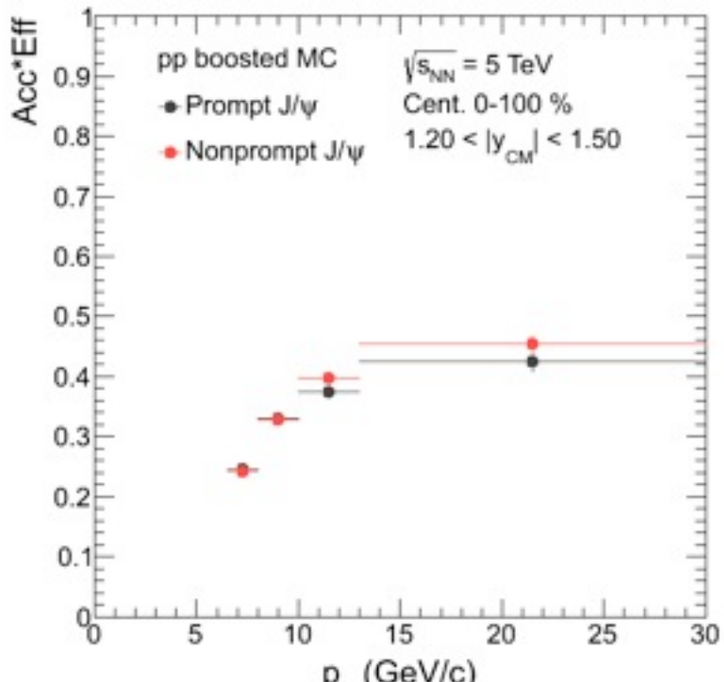


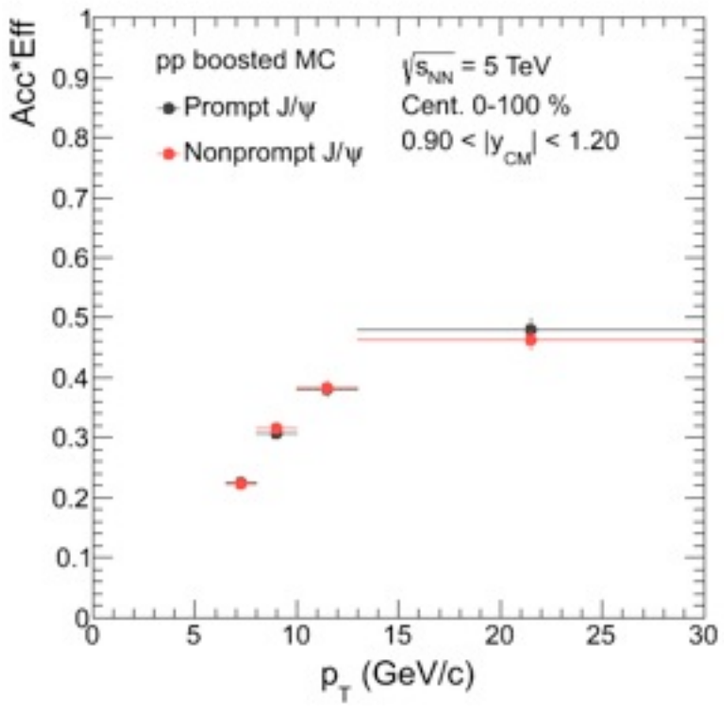


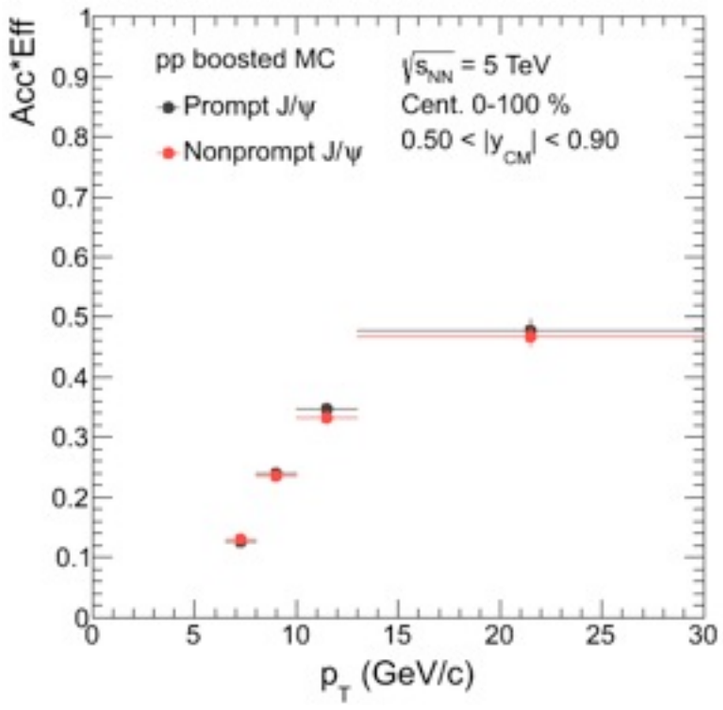
Binning 1 (pAJpsi_double)

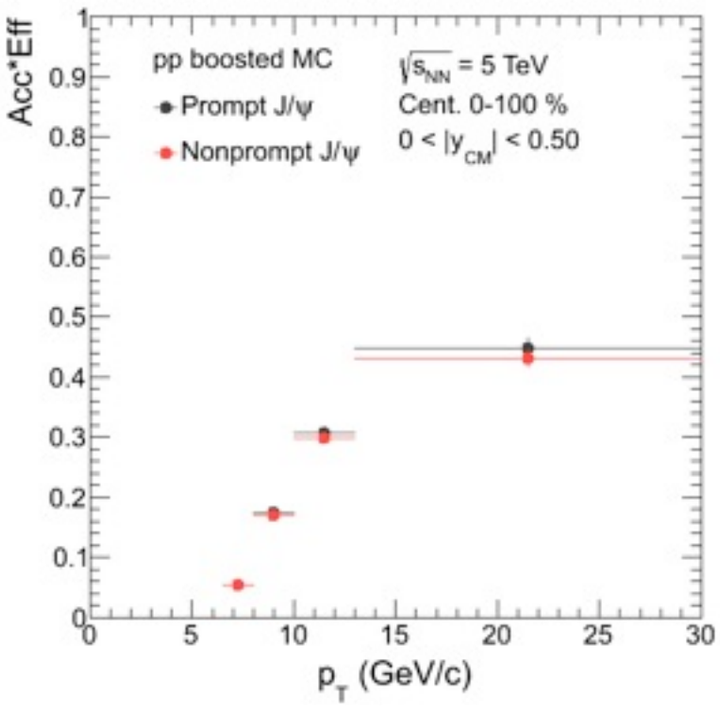
FW





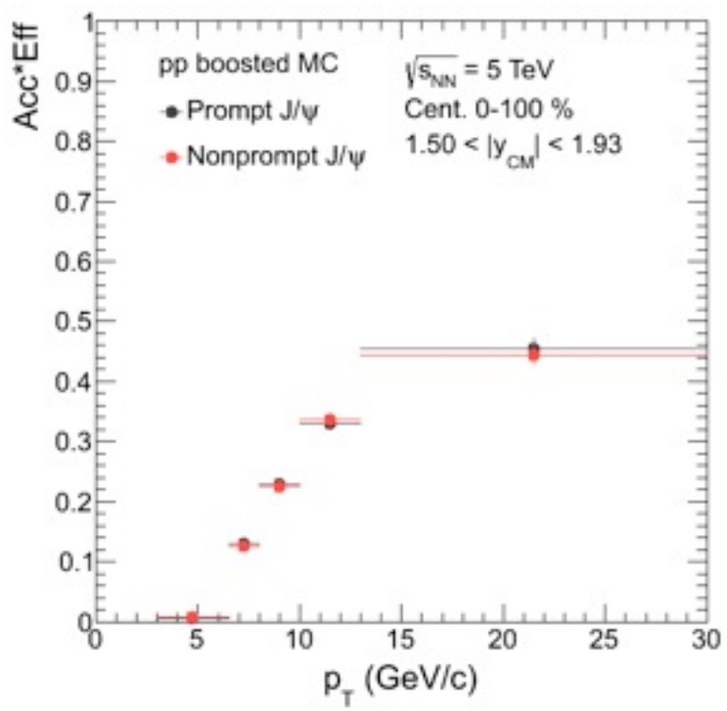


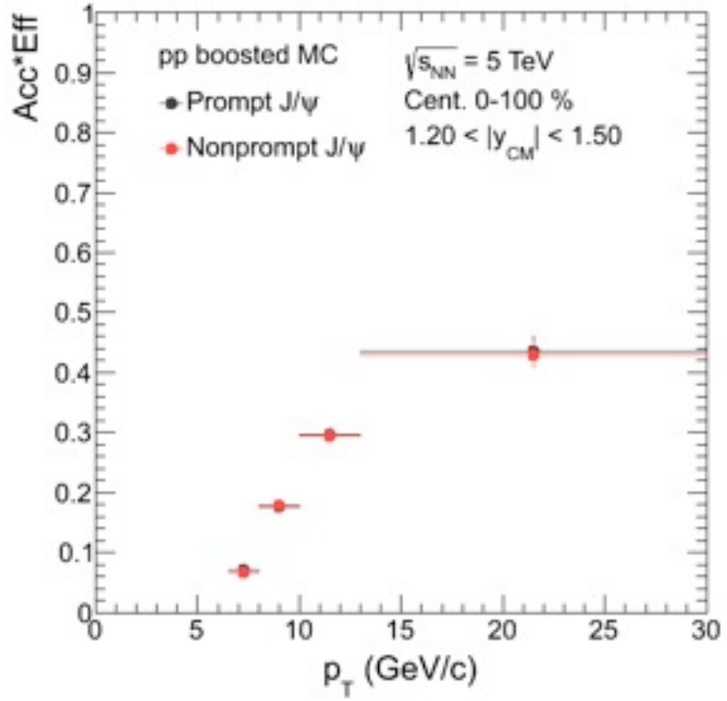


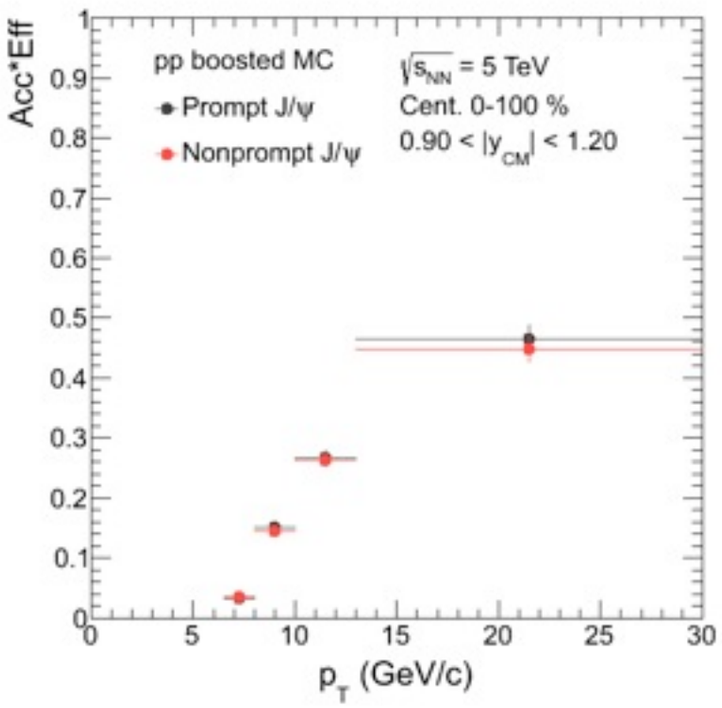


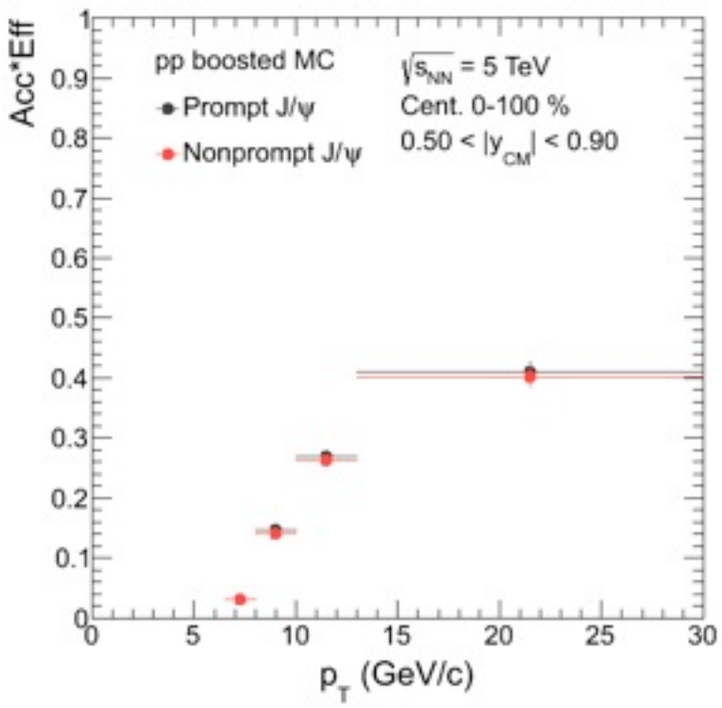
Binning 1 (pAJpsi_double)

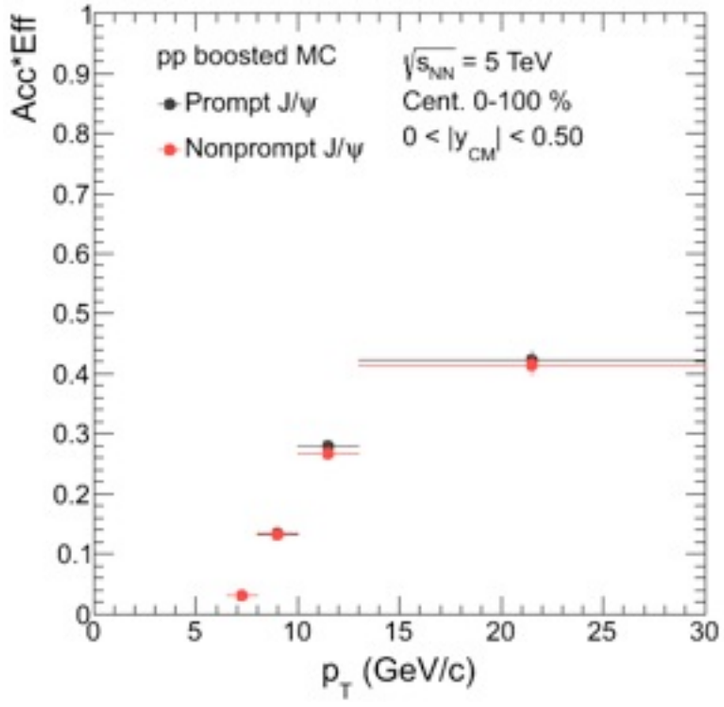
BW





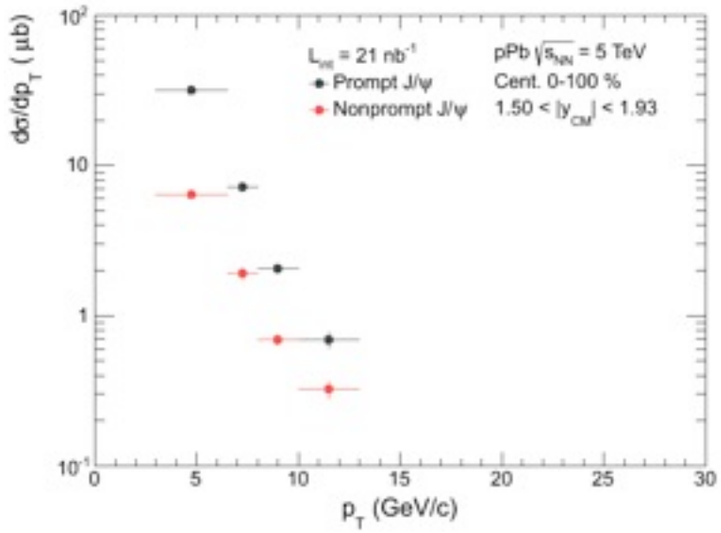


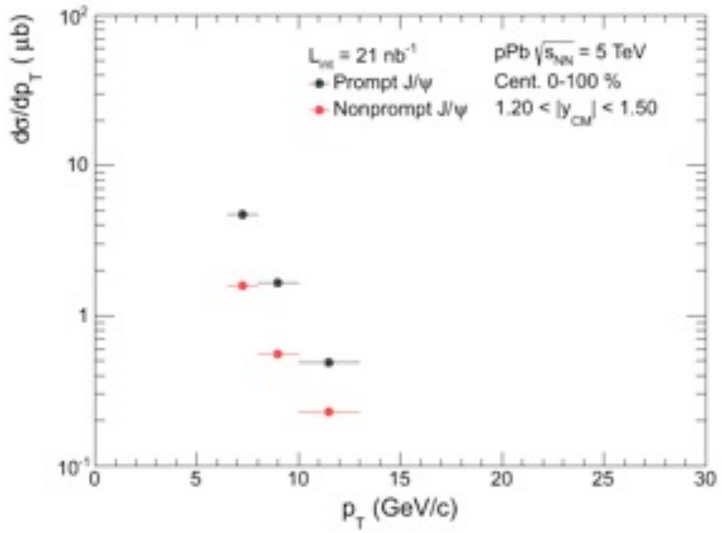


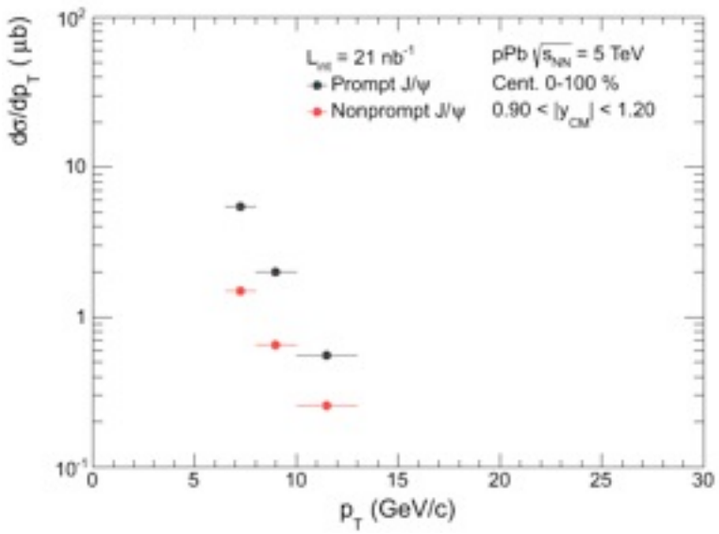


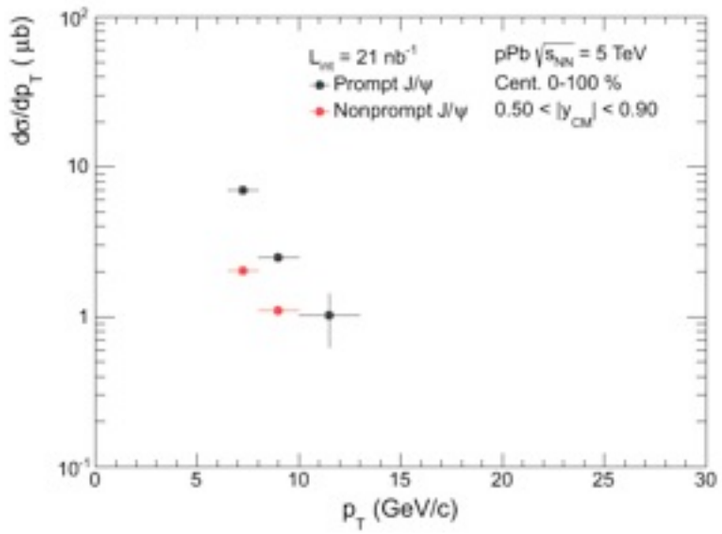
Binning 1 (pAJpsi_double)

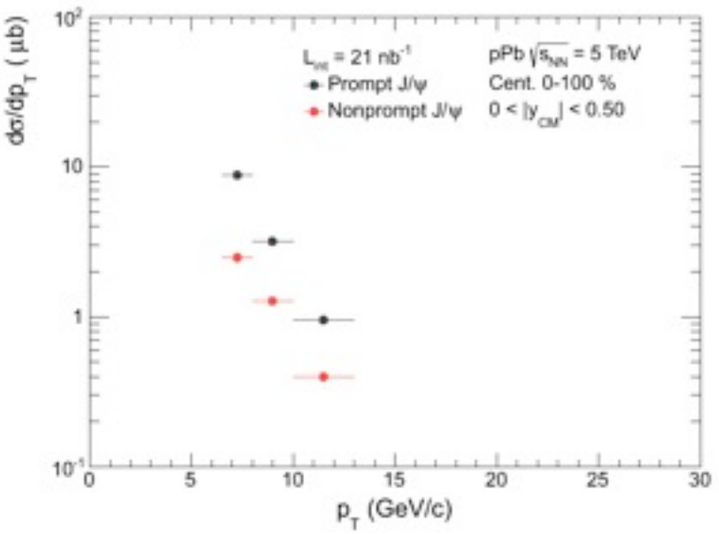
FW





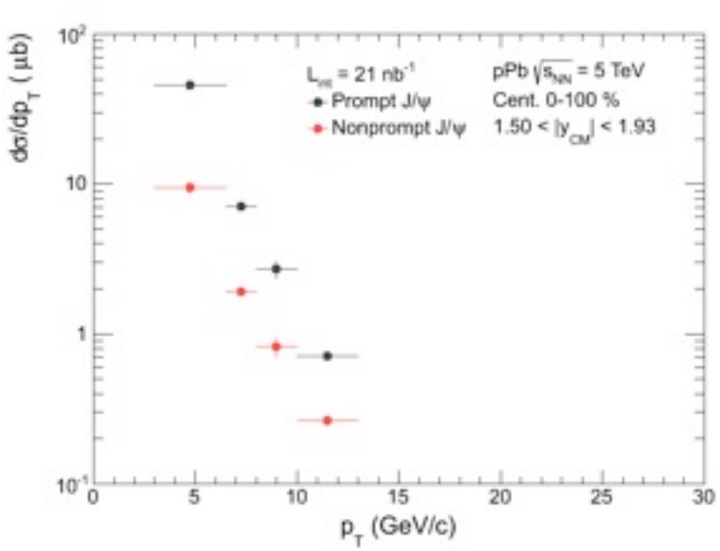


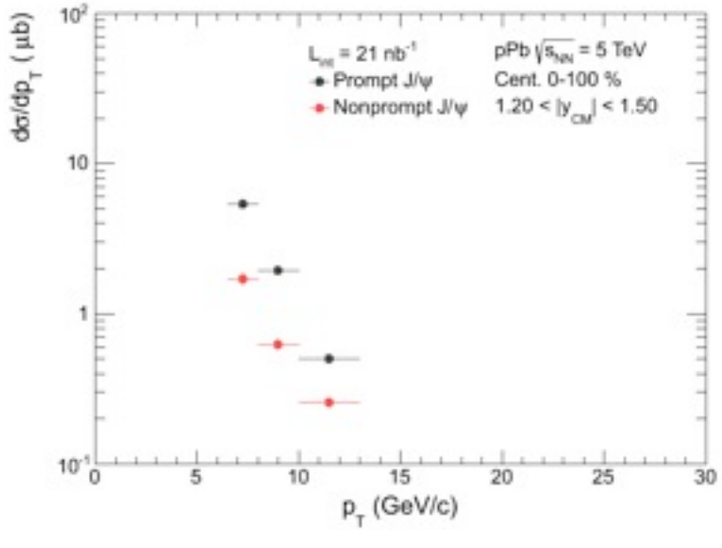


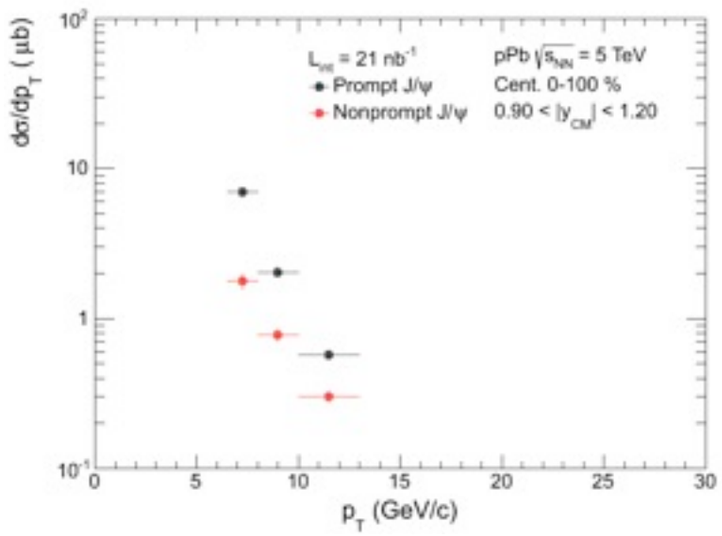


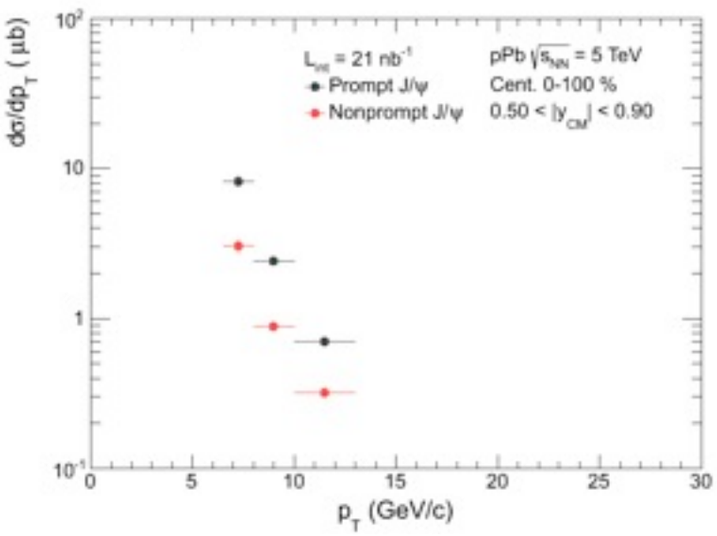
Binning 1 (pAJpsi_double)

