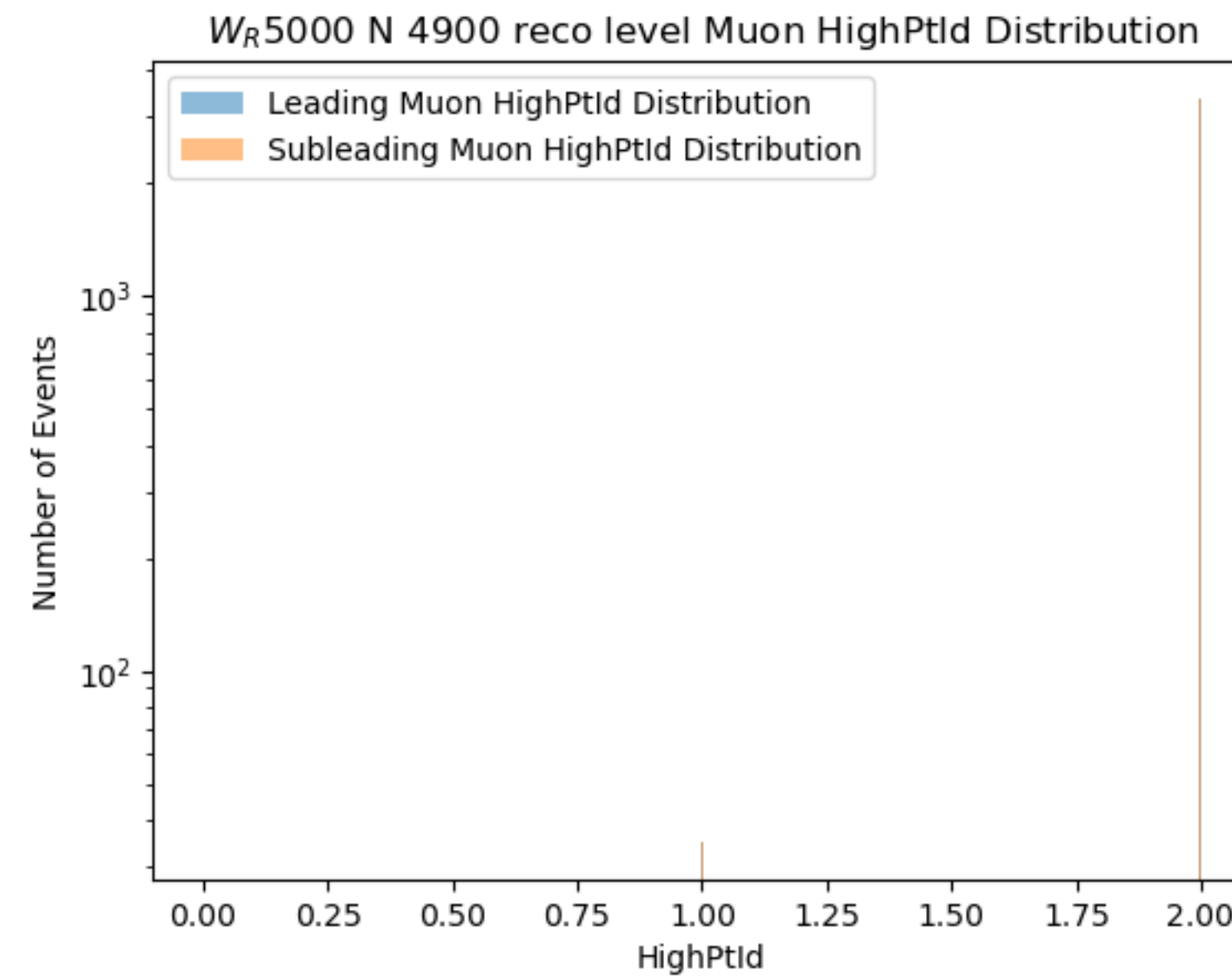
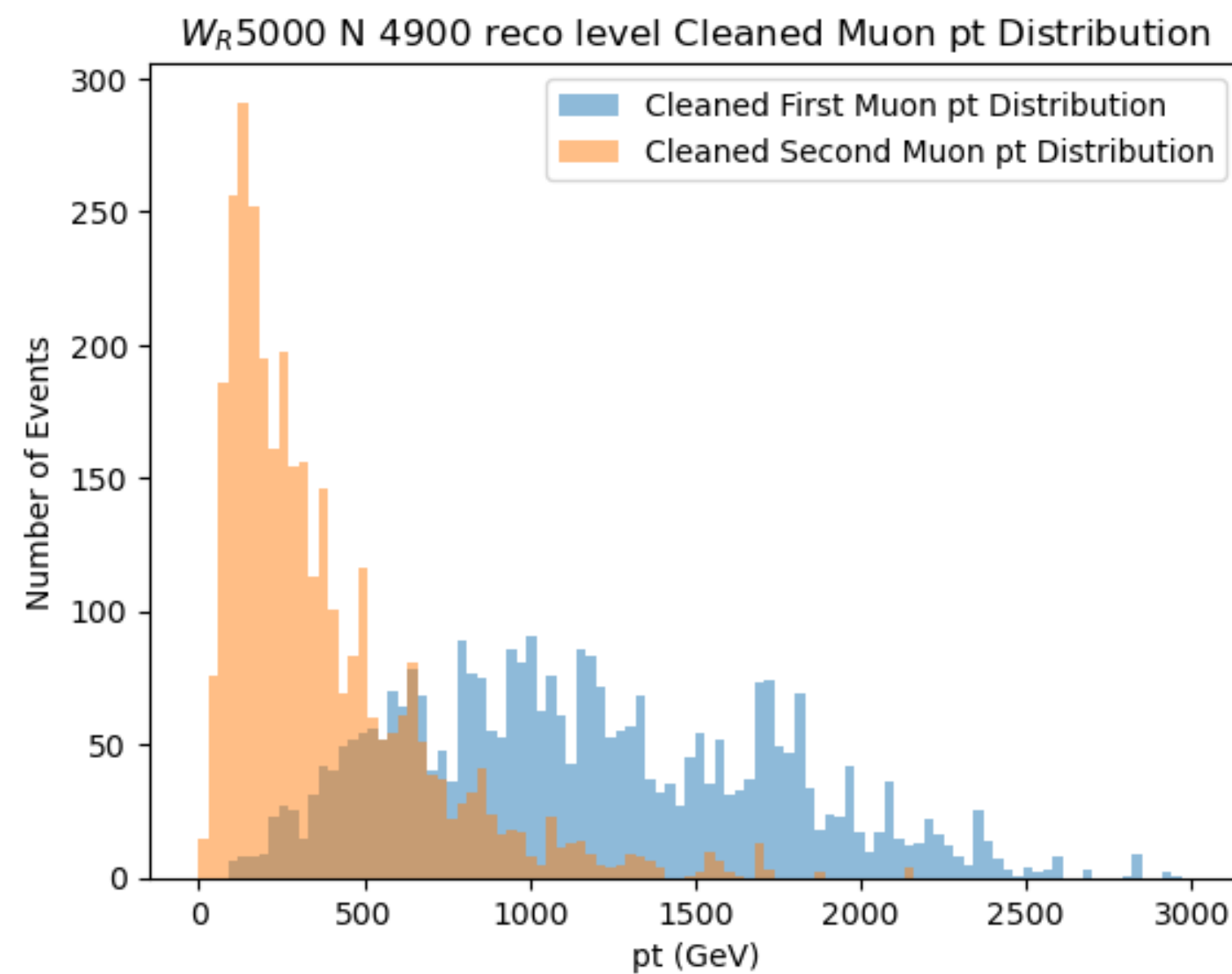


