



5.19

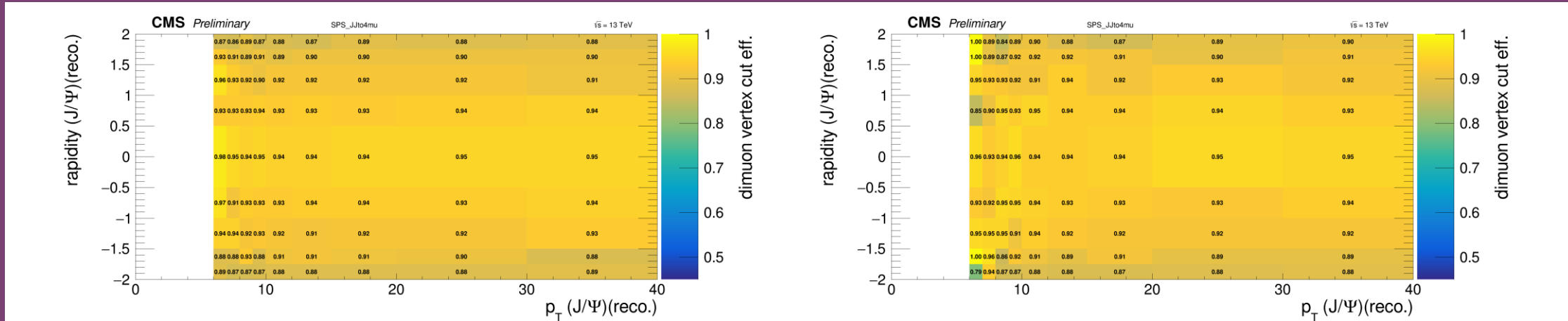
# Inclusive $J/\psi J/\psi$ Cross Section Measurement

Jinfeng Liu

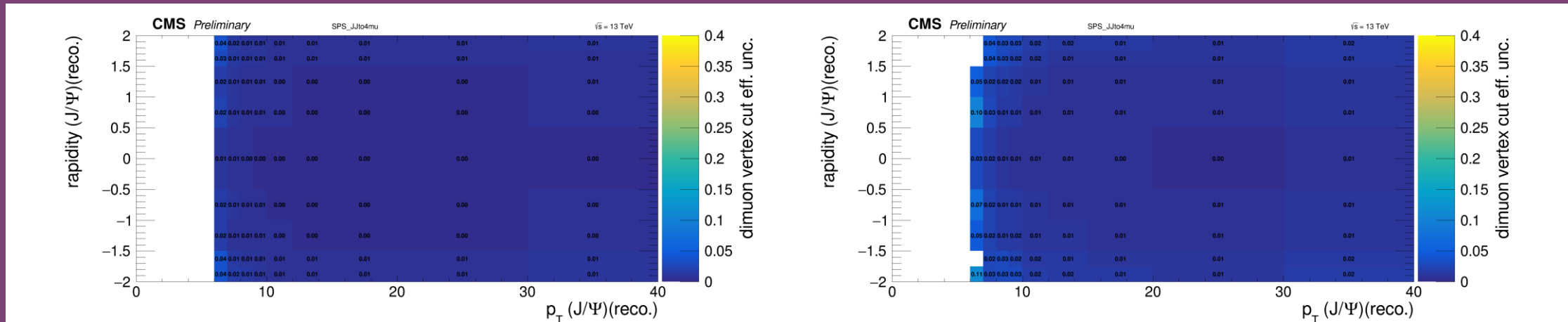




# Comparison between official and private samples



SPS\_vtx  
(A)