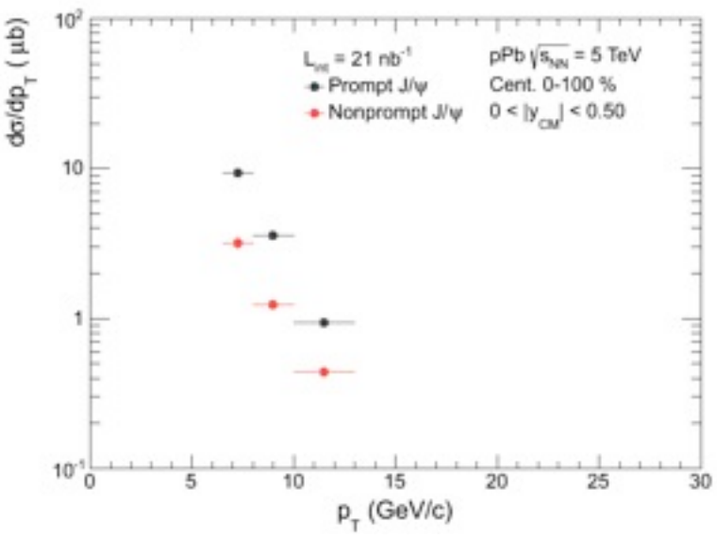
BW





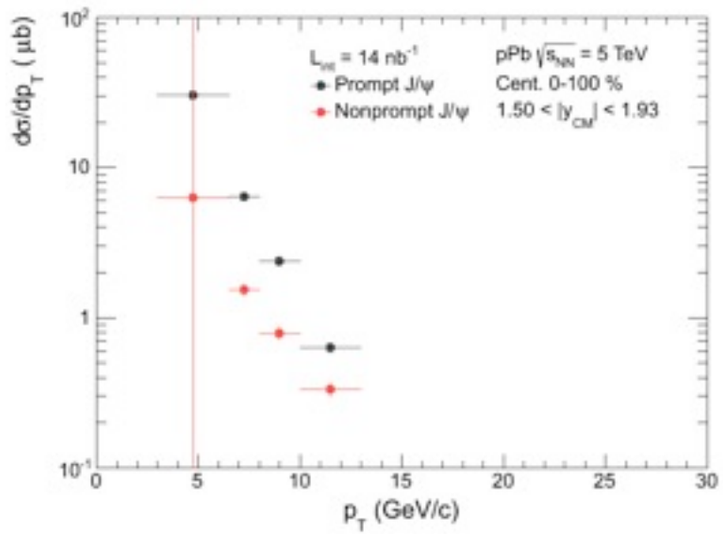


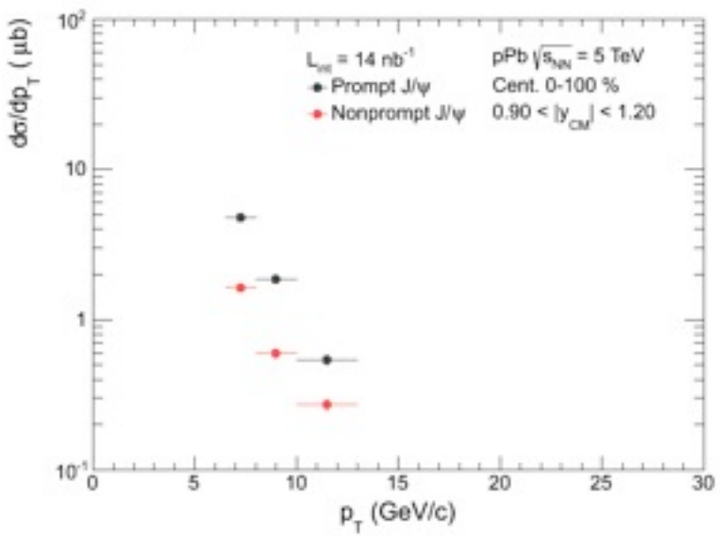


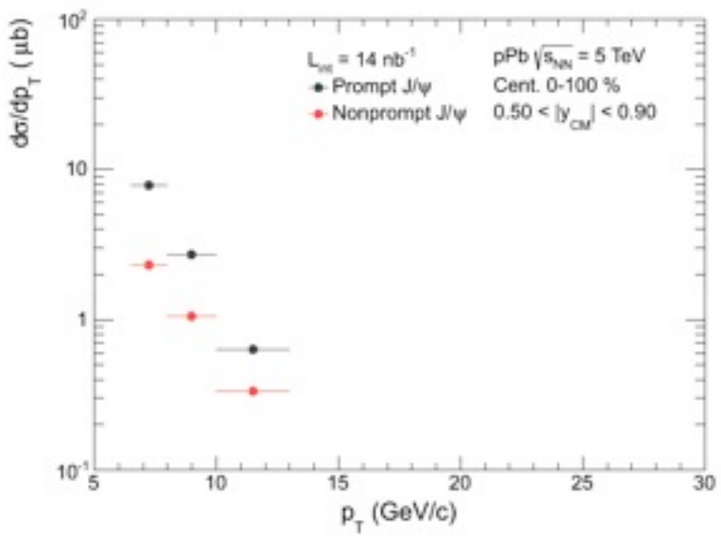


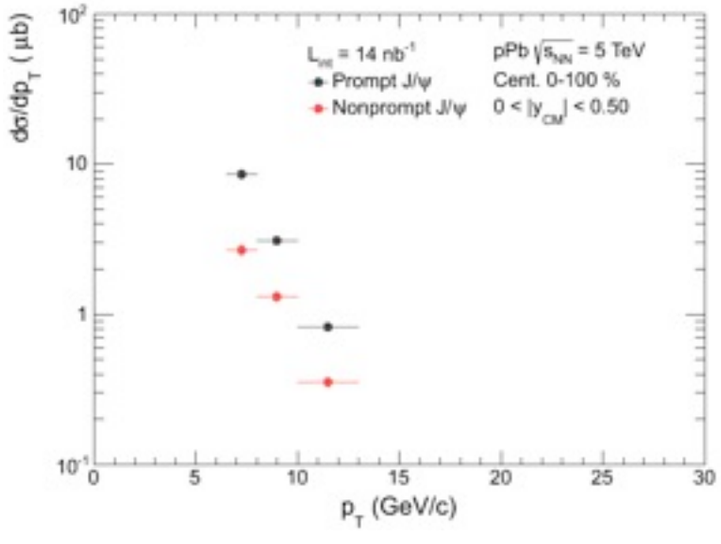
Binning 1 (pAJpsi_double)

FW

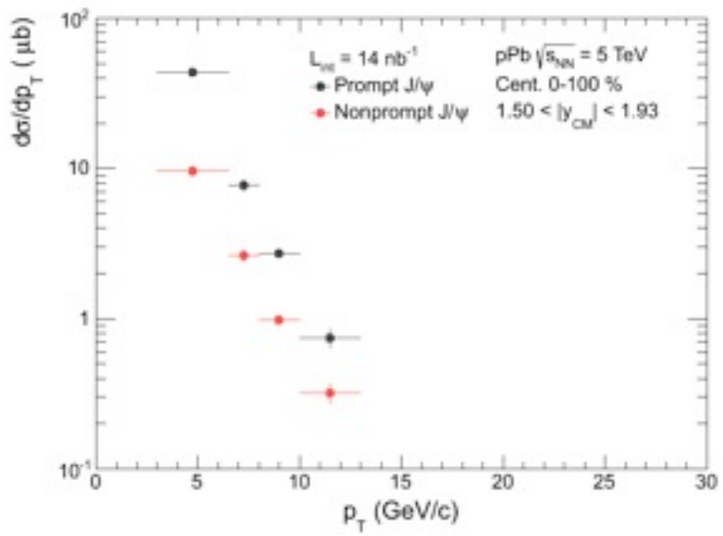


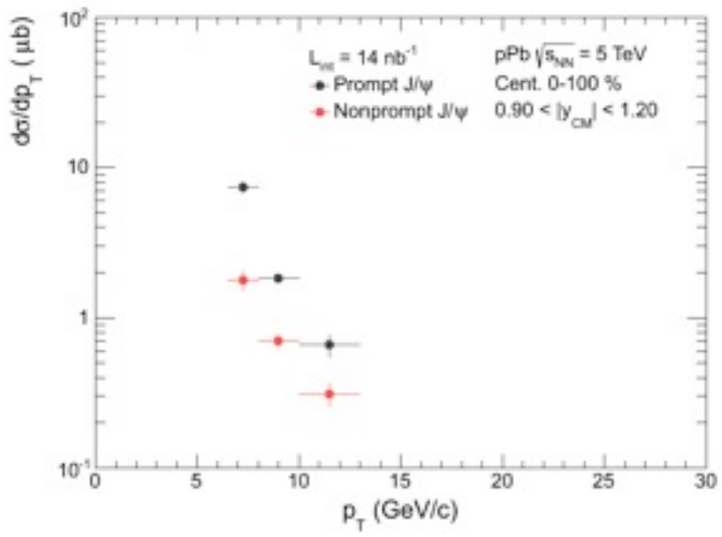


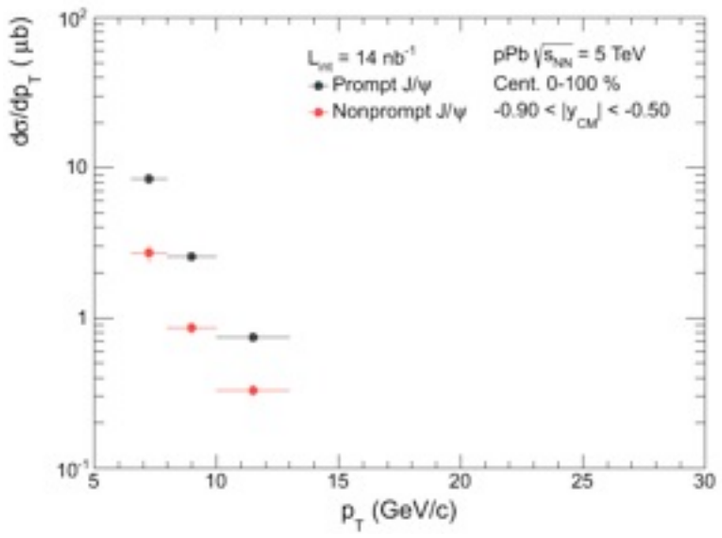


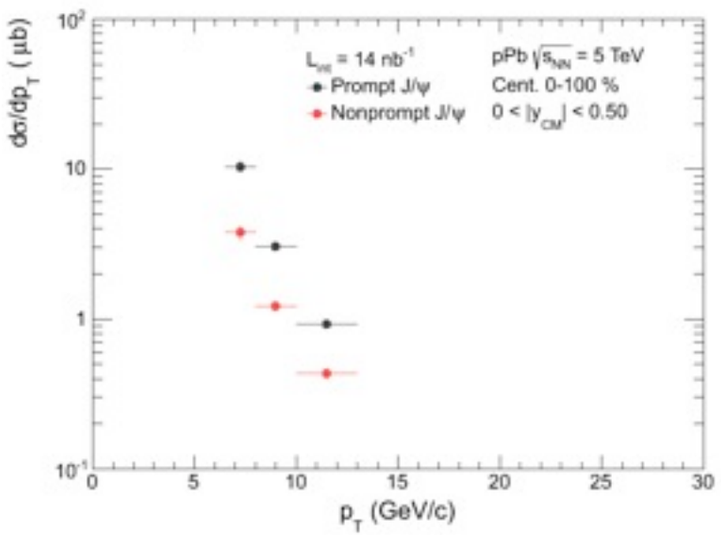


Binning 1 (pAJpsi_double)









A. 2D correction

Binning 2 (pAJpsi_double_v2)

- **Double differential binning (y Dep)**
  - 10+1 rapidity bins : bin width = 0.5, 0.4, 0.3, 0.3, 0.43
  - 2+2 pT bins : 0, 3, 6.5, 10, 30 GeV/c

- **Double differential binning (pT Dep)**
  - 3 rapidity bins : [0. 0.9, 1.5, 1.93]
  - 2+2 pT bins : 0, 3, 6.5, 8, 10, 13, 30 GeV/c

$-\eta_{CM}$ -0.47 $\eta_{CM}+0.47$

y_{CM}	[1st run] y_{lab}	[2nd run] y_{lab}
1.93	-2.4	2.4
1.5	-1.97	1.97
1.2	-1.67	1.67
0.9	-1.37	1.37
0.5	-0.97	0.97
0.0	-0.47	0.47
-0.5	0.03	-0.03
-0.9	0.43	-0.43
-1.2	0.73	-0.73
-1.5	1.03	-1.03
-1.93	1.46	-1.46

for cross section: -2.4 1.93 -1.93

Binning 2 (pAJpsi_double_v2)

Binning 1

- **Pbp fit results – yDep**

100) 3.0–6.5 GeV/c

101) 6.5–10.0 GeV/c

```
double52/summary/fit_table fit_table_RFB_Pbp_yDep_101.out
-2.4--1.97      6.5-10.0        0.0-100.0       3240.43 350.911 2485.18 271.305 755.247 88.7015
-1.97--1.67     6.5-10.0        0.0-100.0       4456.07 89.9231 4130.74 1625.78 325.324 1623.66
-1.67--1.37     6.5-10.0        0.0-100.0       4726.77 172.283 3674.6  139.609 1052.17 54.984
-1.37--0.97     6.5-10.0        0.0-100.0       4101.62 94.2573 3039.55 79.3041 1062.07 44.7857
-0.97--0.47     6.5-10.0        0.0-100.0       3018.7  70.7378 2243.5  60.1912 775.2   34.4835
-0.47-0.03      6.5-10.0        0.0-100.0       2309.99 102.961 1735.35 81.5012 574.636 36.2728
0.03-0.43       6.5-10.0        0.0-100.0       1805.85 46.0135 1332.03 41.2256 473.818 26.3317
0.43-0.73       6.5-10.0        0.0-100.0       1571.18 94.6432 1182.22 74.3633 388.963 31.7418
0.73-1.03       6.5-10.0        0.0-100.0       2049.97 65.7645 1543.22 55.3109 506.754 29.5397
1.03-1.46       6.5-10.0        0.0-100.0       4028.99 71.3413 3162.03 65.616  866.96  37.4998
```

102) 10.0–30.0 GeV/c

```
double52/summary/fit_table fit_table_RFB_Pbp_yDep_102.out
-2.4--1.97      10.0-30.0       0.0-100.0       1366.16 258.46  876.367 167.494 489.794 95.6652
-1.97--1.67     10.0-30.0       0.0-100.0       1572.58 60.1281 979.371 44.6576 593.212 33.2644
-1.67--1.37     10.0-30.0       0.0-100.0       1820.3  45.5485 1155.22 38.4603 665.078 30.3407
-1.37--0.97     10.0-30.0       0.0-100.0       2236.32 61.8147 1381.63 47.5825 854.691 36.9289
-0.97--0.47     10.0-30.0       0.0-100.0       2549.51 55.9322 1665.2  46.5086 884.303 34.7108
-0.47-0.03      10.0-30.0       0.0-100.0       2395.23 62.9685 1543.9  49.36   851.328 35.9156
0.03-0.43       10.0-30.0       0.0-100.0       1795.11 54.8693 1144.54 42.637  650.573 31.4558
0.43-0.73       10.0-30.0       0.0-100.0       1494.38 48.5069 879.149 36.3551 615.233 30.1024
0.73-1.03       10.0-30.0       0.0-100.0       1375.41 41.4395 874.529 33.9408 500.881 26.1815
1.03-1.46       10.0-30.0       0.0-100.0       1939    53.0421 1318.97 43.7315 620.032 29.9716
```

Binning 1

- **pPb fit results – yDep**

100) 3.0–6.5 GeV/c

101) 6.5–10.0 GeV/c

```
double52/summary/fit_table fit_table_RFB_pPb_yDep_101.out
1.97-2.4        6.5-10.0        0.0-100.0       2092.44 60.1276 1627.18 53.9319 465.262 30.0181
1.67-1.97       6.5-10.0        0.0-100.0       3342.28 379.082 2577.87 294.315 764.412 93.0105
1.37-1.67       6.5-10.0        0.0-100.0       3055.11 62.4009 2322.16 56.9845 732.946 34.9528
0.97-1.37       6.5-10.0        0.0-100.0       3026.32 110.057 2290.71 89.1626 735.613 41.5429
0.47-0.97       6.5-10.0        0.0-100.0       2026.98 68.5183 1473.1  55.6176 553.885 31.0531
-0.03-0.47      6.5-10.0        0.0-100.0       1481.32 39.6783 1085.87 35.7591 395.458 23.3439
-0.43--0.03     6.5-10.0        0.0-100.0       1245.14 38.1314 949.154 34.4895 295.986 20.6589
-0.73--0.43     6.5-10.0        0.0-100.0       998.608 33.3764 762.792 30.6192 235.816 18.6996
-1.03--0.73     6.5-10.0        0.0-100.0       1418.88 53.0175 1091.42 45.579  327.455 23.7486
-1.46--1.03     6.5-10.0        0.0-100.0       2899.51 97.4189 2245.58 81.0602 653.929 36.893
```