Search For N , W_R Using t/b Jets

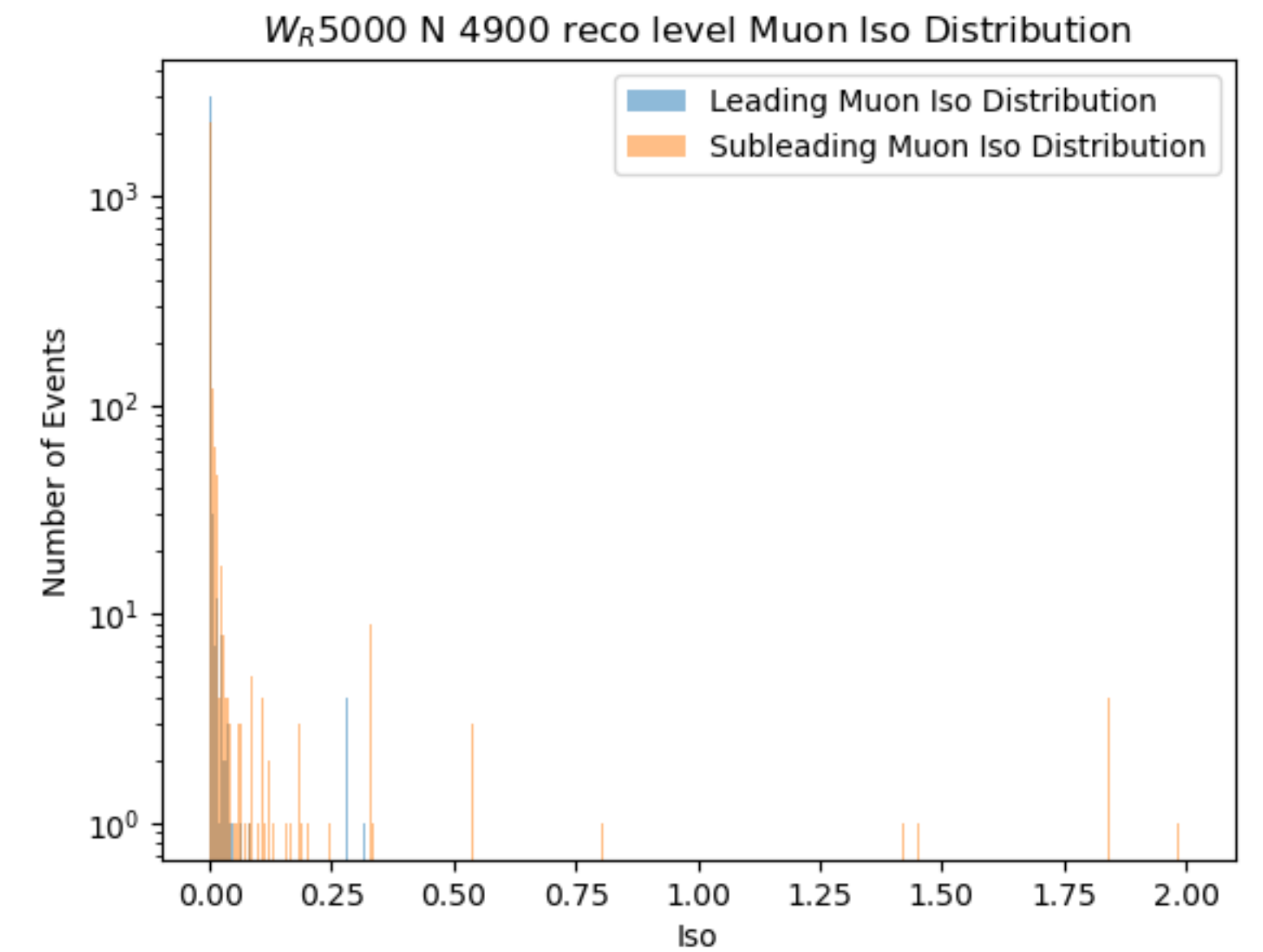
Lepton (Muon) features

2 lepton

: no cut
(no overlap with 2 leptons each)



[Muon_highPtId]
(1 : tracker high p_t ID
2: global high p_t ID)



[Muon_tkRelIso]

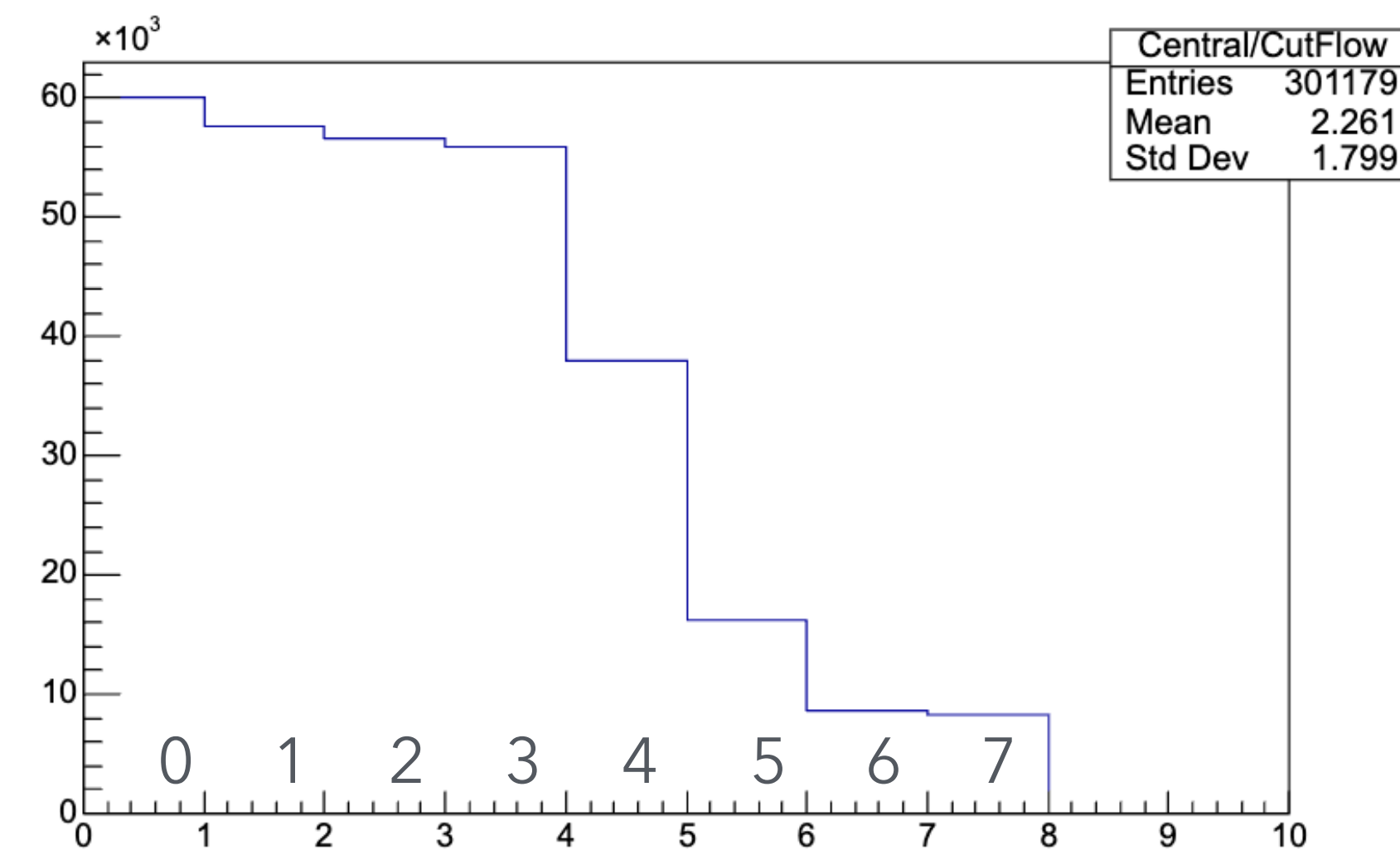
Cleaned Leading/Subleading Muons -> Hight p_t