Private MC

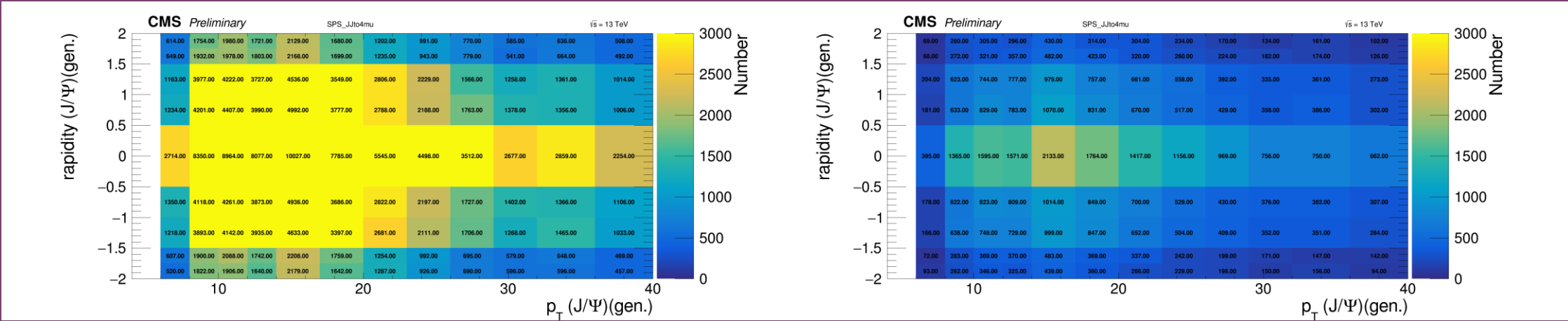
Official MC



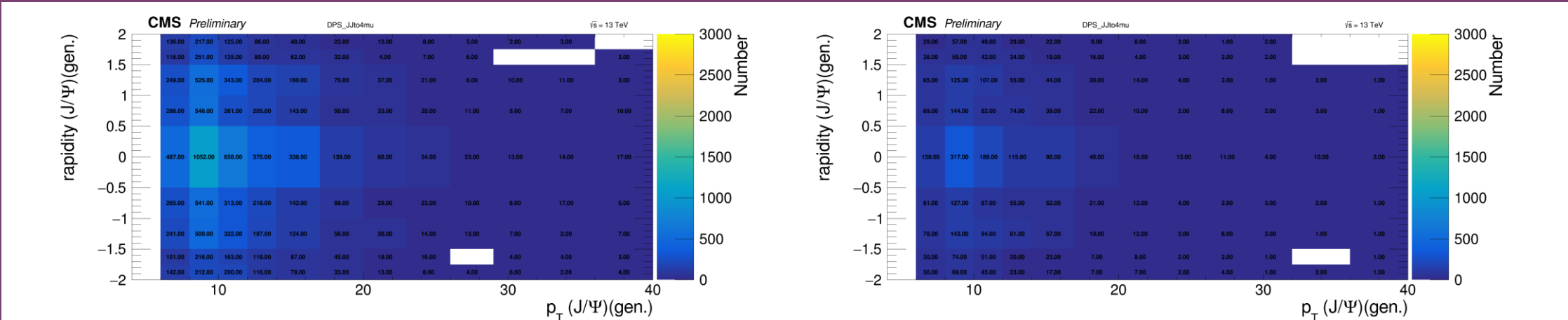
# Comparison between official and private samples

Number of event after GEN cuts ( $|\eta| < 2.4, p^T > 3.5\text{GeV}$ )

SPS (A)



DPS (A)