102) 10.0–30.0 GeV/c

```
double52/summary/fit_table fit_table_RFB_pPb_yDep_102.out
1.97-2.4        10.0-30.0       0.0-100.0       852.108 34.4006 539.757 28.3091 312.351 22.036
1.67-1.97       10.0-30.0       0.0-100.0       1150.11 38.3372 728.092 31.8625 422.02  24.9818
1.37-1.67       10.0-30.0       0.0-100.0       1324.03 46.8167 826.895 36.118  497.131 27.543
0.97-1.37       10.0-30.0       0.0-100.0       1405.91 42.6664 866.331 34.3724 539.578 27.5385
0.47-0.97       10.0-30.0       0.0-100.0       1630.44 48.2609 1076.8  39.2355 553.64  28.1439
-0.03-0.47      10.0-30.0       0.0-100.0       1605.04 44.5347 1050.99 36.8787 554.051 27.3126
-0.43--0.03     10.0-30.0       0.0-100.0       1239.51 36.1512 783.081 30.4232 456.433 24.1073
-0.73--0.43     10.0-30.0       0.0-100.0       993.553 39.4189 654.247 31.2701 339.307 22.029
-1.03--0.73     10.0-30.0       0.0-100.0       1040.07 38.7167 689.588 31.2576 350.486 22.0979
-1.46--1.03     10.0-30.0       0.0-100.0       1329.81 58.4652 874.38  43.8252 455.434 29.0479
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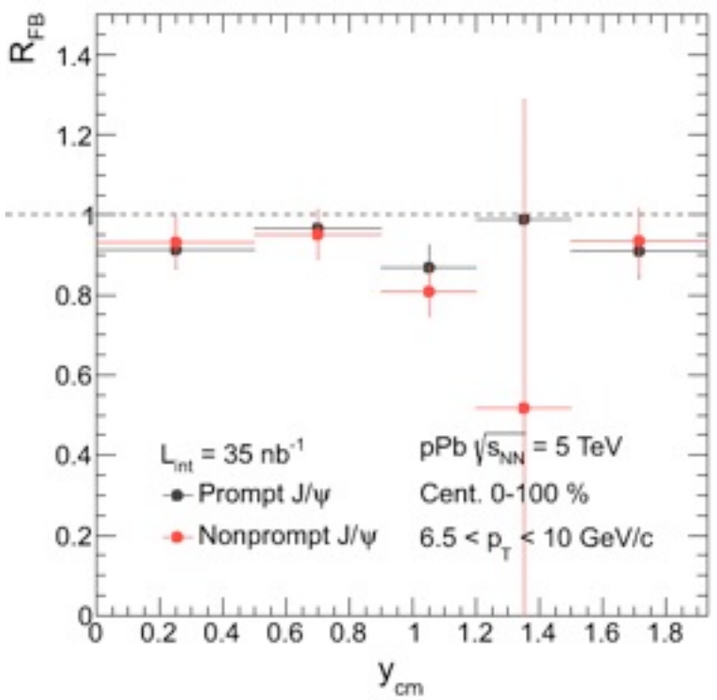
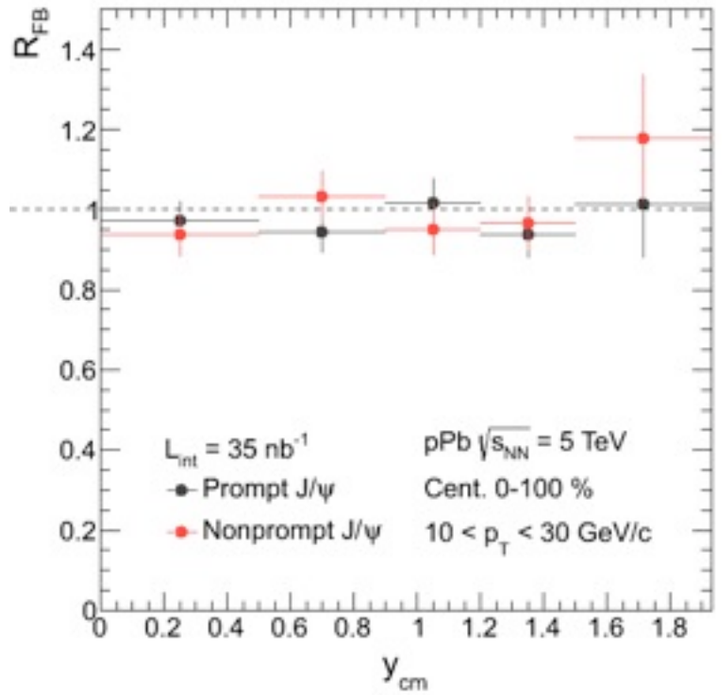
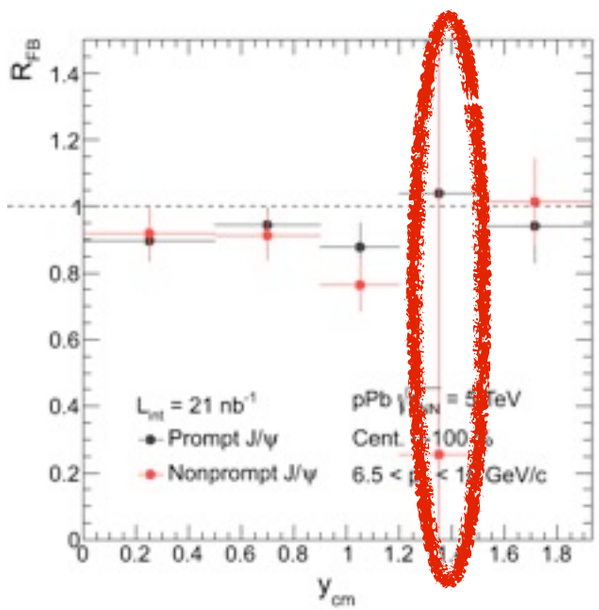
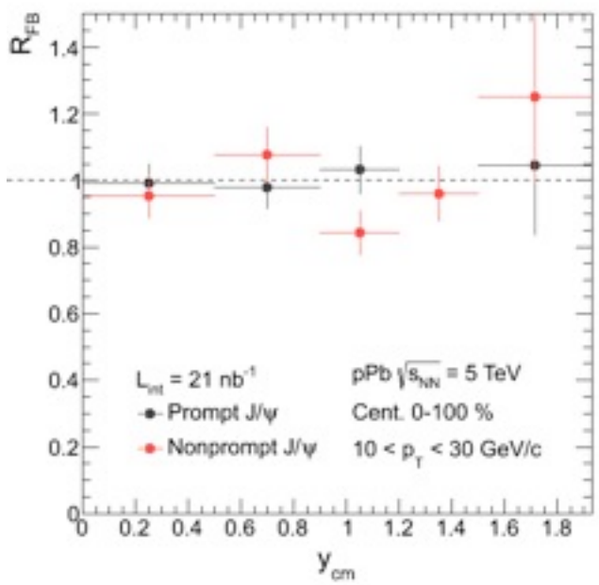
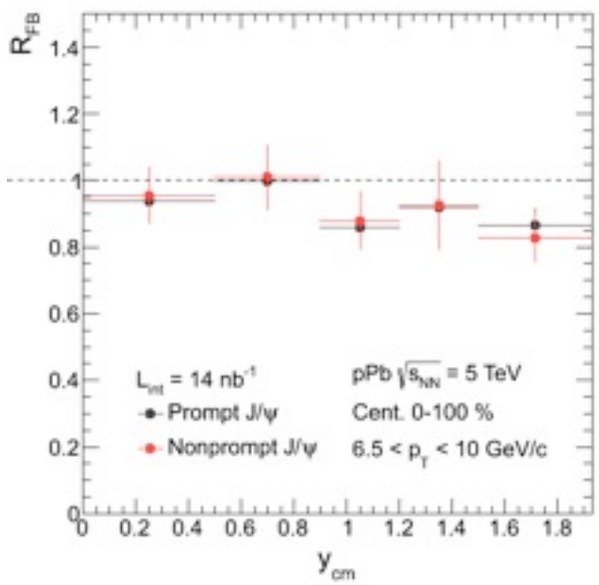
Binning 2 (pAJpsi_double_v2)

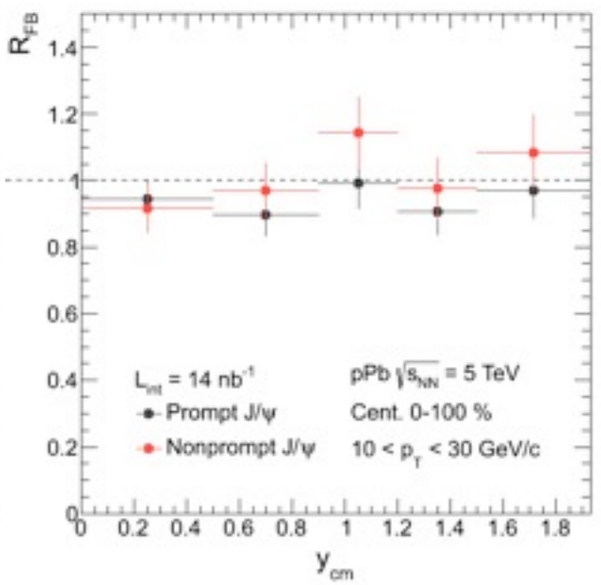




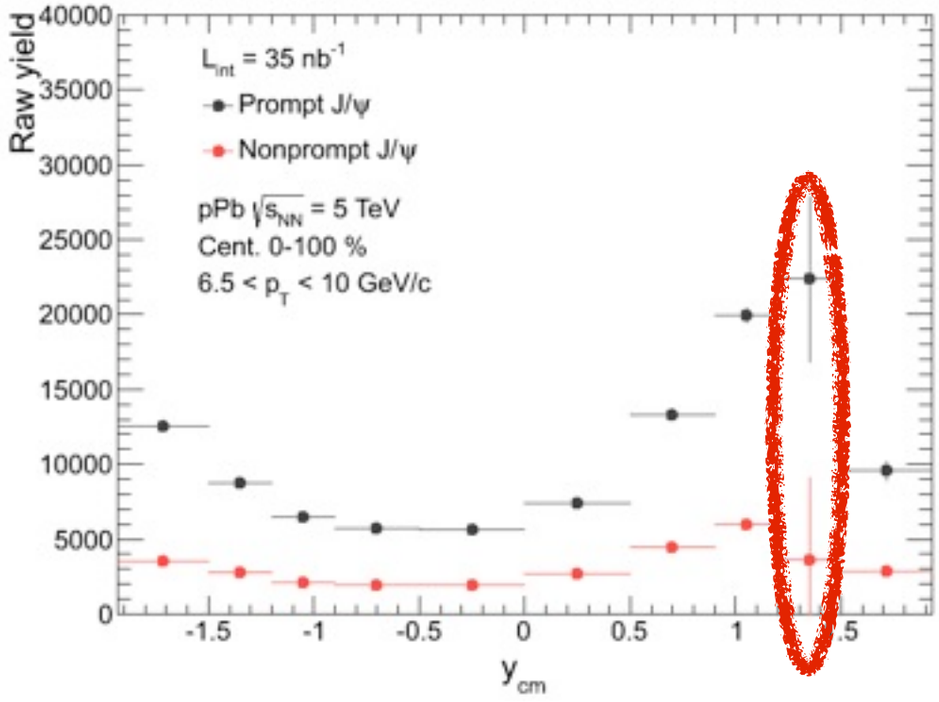


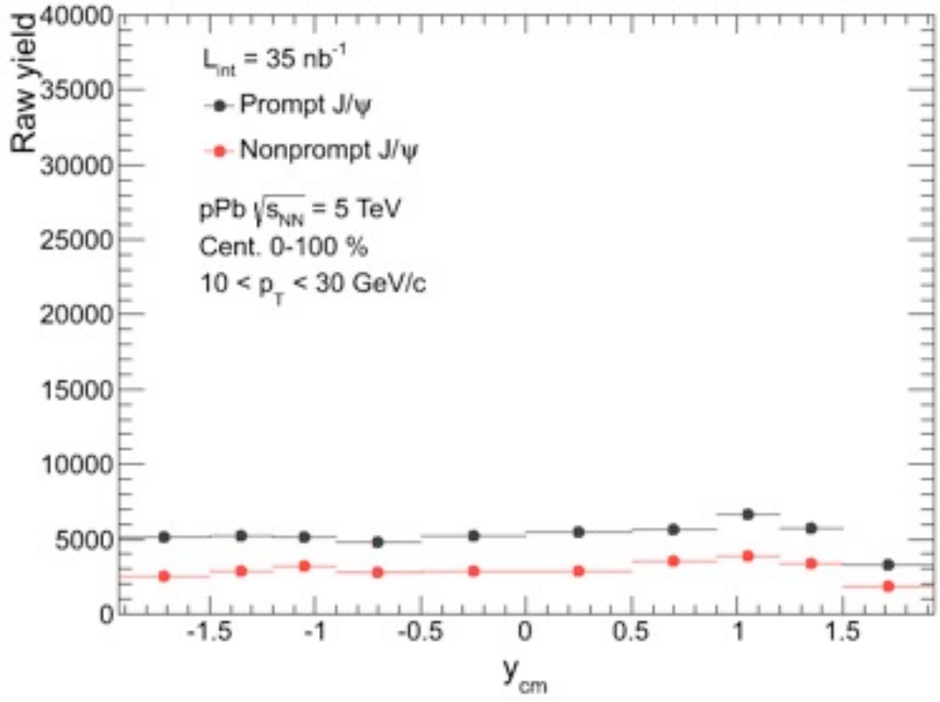


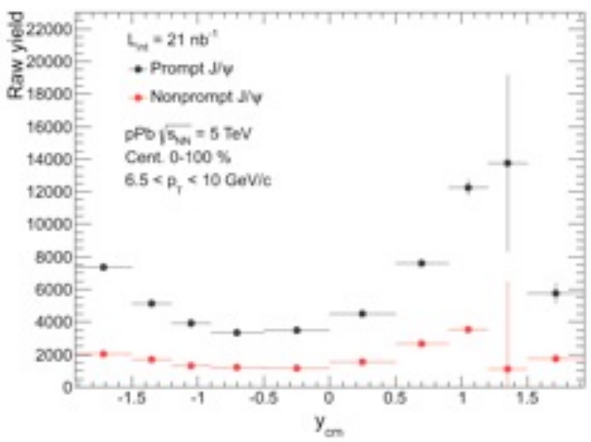


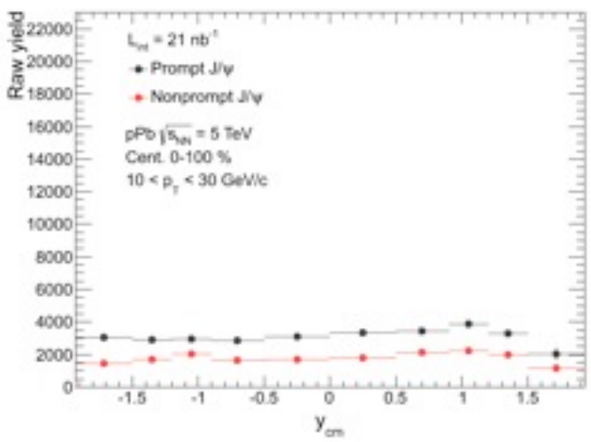


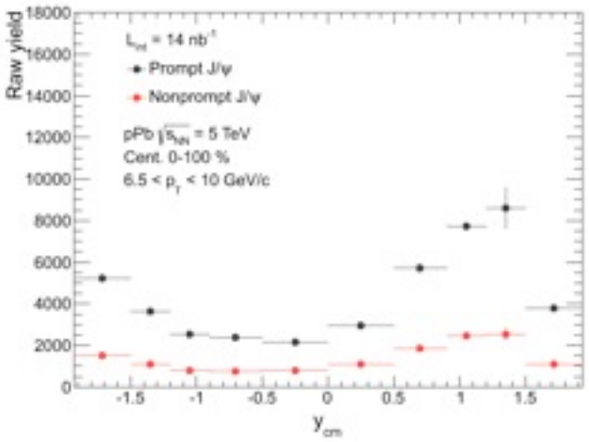
Binning 2 (pAJpsi_double_v2)

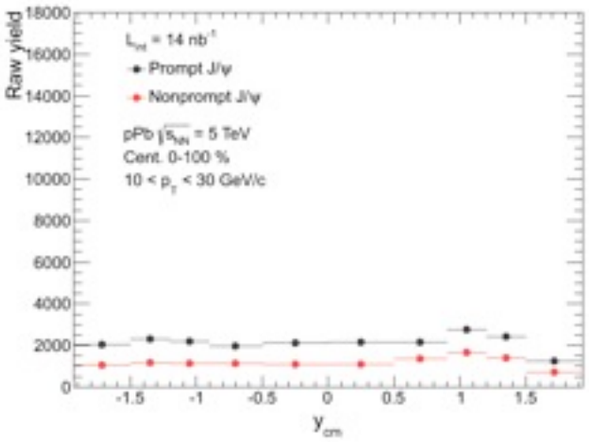




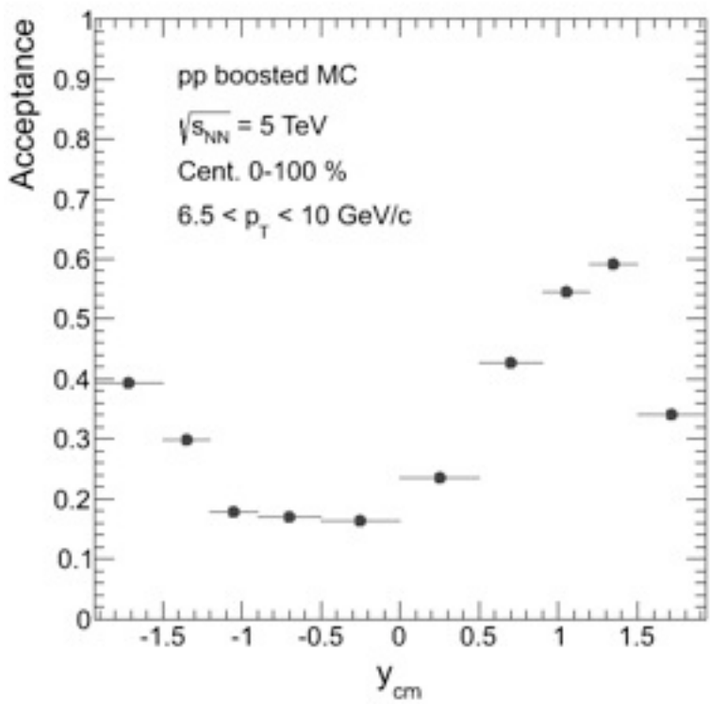


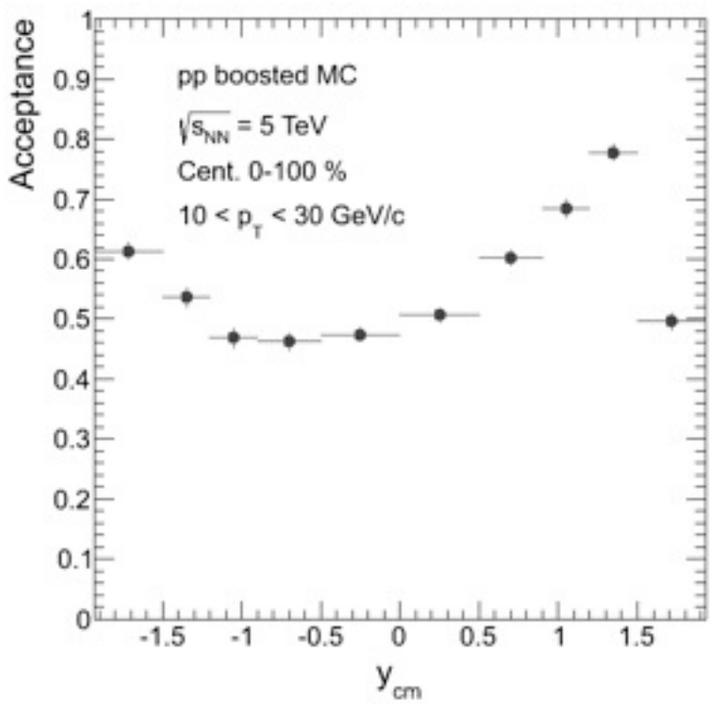


