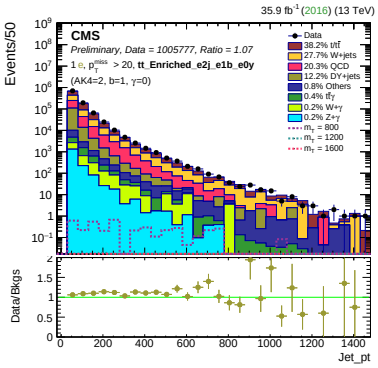
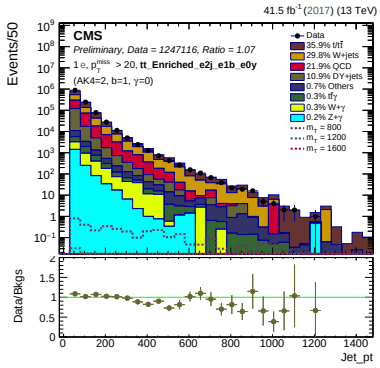
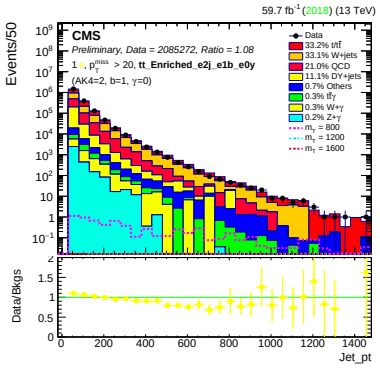
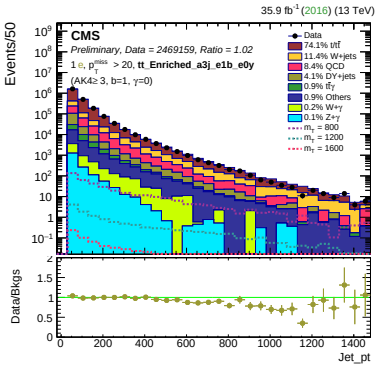
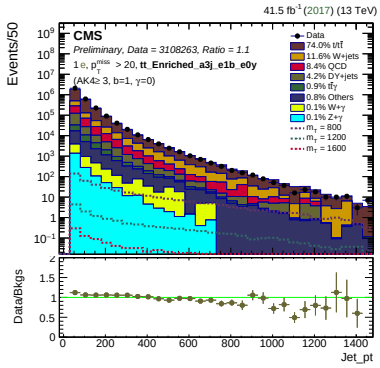
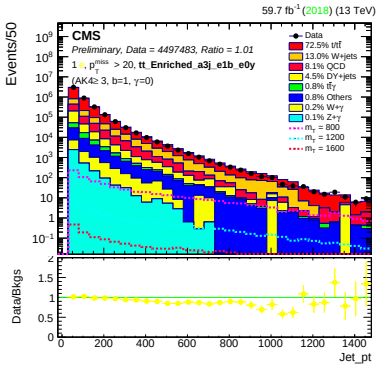

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1005777, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
38.2% tt̄t
27.7% W+jets
20.3% QCD
12.2% DY+jets
0.8% Others
0.4% tt̄γ
0.2% W+γ
0.2% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

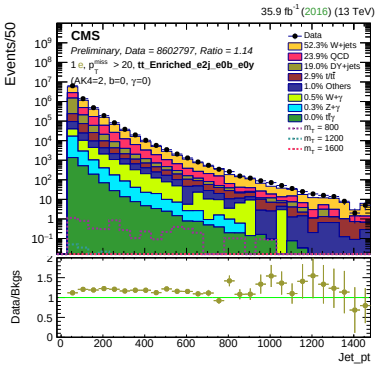

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1247116, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
35.9% tt̄t
29.8% W+jets
21.9% QCD
10.9% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

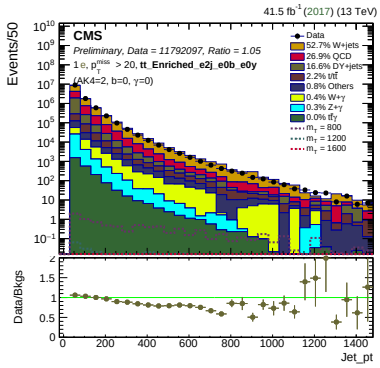

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2085272, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
33.2% tt̄t
33.1% W+jets
21.0% QCD
11.1% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

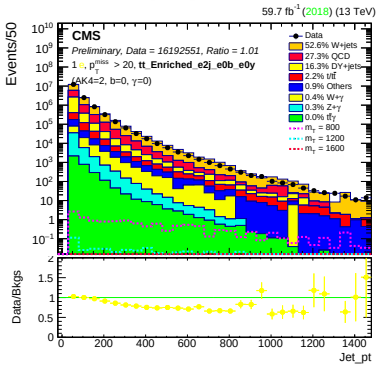

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 2469159, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
74.1% tt̄t
11.4% W+jets
8.4% QCD
4.1% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

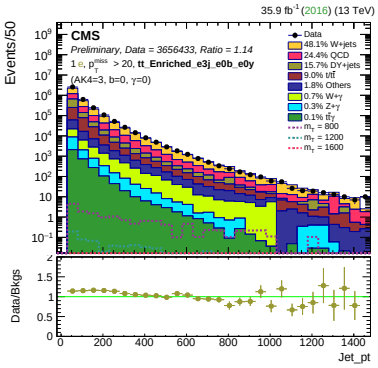

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 3108263, Ratio = 1.1
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
74.0% tt̄t
11.6% W+jets
8.4% QCD
4.2% DY+jets
0.9% tt̄γ
0.8% Others
0.1% W+γ
0.1% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

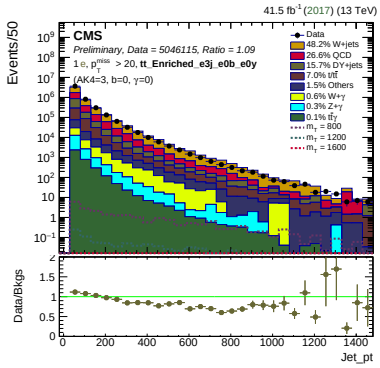

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 4497483, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.5% tt̄t
13.0% W+jets
8.1% QCD
4.5% DY+jets
0.8% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

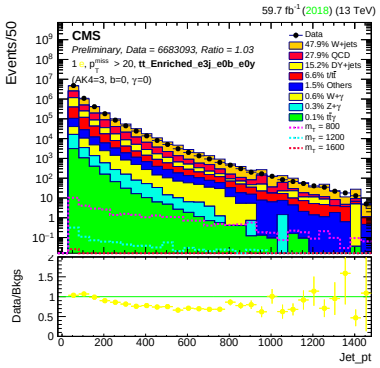

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 8602797, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.3% W+jets
23.9% QCD
19.0% DY+jets
2.9% tt̄t
1.0% Others
0.5% W+γ
0.3% Z+γ
0.0% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

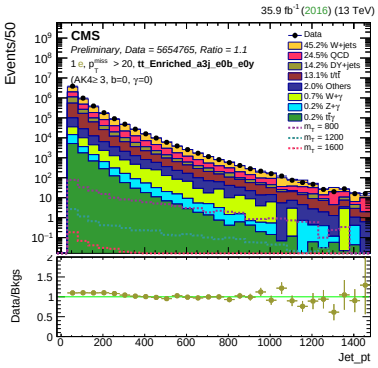

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 11792097, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
26.9% QCD
16.6% DY+jets
2.2% tt̄t
0.8% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