Private MC

Official MC



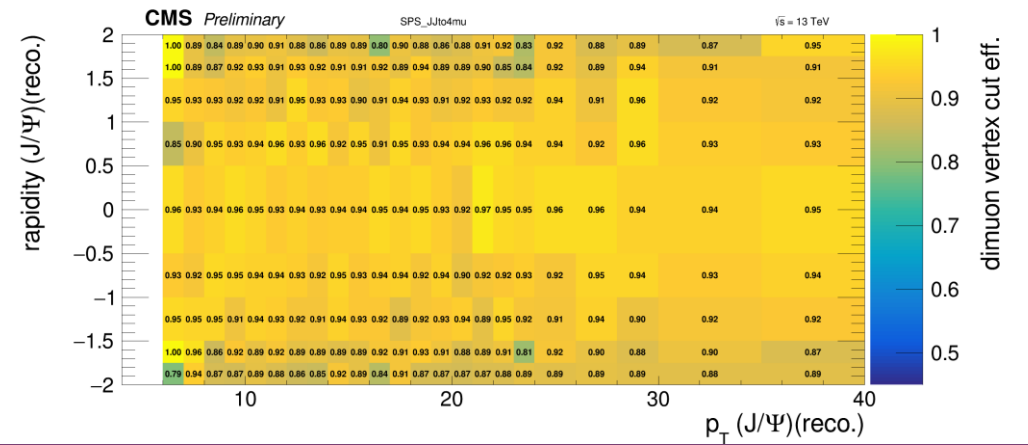
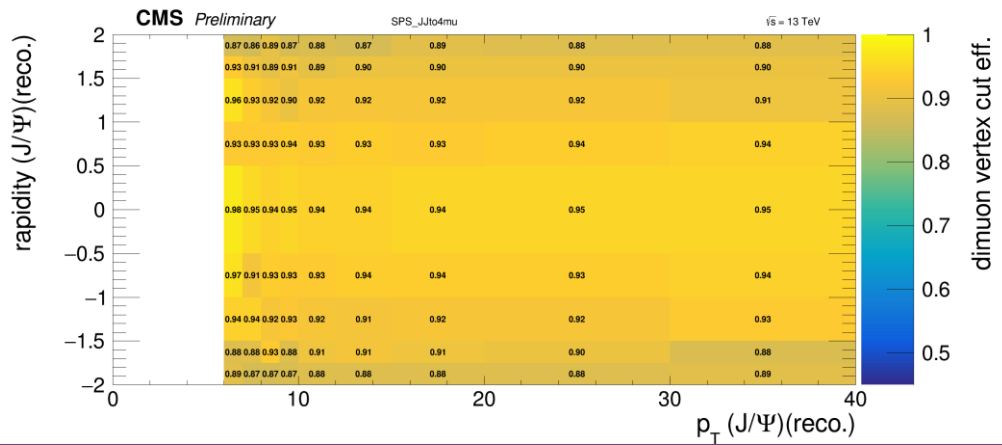
## Rebin

- Try to decrease the map bin width to reduce the uncertainty
- Low  $p^T$  range is omitted where no accepted event is found
- |0|1|2|3.5|5|6|7|8|9|10|12|15|20|30|40| →  
|4|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21|22|23|24|26|28|30|35|40|
- |0|2.5|5.0|7.5|10.0|20.0|40.0| →  
|4|6|7|8|9|10|12|14|16|17|18|19|20|21|22|23|24|26|30|40|



# Rebin

Rebin



SPS\_vtx  
(A)



Closure test  
(Private samples were used to test)

SPS

cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	618108.0	$617815.69^{+2076.99}_{-2071.17}$	$617744.02^{+2808.02}_{-2796.51}$
$p_T(\mu) > 3.5$	75253.0	$75871.53^{+2841.76}_{-2773.63}$	$77397.25^{+5567.27}_{-5333.5}$
$reco.(\mu)$	66966.0	$68805.23^{+4224.35}_{-4024.0}$	$70457.53^{+7249.89}_{-6731.64}$
$id.(\mu)$	66456.0	$67432.64^{+4837.15}_{-4557.88}$	$69081.48^{+7930.42}_{-7270.32}$
$vtx(\mu\mu)$	57694.0	$57711.88^{+6266.54}_{-5697.67}$	$59598.4^{+9712.47}_{-8501.28}$
$HLT$	43463.0	$43444.06^{+7636.44}_{-6637.08}$	$45023.22^{+10667.09}_{-8858.93}$
$4 \mu cuts$	38951.0	$38640.86^{+8681.99}_{-7234.44}$	$39980.52^{+11463.05}_{-9133.55}$