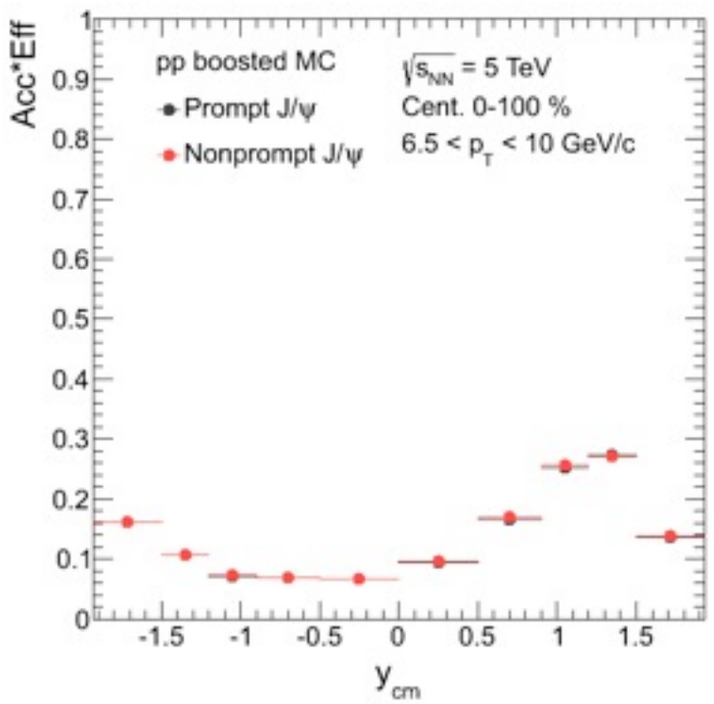


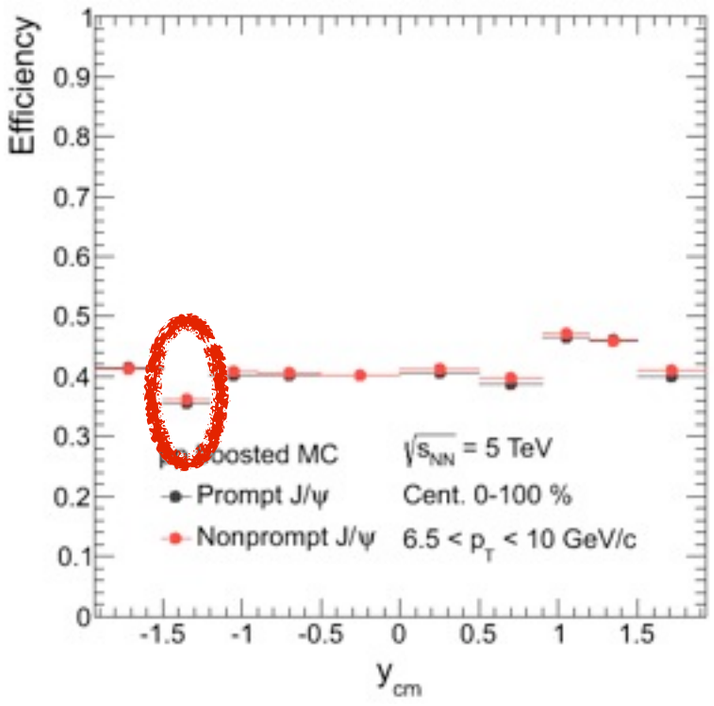


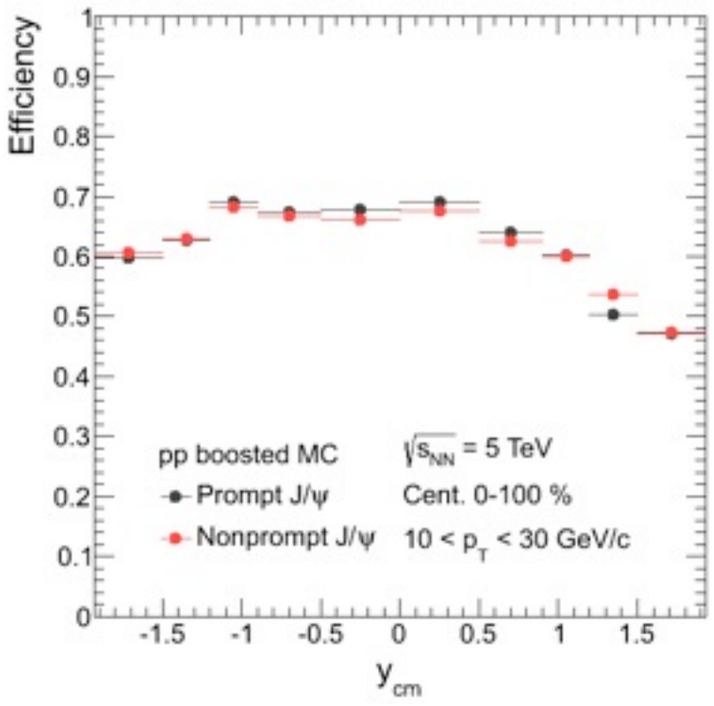
Binning 2 (pAJpsi_double_v2)

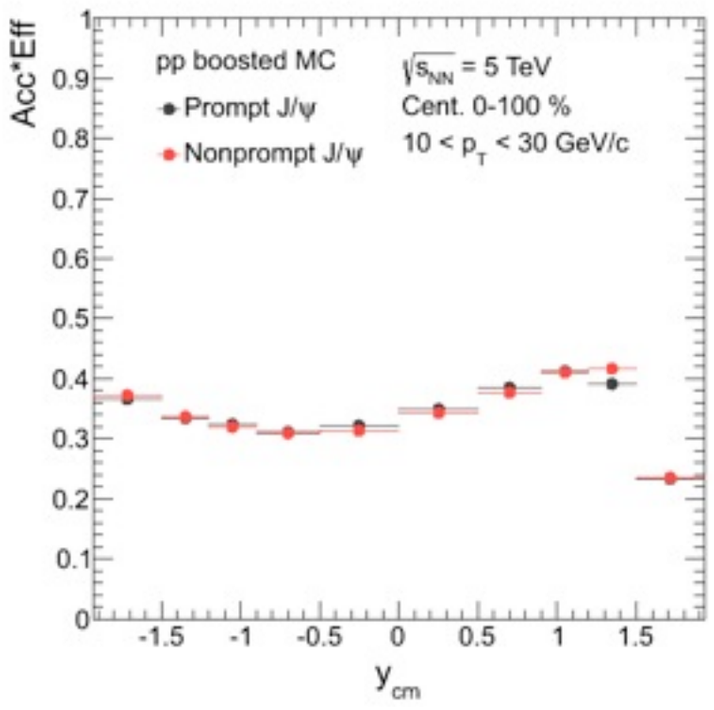




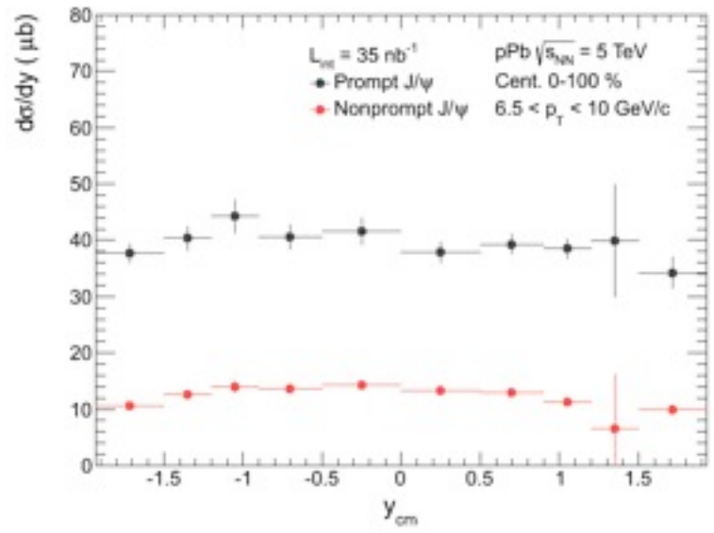


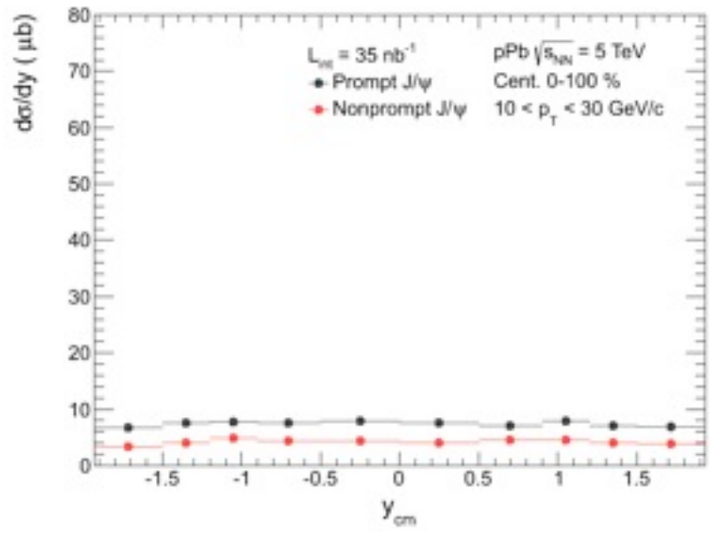


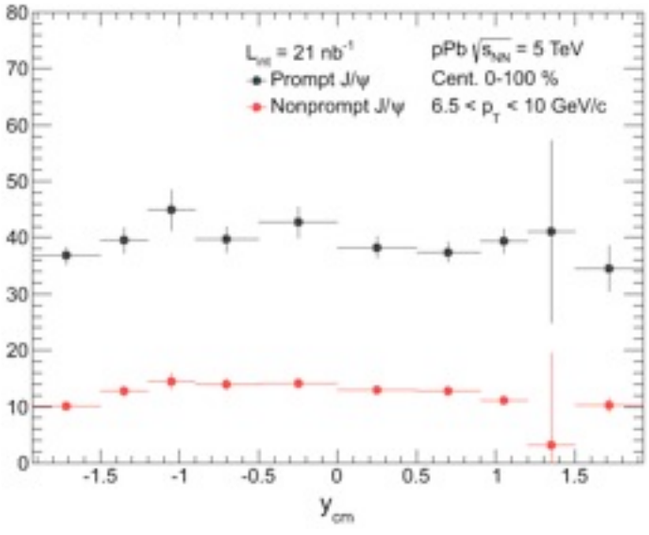


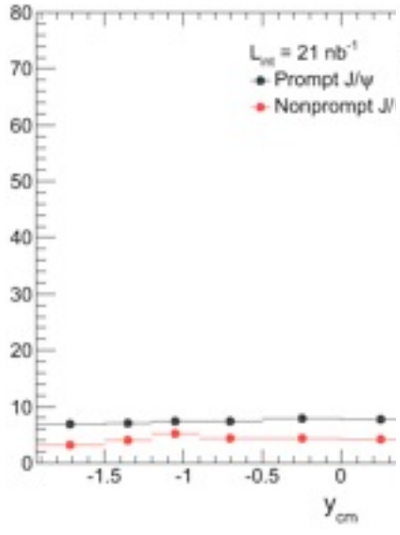


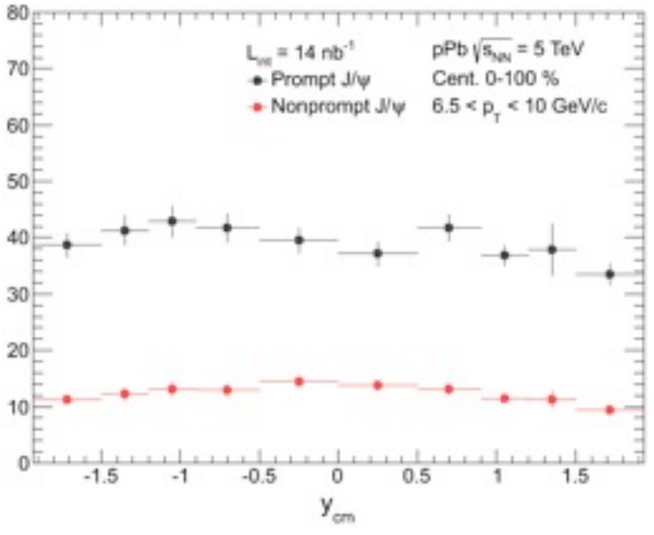
Binning 2 (pAJpsi_double_v2)

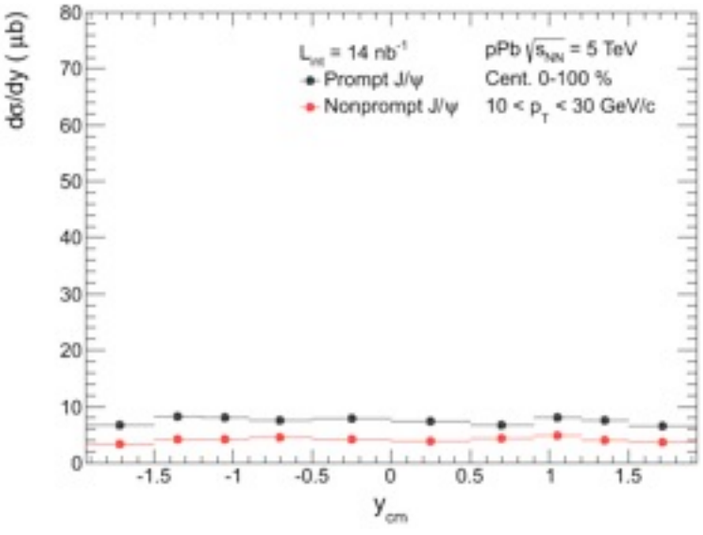












Binning 2 (pAJpsi_double_v2)

- **Pbp fit results – pt dep**

100) 1.5–1.93

mmary/fit_table	fit_table_RFB_Pbp_ptDep_100.out						
-2.4--1.97	3.0-6.5	0.0-100.0	8777.98	134.427	7264.01	127.718	1513.98	66.8936
-2.4--1.97	6.5-8.0	0.0-100.0	2009.99	134.859	1583.39	109.479	426.598	38.9697
-2.4--1.97	8.0-10.0	0.0-100.0	1165.15	50.5114	863.971	42.8933	301.175	24.6464
-2.4--1.97	10.0-13.0	0.0-100.0	806.368	85.1057	552.726	61.0698	253.642	32.2966
-2.4--1.97	13.0-30.0	0.0-100.0	458.457	23.574	277.864	19.4778	180.593	16.1702
1.03-1.46	3.0-6.5	0.0-100.0	1693.33	95.2416	1379.25	81.2832	314.077	30.0158
1.03-1.46	6.5-8.0	0.0-100.0	2145.09	57.217	1696.13	51.4695	448.959	27.3076
1.03-1.46	8.0-10.0	0.0-100.0	1979.2	250.494	1526.22	194.741	452.978	62.4394
1.03-1.46	10.0-13.0	0.0-100.0	1196.58	41.6147	870.539	35.5627	326.043	21.8328
1.03-1.46	13.0-30.0	0.0-100.0	739.716	28.8836	443.474	23.2802	296.242	19.3886

101) 0.9–1.5

mmary/fit_table	fit_table_RFB_Pbp_ptDep_101.out						
-1.97--1.37	6.5-8.0	0.0-100.0	5410.04	171.695	4265.16	141.778	1144.88	55.6651
-1.97--1.37	8.0-10.0	0.0-100.0	3783.47	78.6194	2798.81	68.4854	984.653	41.5509
-1.97--1.37	10.0-13.0	0.0-100.0	2163.03	59.1336	1467.46	48.9993	695.566	33.9569
