

SR, Nominal Systematic, Yield Table for h yields SR ICHEP			
Sample	2jets modTopness $\geq 6.4$ $250 < MET < 350$	2jets modTopness $\geq 6.4$ $350 < MET < 450$	2jets modTopness $\geq 6.4$ $MET > 450$
$t\bar{t}$ , $\geq 2$ leptons	$57.20 \pm 2.03$	$6.23 \pm 0.62$	$0.49 \pm 0.16$
$t\bar{t}$ , 1 lepton	$0.59 \pm 0.30$	—	—
single $t$	$3.65 \pm 1.66$	$0.70 \pm 0.70$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	$17.02 \pm 3.65$	$4.36 \pm 1.45$	$2.41 \pm 0.79$
diBoson	$7.83 \pm 1.41$	$1.89 \pm 0.53$	$1.20 \pm 0.53$
$t\bar{t} + W$	$0.41 \pm 0.11$	$0.01 \pm 0.01$	$0.02 \pm 0.04$
$t\bar{t} + Z$	$1.88 \pm 0.04$	$0.45 \pm 0.02$	$0.23 \pm 0.01$
All Background	$88.56 \pm 4.72$	$13.64 \pm 1.81$	$4.35 \pm 0.96$
Data, single $e/\mu$ , MET	$107.00 \pm 10.34$	$17.00 \pm 4.12$	$8.00 \pm 2.83$
Data/MC	$1.21 \pm 0.13$	$1.25 \pm 0.34$	$1.84 \pm 0.77$
1 lepton, from $W$	$19.85 \pm 3.80$	$4.53 \pm 1.46$	$2.41 \pm 0.79$
1 lepton, from $t$	$0.59 \pm 0.30$	—	—
$\geq 2$ leptons	$62.89 \pm 2.68$	$7.23 \pm 0.95$	$0.72 \pm 0.20$
$Z \rightarrow \nu\nu$	$5.23 \pm 0.75$	$1.88 \pm 0.50$	$1.23 \pm 0.51$

SR, Nominal Systematic, Yield Table for h yields SR ICHEP

Sample	3jets MT2W $\geq$ 200 250 < MET < 350	3jets MT2W $\geq$ 200 350 < MET < 450	3jets MT2W $\geq$ 200 450 < MET < 550	3jets MT2W $\geq$ 200 MET > 550
$t\bar{t}$ , $\geq 2$ leptons	35.82 $\pm$ 1.81	5.30 $\pm$ 0.63	0.99 $\pm$ 0.38	0.28 $\pm$ 0.11
$t\bar{t}$ , 1 lepton	0.23 $\pm$ 0.13	—	—	—
single $t$	7.06 $\pm$ 2.32	1.05 $\pm$ 0.74	0.38 $\pm$ 0.38	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	21.46 $\pm$ 3.84	4.84 $\pm$ 1.47	2.02 $\pm$ 0.78	1.88 $\pm$ 0.92
diBoson	4.79 $\pm$ 1.08	1.24 $\pm$ 0.51	1.88 $\pm$ 0.62	0.39 $\pm$ 0.25
$t\bar{t} + W$	0.61 $\pm$ 0.20	0.24 $\pm$ 0.17	—	0.03 $\pm$ 0.02
$t\bar{t} + Z$	4.10 $\pm$ 0.06	1.34 $\pm$ 0.03	0.41 $\pm$ 0.02	0.23 $\pm$ 0.01
All Background	74.07 $\pm$ 4.96	14.01 $\pm$ 1.84	5.67 $\pm$ 1.13	2.81 $\pm$ 0.96
Data, single $e/\mu$ , MET	63.00 $\pm$ 7.94	15.00 $\pm$ 3.87	9.00 $\pm$ 3.00	4.00 $\pm$ 2.00
Data/MC	0.85 $\pm$ 0.12	1.07 $\pm$ 0.31	1.59 $\pm$ 0.62	1.42 $\pm$ 0.86
1 lepton, from $W$	23.70 $\pm$ 3.97	5.12 $\pm$ 1.47	2.44 $\pm$ 0.87	2.00 $\pm$ 0.92
1 lepton, from $t$	0.23 $\pm$ 0.13	0.00 $\pm$ 0.00	0.00 $\pm$ 0.00	—
$\geq 2$ leptons	44.17 $\pm$ 2.89	6.78 $\pm$ 1.00	1.63 $\pm$ 0.60	0.42 $\pm$ 0.16
$Z \rightarrow \nu\nu$	5.97 $\pm$ 0.63	2.12 $\pm$ 0.48	1.61 $\pm$ 0.40	0.39 $\pm$ 0.22

SR, Nominal Systematic, Yield Table for h yields SR ICHEP			
Sample	$\geq 4\text{jets}$ MT2W < 200	$\geq 4\text{jets}$ MT2W < 200	$\geq 4\text{jets}$ MT2W < 200
	250 < MET < 350	350 < MET < 450	MET > 450
$t\bar{t}$ , $\geq 2$ leptons	284.53 $\pm$ 5.13	43.54 $\pm$ 1.86	11.72 $\pm$ 0.89
$t\bar{t}$ , 1 lepton	8.17 $\pm$ 1.27	1.51 $\pm$ 0.57	0.44 $\pm$ 0.22
single $t$	4.68 $\pm$ 1.76	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	8.67 $\pm$ 2.14	1.65 $\pm$ 0.71	0.27 $\pm$ 0.09
diBoson	2.44 $\pm$ 0.80	0.47 $\pm$ 0.23	0.05 $\pm$ 0.09
$t\bar{t}$ + W	1.99 $\pm$ 0.47	0.40 $\pm$ 0.20	0.29 $\pm$ 0.12
$t\bar{t}$ + Z	6.79 $\pm$ 0.07	1.31 $\pm$ 0.03	0.33 $\pm$ 0.01
All Background	317.27 $\pm$ 6.04	48.88 $\pm$ 2.09	13.10 $\pm$ 0.93
Data, single $e/\mu$ , MET	188.00 $\pm$ 13.71	43.00 $\pm$ 6.56	17.00 $\pm$ 4.12
Data/MC	0.59 $\pm$ 0.04	0.88 $\pm$ 0.14	1.30 $\pm$ 0.33
1 lepton, from W	9.64 $\pm$ 2.22	1.71 $\pm$ 0.71	0.30 $\pm$ 0.10
1 lepton, from $t$	9.95 $\pm$ 1.59	1.53 $\pm$ 0.57	0.46 $\pm$ 0.22
$\geq 2$ leptons	290.11 $\pm$ 5.36	43.95 $\pm$ 1.87	12.00 $\pm$ 0.90
Z $\rightarrow \nu\nu$	7.57 $\pm$ 0.46	1.69 $\pm$ 0.22	0.33 $\pm$ 0.09