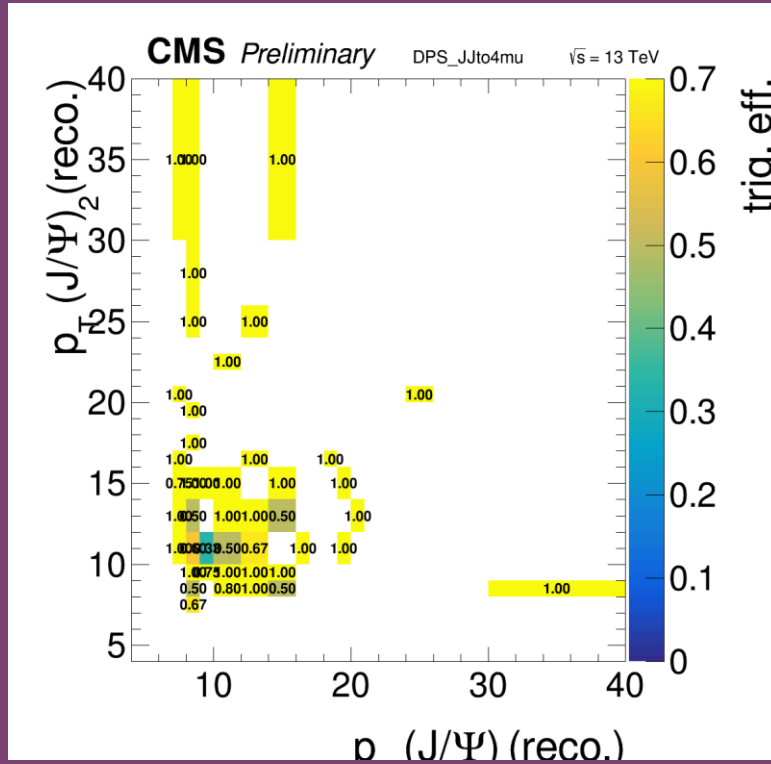
DPS

cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	15084.0	$15268.43^{+52.5}_{-52.4}$	$15265.33^{+62.32}_{-62.19}$
$p_T(\mu) > 3.5$	118.0	$118.55^{+5.02}_{-4.89}$	$120.52^{+8.72}_{-8.36}$
$reco.(\mu)$	110.0	$104.65^{+7.39}_{-6.98}$	$106.56^{+11.59}_{-10.68}$
$id.(\mu)$	106.0	$102.56^{+8.36}_{-7.79}$	$104.47^{+12.66}_{-11.52}$
$vtx(\mu\mu)$	87.0	$87.38^{+10.6}_{-9.51}$	$89.67^{+15.46}_{-13.39}$
$HLT$	64.0	$60.6^{+12.14}_{-10.31}$	$62.55^{+16.53}_{-13.44}$
$4 \mu cuts$	55.0	$53.71^{+13.57}_{-11.0}$	$55.52^{+17.54}_{-13.67}$