-1.97--1.37	13.0-30.0	0.0-100.0	1224.91	42.0754	672.713	31.1843	552.196	28.2538
0.43-1.03	6.5-8.0	0.0-100.0	1462.82	43.359	1132.15	39.6178	330.663	23.227
0.43-1.03	8.0-10.0	0.0-100.0	2148.43	74.4013	1601.22	60.9969	547.211	31.7004
0.43-1.03	10.0-13.0	0.0-100.0	1623.6	57.2565	1082.87	44.4439	540.726	29.6745
0.43-1.03	13.0-30.0	0.0-100.0	1104.04	36.4958	624.219	28.1907	479.819	24.91

102) 0.0–0.9

mmary/fit_table	fit_table_RFB_Pbp_ptDep_102.out						
-1.37--0.47	6.5-8.0	0.0-100.0	3270.79	64.2644	2534	58.7723	736.791	34.4225
-1.37--0.47	8.0-10.0	0.0-100.0	3900.82	106.022	2787.87	83.931	1112.95	47.0949
-1.37--0.47	10.0-13.0	0.0-100.0	2880.36	58.9405	1966.23	50.5837	914.131	35.9135
-1.37--0.47	13.0-30.0	0.0-100.0	1892.04	47.291	1065.06	36.9083	826.981	32.8757
-0.47-0.43	6.5-8.0	0.0-100.0	1353.18	39.191	1009.89	35.451	343.286	22.3638
-0.47-0.43	8.0-10.0	0.0-100.0	2784.67	63.943	2071.77	55.5043	712.899	32.9471
-0.47-0.43	10.0-13.0	0.0-100.0	2387.16	69.3526	1650.08	55.1962	737.082	34.7429
-0.47-0.43	13.0-30.0	0.0-100.0	1822.56	55.0109	1056.74	40.5163	765.821	34.0372

Binning 2 (pAJpsi_double_v2)

- **pPb fit results – pt dep**

100) 1.5–1.93

1.97-2.4	3.0-6.5	0.0-100.0	5696.25	98.9119	4697.01	73382.2	999.247	73382.2
1.97-2.4	6.5-8.0	0.0-100.0	1185.25	40.5308	954.861	38.4982	230.393	21.8633
1.97-2.4	8.0-10.0	0.0-100.0	911.039	46.3686	679.047	38.9126	231.991	21.4276
1.97-2.4	10.0-13.0	0.0-100.0	519.917	25.8935	342.575	22.2139	177.342	16.7445
1.97-2.4	13.0-30.0	0.0-100.0	358.028	11.2339	207.235	13.328	150.793	12.5595
-1.46--1.03	3.0-6.5	0.0-100.0	1102.59	10.8634	886.486	20.7656	216.099	18.9593
-1.46--1.03	6.5-8.0	0.0-100.0	1658.97	153.452	1244.23	115.089	414.742	38.3629
-1.46--1.03	8.0-10.0	0.0-100.0	1402.22	71.7089	1036.28	56.9572	365.937	28.0332