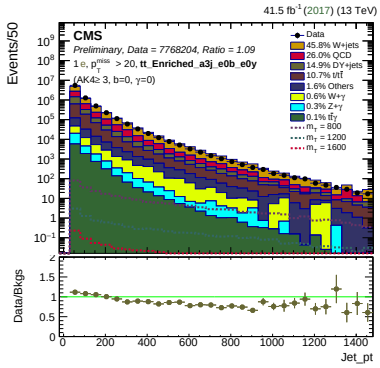

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 16192551, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.6% W+jets
27.3% QCD
16.3% DY+jets
2.2% tt̄t
0.9% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

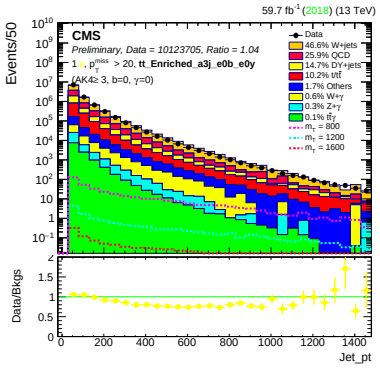

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 3656433, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.1% W+jets
24.4% QCD
15.7% DY+jets
9.0% tt̄t
1.8% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

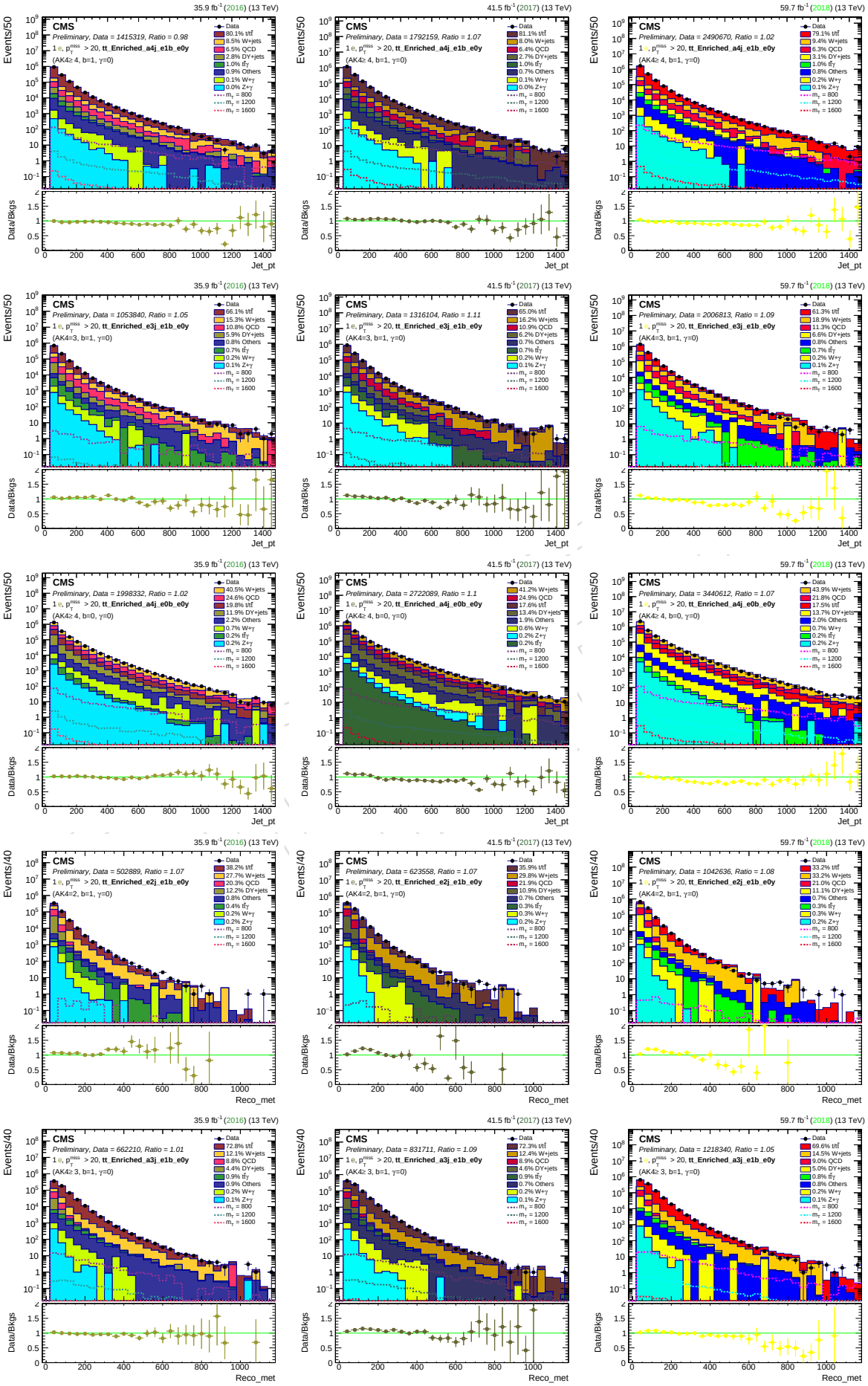

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 5046115, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.2% W+jets
26.6% QCD
15.7% DY+jets
7.0% tt̄t
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

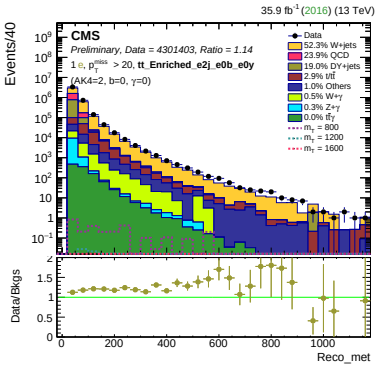

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 6683093, Ratio = 1.03
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
47.9% W+jets
27.9% QCD
15.2% DY+jets
6.6% tt̄t
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

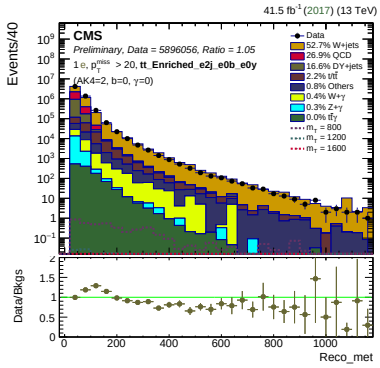

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 5654765, Ratio = 1.1
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.2% W+jets
24.5% QCD
14.2% DY+jets
13.1% tt̄t
2.0% Others
0.7% W+γ
0.2% Z+γ
0.2% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

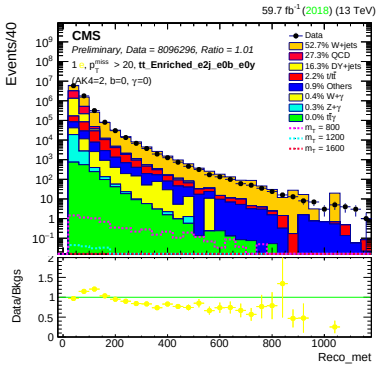

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 7768204, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.8% W+jets
26.0% QCD
14.9% DY+jets
10.7% tt̄t
1.6% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

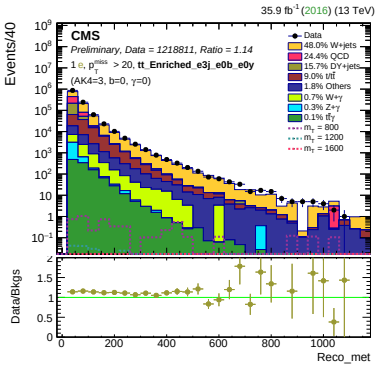

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 10123705, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
46.6% W+jets
25.9% QCD
14.7% DY+jets
10.2% tt̄t
1.7% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_X = 800
m_X = 1200
m_X = 1600
Events/50
Data/Bkgs
Jet_pt