SR, Nominal Systematic, Yield Table for h yields SR ICHEP					
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$ 250 < MET < 350	$\geq 4\text{jets}$ MT2W $\geq 200$ 350 < MET < 450	$\geq 4\text{jets}$ MT2W $\geq 200$ 450 < MET < 550	$\geq 4\text{jets}$ MT2W $\geq 200$ 550 < MET < 650	$\geq 4\text{jets}$ MT2W $\geq 200$ MET > 650
$t\bar{t}$ , $\geq 2$ leptons	51.65 $\pm$ 2.33	15.08 $\pm$ 1.32	3.77 $\pm$ 0.64	0.78 $\pm$ 0.27	0.46 $\pm$ 0.20
$t\bar{t}$ , 1 lepton	4.33 $\pm$ 0.84	1.86 $\pm$ 0.62	0.05 $\pm$ 0.05	—	0.17 $\pm$ 0.09
single $t$	5.84 $\pm$ 2.12	1.23 $\pm$ 0.87	0.85 $\pm$ 0.85	0.63 $\pm$ 0.63	0.28 $\pm$ 0.28
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	14.43 $\pm$ 2.62	5.42 $\pm$ 1.19	3.12 $\pm$ 1.01	0.74 $\pm$ 0.28	1.17 $\pm$ 0.36
diBoson	2.26 $\pm$ 0.73	2.20 $\pm$ 0.57	0.76 $\pm$ 0.42	0.29 $\pm$ 0.23	0.08 $\pm$ 0.19
$t\bar{t}$ + W	2.15 $\pm$ 0.39	0.63 $\pm$ 0.25	0.19 $\pm$ 0.09	0.10 $\pm$ 0.07	0.13 $\pm$ 0.05
$t\bar{t}$ + Z	6.13 $\pm$ 0.07	2.66 $\pm$ 0.04	0.97 $\pm$ 0.03	0.31 $\pm$ 0.01	0.14 $\pm$ 0.01
All Background	86.78 $\pm$ 4.26	29.08 $\pm$ 2.17	9.71 $\pm$ 1.53	2.87 $\pm$ 0.78	2.43 $\pm$ 0.54
Data, single $e/\mu$ , MET	61.00 $\pm$ 7.81	22.00 $\pm$ 4.69	6.00 $\pm$ 2.45	1.00 $\pm$ 1.00	6.00 $\pm$ 2.45
Data/MC	0.70 $\pm$ 0.10	0.76 $\pm$ 0.17	0.62 $\pm$ 0.27	0.35 $\pm$ 0.36	2.47 $\pm$ 1.15
1 lepton, from W	16.30 $\pm$ 2.80	6.40 $\pm$ 1.39	3.25 $\pm$ 1.01	0.77 $\pm$ 0.29	1.17 $\pm$ 0.36
1 lepton, from $t$	4.39 $\pm$ 0.85	1.86 $\pm$ 0.62	0.05 $\pm$ 0.05	—	0.17 $\pm$ 0.09
$\geq 2$ leptons	59.27 $\pm$ 3.07	16.36 $\pm$ 1.45	4.95 $\pm$ 1.08	1.51 $\pm$ 0.69	0.88 $\pm$ 0.34
Z $\rightarrow \nu\nu$	6.81 $\pm$ 0.46	4.45 $\pm$ 0.55	1.46 $\pm$ 0.39	0.59 $\pm$ 0.23	0.21 $\pm$ 0.19

SR, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	2jets modTopness $\geq$ 6.4 250 < MET < 350	2jets modTopness $\geq$ 6.4 350 < MET < 450	2jets modTopness $\geq$ 6.4 450 < MET < 550	2jets modTopness $\geq$ 6.4 550 < MET < 650	2jets modTopness $\geq$ 6.4 MET > 650
$t\bar{t}$ , $\geq$ 2 leptons	57.20 $\pm$ 2.03	6.23 $\pm$ 0.62	0.40 $\pm$ 0.14	0.10 $\pm$ 0.07	—
$t\bar{t}$ , 1 lepton	0.59 $\pm$ 0.30	—	—	—	—
single $t$	3.65 $\pm$ 1.66	0.70 $\pm$ 0.70	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	17.02 $\pm$ 3.65	4.36 $\pm$ 1.45	1.21 $\pm$ 0.59	0.59 $\pm$ 0.39	0.61 $\pm$ 0.35
diBoson	7.83 $\pm$ 1.41	1.89 $\pm$ 0.53	0.95 $\pm$ 0.27	0.03 $\pm$ 0.25	0.27 $\pm$ 0.37
$t\bar{t}$ + W	0.41 $\pm$ 0.11	0.01 $\pm$ 0.01	—	0.02 $\pm$ 0.02	—
$t\bar{t}$ + Z	1.88 $\pm$ 0.04	0.45 $\pm$ 0.02	0.14 $\pm$ 0.01	0.05 $\pm$ 0.01	0.04 $\pm$ 0.00
All Background	88.56 $\pm$ 4.72	13.64 $\pm$ 1.81	2.69 $\pm$ 0.67	0.78 $\pm$ 0.47	0.93 $\pm$ 0.51
Data, single $e/\mu$ , MET	107.00 $\pm$ 10.34	17.00 $\pm$ 4.12	4.00 $\pm$ 2.00	2.00 $\pm$ 1.41	2.00 $\pm$ 1.41
Data/MC	1.21 $\pm$ 0.13	1.25 $\pm$ 0.34	1.49 $\pm$ 0.83	2.55 $\pm$ 2.36	2.16 $\pm$ 1.93
1 lepton, from W	19.85 $\pm$ 3.80	4.53 $\pm$ 1.46	1.21 $\pm$ 0.59	0.60 $\pm$ 0.39	0.61 $\pm$ 0.35
1 lepton, from $t$	0.59 $\pm$ 0.30	—	—	—	—
$\geq$ 2 leptons	62.89 $\pm$ 2.68	7.23 $\pm$ 0.95	0.51 $\pm$ 0.17	0.13 $\pm$ 0.07	0.08 $\pm$ 0.08
Z $\rightarrow \nu\nu$	5.23 $\pm$ 0.75	1.88 $\pm$ 0.50	0.97 $\pm$ 0.25	0.05 $\pm$ 0.25	0.24 $\pm$ 0.36

SR, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200
	250 < MET < 350	350 < MET < 450	450 < MET < 550	550 < MET < 650	MET > 650
$t\bar{t}$ , $\geq 2$ leptons	35.82 $\pm$ 1.81	5.30 $\pm$ 0.63	0.99 $\pm$ 0.38	0.19 $\pm$ 0.09	0.09 $\pm$ 0.06
$t\bar{t}$ , 1 lepton	0.23 $\pm$ 0.13	—	—	—	—
single $t$	7.06 $\pm$ 2.32	1.05 $\pm$ 0.74	0.38 $\pm$ 0.38	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	21.46 $\pm$ 3.84	4.84 $\pm$ 1.47	2.02 $\pm$ 0.78	0.31 $\pm$ 0.19	1.57 $\pm$ 0.90
diBoson	4.79 $\pm$ 1.08	1.24 $\pm$ 0.51	1.88 $\pm$ 0.62	0.35 $\pm$ 0.19	0.19 $\pm$ 0.15
$t\bar{t}$ + W	0.61 $\pm$ 0.20	0.24 $\pm$ 0.17	—	—	0.03 $\pm$ 0.02
$t\bar{t}$ + Z	4.10 $\pm$ 0.06	1.34 $\pm$ 0.03	0.41 $\pm$ 0.02	0.13 $\pm$ 0.01	0.09 $\pm$ 0.01
All Background	74.07 $\pm$ 4.96	14.01 $\pm$ 1.84	5.67 $\pm$ 1.13	0.98 $\pm$ 0.29	1.97 $\pm$ 0.91
Data, single $e/\mu$ , MET	63.00 $\pm$ 7.94	15.00 $\pm$ 3.87	9.00 $\pm$ 3.00	3.00 $\pm$ 1.73	1.00 $\pm$ 1.00
Data/MC	0.85 $\pm$ 0.12	1.07 $\pm$ 0.31	1.59 $\pm$ 0.62	3.07 $\pm$ 1.99	0.51 $\pm$ 0.56
1 lepton, from W	23.70 $\pm$ 3.97	5.12 $\pm$ 1.47	2.44 $\pm$ 0.87	0.36 $\pm$ 0.19	1.64 $\pm$ 0.90
1 lepton, from $t$	0.23 $\pm$ 0.13	0.00 $\pm$ 0.00	0.00 $\pm$ 0.00	—	—
$\geq 2$ leptons	44.17 $\pm$ 2.89	6.78 $\pm$ 1.00	1.63 $\pm$ 0.60	0.19 $\pm$ 0.09	0.23 $\pm$ 0.12
Z $\rightarrow \nu\nu$	5.97 $\pm$ 0.63	2.12 $\pm$ 0.48	1.61 $\pm$ 0.40	0.43 $\pm$ 0.19	0.10 $\pm$ 0.10