-1.46--1.03	10.0-13.0	0.0-100.0	881.821	118.539	612.892	84.1997	268.929	40.1088
-1.46--1.03	13.0-30.0	0.0-100.0	460.776	22.4795	271.585	17.9556	189.191	15.2329

101) 0.9–1.5

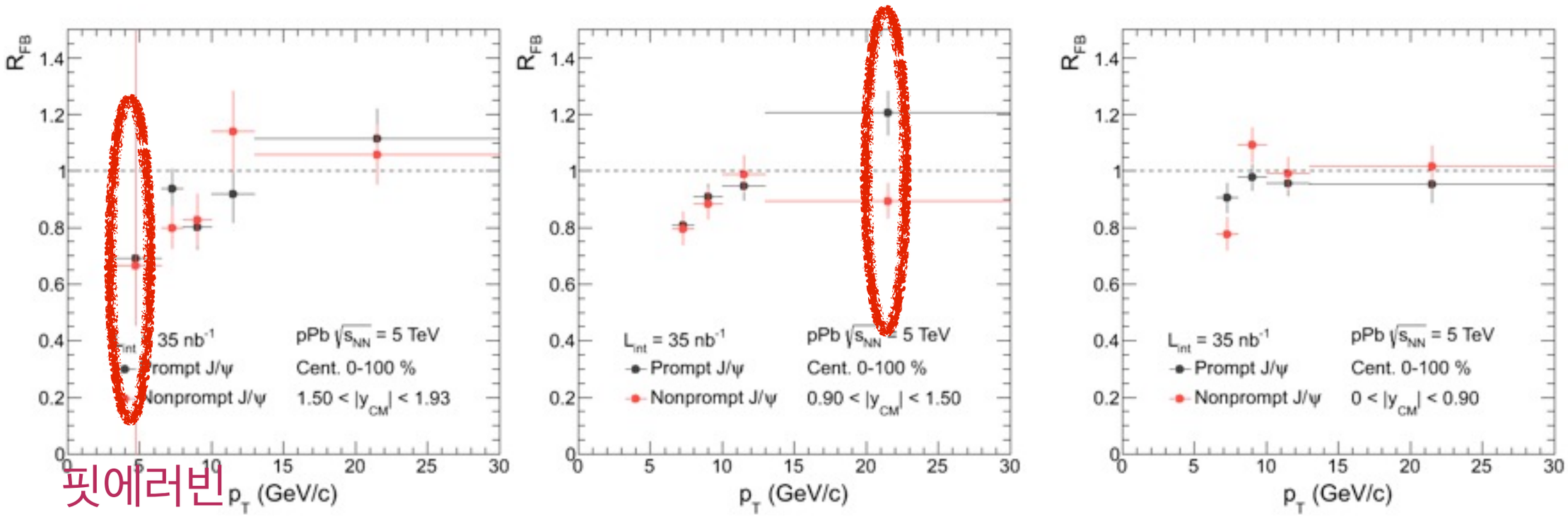
mmary/fit_table	fit_table_RFB_pPb_ptDep_101.out						
1.37-1.97	6.5-8.0	0.0-100.0	3719.44	111.997	2900.97	93.9181	818.468	42.3982
1.37-1.97	8.0-10.0	0.0-100.0	2485.03	61.6944	1873.21	54.4737	611.823	32.1773
1.37-1.97	10.0-13.0	0.0-100.0	1560.15	1.20619	1036.3	23.8125	523.85	23.8025
1.37-1.97	13.0-30.0	0.0-100.0	853.543	31.4928	640.157	23.6196	213.386	7.87321
-1.03--0.43	6.5-8.0	0.0-100.0	1017.53	38.8967	811.572	35.2877	205.962	18.5675
-1.03--0.43	8.0-10.0	0.0-100.0	1390.63	39.4998	1035.83	35.6911	354.798	22.578
-1.03--0.43	10.0-13.0	0.0-100.0	1223.29	37.9672	882.906	33.115	340.389	21.3849
-1.03--0.43	13.0-30.0	0.0-100.0	799.635	32.9058	461.51	24.8747	338.125	21.2526

102) 0.0–0.9

mmary/fit_table	fit_table_RFB_pPb_ptDep_101.out						
0.47-1.37	6.5-8.0	0.0-100.0	2375.3	119.137	1817.24	95.1141	558.061	39.0184
0.47-1.37	8.0-10.0	0.0-100.0	2772.07	107.252	1993.9	83.0484	778.171	43.0383
0.47-1.37	10.0-13.0	0.0-100.0	1715.93	44.3388	1182.68	38.5534	533.251	27.2456
0.47-1.37	13.0-30.0	0.0-100.0	1376.95	99.4124	791.739	61.2583	585.211	47.6471
-0.43-0.47	6.5-8.0	0.0-100.0	980.039	44.0355	741.537	37.3311	238.502	19.9572
-0.43-0.47	8.0-10.0	0.0-100.0	1780.34	43.7513	1307.99	39.3249	472.345	25.4554
-0.43-0.47	10.0-13.0	0.0-100.0	1642.59	45.0611	1143.8	38.3211	498.789	25.907
-0.43-0.47	13.0-30.0	0.0-100.0	1209.03	104.067	702.389	63.7389	506.644	48.0547

Binning 2 (pAJpsi_double_v2)

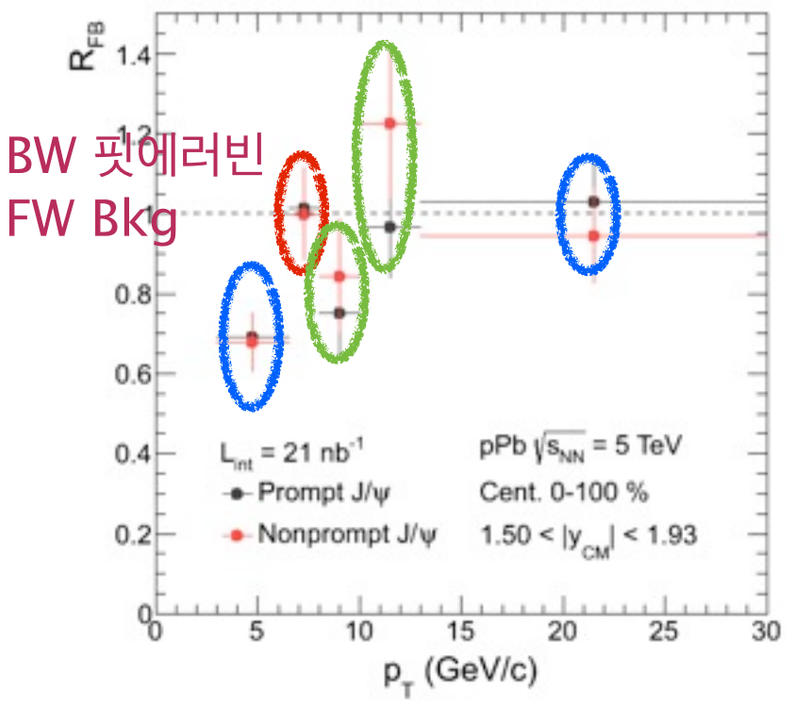
- **pPb fit results – pt dep**

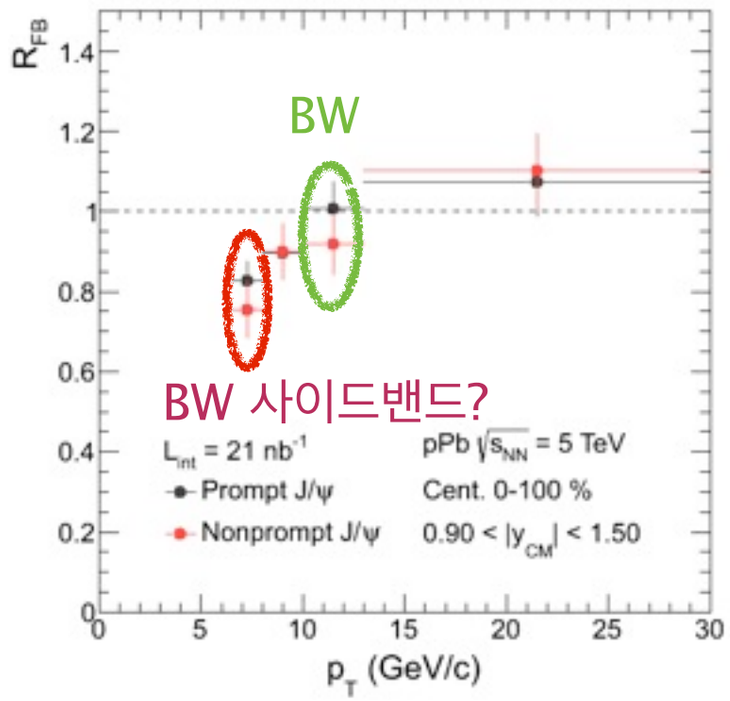