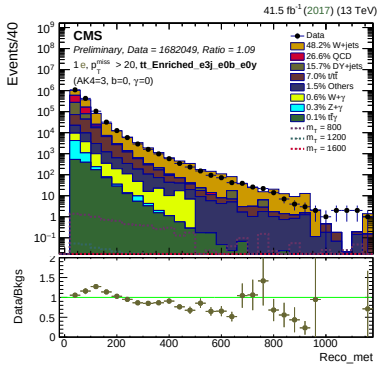

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1415319, Ratio = 0.98
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
80.1% tt̄
8.5% W+jets
6.5% QCD
2.8% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1792159, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
81.1% tt̄
8.0% W+jets
6.4% QCD
2.7% DY+jets
1.0% tt̄γ
0.7% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2490670, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
79.1% tt̄
9.4% W+jets
6.3% QCD
3.1% DY+jets
1.0% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1053840, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
66.1% tt̄
15.3% W+jets
10.8% QCD
5.9% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1316104, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
65.0% tt̄
16.2% W+jets
10.9% QCD
6.2% DY+jets
0.7% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2006813, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
61.3% tt̄
18.9% W+jets
11.3% QCD
6.6% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1998332, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
40.5% W+jets
24.6% QCD
19.8% tt̄
11.9% DY+jets
2.2% Others
0.7% W+γ
0.2% tt̄γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 2722089, Ratio = 1.1
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
41.2% W+jets
24.9% QCD
17.6% tt̄
13.4% DY+jets
1.9% Others
0.6% W+γ
0.2% Z+γ
0.2% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 3440612, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
43.9% W+jets
21.8% QCD
17.5% tt̄
13.7% DY+jets
2.0% Others
0.7% W+γ
0.2% tt̄γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Jet_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 502889, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
38.2% tt̄
27.7% W+jets
20.3% QCD
12.2% DY+jets
0.8% Others
0.4% tt̄γ
0.2% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 623558, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
35.9% tt̄
29.8% W+jets
21.9% QCD
10.9% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1042636, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
33.2% tt̄
33.2% W+jets
21.0% QCD
11.1% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 662210, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.8% tt̄
12.1% W+jets
8.8% QCD
4.4% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 831711, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.3% tt̄
12.4% W+jets
8.9% QCD
4.6% DY+jets
0.9% tt̄γ
0.7% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1218340, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
69.6% tt̄
14.5% W+jets
9.0% QCD
5.0% DY+jets
0.8% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

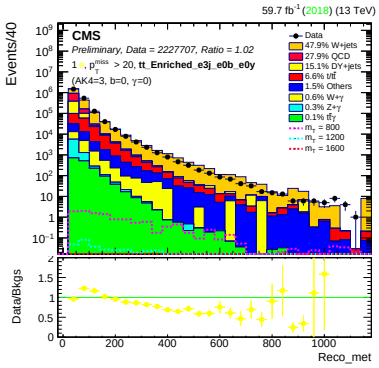

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 4301403, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.3% W+jets
23.9% QCD
19.0% DY+jets
2.9% tt̄
1.0% Others
0.5% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

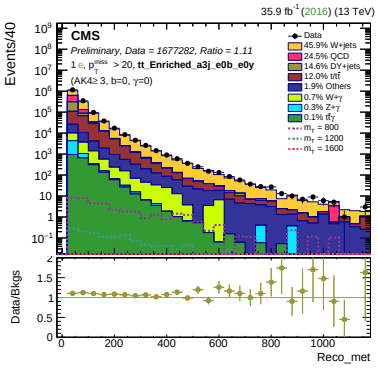

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 5896056, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
26.9% QCD
16.6% DY+jets
2.2% tt̄
0.8% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

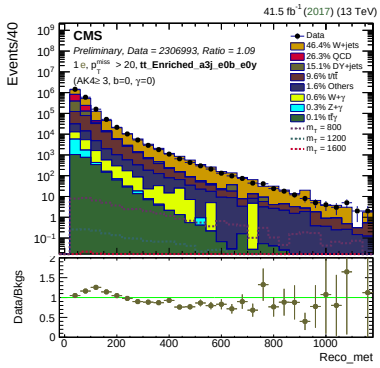

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 8096296, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
27.3% QCD
16.3% DY+jets
2.2% tt̄
0.9% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

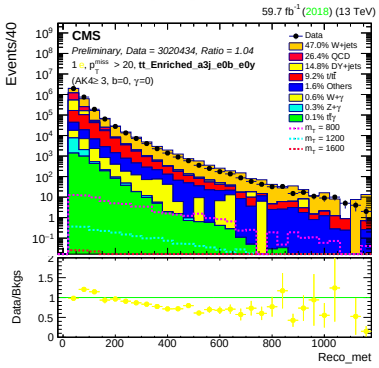

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1218811, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.0% W+jets
24.4% QCD
15.7% DY+jets
9.0% tt̄
1.8% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

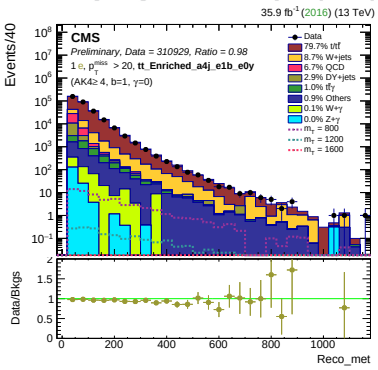

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1682049, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.2% W+jets
26.6% QCD
15.7% DY+jets
7.0% tt̄
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

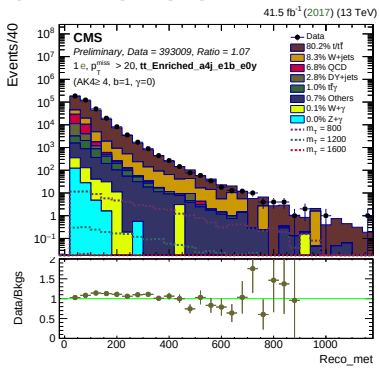

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2227707, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
47.9% W+jets
27.9% QCD
15.1% DY+jets
6.6% tt̄
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

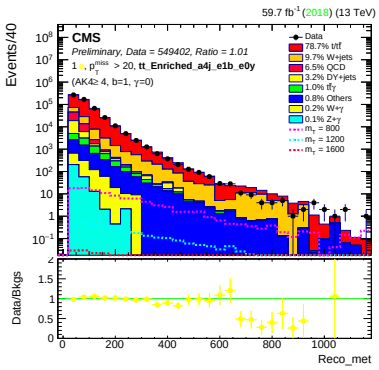

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1677282, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.9% W+jets
24.5% QCD
14.6% DY+jets
12.0% tt̄
1.9% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

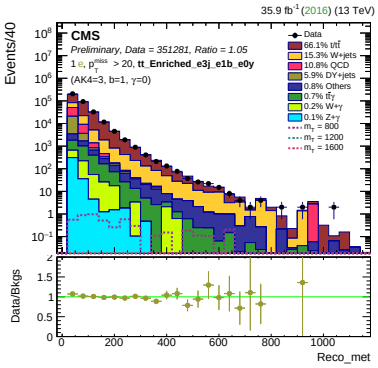

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 2306993, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
46.4% W+jets
26.3% QCD
15.1% DY+jets
9.6% tt̄
1.6% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

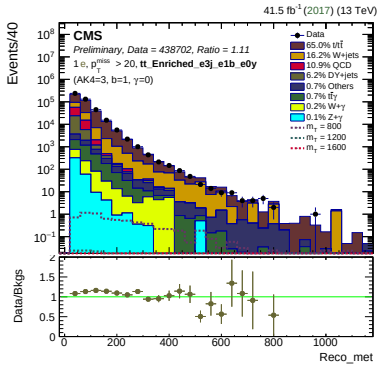

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 3020434, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
47.0% W+jets
26.4% QCD
14.8% DY+jets
9.2% tt̄
1.6% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