Isolated

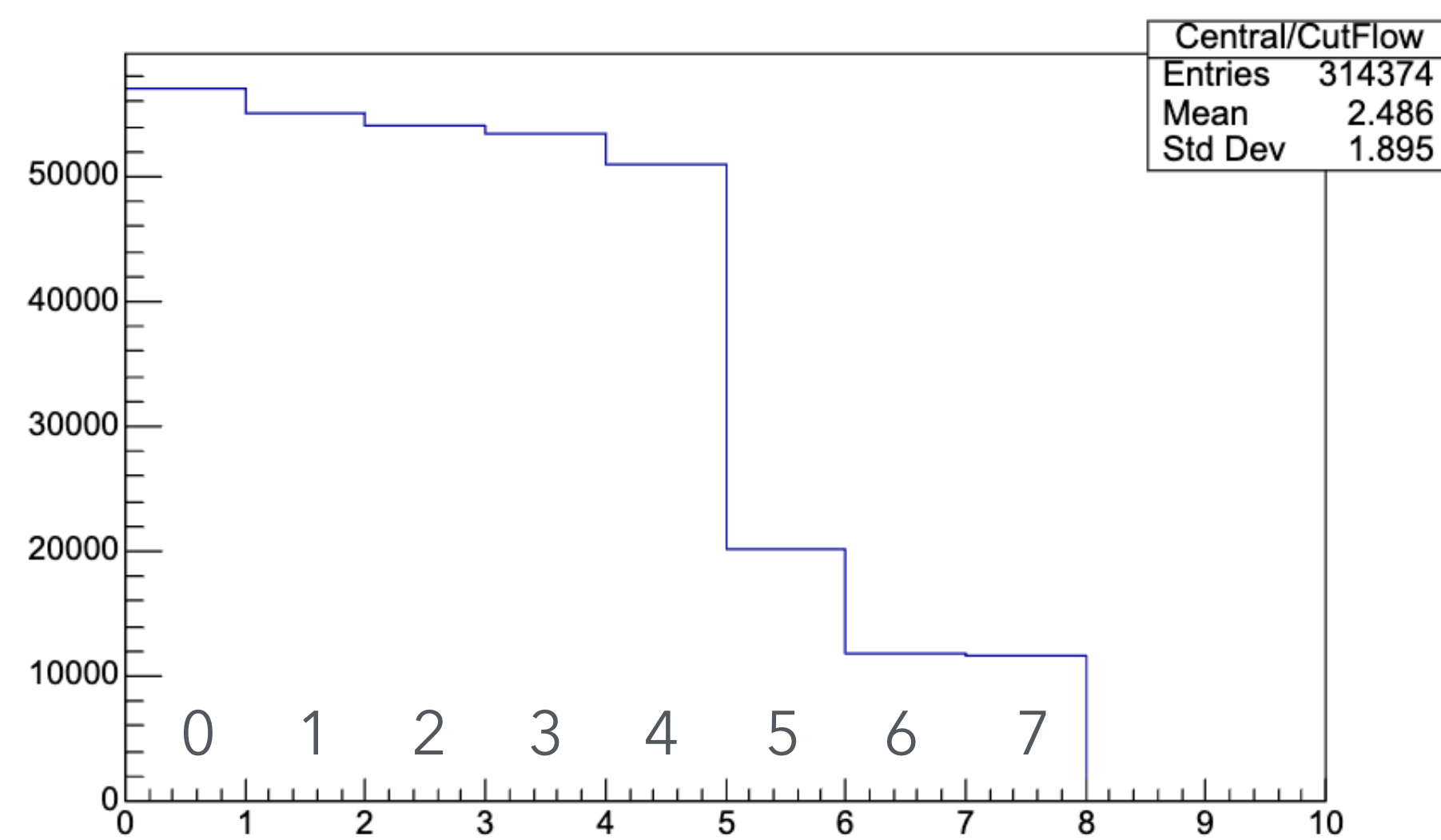
Selection cuts v.1

AK8 Jet	Top tagging : >0.9 , SDM 120 ~ 250 p_t , $ \eta $: 0 , < 2.5 <i>* no WP in NANOAOB v 12 (FatJet_particleNetWithMass_TvsQCD)</i> <i>* Run2 : MSD : 105 ~ 210 ,</i> <i>p_t eta : >300 , 2.5</i>
AK4 Jet	B tagging : Tight p_t , $ \eta $: > 30 , < 2.4 <i>* Jet_btagPNetB ,</i> <i>jet selected p_t η : 30 2.5</i>
2 Muon	HLT : HLT_IsoMu30 p_t , $ \eta $: > 50 , < 2.4 <i>* p_t safe cut : 32</i> m_{ll} : > 300
W_R mass	m_{lljj} : >2000

Selection cuts v.1 (signals)



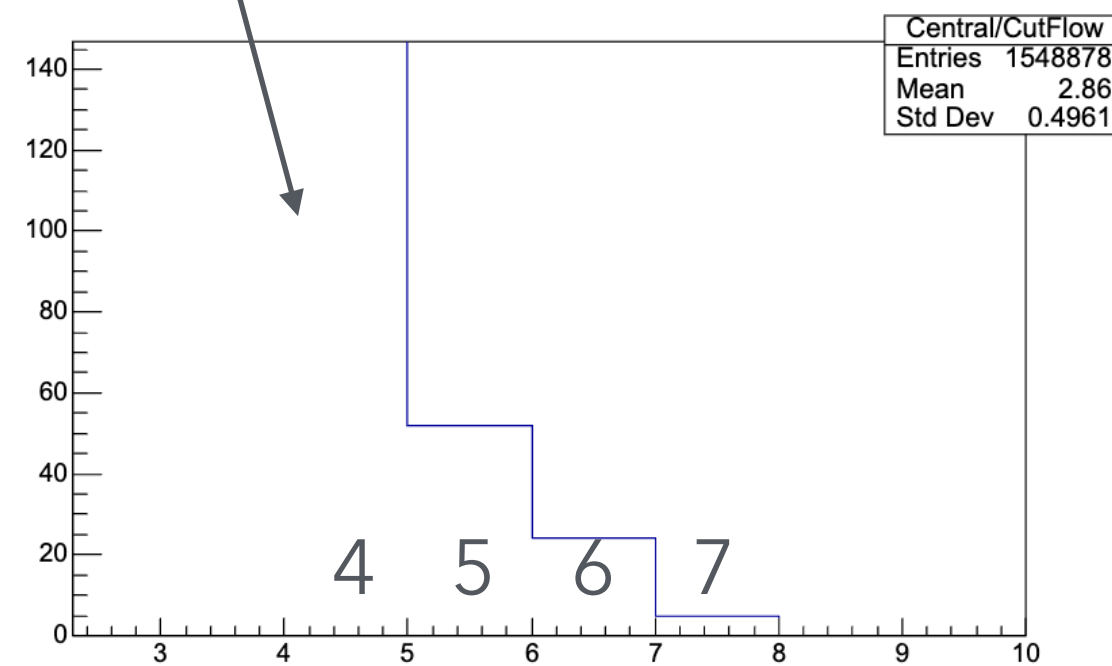
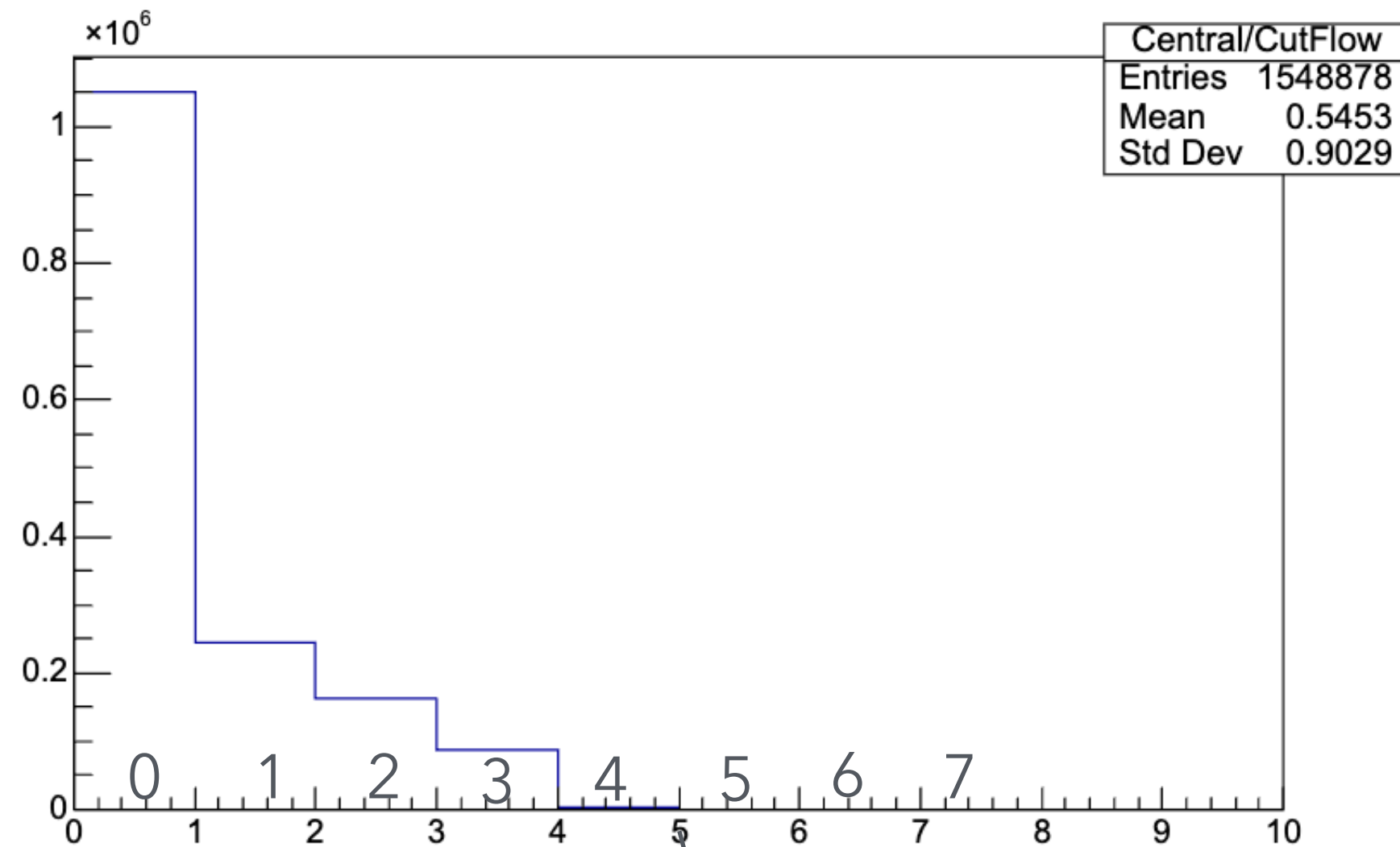
W_R 3000 N 2900