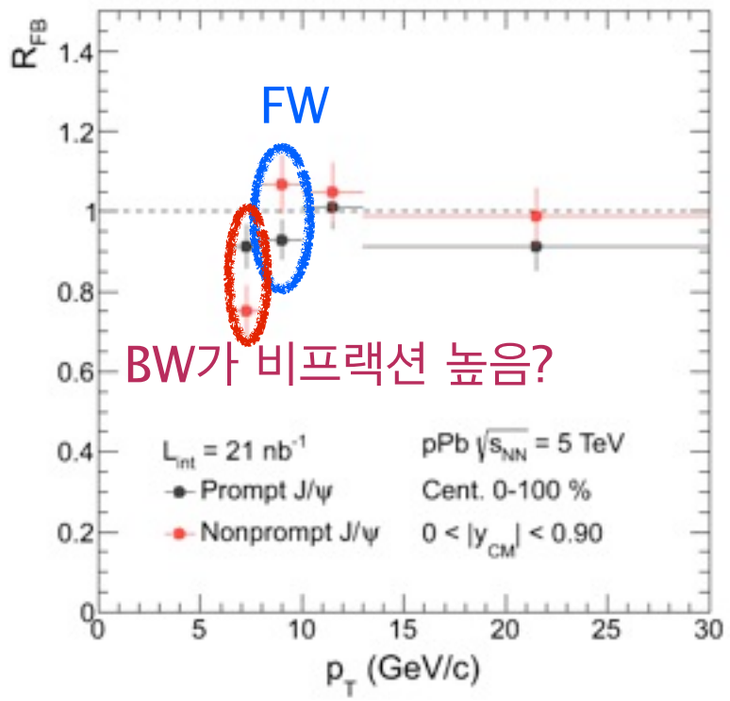
핏에러빈

Binning 2 (pAJpsi_double_v2)

- **pPb fit results – pt dep**

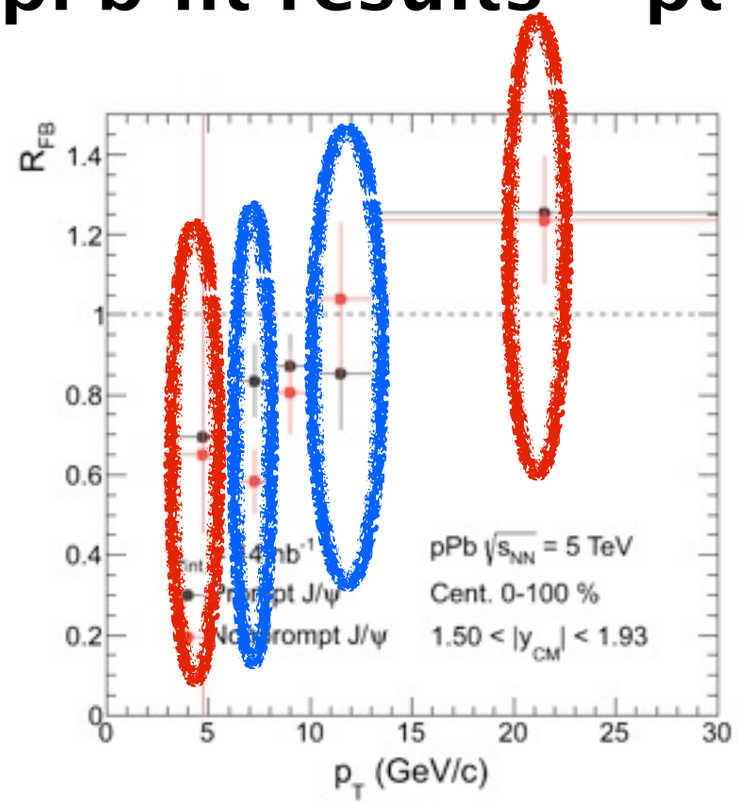


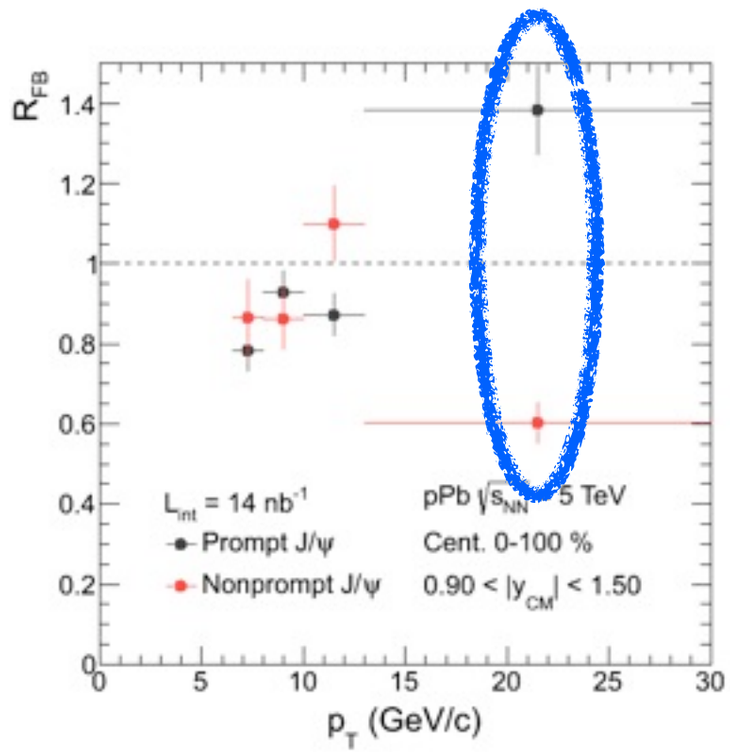


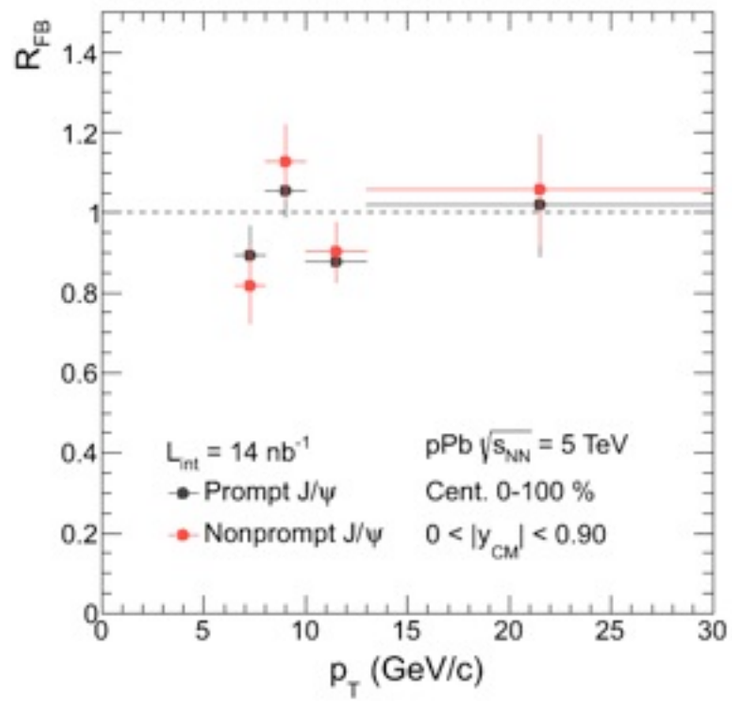


Binning 2 (pAJpsi_double_v2)

- **pPb fit results – pt dep**

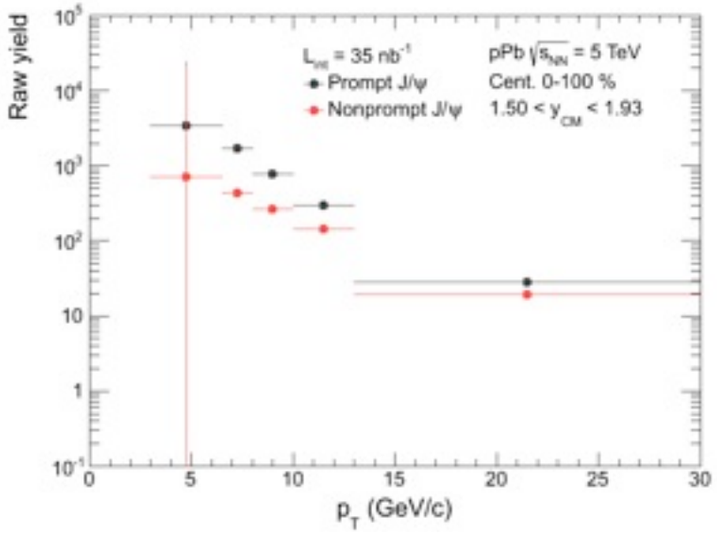


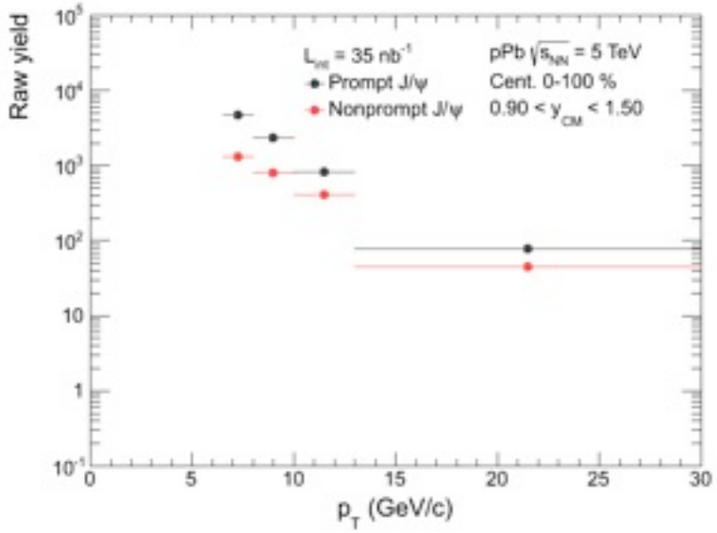


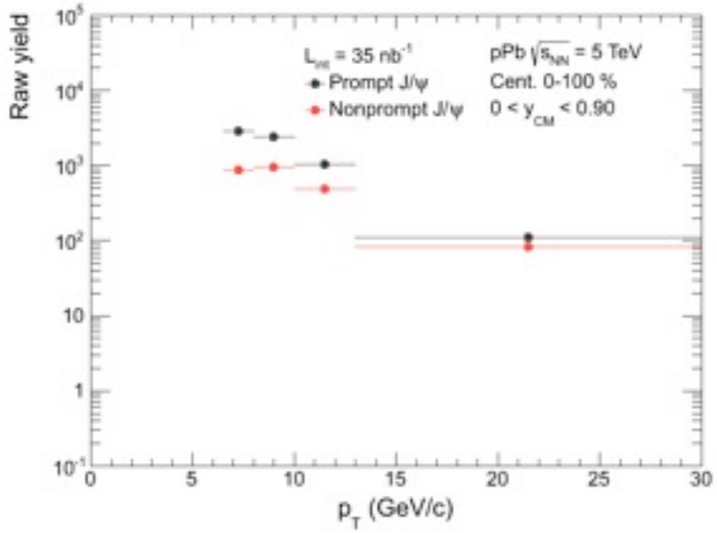


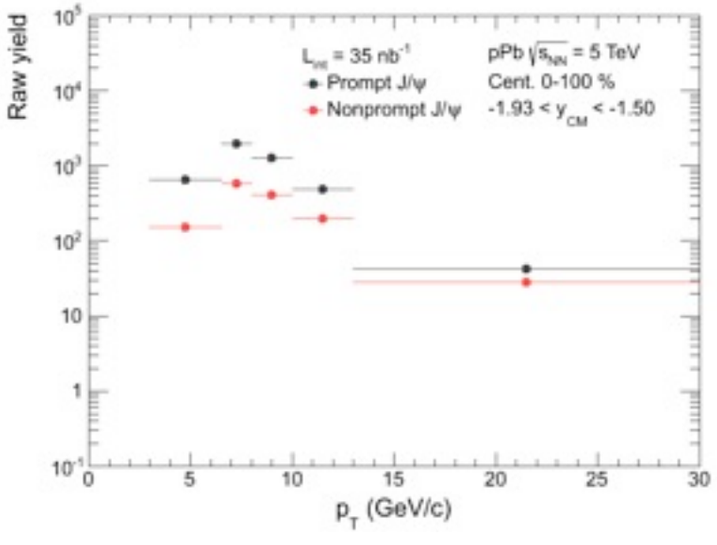
Binning 2 (pAJpsi_double_v2)

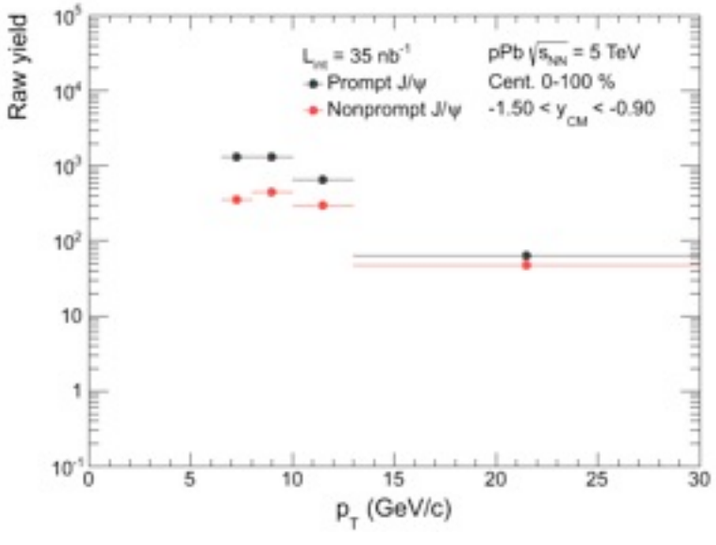
- **pPb fit results – pt dep**

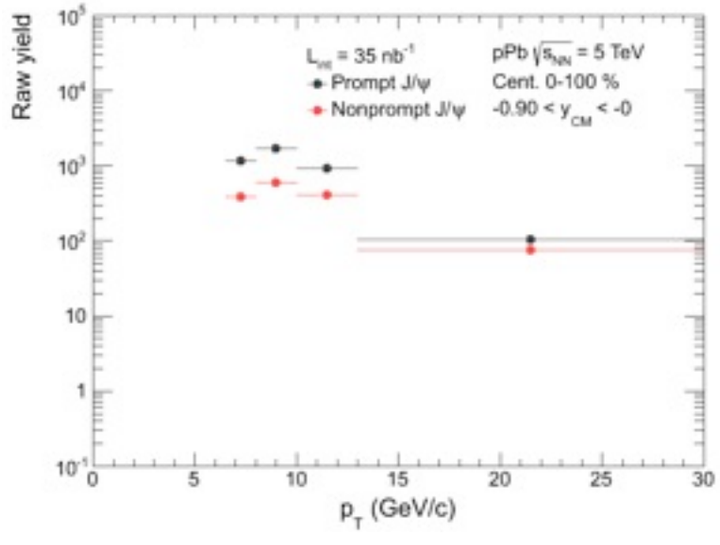






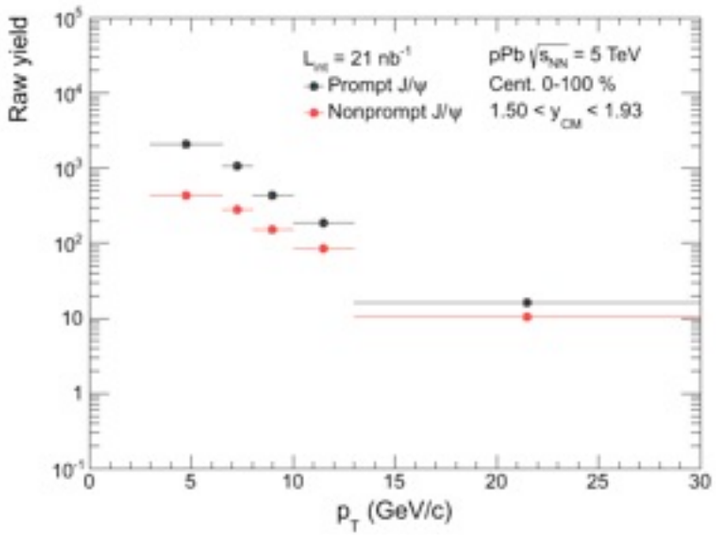


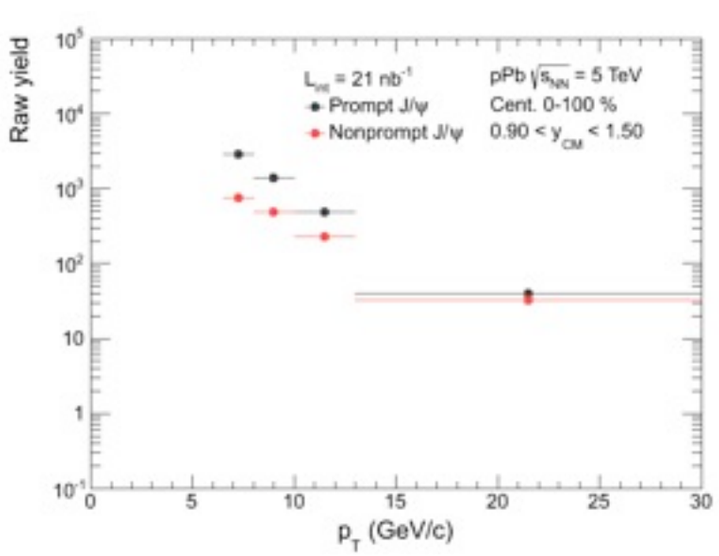


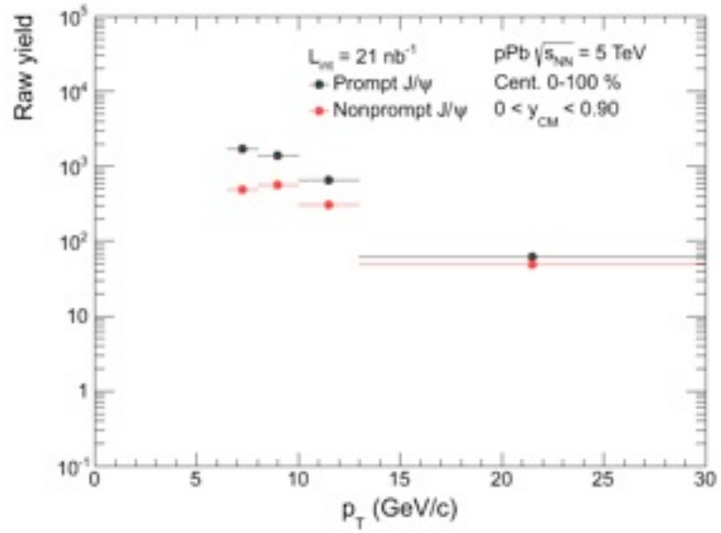


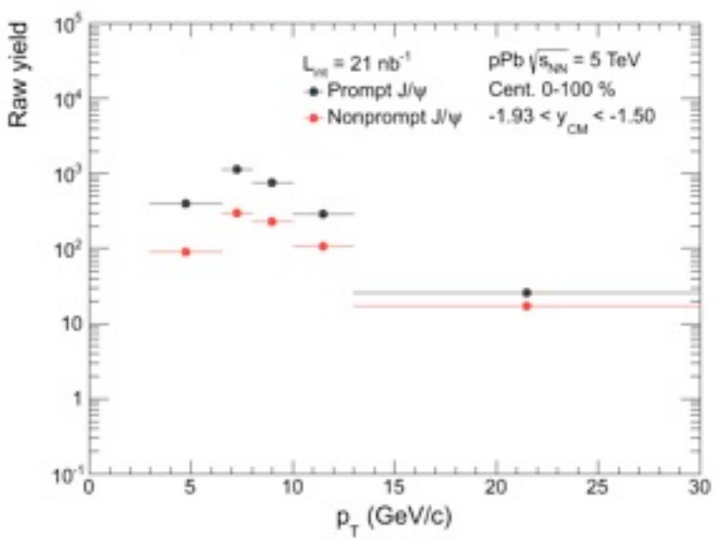
Binning 2 (pAJpsi_double_v2)

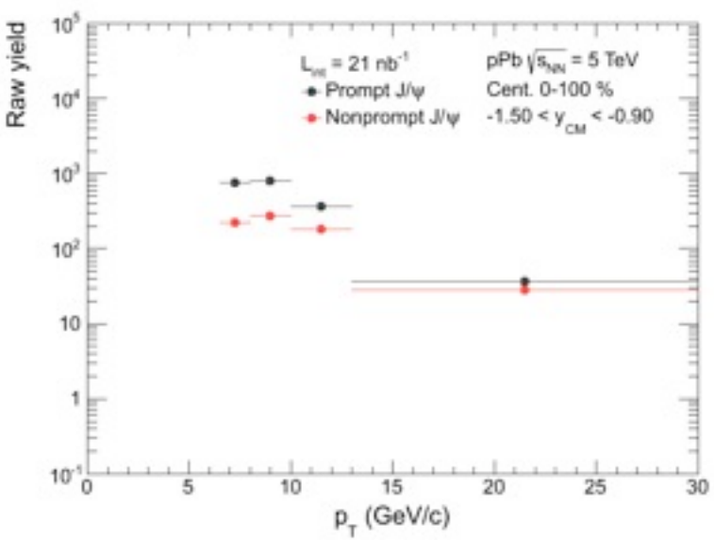
- **pPb fit results – pt dep**

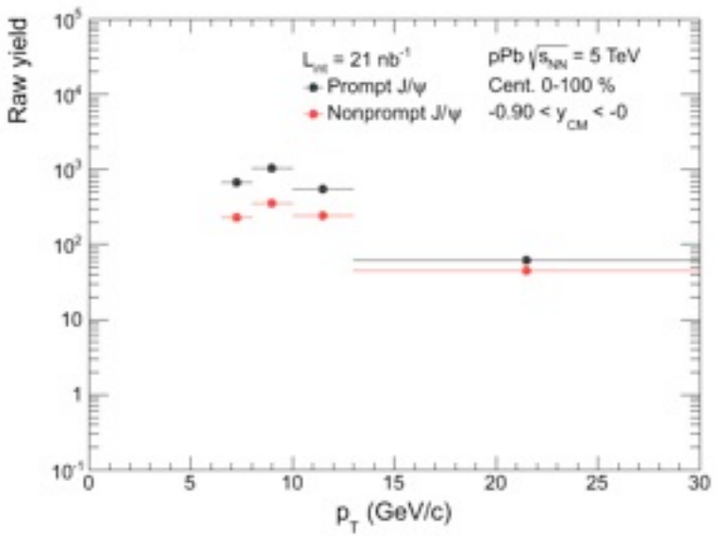






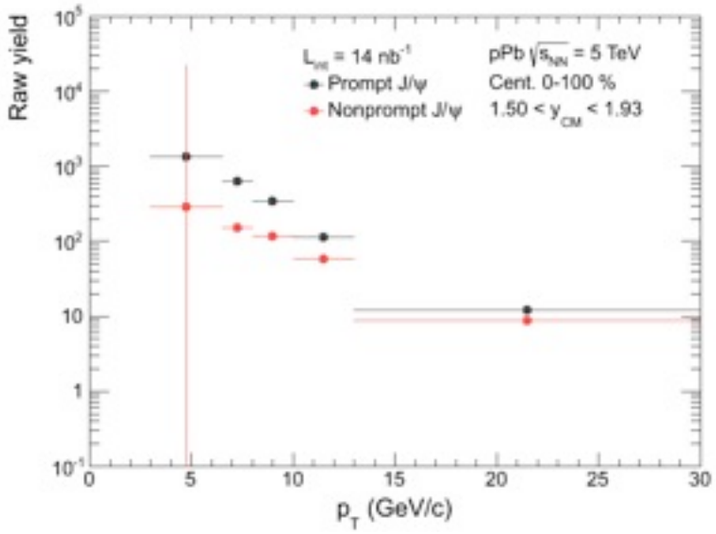


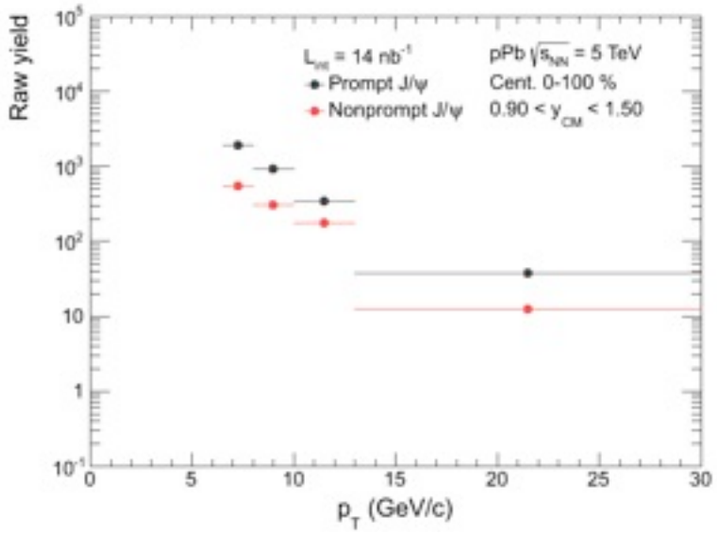


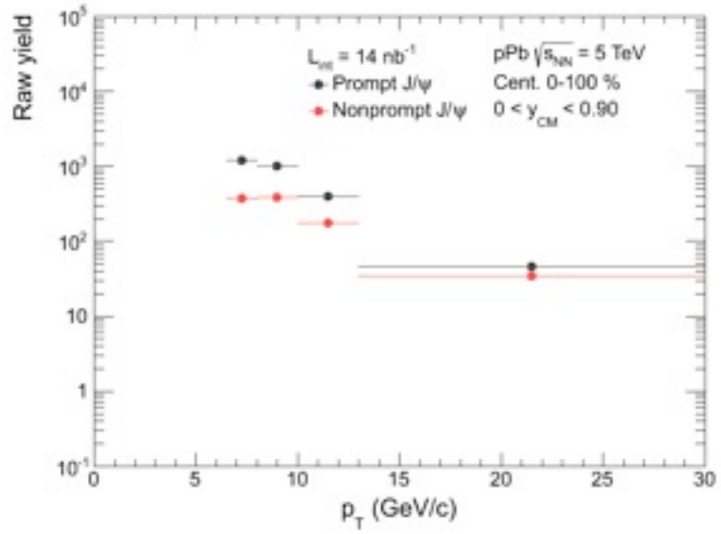


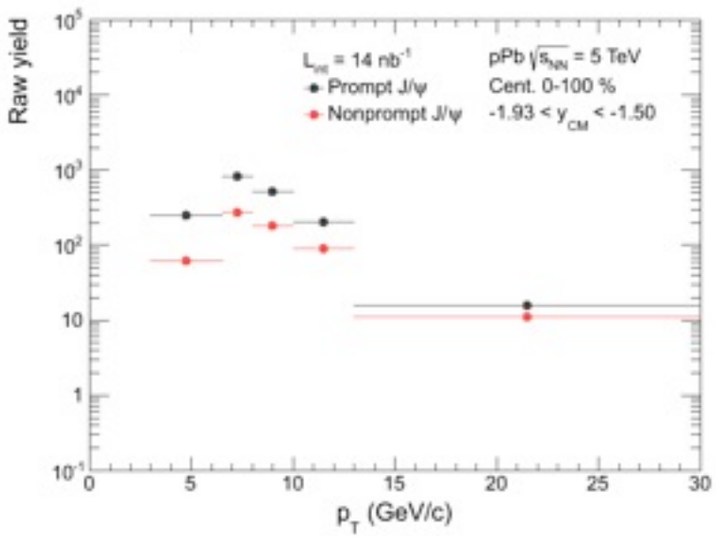
Binning 2 (pAJpsi_double_v2)

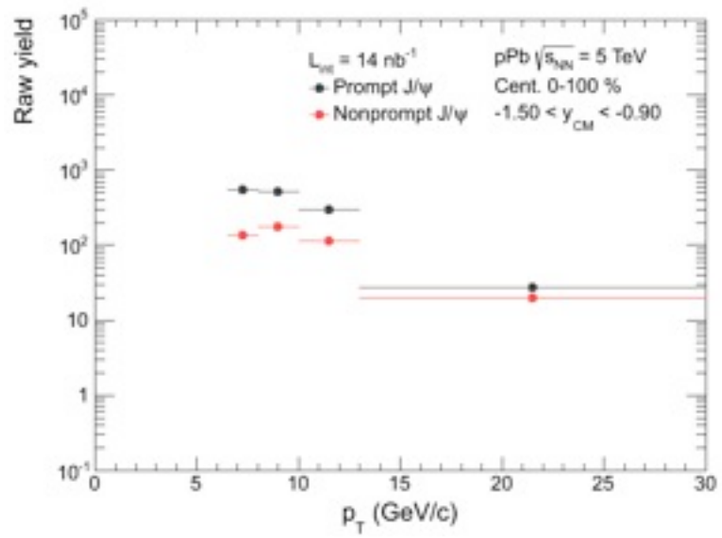
- **pPb fit results – pt dep**

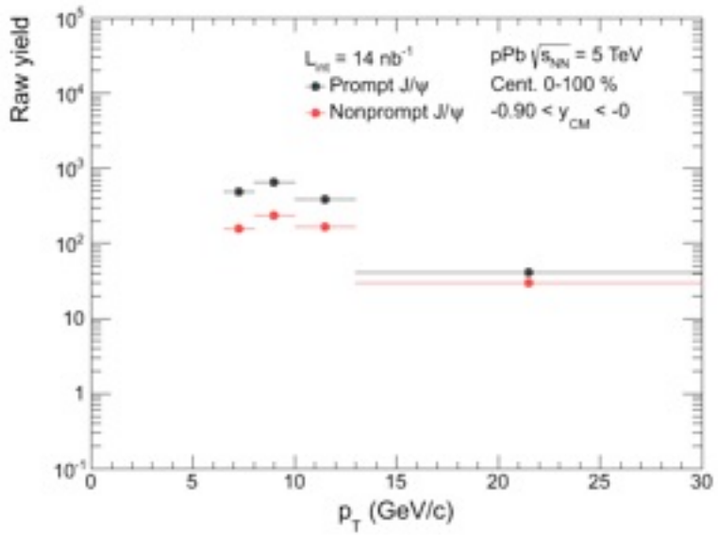






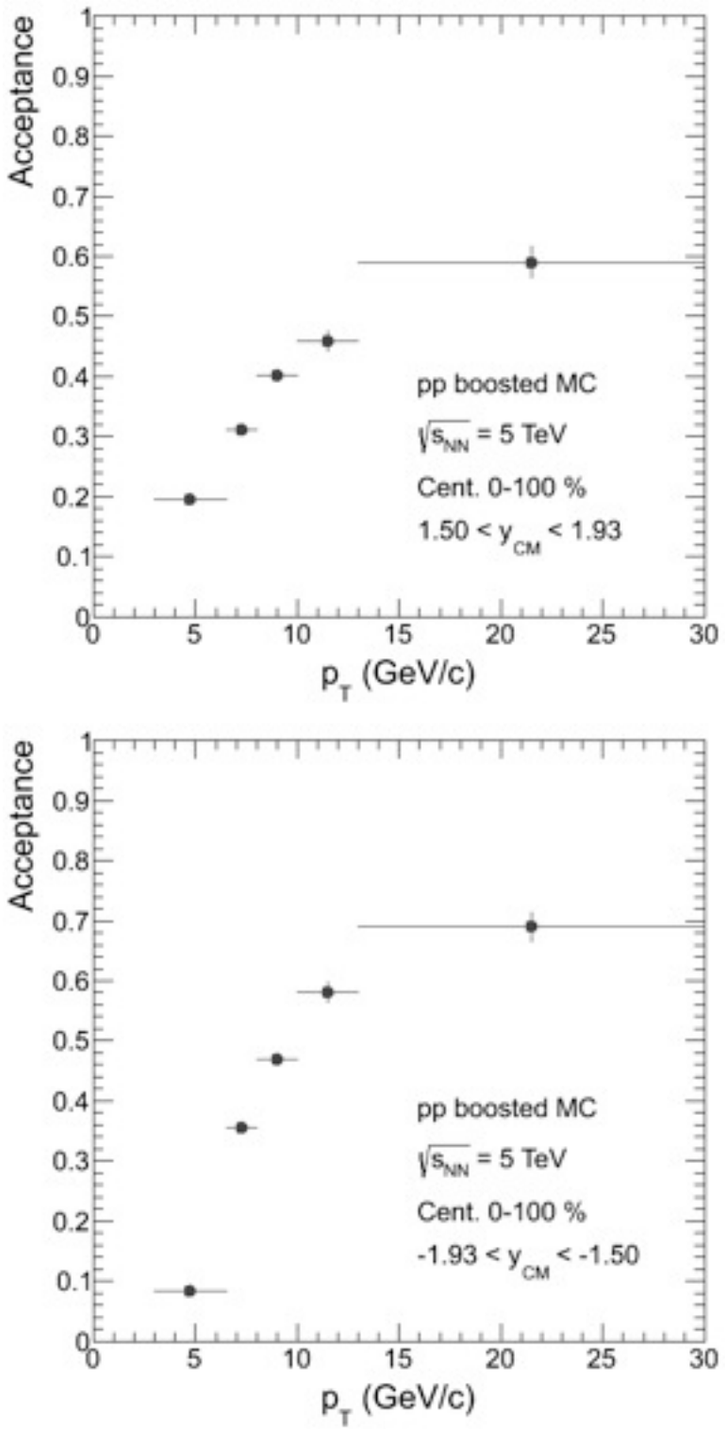


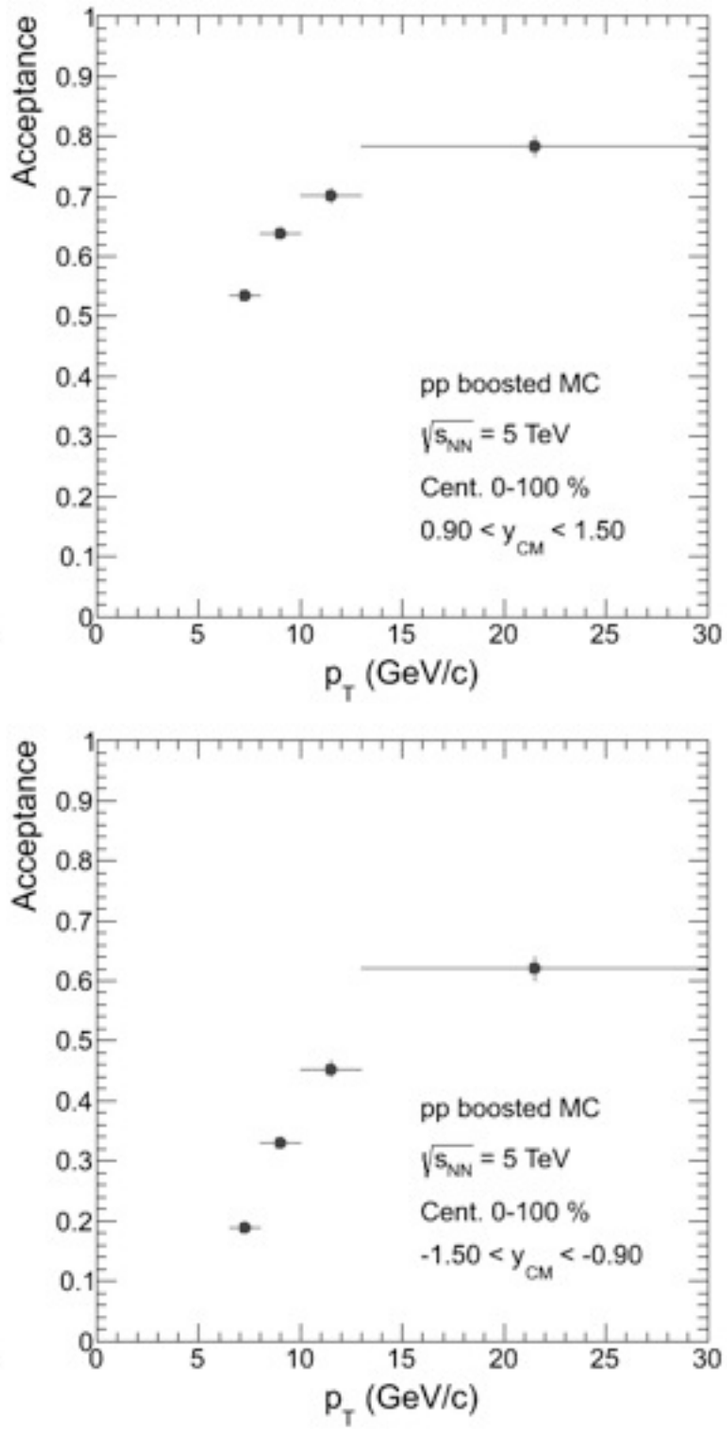


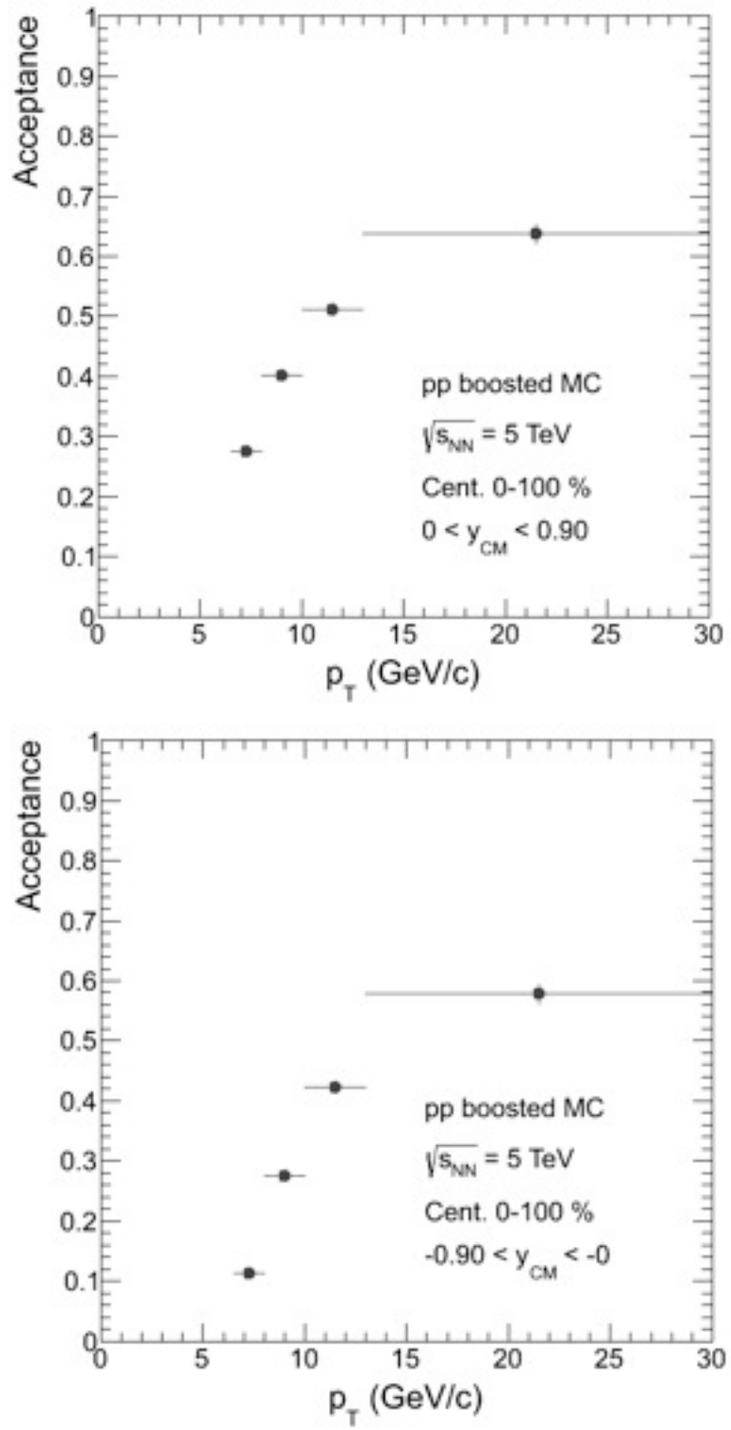


Binning 2 (pAJpsi_double_v2)

- **pPb fit results – pt dep**

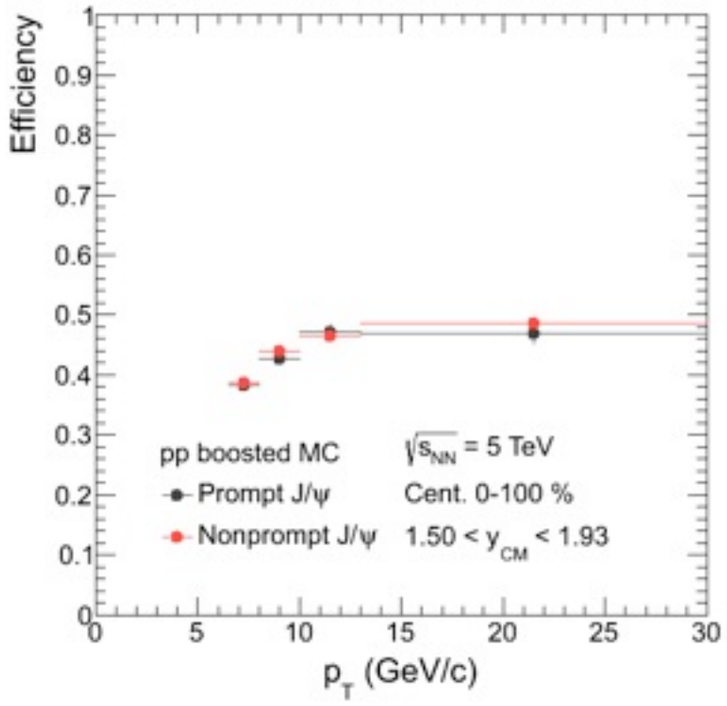


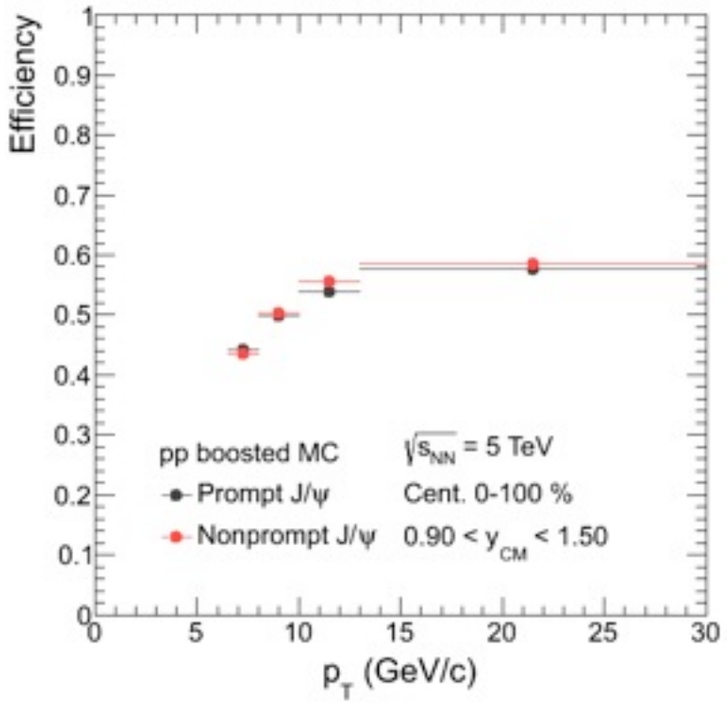


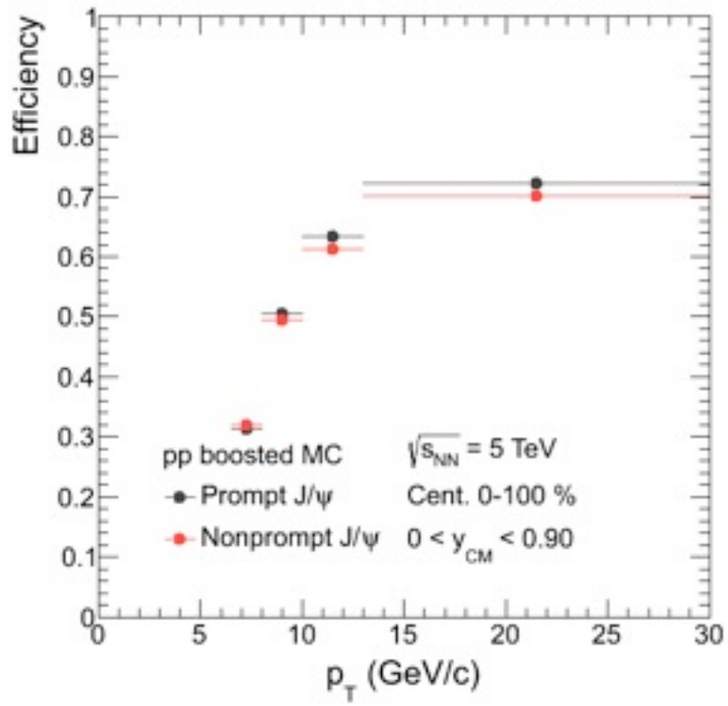


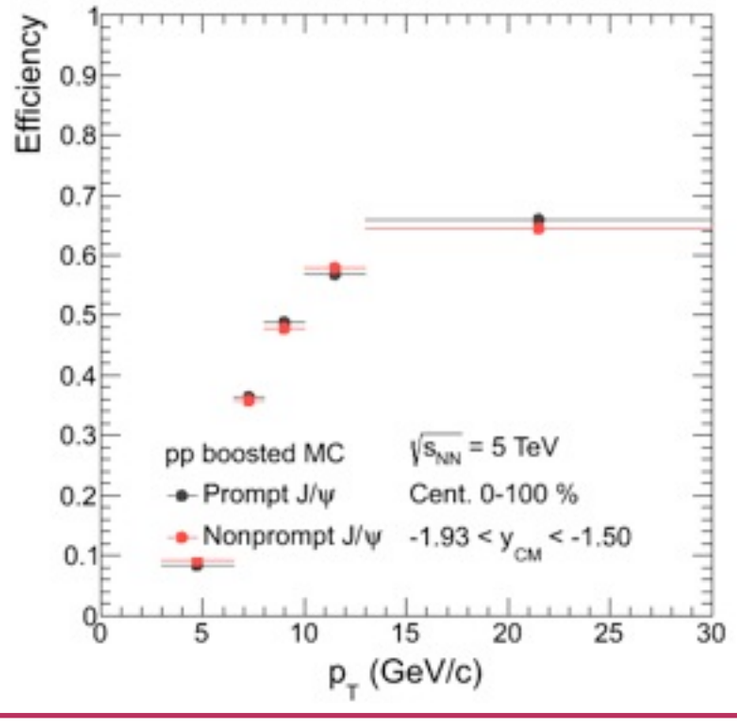
Binning 2 (pAJpsi_double_v2)

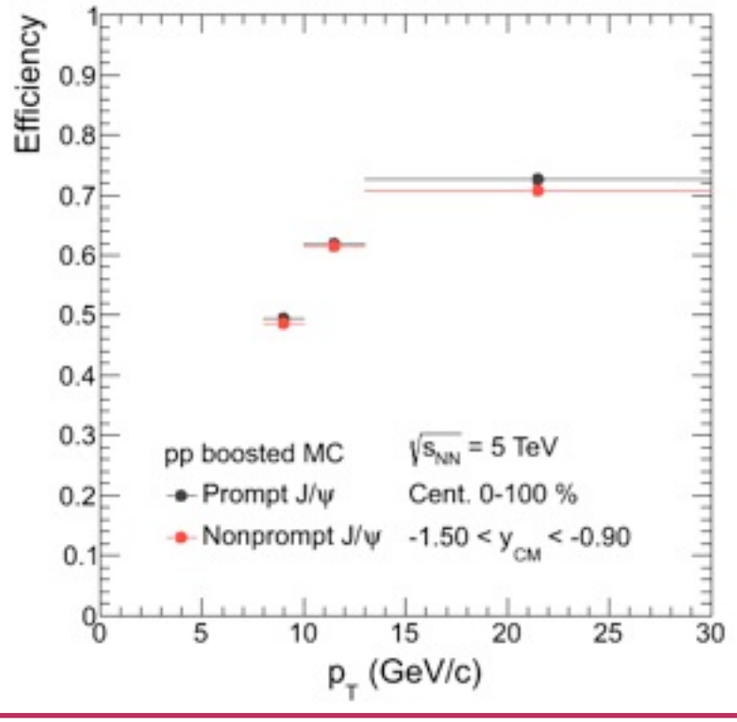
- **pPb fit results – pt dep**