SR, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	$\geq 4\text{jets}$ MT2W < 200 250 < MET < 350	$\geq 4\text{jets}$ MT2W < 200 350 < MET < 450	$\geq 4\text{jets}$ MT2W < 200 450 < MET < 550	$\geq 4\text{jets}$ MT2W < 200 550 < MET < 650	$\geq 4\text{jets}$ MT2W < 200 MET > 650
$t\bar{t}$ , $\geq 2$ leptons	$284.53 \pm 5.13$	$43.54 \pm 1.86$	$8.02 \pm 0.75$	$2.34 \pm 0.38$	$1.37 \pm 0.30$
$t\bar{t}$ , 1 lepton	$8.17 \pm 1.27$	$1.51 \pm 0.57$	$0.14 \pm 0.08$	$0.06 \pm 0.06$	$0.24 \pm 0.20$
single $t$	$4.68 \pm 1.76$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$8.67 \pm 2.14$	$1.65 \pm 0.71$	$0.21 \pm 0.09$	$0.03 \pm 0.02$	$0.03 \pm 0.02$
diBoson	$2.44 \pm 0.80$	$0.47 \pm 0.23$	$0.08 \pm 0.07$	—	$0.02 \pm 0.06$
$t\bar{t} + W$	$1.99 \pm 0.47$	$0.40 \pm 0.20$	$0.18 \pm 0.09$	$0.08 \pm 0.06$	$0.04 \pm 0.04$
$t\bar{t} + Z$	$6.79 \pm 0.07$	$1.31 \pm 0.03$	$0.23 \pm 0.01$	$0.07 \pm 0.01$	$0.03 \pm 0.00$
All Background	$317.27 \pm 6.04$	$48.88 \pm 2.09$	$8.86 \pm 0.77$	$2.58 \pm 0.39$	$1.72 \pm 0.36$
Data, single $e/\mu$ , MET	$188.00 \pm 13.71$	$43.00 \pm 6.56$	$11.00 \pm 3.32$	$3.00 \pm 1.73$	$3.00 \pm 1.73$
Data/MC	$0.59 \pm 0.04$	$0.88 \pm 0.14$	$1.24 \pm 0.39$	$1.16 \pm 0.70$	$1.74 \pm 1.07$
1 lepton, from $W$	$9.64 \pm 2.22$	$1.71 \pm 0.71$	$0.22 \pm 0.10$	$0.03 \pm 0.02$	$0.05 \pm 0.03$
1 lepton, from $t$	$9.95 \pm 1.59$	$1.53 \pm 0.57$	$0.15 \pm 0.08$	$0.06 \pm 0.06$	$0.24 \pm 0.20$
$\geq 2$ leptons	$290.11 \pm 5.36$	$43.95 \pm 1.87$	$8.18 \pm 0.75$	$2.41 \pm 0.39$	$1.41 \pm 0.30$
$Z \rightarrow \nu\nu$	$7.57 \pm 0.46$	$1.69 \pm 0.22$	$0.29 \pm 0.07$	$0.07 \pm 0.01$	$0.03 \pm 0.05$

SR, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb						
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$ 250 < MET < 350	$\geq 4\text{jets}$ MT2W $\geq 200$ 350 < MET < 450	$\geq 4\text{jets}$ MT2W $\geq 200$ 450 < MET < 550	$\geq 4\text{jets}$ MT2W $\geq 200$ 550 < MET < 650	$\geq 4\text{jets}$ MT2W $\geq 200$ 650 < MET < 800	$\geq 4\text{jets}$ MT2W $\geq 200$ MET > 800
$t\bar{t}$ , $\geq 2$ leptons	51.65 $\pm$ 2.33	15.08 $\pm$ 1.32	3.77 $\pm$ 0.64	0.78 $\pm$ 0.27	0.16 $\pm$ 0.08	0.31 $\pm$ 0.18
$t\bar{t}$ , 1 lepton	4.33 $\pm$ 0.84	1.86 $\pm$ 0.62	0.05 $\pm$ 0.05	—	0.07 $\pm$ 0.05	0.10 $\pm$ 0.07
single $t$	5.84 $\pm$ 2.12	1.23 $\pm$ 0.87	0.85 $\pm$ 0.85	0.63 $\pm$ 0.63	0.28 $\pm$ 0.28	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	14.43 $\pm$ 2.62	5.42 $\pm$ 1.19	3.12 $\pm$ 1.01	0.74 $\pm$ 0.28	0.72 $\pm$ 0.27	0.45 $\pm$ 0.25
diBoson	2.26 $\pm$ 0.73	2.20 $\pm$ 0.57	0.76 $\pm$ 0.42	0.29 $\pm$ 0.23	0.13 $\pm$ 0.07	0.01 $\pm$ 0.18
$t\bar{t}$ + W	2.15 $\pm$ 0.39	0.63 $\pm$ 0.25	0.19 $\pm$ 0.09	0.10 $\pm$ 0.07	0.12 $\pm$ 0.05	0.01 $\pm$ 0.01
$t\bar{t}$ + Z	6.13 $\pm$ 0.07	2.66 $\pm$ 0.04	0.97 $\pm$ 0.03	0.31 $\pm$ 0.01	0.11 $\pm$ 0.01	0.03 $\pm$ 0.00
All Background	86.78 $\pm$ 4.26	29.08 $\pm$ 2.17	9.71 $\pm$ 1.53	2.87 $\pm$ 0.78	1.58 $\pm$ 0.41	0.90 $\pm$ 0.36
Data, single $e/\mu$ , MET	61.00 $\pm$ 7.81	22.00 $\pm$ 4.69	6.00 $\pm$ 2.45	1.00 $\pm$ 1.00	1.00 $\pm$ 1.00	5.00 $\pm$ 2.24
Data/MC	0.70 $\pm$ 0.10	0.76 $\pm$ 0.17	0.62 $\pm$ 0.27	0.35 $\pm$ 0.36	0.63 $\pm$ 0.65	5.53 $\pm$ 3.32
1 lepton, from W	16.30 $\pm$ 2.80	6.40 $\pm$ 1.39	3.25 $\pm$ 1.01	0.77 $\pm$ 0.29	0.73 $\pm$ 0.27	0.45 $\pm$ 0.25
1 lepton, from $t$	4.39 $\pm$ 0.85	1.86 $\pm$ 0.62	0.05 $\pm$ 0.05	—	0.07 $\pm$ 0.05	0.10 $\pm$ 0.07
$\geq 2$ leptons	59.27 $\pm$ 3.07	16.36 $\pm$ 1.45	4.95 $\pm$ 1.08	1.51 $\pm$ 0.69	0.56 $\pm$ 0.29	0.32 $\pm$ 0.18
Z $\rightarrow \nu\nu$	6.81 $\pm$ 0.46	4.45 $\pm$ 0.55	1.46 $\pm$ 0.39	0.59 $\pm$ 0.23	0.22 $\pm$ 0.07	0.04 $\pm$ 0.18



SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $MET > 550$
$t\bar{t}, \geq 2$ leptons	$70.96 \pm 2.29$	$9.30 \pm 0.76$	$0.71 \pm 0.20$	$0.29 \pm 0.12$
$t\bar{t}, 1$ lepton	$0.52 \pm 0.29$	—	—	—
single $t$	$1.87 \pm 1.09$	$0.70 \pm 0.70$	$0.38 \pm 0.38$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$11.08 \pm 2.72$	$1.06 \pm 0.65$	$0.90 \pm 0.58$	$0.80 \pm 0.70$
diBoson	$5.15 \pm 1.20$	$0.47 \pm 0.38$	$0.89 \pm 0.35$	$0.06 \pm 0.09$
$t\bar{t} + W$	$0.44 \pm 0.16$	$0.05 \pm 0.06$	—	$0.03 \pm 0.02$
$t\bar{t} + Z$	$3.79 \pm 0.05$	$1.22 \pm 0.03$	$0.35 \pm 0.01$	$0.19 \pm 0.01$
All Background	$93.81 \pm 3.92$	$12.79 \pm 1.28$	$3.22 \pm 0.80$	$1.38 \pm 0.72$
Data, single $e/\mu$ , MET	$88.00 \pm 9.38$	$15.00 \pm 3.87$	$6.00 \pm 2.45$	$3.00 \pm 1.73$
Data/MC	$0.94 \pm 0.11$	$1.17 \pm 0.32$	$1.86 \pm 0.89$	$2.18 \pm 1.70$
1 lepton, from $W$	$13.27 \pm 2.88$	$1.14 \pm 0.65$	$0.90 \pm 0.58$	$0.85 \pm 0.70$
1 lepton, from $t$	$0.52 \pm 0.29$	—	—	—
$\geq 2$ leptons	$74.61 \pm 2.59$	$10.11 \pm 1.04$	$1.35 \pm 0.50$	$0.30 \pm 0.12$
$Z \rightarrow \nu\nu$	$5.41 \pm 0.55$	$1.54 \pm 0.37$	$0.98 \pm 0.23$	$0.22 \pm 0.09$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}, \geq 2$ leptons	$1.44 \pm 0.37$	$0.19 \pm 0.11$	$0.05 \pm 0.05$	—
$t\bar{t}, 1$ lepton	—	—	—	—
single $t$	$1.89 \pm 1.33$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$9.80 \pm 2.75$	$4.69 \pm 1.56$	$1.84 \pm 0.76$	$1.60 \pm 0.56$
diBoson	$3.56 \pm 0.82$	$2.13 \pm 0.48$	$0.96 \pm 0.31$	$0.23 \pm 0.46$
$t\bar{t} + W$	$0.20 \pm 0.08$	—	—	$0.02 \pm 0.02$
$t\bar{t} + Z$	$0.72 \pm 0.02$	$0.29 \pm 0.01$	$0.12 \pm 0.01$	$0.09 \pm 0.01$
All Background	$17.61 \pm 3.19$	$7.29 \pm 1.64$	$2.97 \pm 0.82$	$1.94 \pm 0.73$
Data, single $e/\mu$ , MET	$28.00 \pm 5.29$	$8.00 \pm 2.83$	$2.00 \pm 1.41$	$4.00 \pm 2.00$
Data/MC	$1.59 \pm 0.42$	$1.10 \pm 0.46$	$0.67 \pm 0.51$	$2.06 \pm 1.29$
1 lepton, from $W$	$10.68 \pm 2.79$	$4.94 \pm 1.56$	$1.86 \pm 0.76$	$1.65 \pm 0.56$
1 lepton, from $t$	$0.00 \pm 0.00$	—	—	—
$\geq 2$ leptons	$4.07 \pm 1.42$	$0.29 \pm 0.15$	$0.16 \pm 0.10$	$0.11 \pm 0.08$
$Z \rightarrow \nu\nu$	$2.86 \pm 0.58$	$2.06 \pm 0.47$	$0.94 \pm 0.29$	$0.18 \pm 0.45$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $550 < MET < 650$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	$252.38 \pm 4.77$	$40.02 \pm 1.82$	$8.24 \pm 0.80$	$2.34 \pm 0.38$	$1.24 \pm 0.30$
$t\bar{t}$ , 1 lepton	$6.46 \pm 1.00$	$1.20 \pm 0.49$	$0.18 \pm 0.09$	$0.06 \pm 0.06$	$0.30 \pm 0.21$
single $t$	$3.91 \pm 1.58$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$8.26 \pm 2.18$	$0.91 \pm 0.50$	$1.01 \pm 0.68$	$0.03 \pm 0.02$	$0.04 \pm 0.02$
diBoson	$1.80 \pm 0.76$	$0.48 \pm 0.23$	$0.07 \pm 0.06$	$0.01 \pm 0.01$	$0.01 \pm 0.02$
$t\bar{t} + W$	$2.10 \pm 0.46$	$0.59 \pm 0.19$	$0.15 \pm 0.08$	$0.05 \pm 0.05$	$0.08 \pm 0.06$
$t\bar{t} + Z$	$6.06 \pm 0.07$	$1.28 \pm 0.03$	$0.25 \pm 0.01$	$0.08 \pm 0.01$	$0.03 \pm 0.00$
All Background	$280.97 \pm 5.64$	$44.47 \pm 1.97$	$9.90 \pm 1.06$	$2.57 \pm 0.39$	$1.69 \pm 0.37$
Data, single $e/\mu$ , MET	$181.00 \pm 13.45$	$39.00 \pm 6.24$	$11.00 \pm 3.32$	$3.00 \pm 1.73$	$5.00 \pm 2.24$
Data/MC	$0.64 \pm 0.05$	$0.88 \pm 0.15$	$1.11 \pm 0.36$	$1.17 \pm 0.70$	$2.96 \pm 1.47$
1 lepton, from W	$9.09 \pm 2.25$	$1.01 \pm 0.50$	$1.02 \pm 0.68$	$0.04 \pm 0.02$	$0.04 \pm 0.03$
1 lepton, from $t$	$8.24 \pm 1.38$	$1.22 \pm 0.49$	$0.20 \pm 0.09$	$0.06 \pm 0.06$	$0.30 \pm 0.21$
$\geq 2$ leptons	$257.14 \pm 4.96$	$40.71 \pm 1.83$	$8.38 \pm 0.80$	$2.39 \pm 0.39$	$1.32 \pm 0.31$
$Z \rightarrow \nu\nu$	$6.50 \pm 0.42$	$1.53 \pm 0.20$	$0.30 \pm 0.05$	$0.08 \pm 0.01$	$0.03 \pm 0.00$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$41.01 \pm 2.17$	$9.27 \pm 1.01$	$2.00 \pm 0.46$	$0.86 \pm 0.29$
$t\bar{t}$ , 1 lepton	$4.20 \pm 1.04$	$0.94 \pm 0.40$	—	$0.04 \pm 0.04$
single $t$	$4.74 \pm 1.98$	$0.70 \pm 0.70$	$0.85 \pm 0.85$	$0.63 \pm 0.63$
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$7.14 \pm 1.24$	$4.47 \pm 1.15$	$1.31 \pm 0.41$	$0.69 \pm 0.27$
diBoson	$1.07 \pm 0.47$	$0.94 \pm 0.34$	$0.37 \pm 0.35$	$0.21 \pm 0.27$
$t\bar{t} + W$	$1.03 \pm 0.27$	$0.15 \pm 0.13$	$0.13 \pm 0.09$	$0.09 \pm 0.04$
$t\bar{t} + Z$	$1.36 \pm 0.03$	$0.35 \pm 0.02$	$0.09 \pm 0.01$	$0.04 \pm 0.00$
All Background	$60.55 \pm 3.40$	$16.81 \pm 1.77$	$4.75 \pm 1.11$	$2.56 \pm 0.79$
Data, single $e/\mu$ , MET	$33.00 \pm 5.74$	$13.00 \pm 3.61$	$4.00 \pm 2.00$	$2.00 \pm 1.41$
Data/MC	$0.54 \pm 0.10$	$0.77 \pm 0.23$	$0.84 \pm 0.46$	$0.78 \pm 0.60$
1 lepton, from $W$	$8.43 \pm 1.51$	$5.26 \pm 1.35$	$1.40 \pm 0.42$	$0.69 \pm 0.27$
1 lepton, from $t$	$4.25 \pm 1.04$	$0.94 \pm 0.40$	$0.00 \pm 0.00$	$0.04 \pm 0.04$
$\geq 2$ leptons	$46.25 \pm 2.84$	$9.43 \pm 1.02$	$2.99 \pm 0.97$	$1.59 \pm 0.70$
$Z \rightarrow \nu\nu$	$1.62 \pm 0.38$	$1.18 \pm 0.33$	$0.37 \pm 0.34$	$0.24 \pm 0.27$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1					
Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$17.48 \pm 1.33$	$2.15 \pm 0.49$	$0.34 \pm 0.16$	$1.40 \pm 0.37$	$0.10 \pm 0.07$
$t\bar{t}$ , 1 lepton	$0.78 \pm 0.38$	$0.29 \pm 0.29$	—	$0.30 \pm 0.24$	—
single $t$	—	—	—	$0.64 \pm 0.64$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.27 \pm 0.11$	$0.56 \pm 0.49$	$0.04 \pm 0.02$	$0.25 \pm 0.10$	$0.20 \pm 0.09$
diBoson	$0.26 \pm 0.12$	$0.06 \pm 0.06$	$0.02 \pm 0.06$	$0.50 \pm 0.25$	$0.42 \pm 0.24$
$t\bar{t} + W$	$0.35 \pm 0.18$	$0.06 \pm 0.08$	—	$0.07 \pm 0.06$	—
$t\bar{t} + Z$	$1.47 \pm 0.03$	$0.28 \pm 0.01$	$0.07 \pm 0.01$	$0.28 \pm 0.02$	$0.05 \pm 0.01$
All Background	$20.61 \pm 1.41$	$3.42 \pm 0.76$	$0.47 \pm 0.17$	$3.43 \pm 0.83$	$0.78 \pm 0.27$
Data, single $e/\mu$ , MET	$10.00 \pm 3.16$	$2.00 \pm 1.41$	—	$4.00 \pm 2.00$	$2.00 \pm 1.41$
Data/MC	$0.49 \pm 0.16$	$0.59 \pm 0.43$	—	$1.16 \pm 0.65$	$2.57 \pm 2.03$
1 lepton, from $W$	$0.38 \pm 0.13$	$0.56 \pm 0.49$	$0.06 \pm 0.03$	$0.31 \pm 0.11$	$0.20 \pm 0.10$
1 lepton, from $t$	$0.78 \pm 0.38$	$0.29 \pm 0.29$	—	$0.30 \pm 0.24$	—
$\geq 2$ leptons	$17.82 \pm 1.34$	$2.21 \pm 0.50$	$0.34 \pm 0.16$	$2.11 \pm 0.74$	$0.11 \pm 0.07$
$Z \rightarrow \nu\nu$	$1.63 \pm 0.12$	$0.35 \pm 0.06$	$0.07 \pm 0.06$	$0.71 \pm 0.25$	$0.47 \pm 0.24$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $450 < MET < 600$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $MET > 600$
$t\bar{t}, \geq 2$ leptons	$22.80 \pm 1.47$	$6.63 \pm 0.76$	$1.34 \pm 0.31$	$0.26 \pm 0.12$
$t\bar{t}, 1$ lepton	$1.00 \pm 0.31$	$0.71 \pm 0.43$	—	$0.08 \pm 0.05$
single $t$	$1.22 \pm 0.87$	$0.53 \pm 0.53$	—	$0.28 \pm 0.28$
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$3.01 \pm 1.65$	$0.24 \pm 0.14$	$0.10 \pm 0.06$	$0.13 \pm 0.06$
diBoson	$0.81 \pm 0.52$	$0.28 \pm 0.10$	$0.10 \pm 0.10$	$0.02 \pm 0.06$
$t\bar{t} + W$	$0.52 \pm 0.21$	$0.23 \pm 0.19$	$0.11 \pm 0.08$	$0.04 \pm 0.02$
$t\bar{t} + Z$	$3.38 \pm 0.05$	$1.70 \pm 0.03$	$0.76 \pm 0.02$	$0.18 \pm 0.01$
All Background	$32.74 \pm 2.46$	$10.31 \pm 1.05$	$2.42 \pm 0.34$	$0.98 \pm 0.32$
Data, single $e/\mu$ , MET	$18.00 \pm 4.24$	$10.00 \pm 3.16$	—	$2.00 \pm 1.41$
Data/MC	$0.55 \pm 0.14$	$0.97 \pm 0.32$	—	$2.05 \pm 1.60$
1 lepton, from $W$	$3.55 \pm 1.72$	$0.34 \pm 0.15$	$0.15 \pm 0.07$	$0.13 \pm 0.06$
1 lepton, from $t$	$1.00 \pm 0.31$	$0.71 \pm 0.43$	—	$0.08 \pm 0.05$
$\geq 2$ leptons	$24.69 \pm 1.72$	$7.39 \pm 0.94$	$1.45 \pm 0.32$	$0.58 \pm 0.30$
$Z \rightarrow \nu\nu$	$3.51 \pm 0.18$	$1.87 \pm 0.10$	$0.82 \pm 0.10$	$0.19 \pm 0.06$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1			
Sample	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $400 < MET < 650$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $MET > 650$
$t\bar{t}, \geq 2$ leptons	$1.46 \pm 0.38$	$0.21 \pm 0.16$	—
$t\bar{t}, 1$ lepton	—	—	—
single $t$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	$4.46 \pm 1.56$	$1.58 \pm 0.69$	$0.77 \pm 0.35$
diBoson	$0.82 \pm 0.33$	$0.31 \pm 0.32$	$0.11 \pm 0.07$
$t\bar{t} + W$	$0.16 \pm 0.13$	$0.02 \pm 0.06$	—
$t\bar{t} + Z$	$0.56 \pm 0.02$	$0.31 \pm 0.02$	$0.02 \pm 0.00$
All Background	$7.47 \pm 1.65$	$2.43 \pm 0.78$	$0.90 \pm 0.36$
Data, single $e/\mu$ , MET	$4.00 \pm 2.00$	$1.00 \pm 1.00$	—
Data/MC	$0.54 \pm 0.29$	$0.41 \pm 0.43$	—
1 lepton, from $W$	$4.52 \pm 1.56$	$1.61 \pm 0.70$	$0.78 \pm 0.35$
1 lepton, from $t$	—	—	—
$\geq 2$ leptons	$1.81 \pm 0.44$	$0.35 \pm 0.22$	$0.00 \pm 0.02$
$Z \rightarrow \nu\nu$	$1.14 \pm 0.28$	$0.47 \pm 0.28$	$0.12 \pm 0.07$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$64.65 \pm 2.19$	$6.63 \pm 0.63$	$0.29 \pm 0.13$	$0.16 \pm 0.09$
$t\bar{t}$ , 1 lepton	$0.52 \pm 0.29$	—	—	—
single $t$	$3.00 \pm 1.55$	$0.70 \pm 0.70$	$0.38 \pm 0.38$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$15.68 \pm 3.27$	$4.62 \pm 1.59$	$1.66 \pm 0.82$	$1.20 \pm 0.79$
diBoson	$6.45 \pm 1.31$	$1.08 \pm 0.37$	$1.01 \pm 0.35$	$0.18 \pm 0.15$
$t\bar{t} + W$	$0.49 \pm 0.16$	$0.06 \pm 0.06$	—	$0.06 \pm 0.03$
$t\bar{t} + Z$	$4.09 \pm 0.05$	$1.15 \pm 0.03$	$0.32 \pm 0.01$	$0.18 \pm 0.01$
All Background	$94.88 \pm 4.44$	$14.24 \pm 1.89$	$3.65 \pm 0.98$	$1.77 \pm 0.81$
Data, single $e/\mu$ , MET	$100.00 \pm 10.00$	$18.00 \pm 4.24$	$5.00 \pm 2.24$	$5.00 \pm 2.24$
Data/MC	$1.05 \pm 0.12$	$1.26 \pm 0.34$	$1.37 \pm 0.71$	$2.82 \pm 1.81$
1 lepton, from $W$	$18.68 \pm 3.44$	$4.90 \pm 1.59$	$1.66 \pm 0.82$	$1.28 \pm 0.80$
1 lepton, from $t$	$0.52 \pm 0.29$	—	—	—
$\geq 2$ leptons	$69.11 \pm 2.71$	$7.45 \pm 0.95$	$0.95 \pm 0.48$	$0.20 \pm 0.10$
$Z \rightarrow \nu\nu$	$6.58 \pm 0.67$	$1.89 \pm 0.35$	$1.03 \pm 0.22$	$0.29 \pm 0.15$



SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$7.75 \pm 0.77$	$2.86 \pm 0.44$	$0.47 \pm 0.16$	$0.13 \pm 0.07$
$t\bar{t}$ , 1 lepton	—	—	—	—
single $t$	$0.76 \pm 0.76$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$5.20 \pm 2.06$	$1.13 \pm 0.57$	$1.08 \pm 0.49$	$1.20 \pm 0.42$
diBoson	$2.26 \pm 0.63$	$1.52 \pm 0.49$	$0.82 \pm 0.31$	$0.12 \pm 0.45$
$t\bar{t} + W$	$0.15 \pm 0.09$	$0.01 \pm 0.03$	—	—
$t\bar{t} + Z$	$0.41 \pm 0.02$	$0.35 \pm 0.02$	$0.15 \pm 0.01$	$0.11 \pm 0.01$
All Background	$16.54 \pm 2.41$	$5.88 \pm 0.87$	$2.52 \pm 0.60$	$1.56 \pm 0.62$
Data, single $e/\mu$ , MET	$16.00 \pm 4.00$	$5.00 \pm 2.24$	$3.00 \pm 1.73$	$2.00 \pm 1.41$
Data/MC	$0.97 \pm 0.28$	$0.85 \pm 0.40$	$1.19 \pm 0.74$	$1.29 \pm 1.04$
1 lepton, from $W$	$5.27 \pm 2.06$	$1.18 \pm 0.57$	$1.08 \pm 0.49$	$1.23 \pm 0.42$
1 lepton, from $t$	—	—	—	—
$\geq 2$ leptons	$9.58 \pm 1.17$	$2.98 \pm 0.45$	$0.55 \pm 0.18$	$0.21 \pm 0.11$
$Z \rightarrow \nu\nu$	$1.69 \pm 0.44$	$1.72 \pm 0.48$	$0.89 \pm 0.29$	$0.12 \pm 0.44$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $550 < MET < 650$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	263.09 $\pm$ 4.94	40.66 $\pm$ 1.82	7.90 $\pm$ 0.80	2.10 $\pm$ 0.36	0.93 $\pm$ 0.27
$t\bar{t}$ , 1 lepton	9.13 $\pm$ 1.34	1.83 $\pm$ 0.59	0.14 $\pm$ 0.08	0.06 $\pm$ 0.06	0.34 $\pm$ 0.21
single $t$	5.91 $\pm$ 2.00	0.70 $\pm$ 0.70	0.85 $\pm$ 0.85	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	11.11 $\pm$ 2.31	3.40 $\pm$ 1.00	1.38 $\pm$ 0.69	0.22 $\pm$ 0.13	0.10 $\pm$ 0.03
diBoson	2.87 $\pm$ 0.83	0.69 $\pm$ 0.27	0.19 $\pm$ 0.18	0.10 $\pm$ 0.06	0.07 $\pm$ 0.09
$t\bar{t} + W$	2.62 $\pm$ 0.50	0.68 $\pm$ 0.20	0.24 $\pm$ 0.10	0.03 $\pm$ 0.05	0.13 $\pm$ 0.05
$t\bar{t} + Z$	6.70 $\pm$ 0.07	1.34 $\pm$ 0.03	0.27 $\pm$ 0.01	0.08 $\pm$ 0.01	0.03 $\pm$ 0.00
All Background	301.43 $\pm$ 6.04	49.30 $\pm$ 2.29	10.96 $\pm$ 1.38	2.59 $\pm$ 0.40	1.59 $\pm$ 0.36
Data, single $e/\mu$ , MET	194.00 $\pm$ 13.93	43.00 $\pm$ 6.56	14.00 $\pm$ 3.74	3.00 $\pm$ 1.73	6.00 $\pm$ 2.45
Data/MC	0.64 $\pm$ 0.05	0.87 $\pm$ 0.14	1.28 $\pm$ 0.38	1.16 $\pm$ 0.69	3.76 $\pm$ 1.75
1 lepton, from $W$	13.10 $\pm$ 2.54	4.27 $\pm$ 1.22	1.48 $\pm$ 0.70	0.23 $\pm$ 0.13	0.10 $\pm$ 0.04
1 lepton, from $t$	10.84 $\pm$ 1.65	1.85 $\pm$ 0.59	0.14 $\pm$ 0.08	0.06 $\pm$ 0.06	0.34 $\pm$ 0.21
$\geq 2$ leptons	269.93 $\pm$ 5.21	41.45 $\pm$ 1.84	8.98 $\pm$ 1.17	2.13 $\pm$ 0.37	1.06 $\pm$ 0.27
$Z \rightarrow \nu\nu$	7.57 $\pm$ 0.46	1.73 $\pm$ 0.25	0.35 $\pm$ 0.17	0.17 $\pm$ 0.06	0.10 $\pm$ 0.08