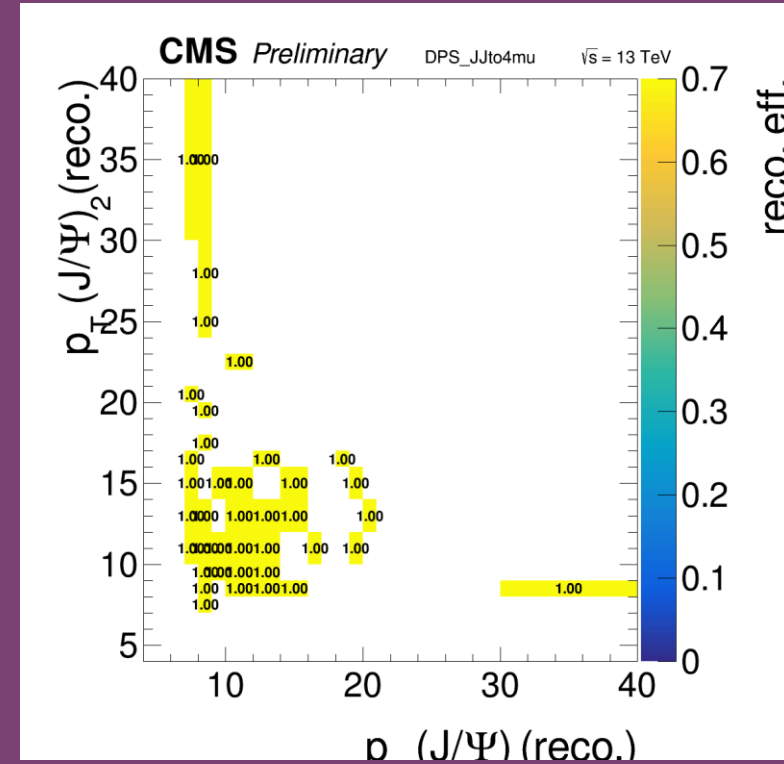


# Rebin

NOT available



DPS\_trg



DPS\_evt



# Rebin

cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (DPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	1247937.0	$1246433.6^{+4167.48}_{-4157.44}$	$1247315.43^{+8454.32}_{-8400.47}$	$1246609.23^{+5023.21}_{-5008.06}$
$p_T(\mu) > 3.5$	75253.0	$75577.98^{+1625.37}_{-1601.87}$	$81466.4^{+10654.64}_{-9826.63}$	$76728.35^{+3343.95}_{-3252.68}$
$reco.(\mu)$	67343.0	$68524.68^{+2433.94}_{-2358.7}$	$74921.16^{+14153.57}_{-12355.8}$	$69768.37^{+4572.66}_{-4345.86}$
$id.(\mu)$	66456.0	$67157.24^{+2800.05}_{-2691.6}$	$73535.48^{+15172.68}_{-13068.69}$	$68399.02^{+5039.02}_{-4744.61}$
$vtx(\mu\mu)$	57694.0	$57474.2^{+3546.01}_{-3336.67}$	$65806.78^{+18951.31}_{-15151.62}$	$59015.65^{+6202.3}_{-5657.65}$
$HLT$	43463.0	$43233.9^{+3164.93}_{-2933.81}$	$52660.2^{+24007.01}_{-17520.8}$	$44947.35^{+6551.87}_{-5792.63}$
$4 \mu cuts$	33374.0	$38429.38^{+3157.76}_{-2890.11}$	$29860.48^{+21873.58}_{-14517.55}$	$37645.32^{+6524.83}_{-5660.09}$

SPS

↓ Rebin

cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	618108.0	$617815.69^{+2076.99}_{-2071.17}$	$617744.02^{+2808.02}_{-2796.51}$
$p_T(\mu) > 3.5$	75253.0	$75871.53^{+2841.76}_{-2773.63}$	$77397.25^{+5567.27}_{-5333.5}$
$reco.(\mu)$	66966.0	$68805.23^{+4224.35}_{-4024.0}$	$70457.53^{+7249.89}_{-6731.64}$
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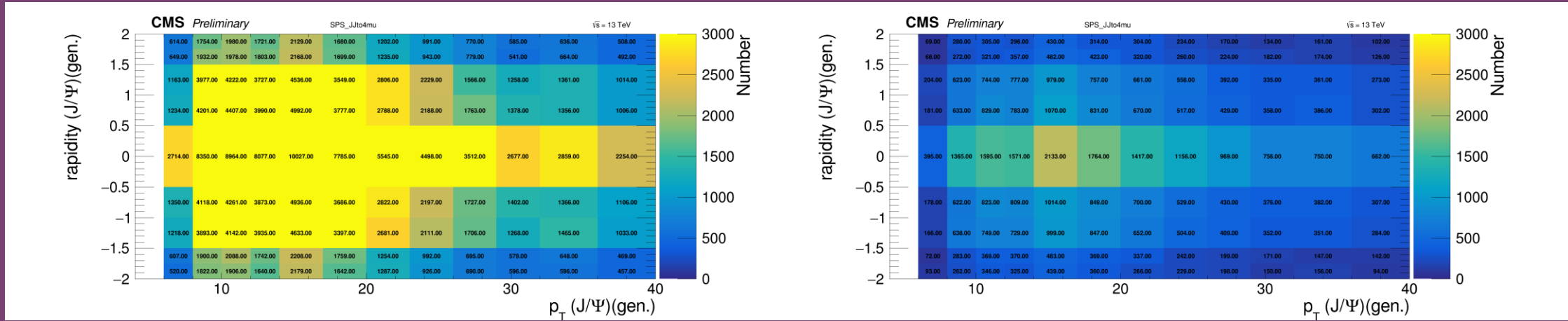
# Proposal to use private samples