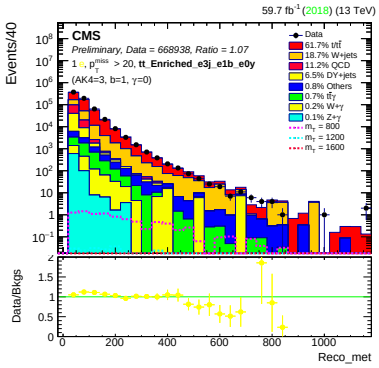

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 310929, Ratio = 0.98
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
79.7% tt̄
8.7% W+jets
6.7% QCD
2.9% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

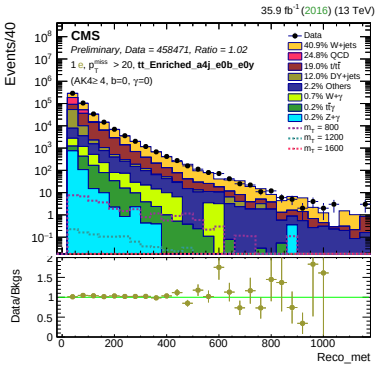

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 393009, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
80.2% tt̄
8.3% W+jets
6.8% QCD
2.8% DY+jets
1.0% tt̄γ
0.7% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

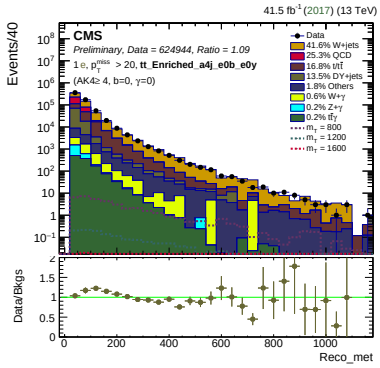

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 549402, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
78.7% tt̄
9.7% W+jets
6.5% QCD
3.2% DY+jets
1.0% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

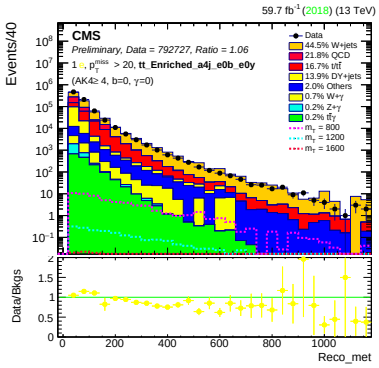

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 351281, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
66.1% tt̄
15.3% W+jets
10.8% QCD
5.9% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

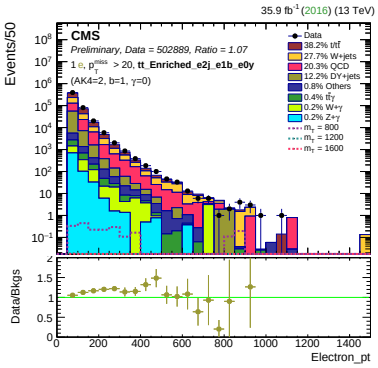

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 438702, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
65.0% tt̄
16.2% W+jets
10.9% QCD
6.2% DY+jets
0.7% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

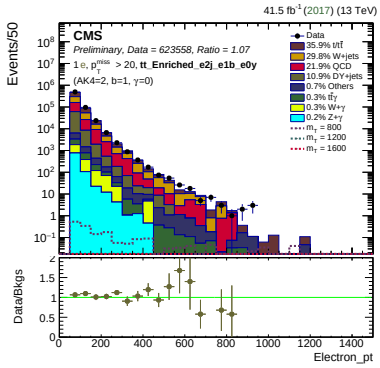

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 668938, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
61.7% tt̄
18.7% W+jets
11.2% QCD
6.5% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

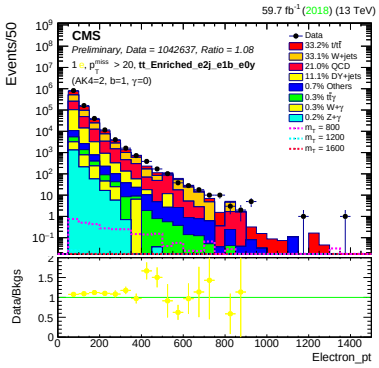

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 458471, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
40.9% W+jets
24.8% QCD
19.0% tt̄
12.0% DY+jets
2.2% Others
0.7% W+γ
0.2% tt̄γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

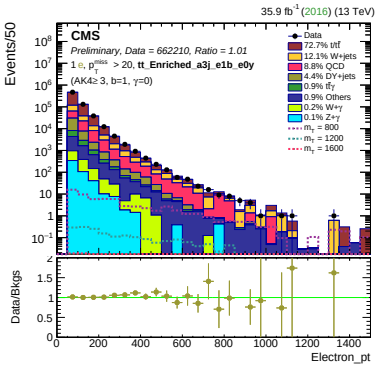

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 624944, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
41.6% W+jets
25.3% QCD
16.8% tt̄
13.5% DY+jets
1.8% Others
0.6% W+γ
0.2% Z+γ
0.2% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

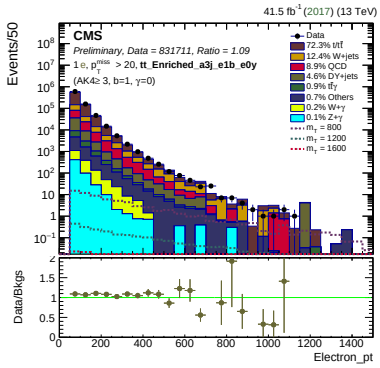

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 792727, Ratio = 1.06
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
44.5% W+jets
21.8% QCD
16.7% tt̄
13.9% DY+jets
2.0% Others
0.7% W+γ
0.2% Z+γ
0.2% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/40
Data/Bkgs
Reco_met

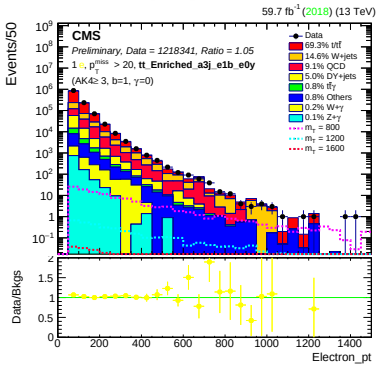

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 502889, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
38.2% tt̄
27.7% W+jets
20.3% QCD
12.2% DY+jets
0.8% Others
0.4% tt̄γ
0.2% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

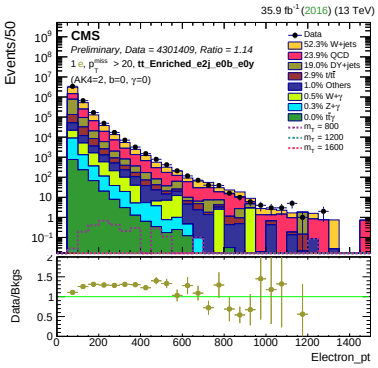

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 623558, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
35.9% tt̄
29.8% W+jets
21.9% QCD
10.9% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

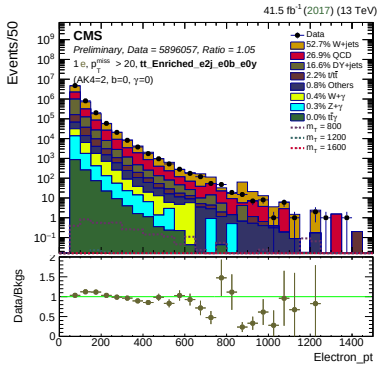

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1042637, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
33.2% tt̄
33.1% W+jets
21.0% QCD
11.1% DY+jets
0.7% Others
0.3% tt̄γ
0.3% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