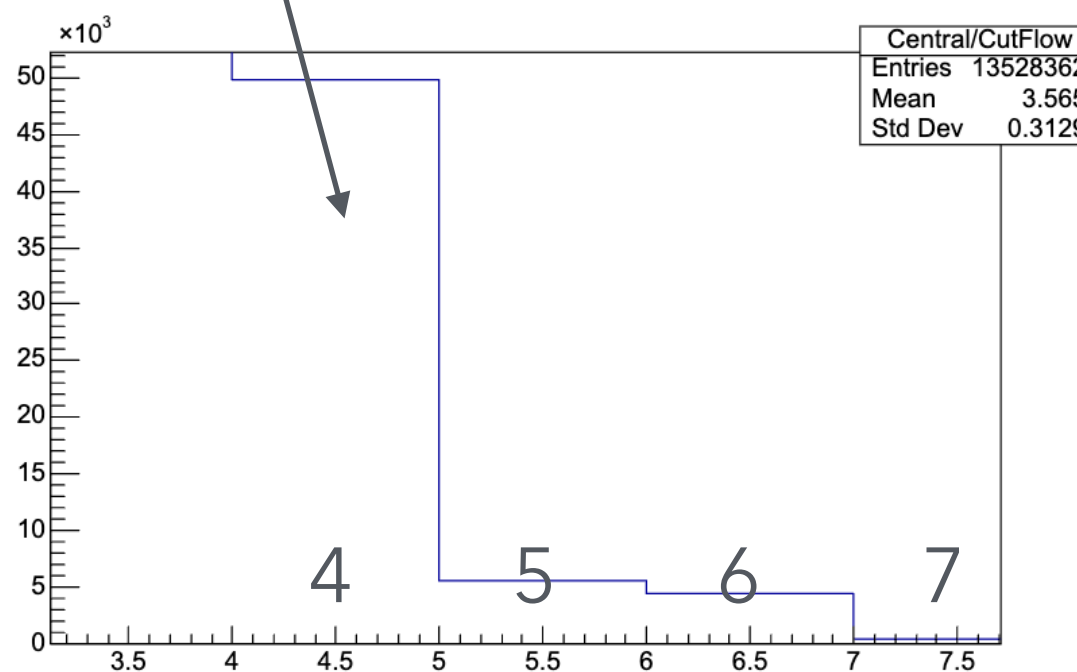
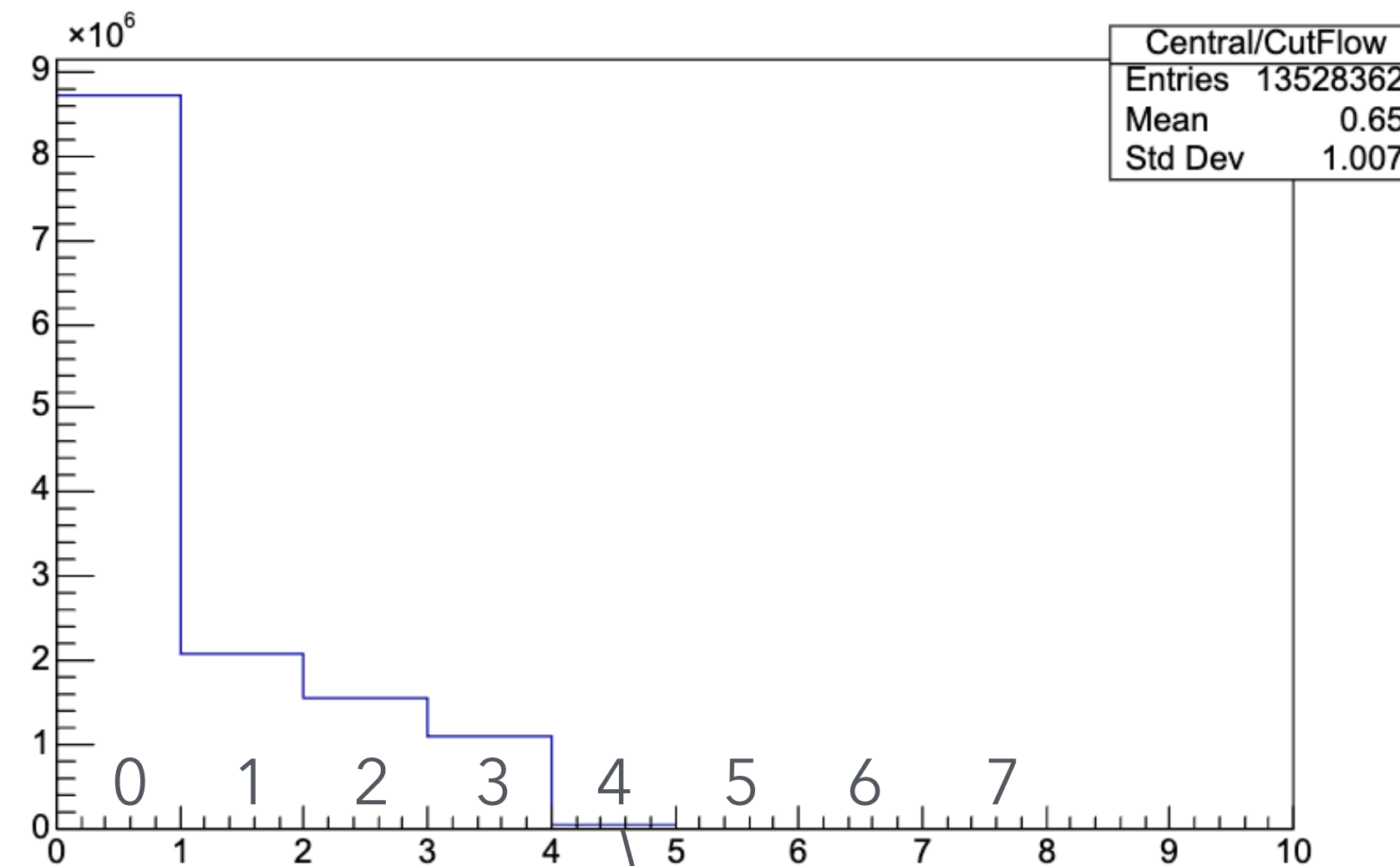
W_R 5000 N 2500