	Private MC	Official MC																																
SPS	<table border="1"><thead><tr><th>cut</th><th><math>N_{obs}</math></th></tr></thead><tbody><tr><td><math> \eta(\mu)  &lt; 2.4</math></td><td>618108.0</td></tr><tr><td><math>p_T(\mu) &gt; 3.5</math></td><td>75253.0</td></tr><tr><td><math>reco.(\mu)</math></td><td>66966.0</td></tr><tr><td><math>id.(\mu)</math></td><td>66456.0</td></tr><tr><td><math>vtx(\mu\mu)</math></td><td>57694.0</td></tr><tr><td><math>HLT</math></td><td>43463.0</td></tr><tr><td><math>4 \mu cuts</math></td><td>38951.0</td></tr></tbody></table>	cut	$N_{obs}$	$ \eta(\mu)  < 2.4$	618108.0	$p_T(\mu) > 3.5$	75253.0	$reco.(\mu)$	66966.0	$id.(\mu)$	66456.0	$vtx(\mu\mu)$	57694.0	$HLT$	43463.0	$4 \mu cuts$	38951.0	<table border="1"><thead><tr><th>cut</th><th><math>N_{obs}</math></th></tr></thead><tbody><tr><td><math> \eta(\mu)  &lt; 2.4</math></td><td>88670.0</td></tr><tr><td><math>p_T(\mu) &gt; 3.5</math></td><td>27005.0</td></tr><tr><td><math>reco.(\mu)</math></td><td>24120.0</td></tr><tr><td><math>id.(\mu)</math></td><td>23852.0</td></tr><tr><td><math>vtx(\mu\mu)</math></td><td>20658.0</td></tr><tr><td><math>HLT</math></td><td>15581.0</td></tr><tr><td><math>4 \mu cuts</math></td><td>13856.0</td></tr></tbody></table>	cut	$N_{obs}$	$ \eta(\mu)  < 2.4$	88670.0	$p_T(\mu) > 3.5$	27005.0	$reco.(\mu)$	24120.0	$id.(\mu)$	23852.0	$vtx(\mu\mu)$	20658.0	$HLT$	15581.0	$4 \mu cuts$	13856.0