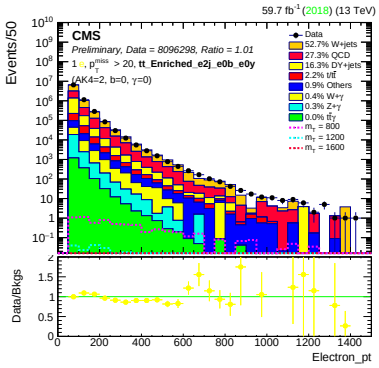

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 662210, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.7% tt̄
12.1% W+jets
8.8% QCD
4.4% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

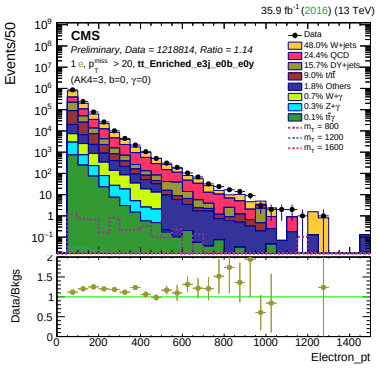

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 831711, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.3% tt̄
12.4% W+jets
8.9% QCD
4.6% DY+jets
0.9% tt̄γ
0.7% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

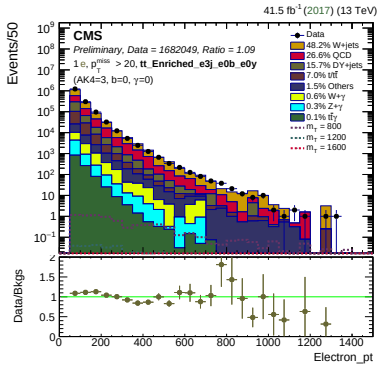

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1218341, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
69.3% tt̄
14.6% W+jets
9.1% QCD
5.0% DY+jets
0.8% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

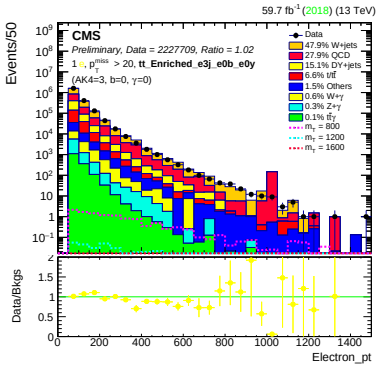

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 4301409, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.3% W+jets
23.9% QCD
19.0% DY+jets
2.9% tt̄
1.0% Others
0.5% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

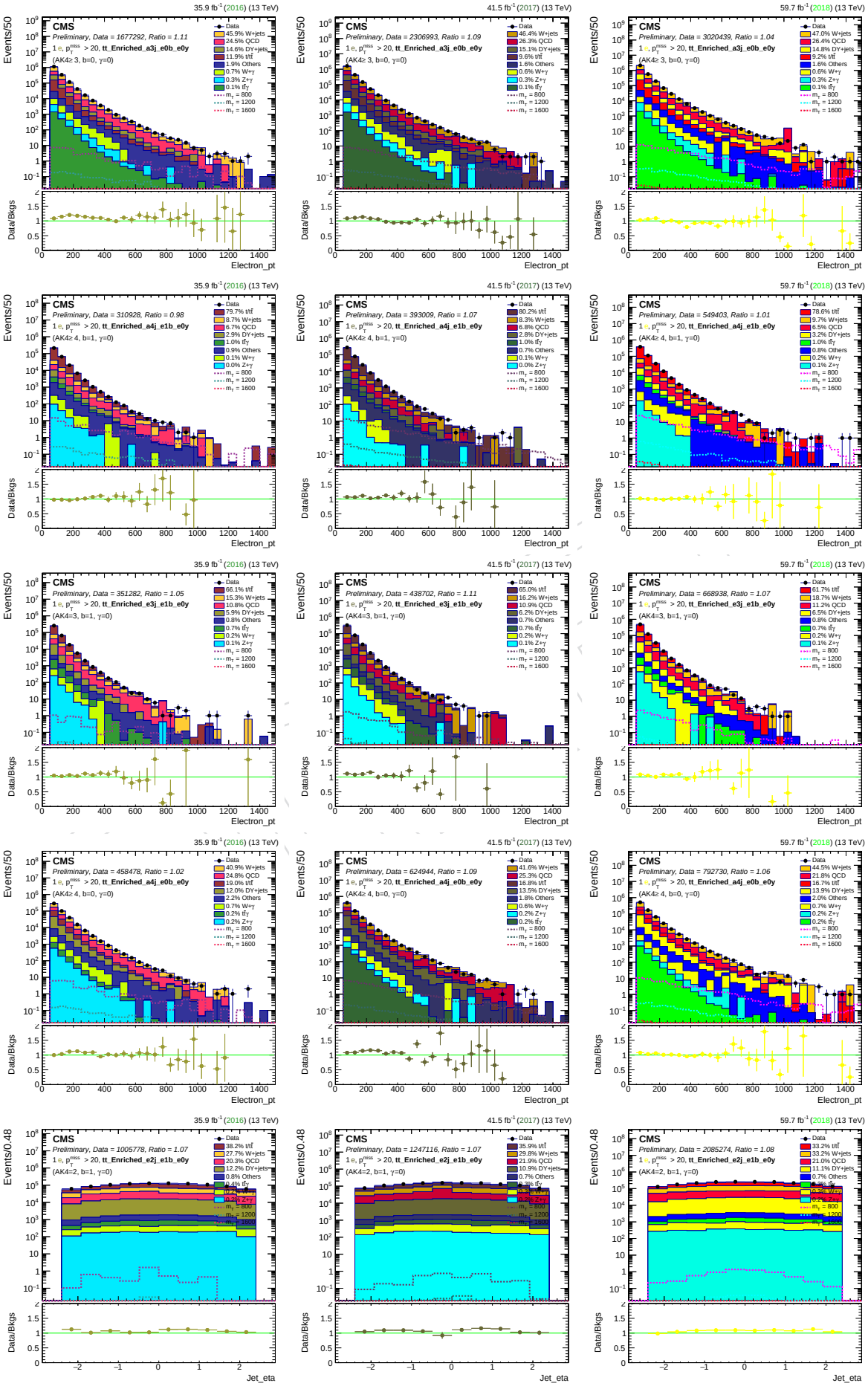

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 5896057, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
26.9% QCD
16.6% DY+jets
2.2% tt̄
0.8% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