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$30.31 \pm 1.75$	$8.63 \pm 1.01$	$2.35 \pm 0.46$	$1.41 \pm 0.34$
$t\bar{t}$ , 1 lepton	$1.53 \pm 0.52$	$0.31 \pm 0.23$	$0.04 \pm 0.04$	—
single $t$	$2.74 \pm 1.56$	—	—	$0.63 \pm 0.63$
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$4.28 \pm 0.97$	$1.98 \pm 0.76$	$0.94 \pm 0.38$	$0.44 \pm 0.23$
diBoson	$0.15 \pm 0.34$	$0.73 \pm 0.31$	$0.24 \pm 0.30$	$0.06 \pm 0.25$
$t\bar{t} + W$	$0.50 \pm 0.18$	$0.05 \pm 0.12$	$0.06 \pm 0.06$	$0.06 \pm 0.05$
$t\bar{t} + Z$	$0.72 \pm 0.02$	$0.29 \pm 0.01$	$0.08 \pm 0.01$	$0.04 \pm 0.00$
All Background	$40.24 \pm 2.61$	$11.99 \pm 1.32$	$3.71 \pm 0.68$	$2.65 \pm 0.80$
Data, single $e/\mu$ , MET	$20.00 \pm 4.47$	$9.00 \pm 3.00$	$1.00 \pm 1.00$	$1.00 \pm 1.00$
Data/MC	$0.50 \pm 0.12$	$0.75 \pm 0.26$	$0.27 \pm 0.27$	$0.38 \pm 0.39$
1 lepton, from $W$	$4.43 \pm 0.97$	$2.01 \pm 0.76$	$0.94 \pm 0.38$	$0.45 \pm 0.23$
1 lepton, from $t$	$1.65 \pm 0.53$	$0.31 \pm 0.23$	$0.06 \pm 0.04$	—
$\geq 2$ leptons	$33.45 \pm 2.34$	$8.69 \pm 1.01$	$2.39 \pm 0.47$	$2.11 \pm 0.72$
$Z \rightarrow \nu\nu$	$0.71 \pm 0.32$	$0.98 \pm 0.30$	$0.32 \pm 0.30$	$0.08 \pm 0.25$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$17.38 \pm 1.33$	$1.99 \pm 0.47$	$0.34 \pm 0.16$	$1.35 \pm 0.35$	$0.40 \pm 0.20$
$t\bar{t}$ , 1 lepton	$0.54 \pm 0.29$	$0.29 \pm 0.29$	—	$0.31 \pm 0.25$	$0.23 \pm 0.23$
single $t$	$0.64 \pm 0.64$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.24 \pm 0.10$	$0.68 \pm 0.49$	$0.07 \pm 0.03$	$0.24 \pm 0.10$	$0.10 \pm 0.06$
diBoson	$0.53 \pm 0.18$	$0.13 \pm 0.08$	$0.06 \pm 0.10$	$0.02 \pm 0.02$	$0.48 \pm 0.31$
$t\bar{t} + W$	$0.42 \pm 0.17$	$0.06 \pm 0.09$	—	—	$0.05 \pm 0.03$
$t\bar{t} + Z$	$1.58 \pm 0.04$	$0.31 \pm 0.01$	$0.07 \pm 0.01$	$0.12 \pm 0.01$	$0.07 \pm 0.01$
All Background	$21.33 \pm 1.53$	$3.46 \pm 0.75$	$0.55 \pm 0.19$	$2.05 \pm 0.45$	$1.33 \pm 0.44$
Data, single $e/\mu$ , MET	$14.00 \pm 3.74$	$2.00 \pm 1.41$	$1.00 \pm 1.00$	—	$1.00 \pm 1.00$
Data/MC	$0.66 \pm 0.18$	$0.58 \pm 0.43$	$1.82 \pm 1.93$	—	$0.75 \pm 0.79$
1 lepton, from $W$	$0.39 \pm 0.12$	$0.70 \pm 0.49$	$0.09 \pm 0.04$	$0.25 \pm 0.10$	$0.10 \pm 0.07$
1 lepton, from $t$	$0.54 \pm 0.29$	$0.29 \pm 0.29$	—	$0.31 \pm 0.25$	$0.23 \pm 0.23$
$\geq 2$ leptons	$18.44 \pm 1.49$	$2.05 \pm 0.48$	$0.34 \pm 0.16$	$1.35 \pm 0.35$	$0.46 \pm 0.20$
$Z \rightarrow \nu\nu$	$1.96 \pm 0.18$	$0.42 \pm 0.08$	$0.12 \pm 0.09$	$0.13 \pm 0.01$	$0.54 \pm 0.30$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $450 < MET < 600$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $MET > 600$
$t\bar{t}$ , $\geq 2$ leptons	$24.77 \pm 1.53$	$2.51 \pm 0.43$	$0.42 \pm 0.15$	$0.10 \pm 0.07$
$t\bar{t}$ , 1 lepton	$1.36 \pm 0.50$	$0.05 \pm 0.05$	—	$0.08 \pm 0.05$
single $t$	$1.22 \pm 0.87$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$6.81 \pm 2.26$	$0.86 \pm 0.62$	$0.32 \pm 0.16$	$0.25 \pm 0.10$
diBoson	$1.64 \pm 0.62$	$0.28 \pm 0.12$	$0.14 \pm 0.15$	$0.06 \pm 0.07$
$t\bar{t} + W$	$0.42 \pm 0.25$	$0.03 \pm 0.08$	$0.03 \pm 0.02$	$0.01 \pm 0.03$
$t\bar{t} + Z$	$4.50 \pm 0.06$	$1.05 \pm 0.03$	$0.41 \pm 0.02$	$0.08 \pm 0.01$
All Background	$40.72 \pm 2.99$	$4.80 \pm 0.77$	$1.33 \pm 0.27$	$0.58 \pm 0.15$
Data, single $e/\mu$ , MET	$26.00 \pm 5.10$	$3.00 \pm 1.73$	$1.00 \pm 1.00$	$2.00 \pm 1.41$
Data/MC	$0.64 \pm 0.13$	$0.63 \pm 0.37$	$0.75 \pm 0.77$	$3.44 \pm 2.59$
1 lepton, from $W$	$7.43 \pm 2.31$	$0.97 \pm 0.62$	$0.34 \pm 0.17$	$0.26 \pm 0.10$
1 lepton, from $t$	$1.36 \pm 0.50$	$0.05 \pm 0.05$	—	$0.08 \pm 0.05$
$\geq 2$ leptons	$26.75 \pm 1.79$	$2.55 \pm 0.44$	$0.58 \pm 0.20$	$0.12 \pm 0.08$
$Z \rightarrow \nu\nu$	$5.19 \pm 0.33$	$1.23 \pm 0.12$	$0.41 \pm 0.06$	$0.13 \pm 0.07$