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DPS	<table border="1"><thead><tr><th>cut</th><th><math>N_{obs}</math></th></tr></thead><tbody><tr><td><math> \eta(\mu)  &lt; 2.4</math></td><td>15084.0</td></tr><tr><td><math>p_T(\mu) &gt; 3.5</math></td><td>118.0</td></tr><tr><td><math>reco.(\mu)</math></td><td>110.0</td></tr><tr><td><math>id.(\mu)</math></td><td>106.0</td></tr><tr><td><math>vtx(\mu\mu)</math></td><td>87.0</td></tr><tr><td><math>HLT</math></td><td>64.0</td></tr><tr><td><math>4 \mu cuts</math></td><td>55.0</td></tr></tbody></table>	cut	$N_{obs}$	$ \eta(\mu)  < 2.4$	15084.0	$p_T(\mu) > 3.5$	118.0	$reco.(\mu)$	110.0	$id.(\mu)$	106.0	$vtx(\mu\mu)$	87.0	$HLT$	64.0	$4 \mu cuts$	55.0	<table border="1"><thead><tr><th>cut</th><th><math>N_{obs}</math></th></tr></thead><tbody><tr><td><math> \eta(\mu)  &lt; 2.4</math></td><td>10584.0</td></tr><tr><td><math>p_T(\mu) &gt; 3.5</math></td><td>114.0</td></tr><tr><td><math>reco.(\mu)</math></td><td>98.0</td></tr><tr><td><math>id.(\mu)</math></td><td>98.0</td></tr><tr><td><math>vtx(\mu\mu)</math></td><td>89.0</td></tr><tr><td><math>HLT</math></td><td>60.0</td></tr><tr><td><math>4 \mu cuts</math></td><td>55.0</td></tr></tbody></table>	cut	$N_{obs}$	$ \eta(\mu)  < 2.4$	10584.0	$p_T(\mu) > 3.5$	114.0	$reco.(\mu)$	98.0	$id.(\mu)$	98.0	$vtx(\mu\mu)$	89.0	$HLT$	60.0	$4 \mu cuts$	55.0
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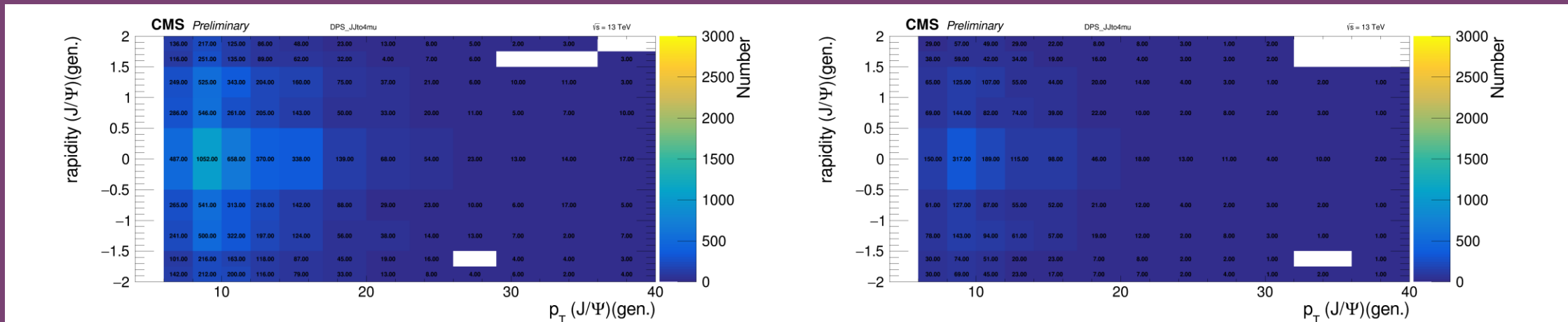