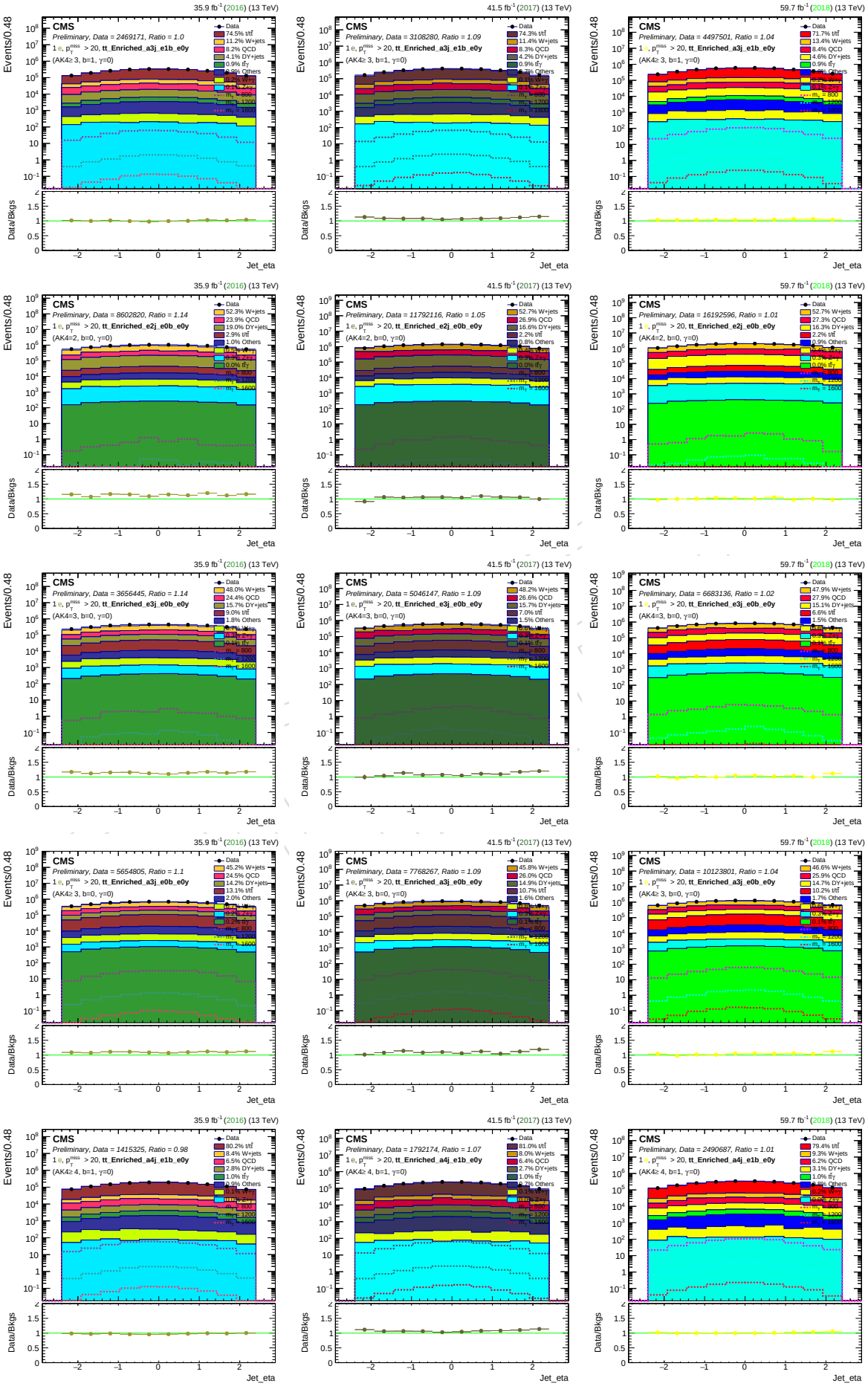

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 8096298, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
27.3% QCD
16.3% DY+jets
2.2% tt̄
0.9% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

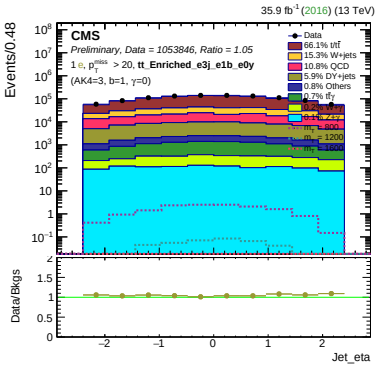

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1218814, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.0% W+jets
24.4% QCD
15.7% DY+jets
9.0% tt̄
1.8% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

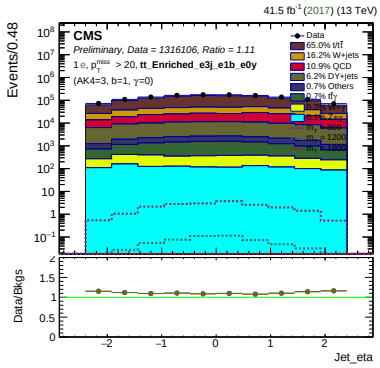

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1682049, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.2% W+jets
26.6% QCD
15.7% DY+jets
7.0% tt̄
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

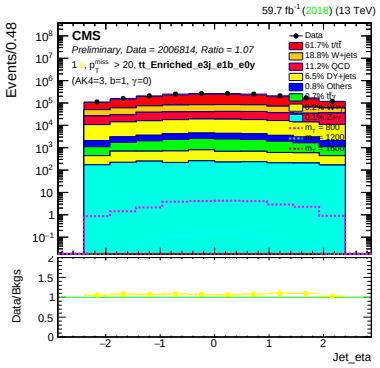

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2227709, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
47.9% W+jets
27.9% QCD
15.1% DY+jets
6.6% tt̄
1.5% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt

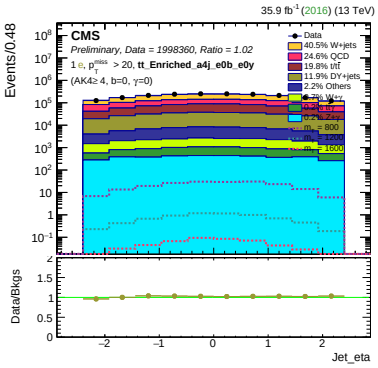

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1677292, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.9% W+jets
24.5% QCD
14.6% DY+jets
11.9% tt̄
1.9% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 2306993, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
46.4% W+jets
26.3% QCD
15.1% DY+jets
9.6% tt̄
1.6% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 3020439, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
47.0% W+jets
26.4% QCD
14.8% DY+jets
9.2% tt̄
1.6% Others
0.6% W+γ
0.3% Z+γ
0.1% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 310928, Ratio = 0.98
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
79.7% tt̄
8.7% W+jets
6.7% QCD
2.9% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 393009, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
80.2% tt̄
8.3% W+jets
6.8% QCD
2.8% DY+jets
1.0% tt̄γ
0.7% Others
0.1% W+γ
0.0% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 549403, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
78.6% tt̄
9.7% W+jets
6.5% QCD
3.2% DY+jets
1.0% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 351282, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
66.1% tt̄
15.3% W+jets
10.8% QCD
5.9% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 438702, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
65.0% tt̄
16.2% W+jets
10.9% QCD
6.2% DY+jets
0.7% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 668938, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
61.7% tt̄
18.7% W+jets
11.2% QCD
6.5% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 458478, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
40.9% W+jets
24.8% QCD
19.0% tt̄
12.0% DY+jets
2.2% Others
0.7% W+γ
0.2% tt̄γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 624944, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
41.6% W+jets
25.3% QCD
16.8% tt̄
13.5% DY+jets
1.8% Others
0.6% W+γ
0.2% Z+γ
0.2% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 792730, Ratio = 1.06
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
44.5% W+jets
21.8% QCD
16.7% tt̄
13.9% DY+jets
2.0% Others
0.7% W+γ
0.2% Z+γ
0.2% tt̄γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/50
Data/Bkgs
Electron_pt
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1005778, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
38.2% tt̄
27.7% W+jets
20.3% QCD
12.2% DY+jets
0.8% Others
0.6% tt̄γ
0.2% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/0.48
Data/Bkgs
Jet_eta
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1247116, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
35.9% tt̄
29.8% W+jets
21.9% QCD
10.9% DY+jets
0.7% Others
0.6% tt̄γ
0.2% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/0.48
Data/Bkgs
Jet_eta
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2085274, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
33.2% tt̄
33.2% W+jets
21.0% QCD
11.1% DY+jets
0.7% Others
0.6% tt̄γ
0.2% W+γ
0.2% Z+γ
m_τ = 800
m_τ = 1200
m_τ = 1600
Events/0.48
Data/Bkgs
Jet_eta