- 0 : Total events
- 1 : Has Iso muon?
- 2 : muon over laps , more than 1 muon
- 3 : muon pt eta cut
- 4 : m_{ll} cut
- 5 : Top tagging , pt eta cut
- 6 : B tagging , pt eta cut
- 7 : W_R mass cut

Selection cuts v.1 (Backgrounds)



TTZ_M4to50

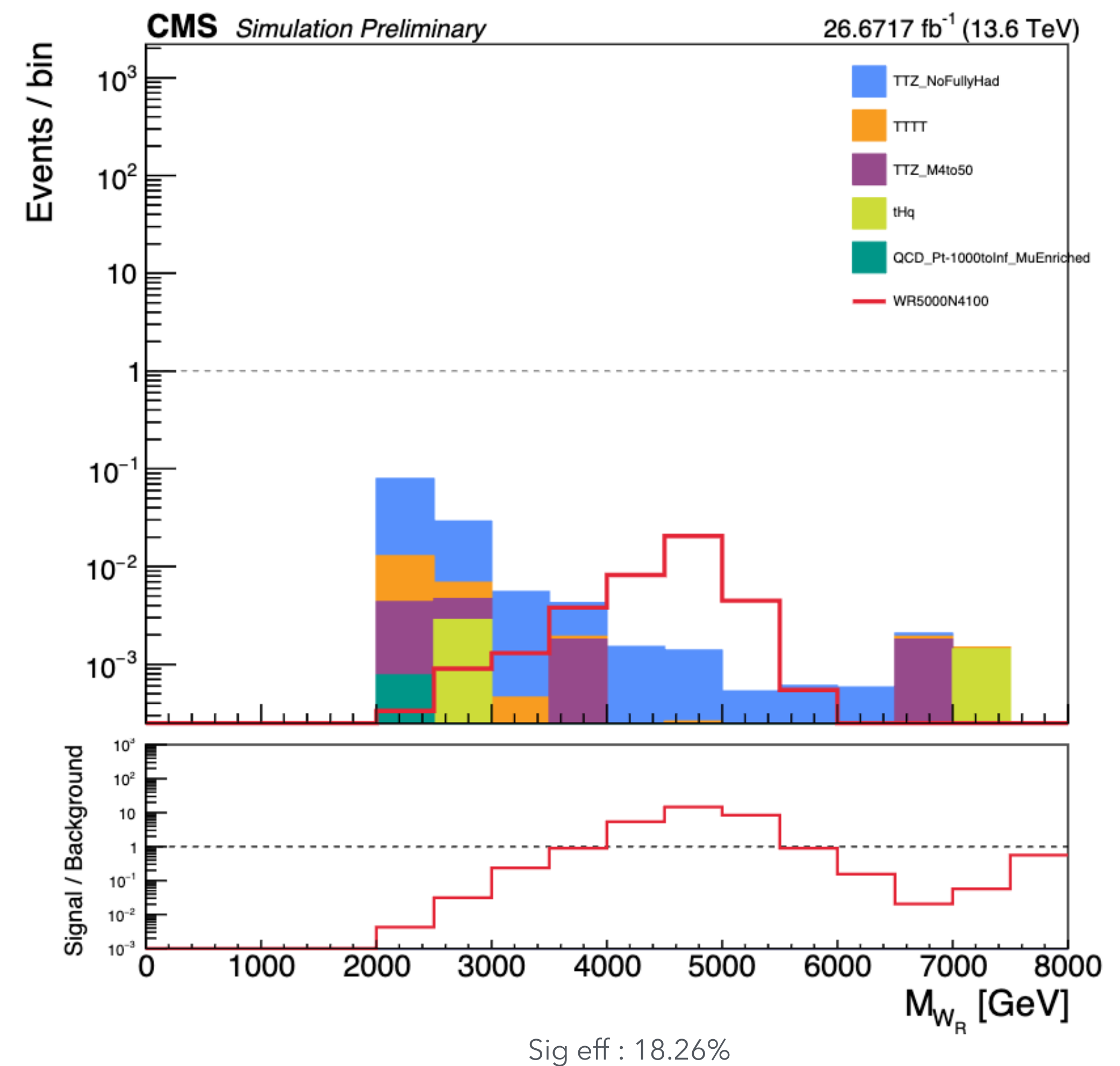
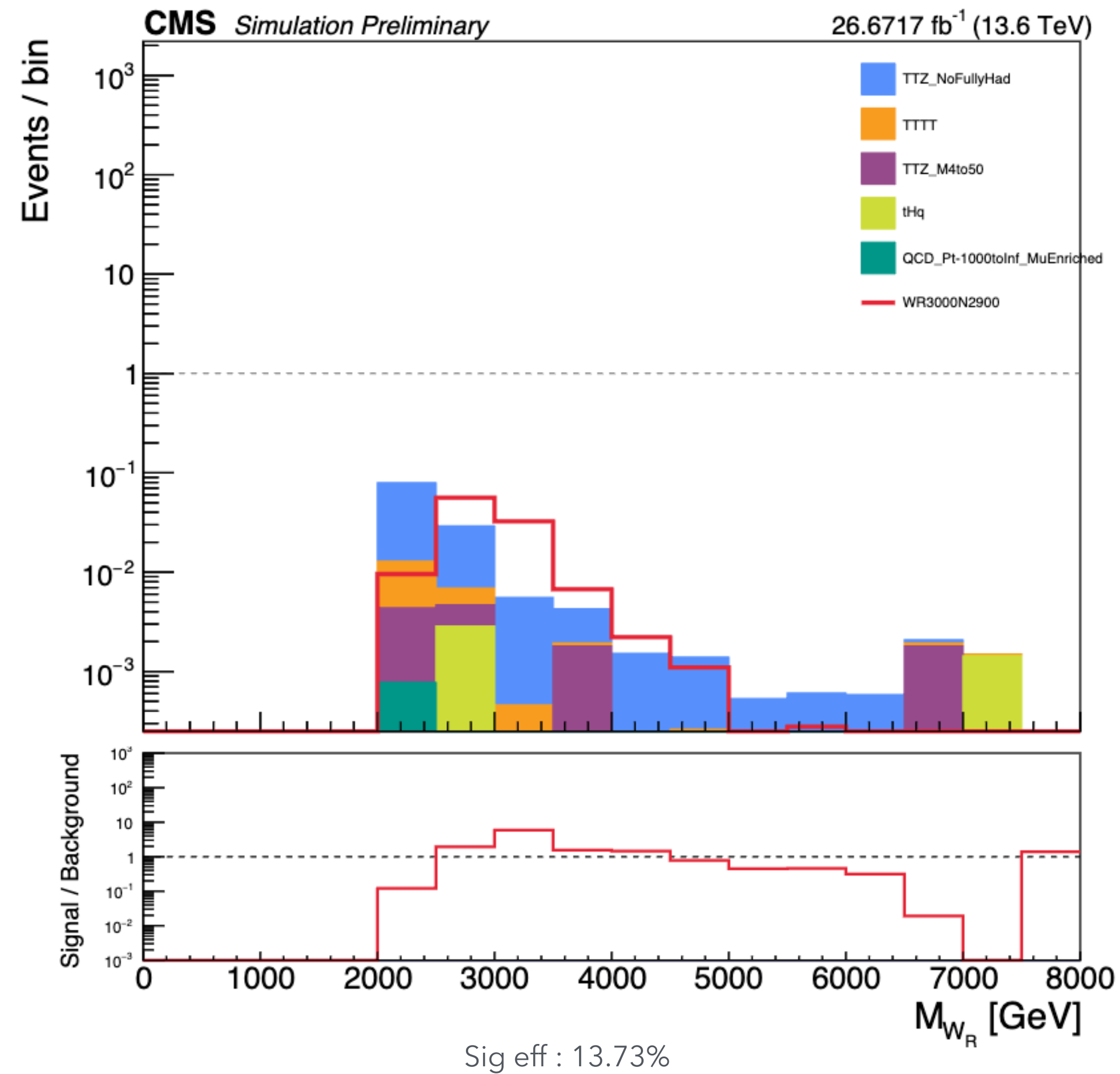