# Proposal to use private samples

SPS  
(A)



DPS  
(A)



Private MC

Official MC

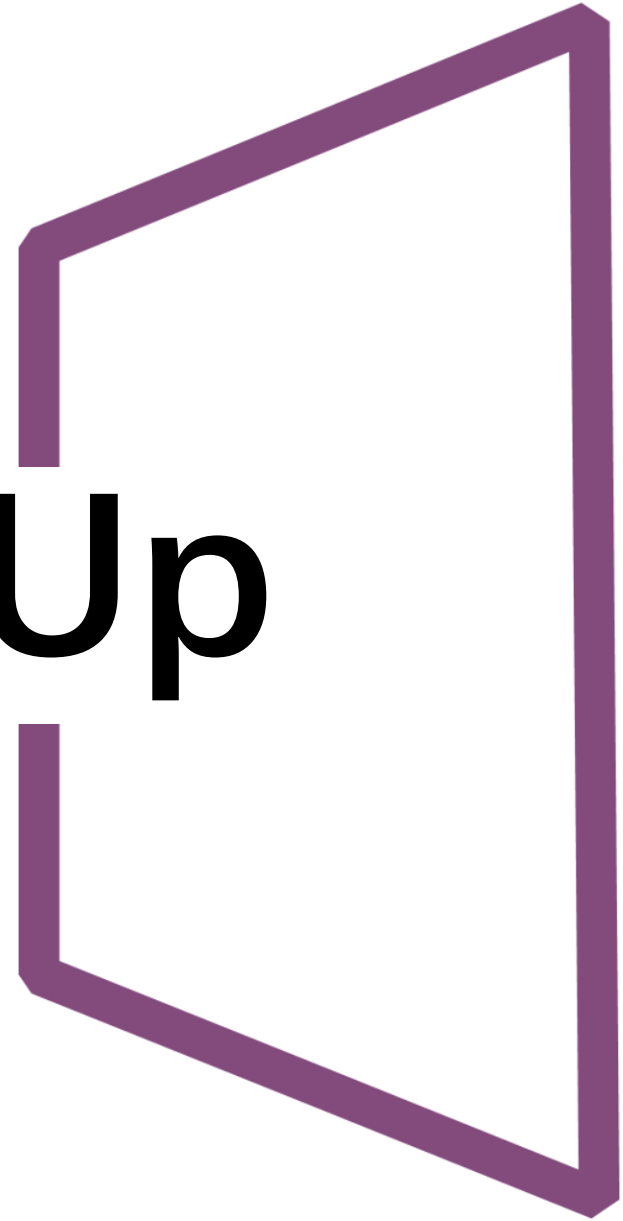


# Summary

- Work of acceptance/efficiency map is about to close
- Will move to 3D fit to extract event number
- May prepare other samples



**Back Up**





cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (DPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	191323.0	$192261.74^{+964.43}_{-962.02}$	$193133.65^{+1150.78}_{-1147.35}$	$192435.98^{+1001.64}_{-999.04}$
$p_T(\mu) > 3.5$	118.0	$118.4^{+3.56}_{-3.48}$	$126.98^{+15.97}_{-14.82}$	$120.09^{+5.93}_{-5.74}$
$reco.(\mu)$	112.0	$104.39^{+5.26}_{-5.03}$	$112.67^{+20.98}_{-18.45}$	$106.02^{+8.17}_{-7.68}$
$id.(\mu)$	106.0	$102.26^{+6.0}_{-5.63}$	$110.48^{+22.63}_{-19.48}$	$103.88^{+9.05}_{-8.36}$
$vtx(\mu\mu)$	87.0	$87.4^{+7.41}_{-6.78}$	$99.12^{+27.37}_{-22.1}$	$89.63^{+10.91}_{-9.77}$
$HLT$	64.0	$60.97^{+6.28}_{-5.56}$	$72.12^{+32.69}_{-24.04}$	$63.12^{+10.89}_{-9.32}$
$4 \mu cuts$	50.0	$54.2^{+6.32}_{-5.47}$	$54.34^{+35.73}_{-23.14}$	$54.87^{+11.04}_{-9.24}$

DPS

↓ Rebin

cut	$N_{obs}$	$N_{corr}$ (SPS)	$N_{corr}$ (Mix)
$ \eta(\mu)  < 2.4$	15084.0	$15268.43^{+52.5}_{-52.4}$	$15265.33^{+62.32}_{-62.19}$
$p_T(\mu) > 3.5$	118.0	$118.55^{+5.02}_{-4.89}$	$120.52^{+8.72}_{-8.36}$
$reco.(\mu)$	110.0	$104.65^{+7.39}_{-6.98}$	$106.56^{+11.59}_{-10.68}$
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