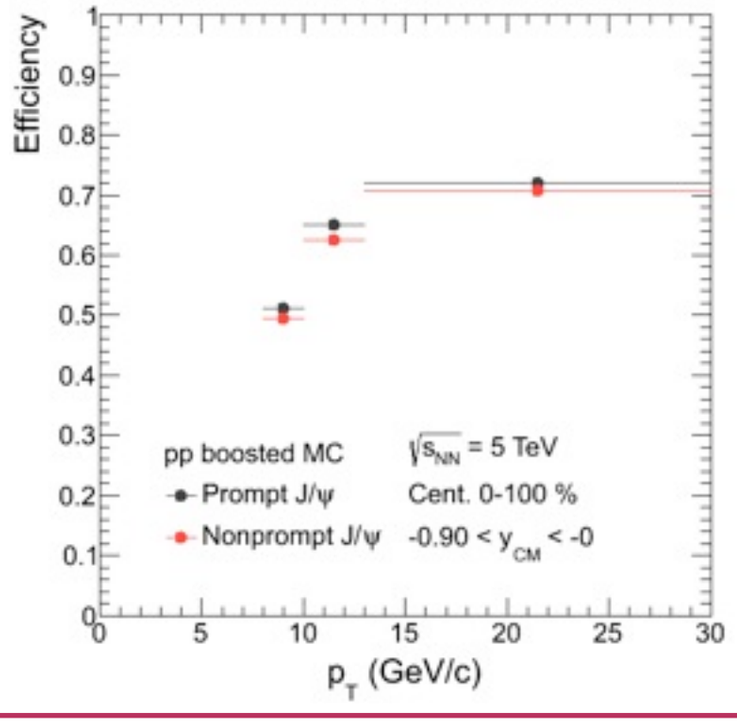






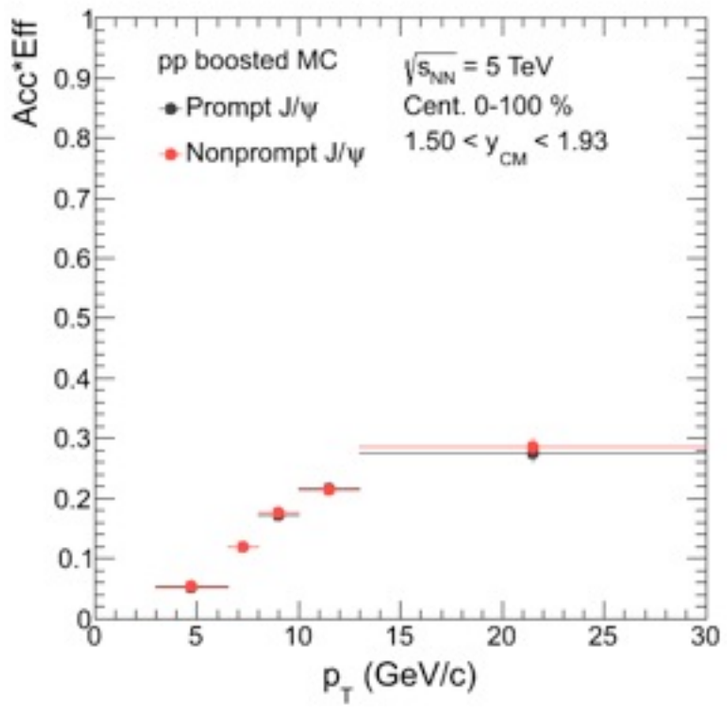


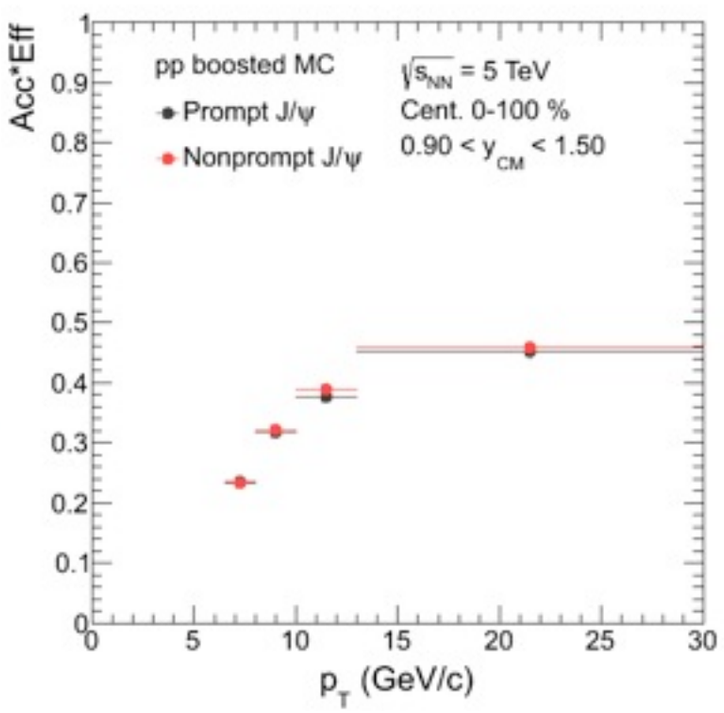


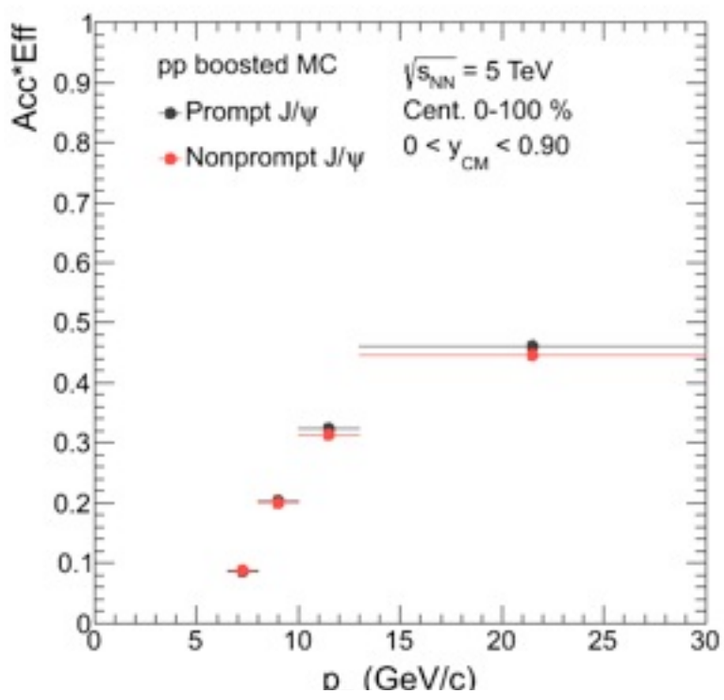


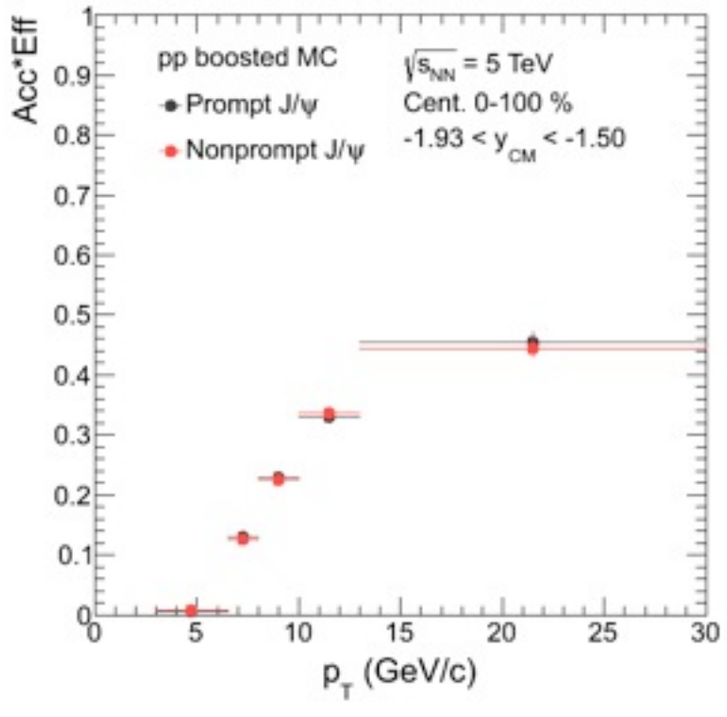
Binning 2 (pAJpsi_double_v2)

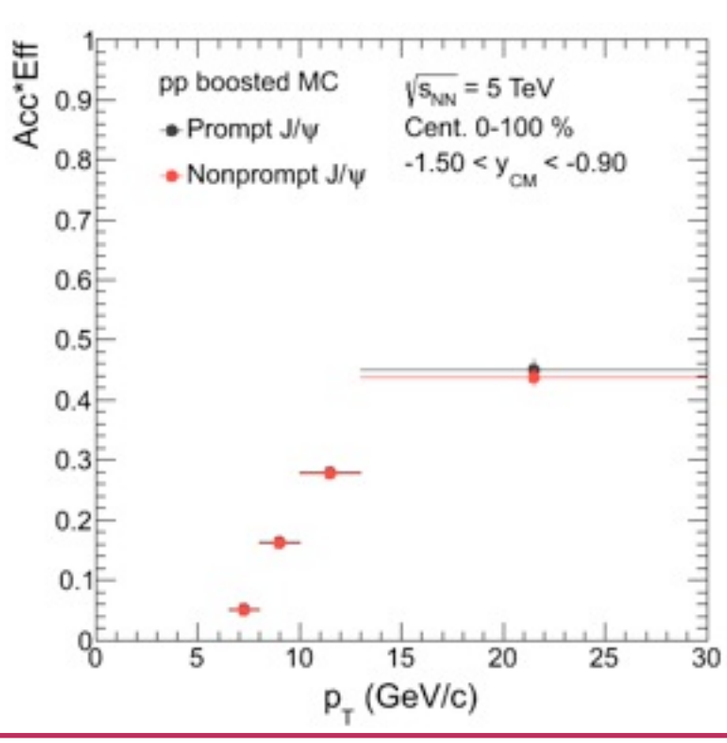
- **pPb fit results – pt dep**

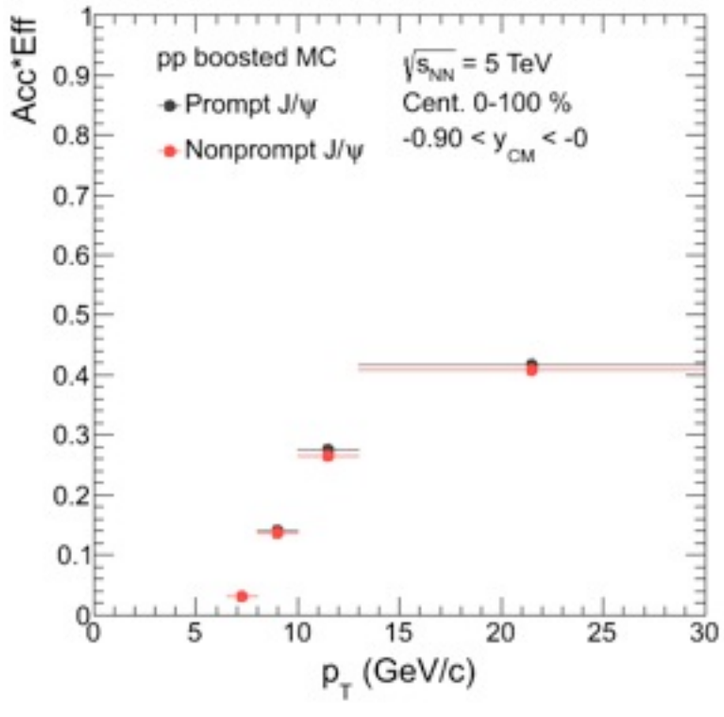




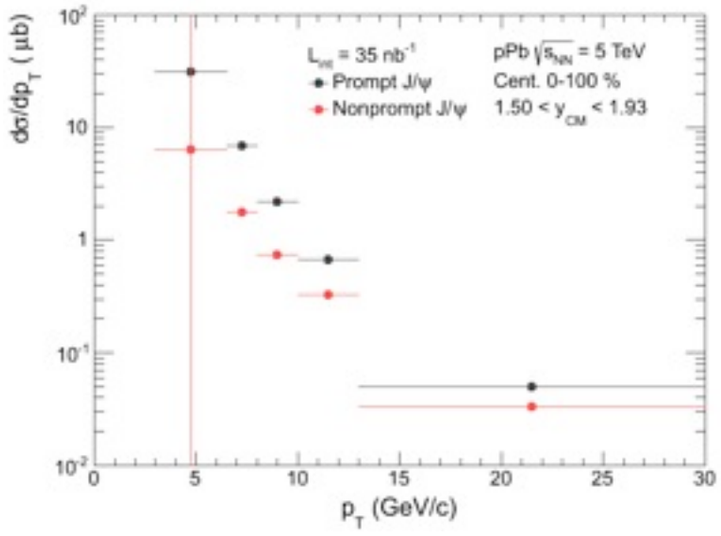


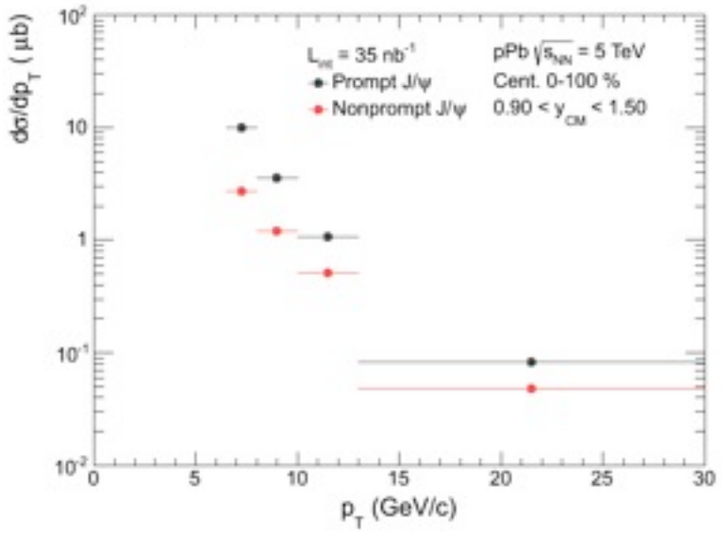


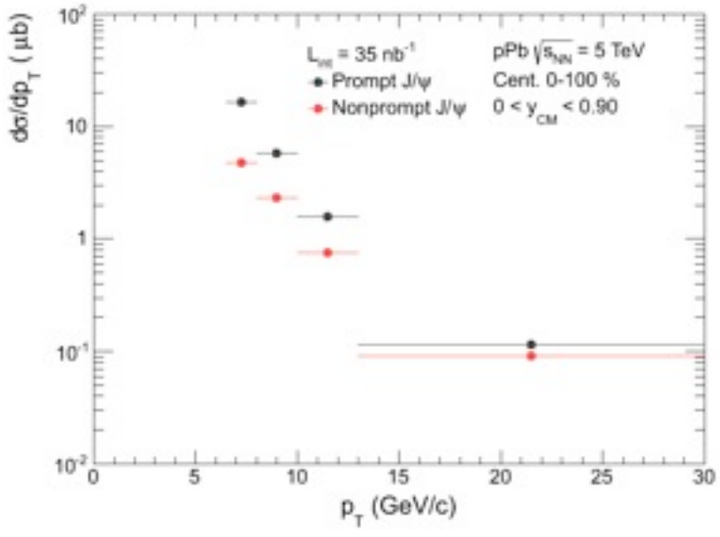


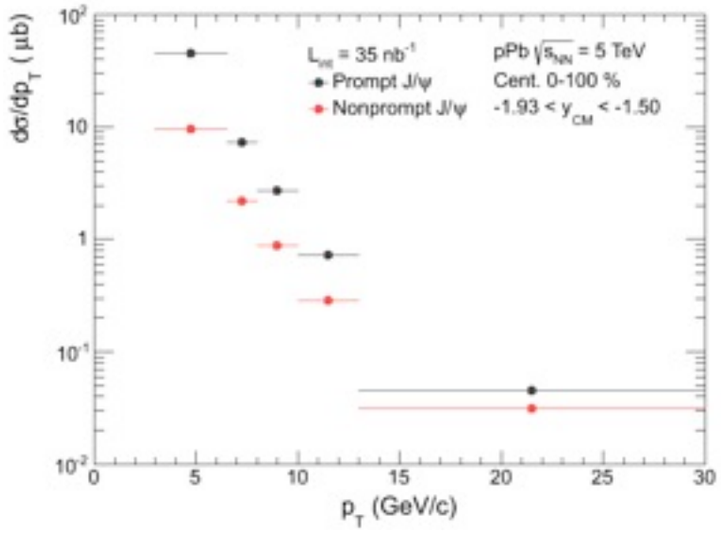


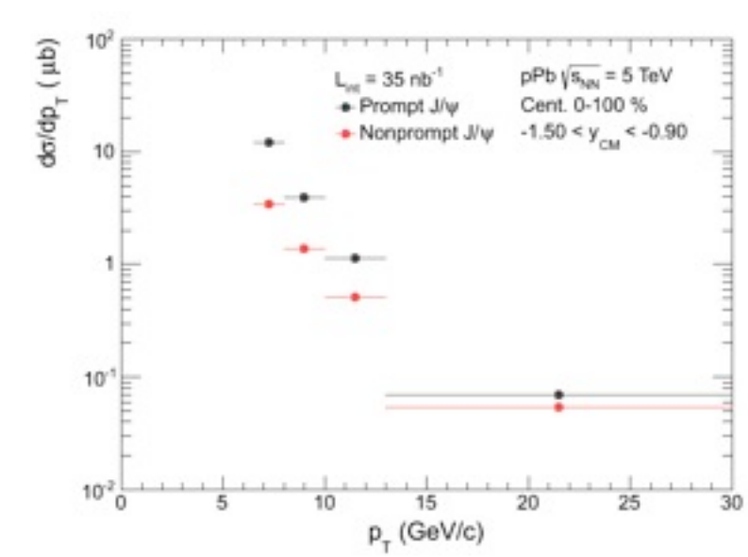
Binning 2 (pAJpsi_double_v2)

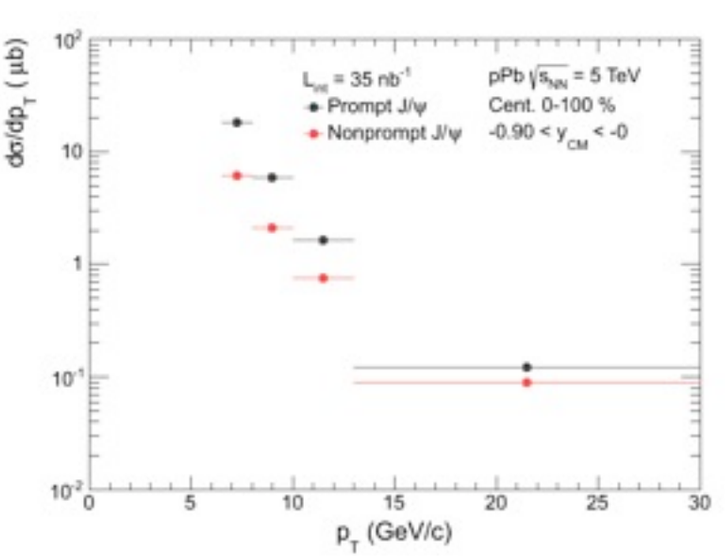








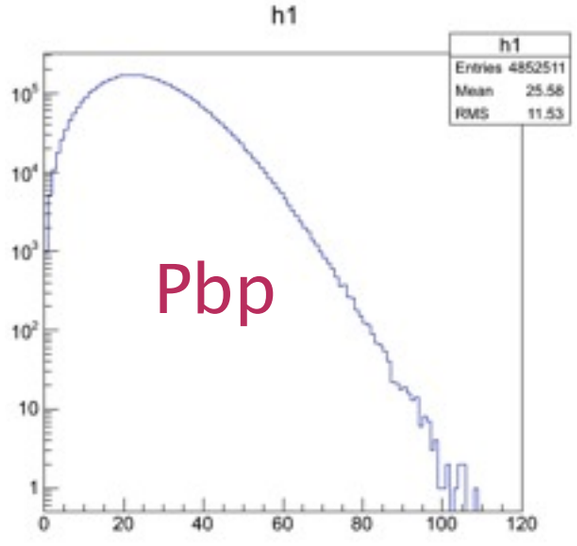


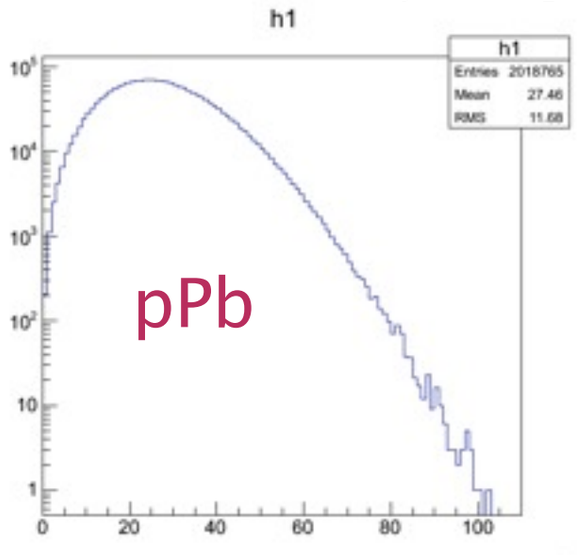


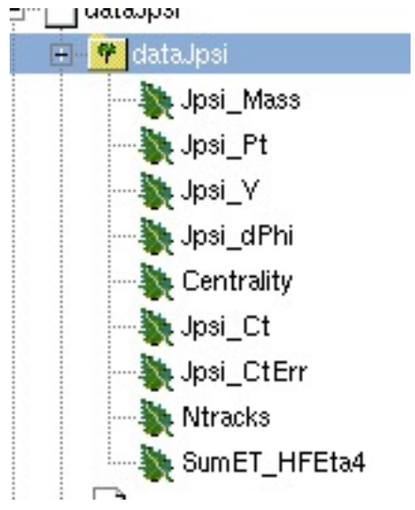
EtHF

Et HF

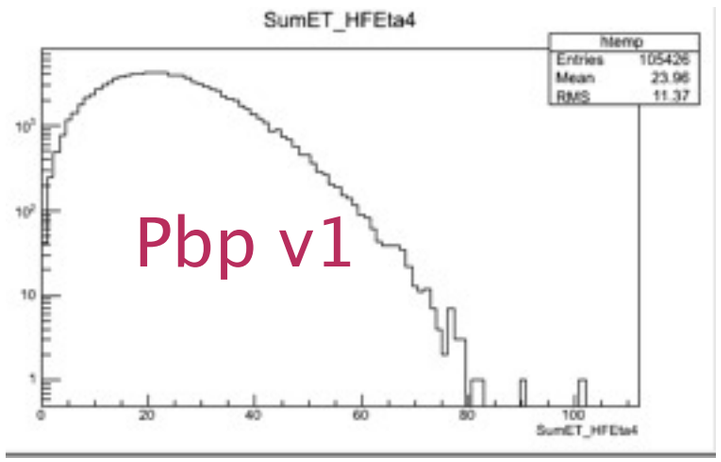
- **TTree : Pbp (v1 wrong 7 run included) + pPb**

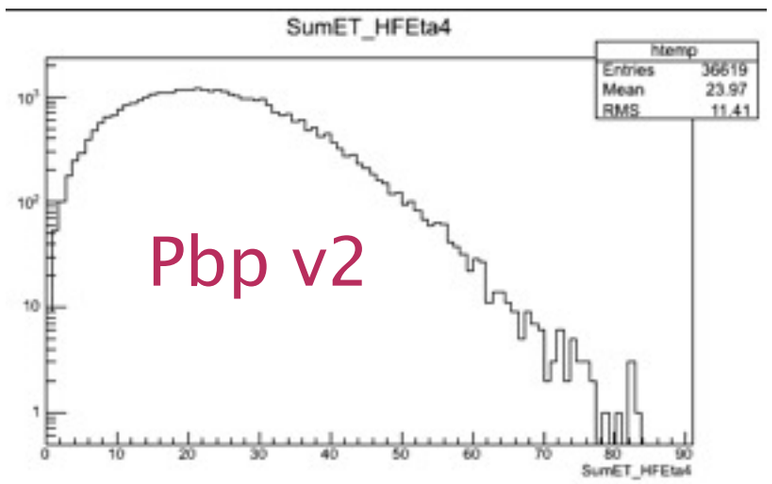


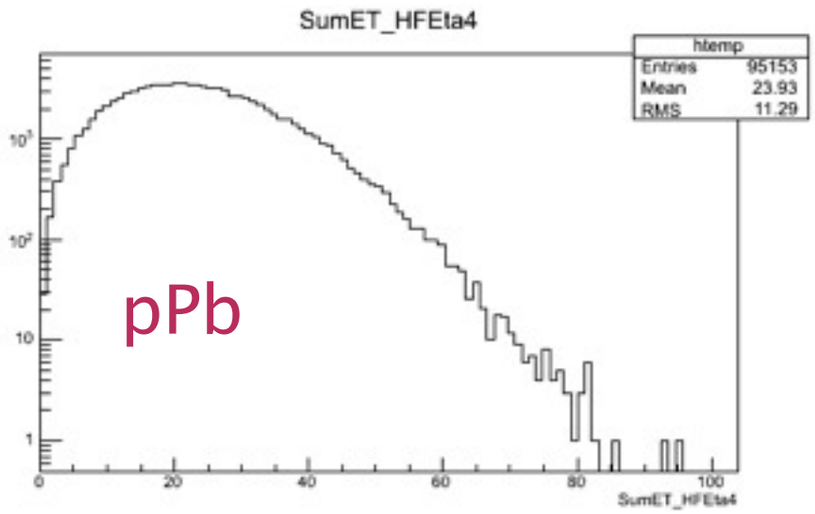




- **RooDataSet**

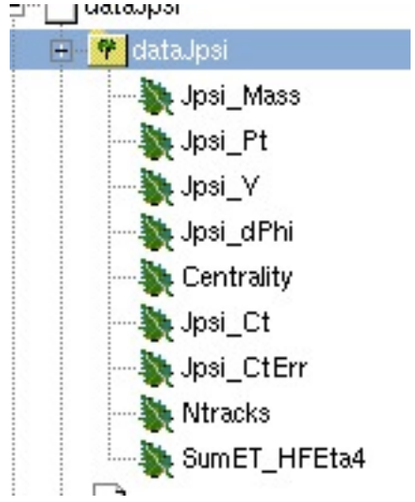






Ntracks

- **TTree : Pbp (v1 wrong 7 run included) + pPb**

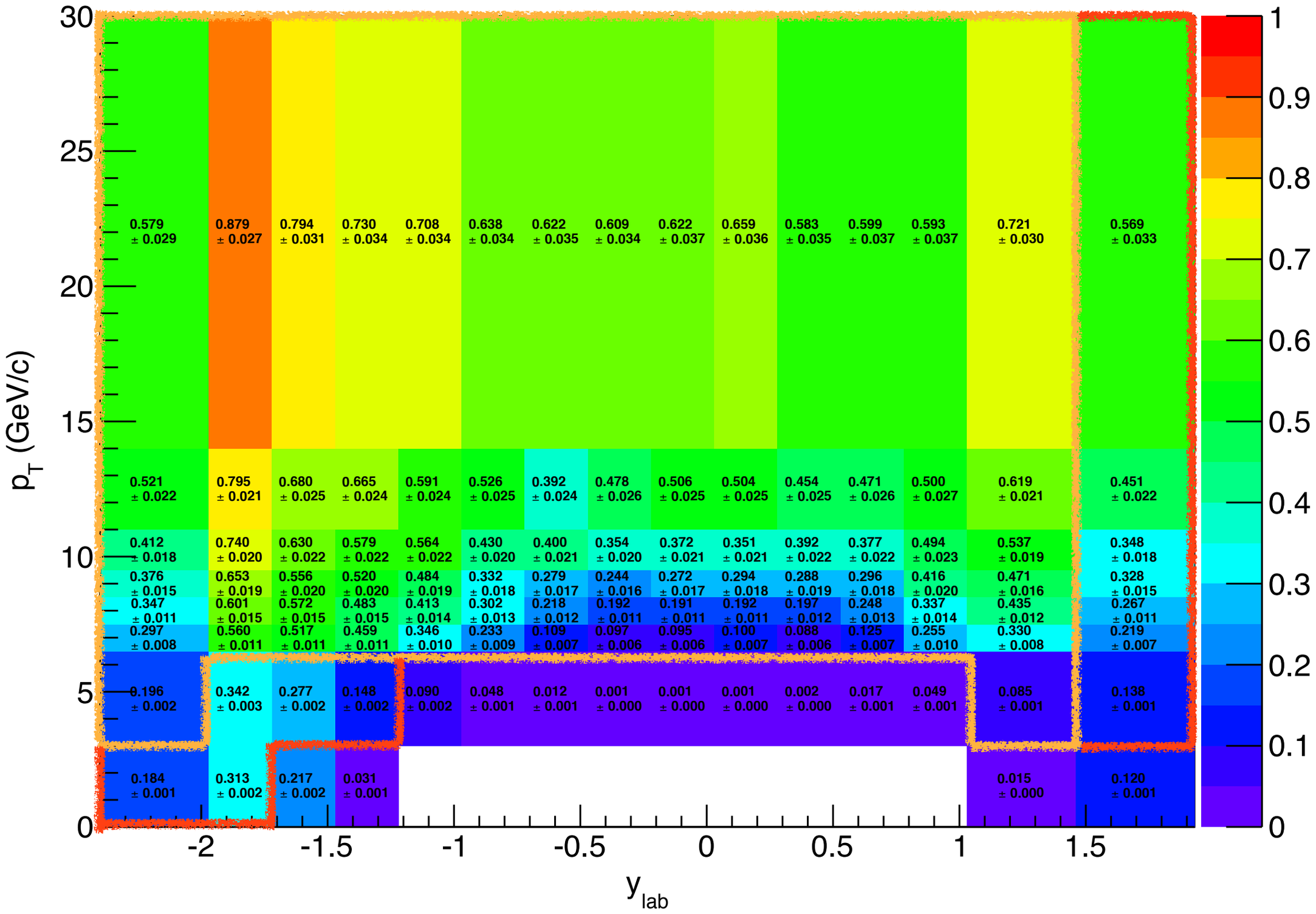


- **RooDataSet**

A. 2D correction

2D Acceptance & Efficiency

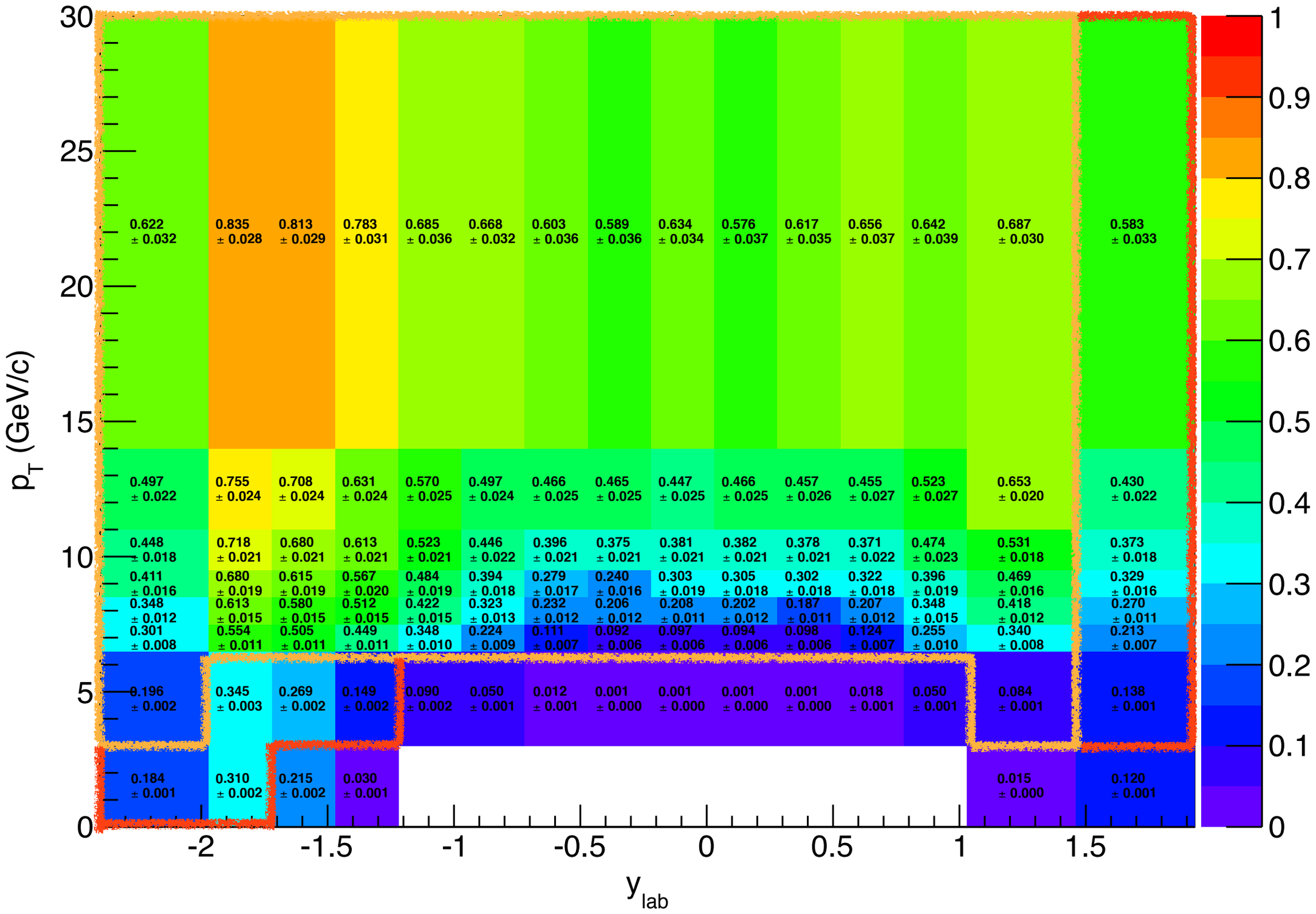
- **Acceptance (prompt) – not wrong but old**



2D Acceptance & Efficiency

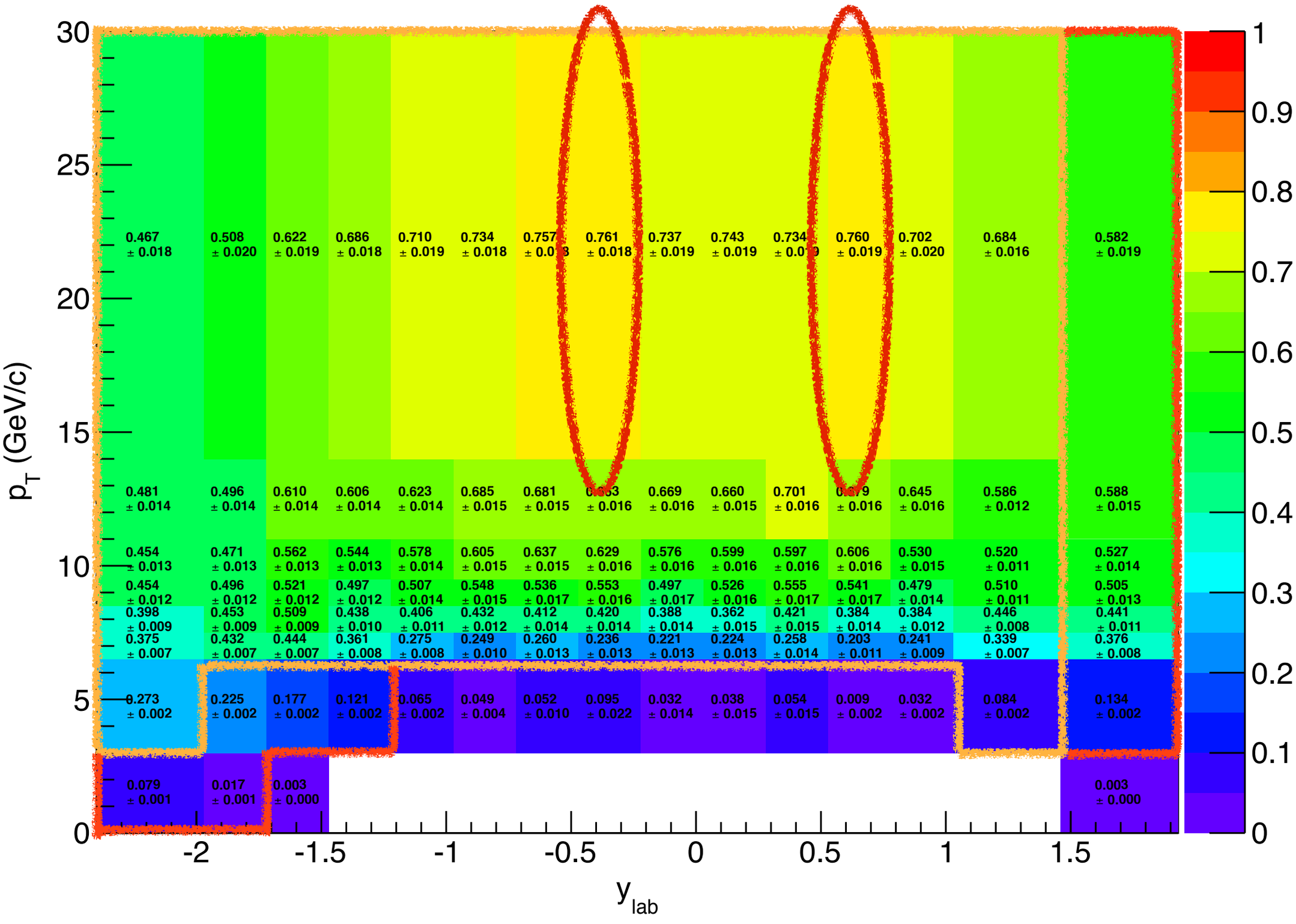
- **Acceptance (prompt)**

: For R_{FB} : For cross-section



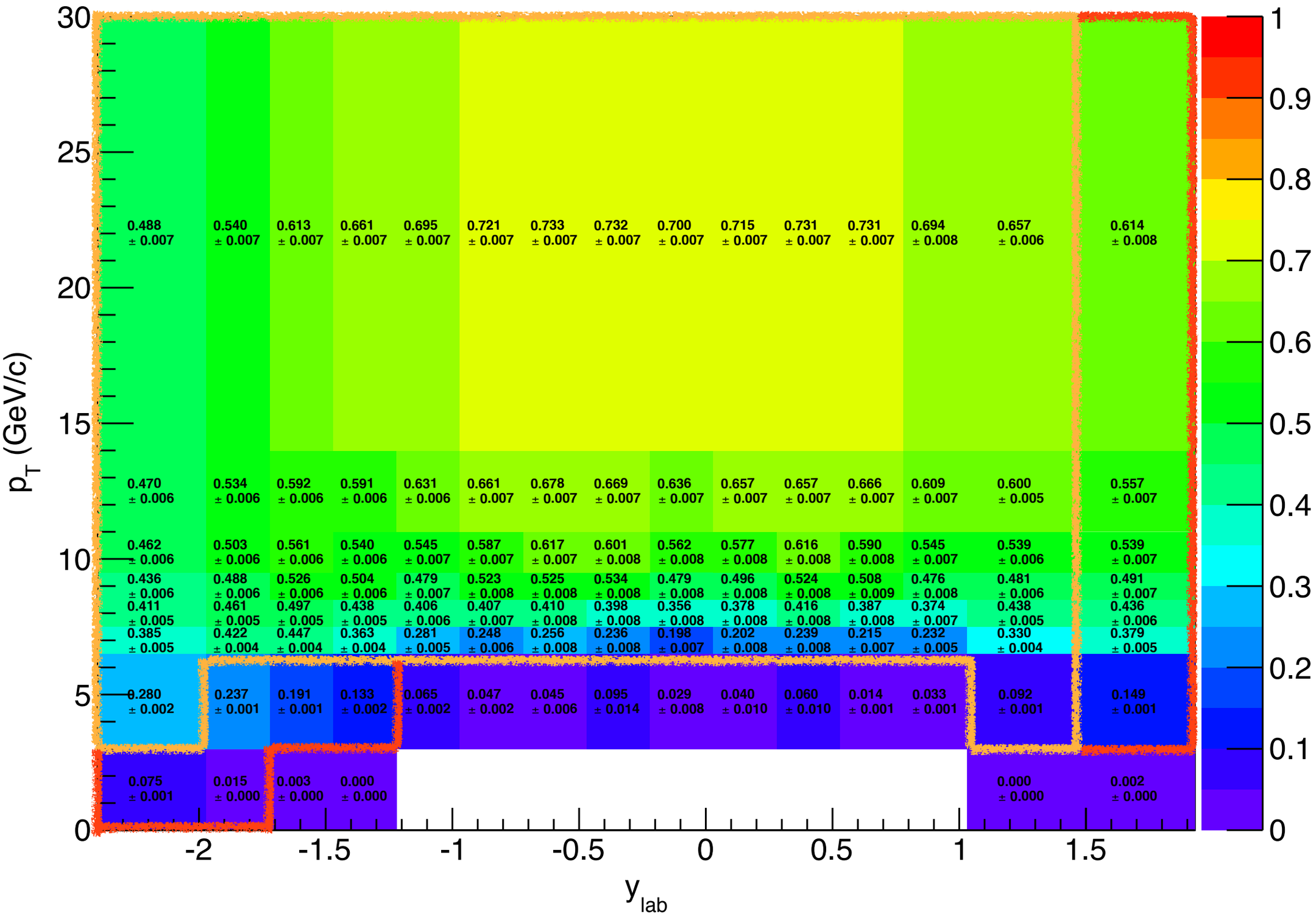
2D Acceptance & Efficiency

- **Efficiency (prompt)**



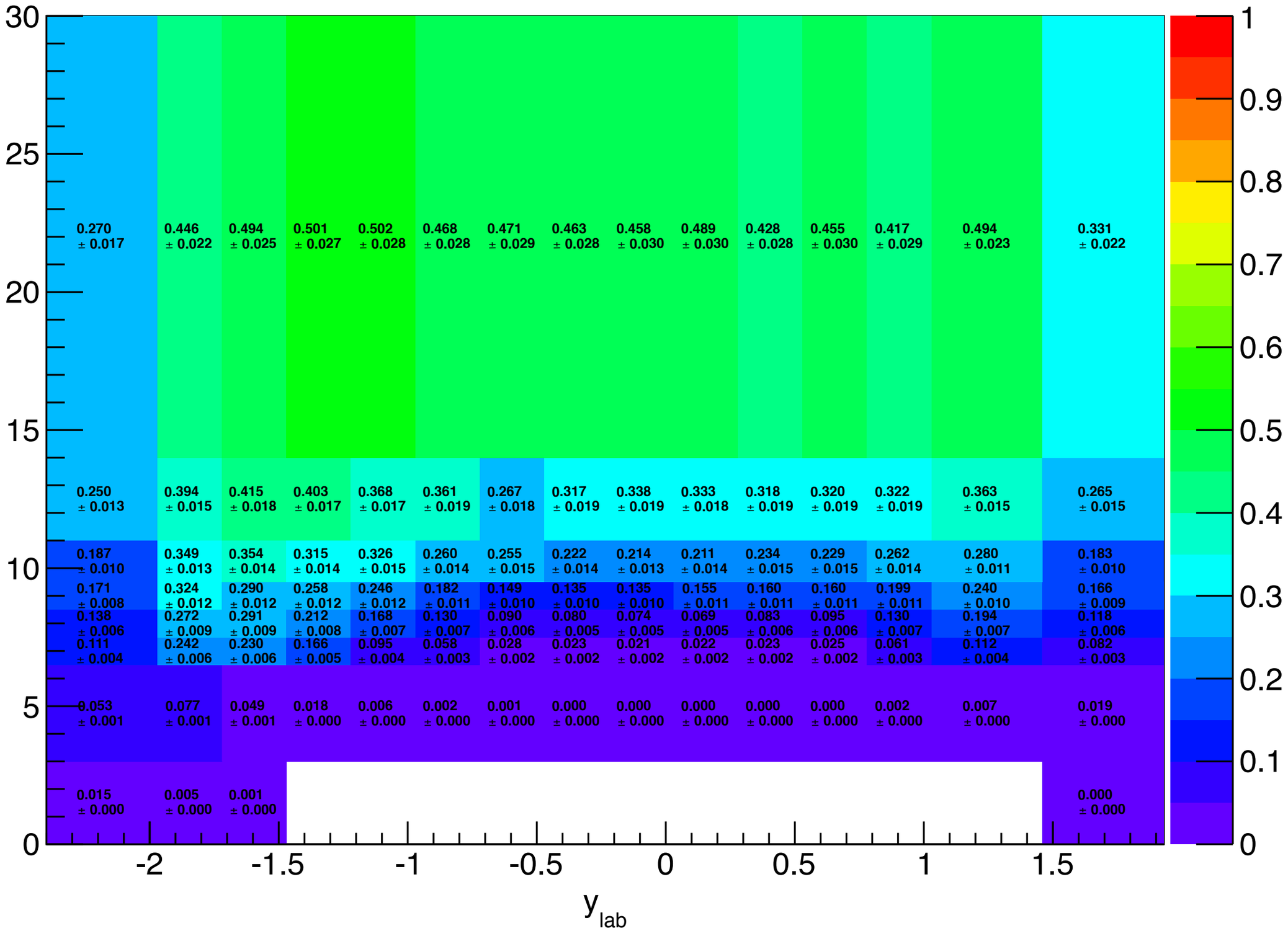
2D Acceptance & Efficiency

- **Efficiency (non-prompt)**



2D Acceptance & Efficiency

- **Acc*Eff (prompt)**



2D Acceptance & Efficiency

- **Acc*Eff (non-prompt)**