TTTT

- 0 : Total events
- 1 : Has Iso muon?
- 2 : muon over laps , more than 1 muon
- 3 : muon pt eta cut
- 4 : m_{ll} cut
- 5 : Top tagging , pt eta cut
- 6 : B tagging , pt eta cut
- 7 : W_R mass cut

Selection cuts v.1 results

[2022 E.F.G era]



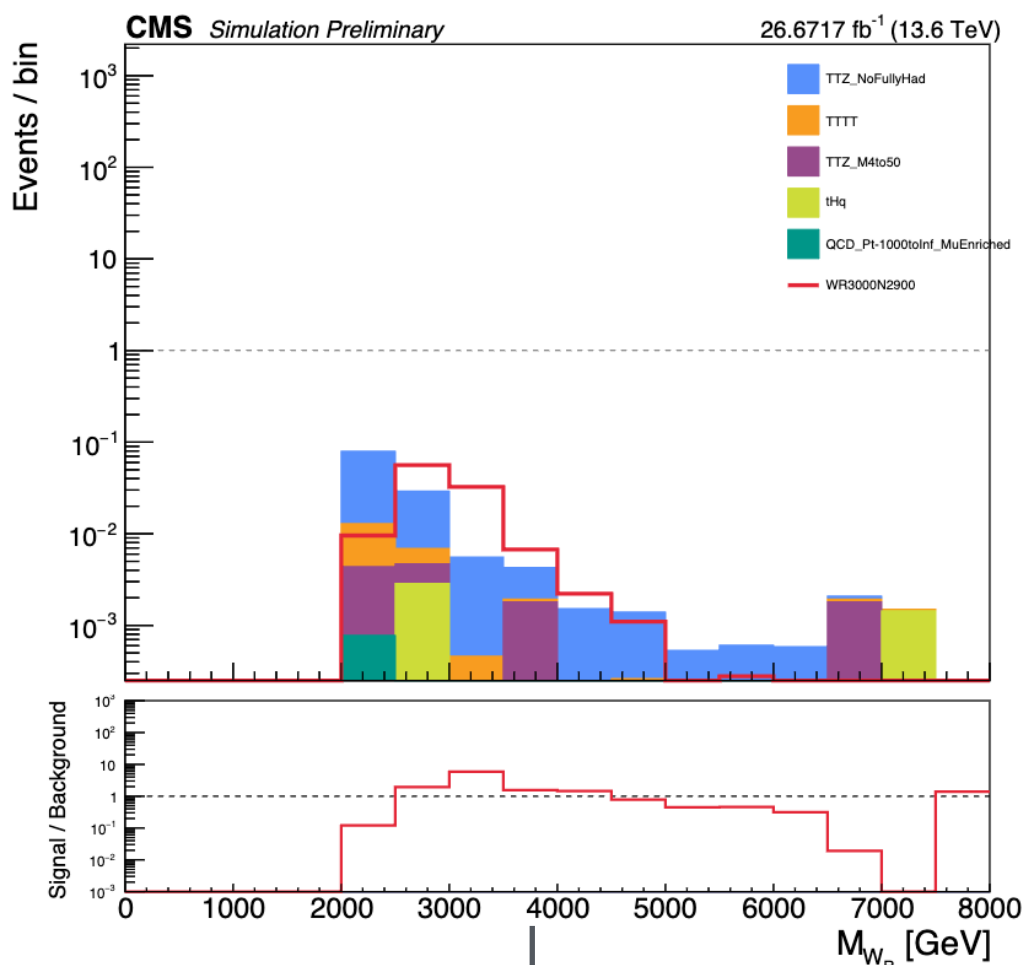
Selection cuts v.2

AK8 Jet	Top tagging : >0.9 , SDM 120 ~ 250 p_t , η : $\varnothing \rightarrow$ 500 , < 2.5 * no WP in NANOAOD v 12 (FatJet_particleNetWithMass_TvsQCD) * Run2 : MSD : 105 ~ 210 , p_t eta : >300 , 2.5
AK4 Jet	B tagging : Tight p_t , η : $> \varnothing \rightarrow$ 300 , < 2.4 * Jet_btagPNetB , jet selected p_t η : 30 2.5
2 Muon	HLT : HLT_IsoMu30 p_t , η > 50 , < 2.4 * p_t safe cut : 32 m_{ll} : > 300
W_R mass	m_{lljj} : >2000

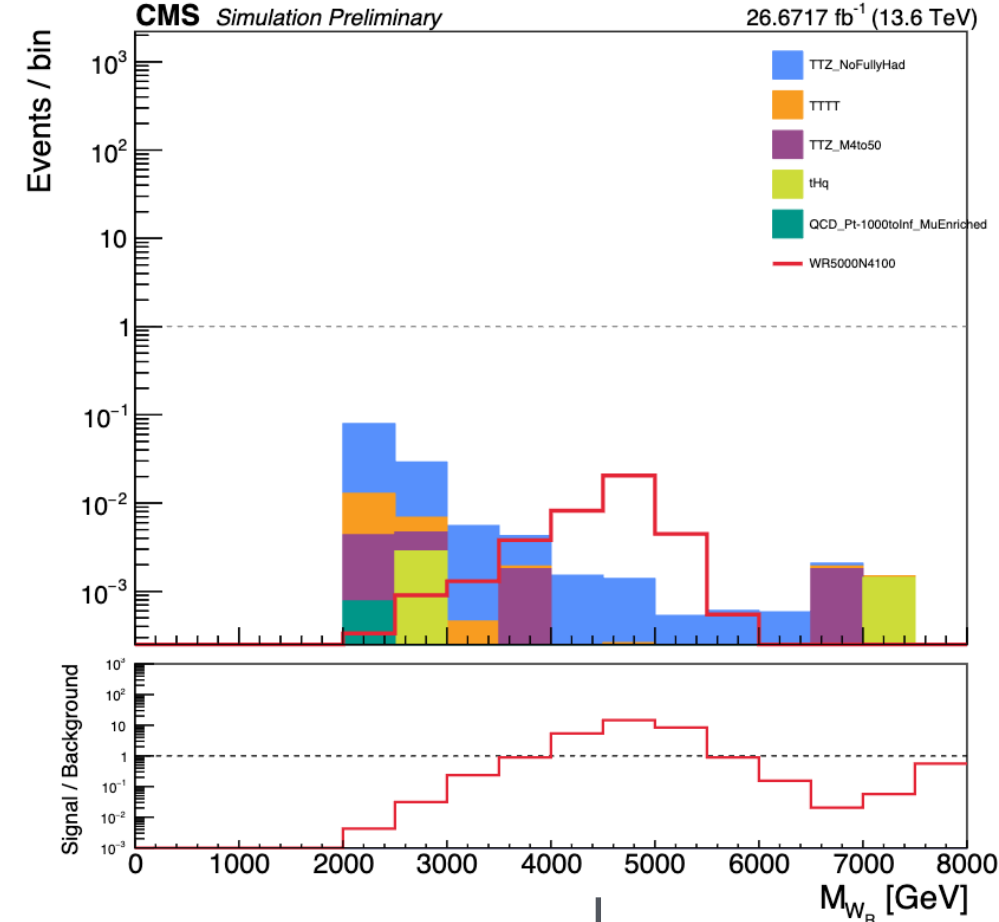
Selection cuts v.2 results

[2022 E.F.G era]