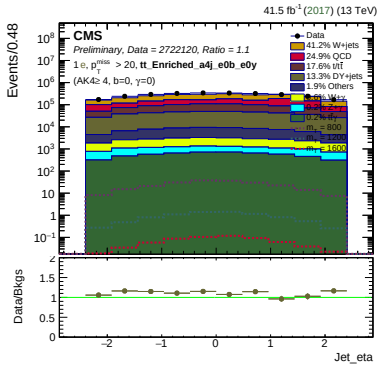

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 2469171, Ratio = 1.0
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
74.5% tt̄
11.2% W+jets
8.2% QCD
4.1% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_T = 800
m_T = 1200
m_T = 1600
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 3108280, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
74.3% tt̄
11.4% W+jets
8.3% QCD
4.2% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_T = 800
m_T = 1200
m_T = 1600
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 4497501, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
71.7% tt̄
13.4% W+jets
8.4% QCD
4.6% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_T = 800
m_T = 1200
m_T = 1600
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 8602820, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.3% W+jets
23.9% QCD
19.0% DY+jets
2.9% tt̄
1.0% Others
0.3% W+γ
0.3% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 11792116, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
26.9% QCD
16.6% DY+jets
2.2% tt̄
0.8% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 16192596, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
27.3% QCD
16.3% DY+jets
2.2% tt̄
0.9% Others
0.4% W+γ
0.3% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 3656445, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.0% W+jets
24.4% QCD
15.7% DY+jets
9.0% tt̄
1.8% Others
0.3% W+γ
0.3% Z+γ
0.1% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 5046147, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.2% W+jets
26.6% QCD
15.7% DY+jets
7.0% tt̄
1.5% Others
0.3% W+γ
0.3% Z+γ
0.1% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 6683136, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
47.9% W+jets
27.9% QCD
15.1% DY+jets
6.6% tt̄
1.5% Others
0.3% W+γ
0.3% Z+γ
0.1% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 5654805, Ratio = 1.1
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.2% W+jets
24.5% QCD
14.2% DY+jets
13.1% tt̄
2.0% Others
0.3% W+γ
0.2% Z+γ
0.2% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 7768267, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.8% W+jets
26.0% QCD
14.9% DY+jets
10.7% tt̄
1.6% Others
0.3% W+γ
0.2% Z+γ
0.1% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 10123801, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
46.6% W+jets
25.9% QCD
14.7% DY+jets
10.2% tt̄
1.7% Others
0.3% W+γ
0.2% Z+γ
0.1% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1415325, Ratio = 0.98
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
80.2% tt̄
8.4% W+jets
6.5% QCD
2.8% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.1% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1792174, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
81.0% tt̄
8.0% W+jets
6.4% QCD
2.7% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.1% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2490687, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
79.4% tt̄
9.3% W+jets
6.2% QCD
3.1% DY+jets
1.0% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
0.0% tt̄γ
m_T = 800
m_T = 1200
m_T = 1600
Events/0.48
Data/Bkgs
Jet_eta

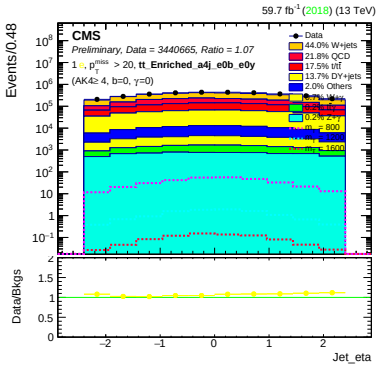

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1053846, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
66.1% tt̄f
15.3% W+jets
10.8% QCD
5.9% DY+jets
0.8% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

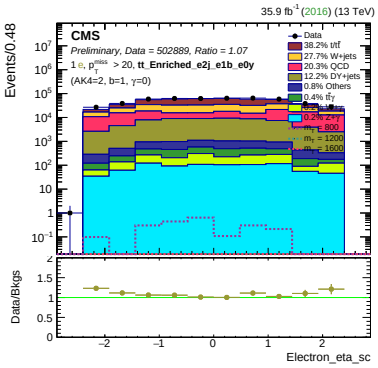

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1316106, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
65.0% tt̄f
16.2% W+jets
10.9% QCD
6.2% DY+jets
0.7% Others
0.7% tt̄γ
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

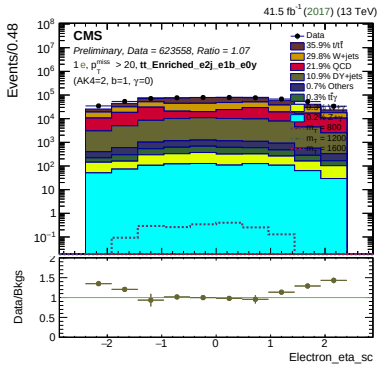

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2006814, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
61.7% tt̄f
18.8% W+jets
11.2% QCD
6.5% DY+jets
0.8% Others
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

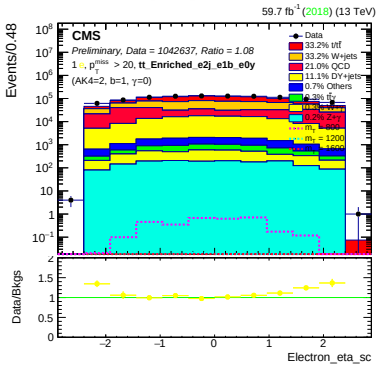

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1998360, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
40.5% W+jets
24.6% QCD
19.8% tt̄f
11.9% DY+jets
2.2% Others
0.7% W+γ
0.2% tt̄γ
0.2% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

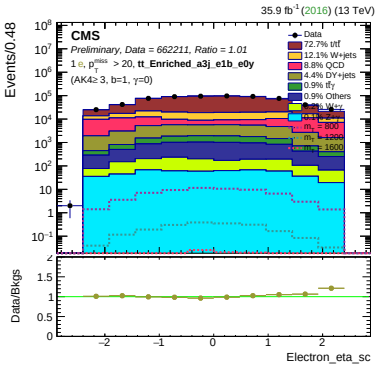

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 2722120, Ratio = 1.1
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
41.2% W+jets
24.9% QCD
17.6% tt̄f
13.3% DY+jets
1.9% Others
0.8% W+γ
0.2% Z+γ
0.2% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

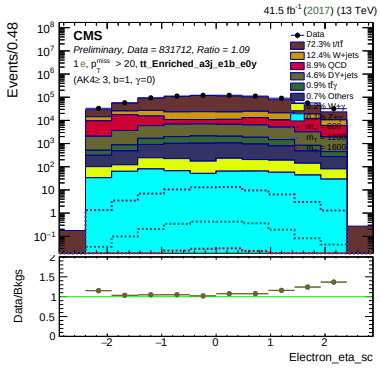

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 3440665, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
44.0% W+jets
21.8% QCD
17.5% tt̄f
13.7% DY+jets
2.0% Others
0.7% W+γ
0.2% Z+γ
0.2% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Jet_eta

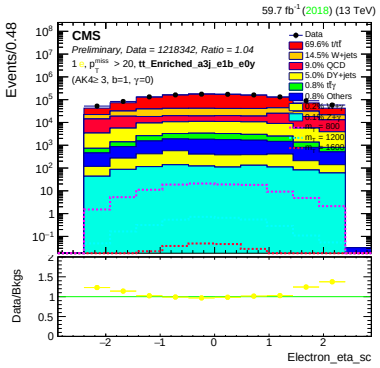

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 502889, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
38.2% tt̄f
27.7% W+jets
20.3% QCD
12.2% DY+jets
0.8% Others
0.4% tt̄γ
0.2% W+γ
0.2% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc

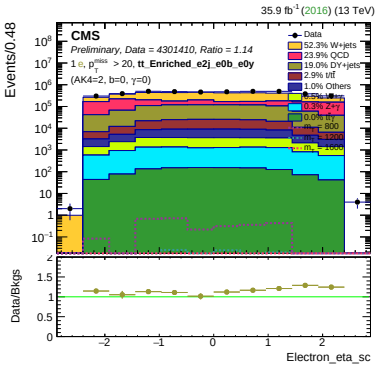

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 623558, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
35.9% tt̄f
29.8% W+jets
21.9% QCD
10.9% DY+jets
0.7% Others
0.3% tt̄γ
0.2% W+γ
0.2% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc

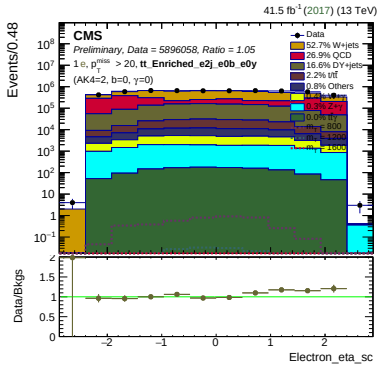

59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1042637, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e1b_e0y
(AK4=2, b=1, γ=0)
Data
33.2% tt̄f
33.2% W+jets
21.0% QCD
11.1% DY+jets
0.7% Others
0.3% tt̄γ
0.2% W+γ
0.2% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc

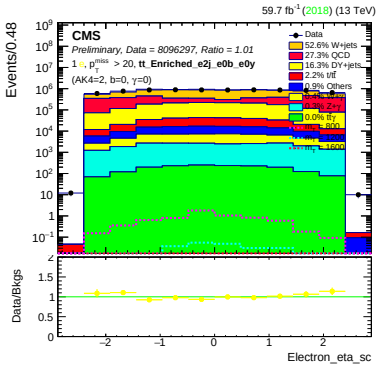

35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 662211, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.7% tt̄f
12.1% W+jets
8.8% QCD
4.4% DY+jets
0.9% tt̄γ
0.9% Others
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc

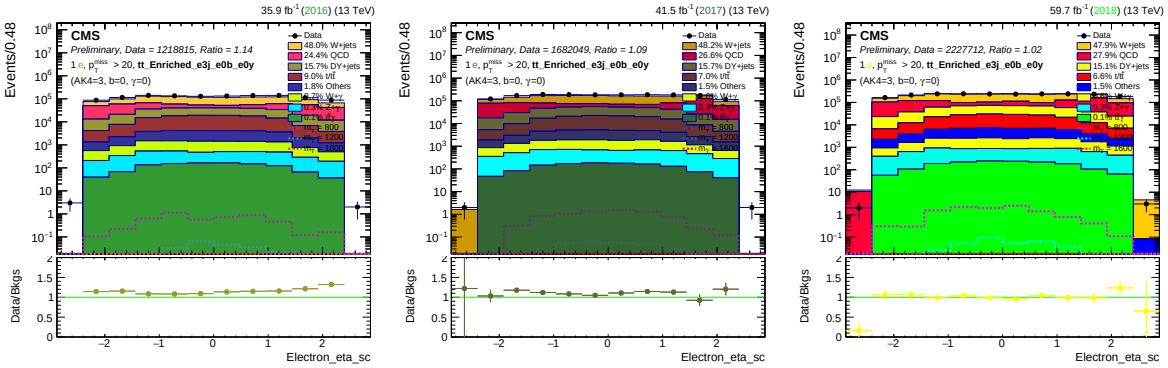

41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 831712, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
72.3% tt̄f
12.4% W+jets
8.9% QCD
4.6% DY+jets
0.9% tt̄γ
0.7% Others
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc


59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 1218342, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e1b_e0y
(AK4≥ 3, b=1, γ=0)
Data
69.6% tt̄f
14.5% W+jets
9.0% QCD
5.0% DY+jets
0.8% tt̄γ
0.8% Others
0.2% W+γ
0.1% Z+γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc


35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 4301410, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.3% W+jets
23.9% QCD
19.0% DY+jets
2.9% tt̄f
1.0% Others
0.3% W+γ
0.3% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc


41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 5896058, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.7% W+jets
26.9% QCD
16.6% DY+jets
2.2% tt̄f
0.8% Others
0.3% W+γ
0.3% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc


59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 8096297, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_e2j_e0b_e0y
(AK4=2, b=0, γ=0)
Data
52.6% W+jets
27.3% QCD
16.3% DY+jets
2.2% tt̄f
0.9% Others
0.3% W+γ
0.3% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc


35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1218815, Ratio = 1.14
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.0% W+jets
24.4% QCD
15.7% DY+jets
9.0% tt̄t̄
1.8% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 1682049, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
48.2% W+jets
26.6% QCD
15.7% DY+jets
7.0% tt̄t̄
1.5% Others
0.8% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 2227712, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e0b_e0y
(AK4=3, b=0, γ=0)
Data
47.9% W+jets
27.9% QCD
15.1% DY+jets
6.6% tt̄t̄
1.5% Others
0.8% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 1677293, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
45.9% W+jets
24.5% QCD
14.6% DY+jets
12.0% tt̄t̄
1.9% Others
0.7% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 2306993, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
46.4% W+jets
26.3% QCD
15.1% DY+jets
9.6% tt̄t̄
1.6% Others
0.8% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 3020445, Ratio = 1.04
1 e, p_T^{miss} > 20, tt_Enriched_a3j_e0b_e0y
(AK4≥ 3, b=0, γ=0)
Data
47.0% W+jets
26.4% QCD
14.8% DY+jets
9.2% tt̄t̄
1.6% Others
0.8% W+γ
0.3% Z+γ
0.1% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 310929, Ratio = 0.98
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
79.7% tt̄t̄
8.7% W+jets
6.7% QCD
2.9% DY+jets
1.0% tt̄γ
0.9% Others
0.1% W+γ
0.0% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 393010, Ratio = 1.07
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
80.2% tt̄t̄
8.3% W+jets
6.8% QCD
2.8% DY+jets
1.0% tt̄γ
0.7% Others
0.1% W+γ
0.0% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 549404, Ratio = 1.01
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e1b_e0y
(AK4≥ 4, b=1, γ=0)
Data
78.6% tt̄t̄
9.7% W+jets
6.5% QCD
3.2% DY+jets
1.0% tt̄γ
0.8% Others
0.1% W+γ
0.0% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 351282, Ratio = 1.05
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
66.1% tt̄t̄
15.3% W+jets
10.8% QCD
5.9% DY+jets
0.8% Others
0.7% tt̄γ
0.3% W+γ
0.1% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 438702, Ratio = 1.11
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
65.0% tt̄t̄
16.2% W+jets
10.9% QCD
6.2% DY+jets
0.7% Others
0.7% tt̄γ
0.3% W+γ
0.1% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 668938, Ratio = 1.08
1 e, p_T^{miss} > 20, tt_Enriched_e3j_e1b_e0y
(AK4=3, b=1, γ=0)
Data
61.7% tt̄t̄
18.8% W+jets
11.2% QCD
6.5% DY+jets
0.8% Others
0.7% tt̄γ
0.3% W+γ
0.1% Z+γ
0.0% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
35.9 fb^{-1} (2016) (13 TeV)
CMS
Preliminary, Data = 458478, Ratio = 1.02
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
40.9% W+jets
24.8% QCD
19.0% tt̄t̄
12.0% DY+jets
2.2% Others
0.7% W+γ
0.3% Z+γ
0.2% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
41.5 fb^{-1} (2017) (13 TeV)
CMS
Preliminary, Data = 624944, Ratio = 1.09
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
41.6% W+jets
25.3% QCD
16.8% tt̄t̄
13.5% DY+jets
1.8% Others
0.6% W+γ
0.3% Z+γ
0.2% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc
59.7 fb^{-1} (2018) (13 TeV)
CMS
Preliminary, Data = 792733, Ratio = 1.06
1 e, p_T^{miss} > 20, tt_Enriched_a4j_e0b_e0y
(AK4≥ 4, b=0, γ=0)
Data
44.5% W+jets
21.8% QCD
16.7% tt̄t̄
13.9% DY+jets
2.0% Others
0.8% W+γ
0.3% Z+γ
0.2% tt̄γ
m_Y = 800
m_Y = 1200
m_Y = 1600
Events/0.48
Data/Bkgs
Electron_eta_sc