SR, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $400 < MET < 650$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	$4.10 \pm 0.62$	$0.75 \pm 0.25$	$0.04 \pm 0.04$
$t\bar{t}$ , 1 lepton	$0.30 \pm 0.15$	—	—
single $t$	$0.53 \pm 0.53$	—	$0.28 \pm 0.28$
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow t\nu$	$0.74 \pm 0.22$	$0.66 \pm 0.30$	$0.65 \pm 0.34$
diBoson	$0.09 \pm 0.07$	$0.22 \pm 0.28$	$0.06 \pm 0.06$
$t\bar{t} + W$	$0.30 \pm 0.14$	$0.24 \pm 0.13$	$0.01 \pm 0.01$
$t\bar{t} + Z$	$0.48 \pm 0.02$	$0.36 \pm 0.02$	$0.04 \pm 0.00$
All Background	$6.54 \pm 0.87$	$2.24 \pm 0.50$	$1.08 \pm 0.45$
Data, single $e/\mu$ , MET	$3.00 \pm 1.73$	—	—
Data/MC	$0.46 \pm 0.27$	—	—
1 lepton, from $W$	$0.76 \pm 0.22$	$0.68 \pm 0.30$	$0.65 \pm 0.34$
1 lepton, from $t$	$0.30 \pm 0.15$	—	—
$\geq 2$ leptons	$4.93 \pm 0.83$	$0.99 \pm 0.28$	$0.33 \pm 0.28$
$Z \rightarrow \nu\nu$	$0.55 \pm 0.07$	$0.56 \pm 0.28$	$0.10 \pm 0.06$

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP			
Sample	2jets modTopness $\geq 6.4$ 250 < MET < 350	2jets modTopness $\geq 6.4$ 350 < MET < 450	2jets modTopness $\geq 6.4$ MET > 450
$t\bar{t}$ , $\geq 2$ leptons	43.15 $\pm$ 2.16	4.76 $\pm$ 0.69	0.67 $\pm$ 0.27
$t\bar{t}$ , 1 lepton	0.41 $\pm$ 0.34	0.07 $\pm$ 0.07	0.06 $\pm$ 0.06
single $t$	3.71 $\pm$ 1.87	—	—
DY+Jets $\rightarrow \ell\ell$	—	5.91 $\pm$ 5.91	—
W+Jets $\rightarrow \ell\nu$	229.35 $\pm$ 13.38	63.59 $\pm$ 6.33	29.21 $\pm$ 3.46
diBoson	56.71 $\pm$ 3.47	18.92 $\pm$ 1.84	11.63 $\pm$ 1.36
$t\bar{t}$ + W	0.32 $\pm$ 0.13	0.06 $\pm$ 0.05	0.04 $\pm$ 0.03
$t\bar{t}$ + Z	1.14 $\pm$ 0.03	0.31 $\pm$ 0.02	0.16 $\pm$ 0.01
All Background	334.79 $\pm$ 17.13	93.61 $\pm$ 8.88	41.77 $\pm$ 3.73
Data, single $e/\mu$ , MET	371.00 $\pm$ 19.26	131.00 $\pm$ 11.45	93.00 $\pm$ 9.64
Data/MC	1.11 $\pm$ 0.08	1.40 $\pm$ 0.18	2.23 $\pm$ 0.30
1 lepton, from W	240.12 $\pm$ 13.57	66.98 $\pm$ 6.44	31.35 $\pm$ 3.57
1 lepton, from $t$	0.41 $\pm$ 0.34	0.07 $\pm$ 0.07	0.06 $\pm$ 0.06
$\geq 2$ leptons	60.41 $\pm$ 10.19	14.23 $\pm$ 5.98	2.55 $\pm$ 0.62
$Z \rightarrow \nu\nu$	33.85 $\pm$ 2.28	12.33 $\pm$ 1.23	7.82 $\pm$ 0.88