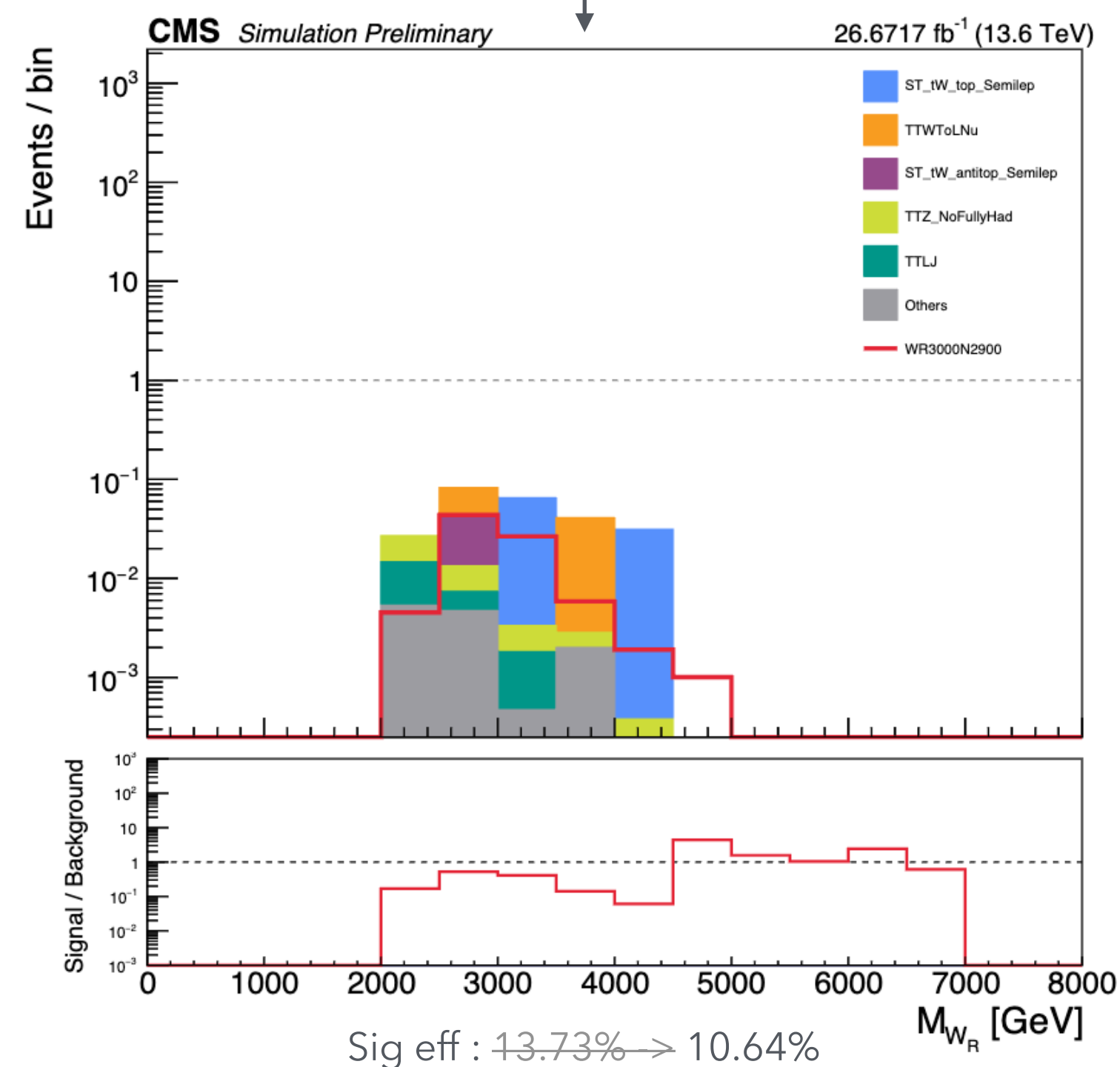
V1



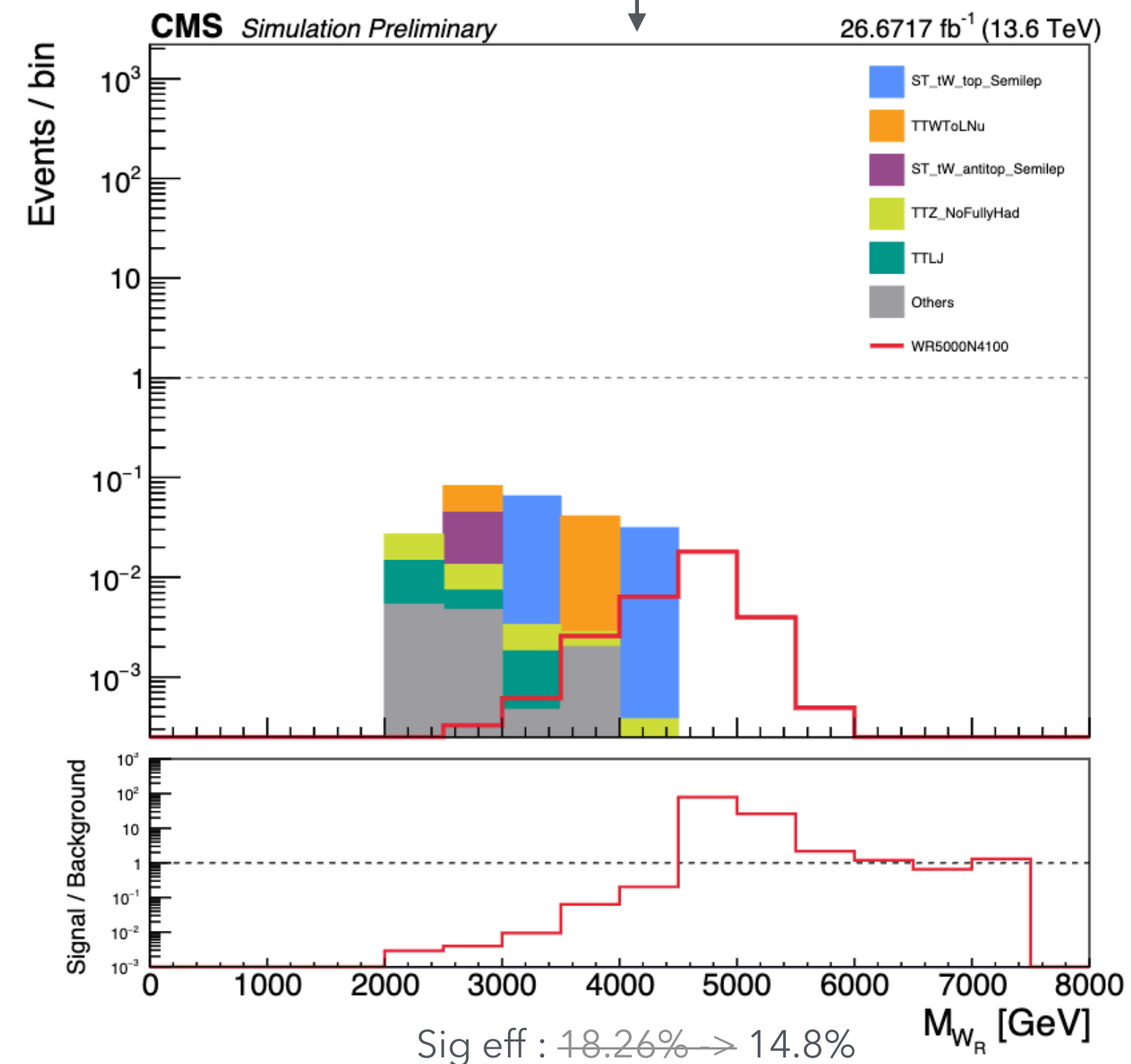
V1



V2



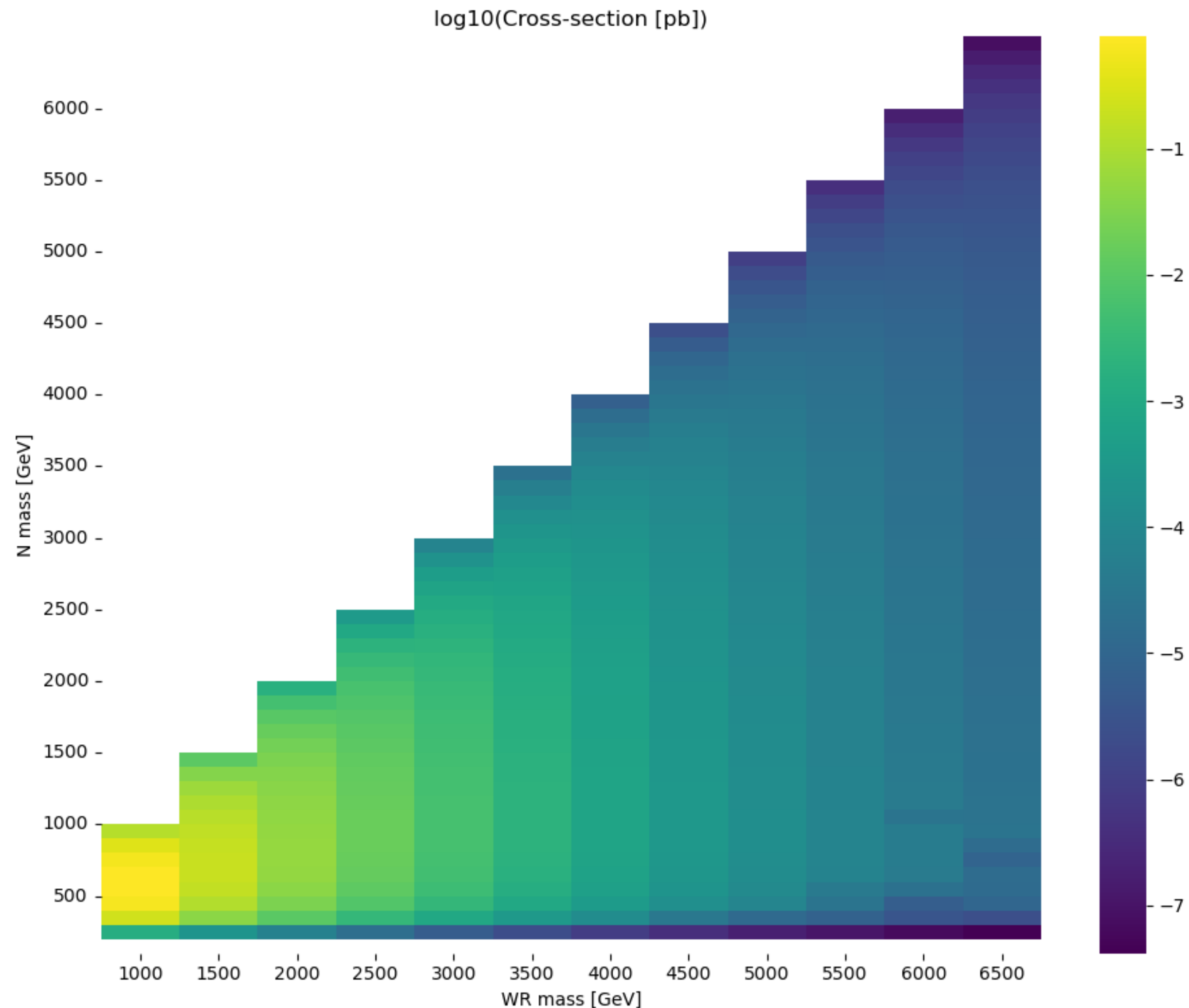
V2



Backups

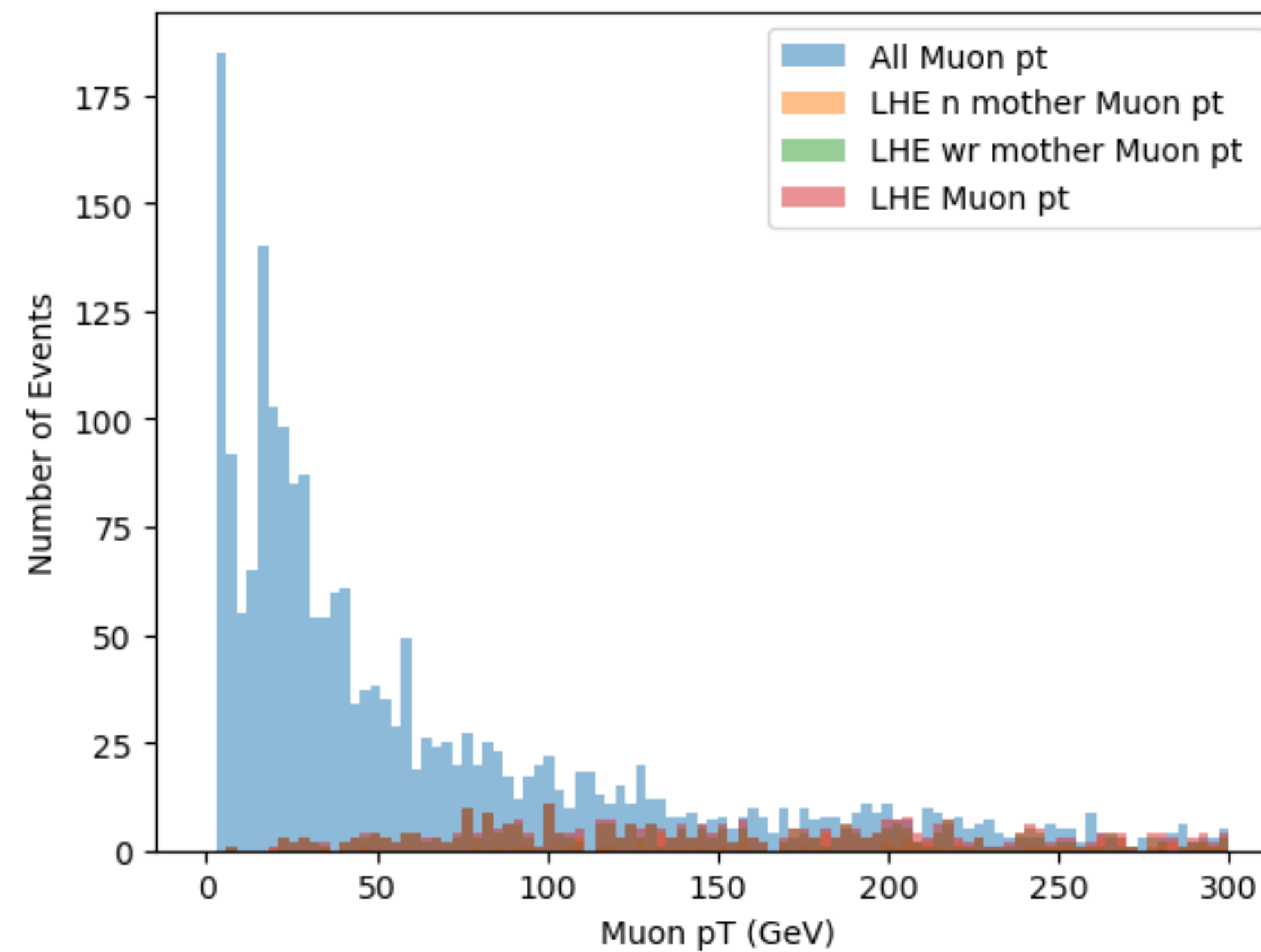
Cross Sections Checking

Full cross section



- W_R fixed & N increase
Cross section **increases** -> **decrease**
: top quark phase space constraint ->
N phase space constraint -> ..

Muon p_t distribution with signal & bkg



Thanks!