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP

Sample	3jets MT2W $\geq$ 200 250 < MET < 350	3jets MT2W $\geq$ 200 350 < MET < 450	3jets MT2W $\geq$ 200 450 < MET < 550	3jets MT2W $\geq$ 200 MET > 550
$t\bar{t}$ , $\geq 2$ leptons	$26.99 \pm 1.90$	$5.65 \pm 0.73$	$0.63 \pm 0.21$	$0.44 \pm 0.17$
$t\bar{t}$ , 1 lepton	$0.65 \pm 0.36$	—	—	$0.27 \pm 0.21$
single $t$	$1.08 \pm 1.08$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$89.66 \pm 7.24$	$35.39 \pm 4.15$	$11.02 \pm 1.98$	$8.63 \pm 1.56$
diBoson	$27.69 \pm 2.16$	$14.36 \pm 1.81$	$2.75 \pm 0.80$	$3.68 \pm 0.70$
$t\bar{t} + W$	$0.49 \pm 0.17$	$0.03 \pm 0.07$	$0.04 \pm 0.05$	—
$t\bar{t} + Z$	$1.59 \pm 0.04$	$0.52 \pm 0.02$	$0.16 \pm 0.01$	$0.09 \pm 0.01$
All Background	$148.16 \pm 7.88$	$55.95 \pm 4.59$	$14.61 \pm 2.14$	$13.11 \pm 1.73$
Data, single $e/\mu$ , MET	$164.00 \pm 12.81$	$48.00 \pm 6.93$	$17.00 \pm 4.12$	$25.00 \pm 5.00$
Data/MC	$1.11 \pm 0.10$	$0.86 \pm 0.14$	$1.16 \pm 0.33$	$1.91 \pm 0.46$
1 lepton, from $W$	$93.41 \pm 7.34$	$40.07 \pm 4.41$	$11.72 \pm 2.05$	$9.52 \pm 1.65$
1 lepton, from $t$	$0.66 \pm 0.36$	$0.00 \pm 0.00$	$0.00 \pm 0.00$	$0.27 \pm 0.21$
$\geq 2$ leptons	$35.97 \pm 2.42$	$8.12 \pm 0.91$	$1.08 \pm 0.30$	$0.88 \pm 0.25$
$Z \rightarrow \nu\nu$	$18.13 \pm 1.51$	$7.77 \pm 0.89$	$1.81 \pm 0.55$	$2.44 \pm 0.42$



CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP			
Sample	$\geq 4\text{jets}$ MT2W < 200	$\geq 4\text{jets}$ MT2W < 200	$\geq 4\text{jets}$ MT2W < 200
	250 < MET < 350	350 < MET < 450	MET > 450
$t\bar{t}$ , $\geq 2$ leptons	68.98 $\pm$ 3.10	11.51 $\pm$ 1.33	3.35 $\pm$ 0.56
$t\bar{t}$ , 1 lepton	3.14 $\pm$ 1.11	0.09 $\pm$ 0.09	0.21 $\pm$ 0.15
single $t$	1.24 $\pm$ 1.24	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	30.59 $\pm$ 4.05	9.96 $\pm$ 2.14	1.42 $\pm$ 0.24
diBoson	10.96 $\pm$ 1.39	2.49 $\pm$ 0.78	1.49 $\pm$ 0.36
$t\bar{t}$ + W	0.22 $\pm$ 0.23	0.13 $\pm$ 0.09	0.06 $\pm$ 0.06
$t\bar{t}$ + Z	1.95 $\pm$ 0.05	0.40 $\pm$ 0.02	0.09 $\pm$ 0.01
All Background	117.08 $\pm$ 5.55	24.58 $\pm$ 2.64	6.61 $\pm$ 0.73
Data, single $e/\mu$ , MET	87.00 $\pm$ 9.33	20.00 $\pm$ 4.47	15.00 $\pm$ 3.87
Data/MC	0.74 $\pm$ 0.09	0.81 $\pm$ 0.20	2.27 $\pm$ 0.64
1 lepton, from W	32.67 $\pm$ 4.14	10.62 $\pm$ 2.20	1.43 $\pm$ 0.24
1 lepton, from $t$	3.15 $\pm$ 1.11	0.09 $\pm$ 0.09	0.23 $\pm$ 0.15
$\geq 2$ leptons	73.52 $\pm$ 3.40	12.75 $\pm$ 1.38	3.86 $\pm$ 0.60
$Z \rightarrow \nu\nu$	7.73 $\pm$ 0.89	1.12 $\pm$ 0.45	1.09 $\pm$ 0.29

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP					
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$ 250 < MET < 350	$\geq 4\text{jets}$ MT2W $\geq 200$ 350 < MET < 450	$\geq 4\text{jets}$ MT2W $\geq 200$ 450 < MET < 550	$\geq 4\text{jets}$ MT2W $\geq 200$ 550 < MET < 650	$\geq 4\text{jets}$ MT2W $\geq 200$ MET > 650
$t\bar{t}$ , $\geq 2$ leptons	29.06 $\pm$ 2.07	6.54 $\pm$ 0.86	1.32 $\pm$ 0.34	0.62 $\pm$ 0.25	0.20 $\pm$ 0.12
$t\bar{t}$ , 1 lepton	1.64 $\pm$ 0.55	0.28 $\pm$ 0.28	—	—	0.06 $\pm$ 0.06
single $t$	2.22 $\pm$ 1.58	—	—	1.24 $\pm$ 1.24	—
DY+Jets $\rightarrow \ell\ell$	14.23 $\pm$ 10.06	—	—	—	—
W+Jets $\rightarrow \ell\nu$	53.82 $\pm$ 5.05	20.56 $\pm$ 2.73	8.54 $\pm$ 1.53	4.06 $\pm$ 0.88	4.17 $\pm$ 1.01
diBoson	15.49 $\pm$ 1.99	5.96 $\pm$ 0.94	3.32 $\pm$ 0.70	1.71 $\pm$ 0.53	1.52 $\pm$ 0.44
$t\bar{t}$ + W	0.75 $\pm$ 0.27	0.66 $\pm$ 0.18	0.00 $\pm$ 0.08	0.01 $\pm$ 0.07	0.01 $\pm$ 0.05
$t\bar{t}$ + Z	1.51 $\pm$ 0.04	0.71 $\pm$ 0.03	0.27 $\pm$ 0.02	0.08 $\pm$ 0.01	0.03 $\pm$ 0.00
All Background	118.73 $\pm$ 11.74	34.72 $\pm$ 3.03	13.45 $\pm$ 1.72	7.72 $\pm$ 1.63	5.99 $\pm$ 1.11
Data, single $e/\mu$ , MET	86.00 $\pm$ 9.27	32.00 $\pm$ 5.66	6.00 $\pm$ 2.45	6.00 $\pm$ 2.45	7.00 $\pm$ 2.65
Data/MC	0.72 $\pm$ 0.11	0.92 $\pm$ 0.18	0.45 $\pm$ 0.19	0.78 $\pm$ 0.36	1.17 $\pm$ 0.49
1 lepton, from W	60.36 $\pm$ 5.42	21.33 $\pm$ 2.78	9.22 $\pm$ 1.60	4.53 $\pm$ 0.97	4.56 $\pm$ 1.06
1 lepton, from $t$	1.68 $\pm$ 0.55	0.29 $\pm$ 0.28	—	—	0.06 $\pm$ 0.06
$\geq 2$ leptons	49.14 $\pm$ 10.35	8.77 $\pm$ 0.97	1.78 $\pm$ 0.41	2.42 $\pm$ 1.29	0.56 $\pm$ 0.20
Z $\rightarrow \nu\nu$	7.55 $\pm$ 0.98	4.33 $\pm$ 0.67	2.45 $\pm$ 0.48	0.77 $\pm$ 0.26	0.81 $\pm$ 0.25

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	2jets modTopness $\geq$ 6.4 250 < MET < 350	2jets modTopness $\geq$ 6.4 350 < MET < 450	2jets modTopness $\geq$ 6.4 450 < MET < 550	2jets modTopness $\geq$ 6.4 550 < MET < 650	2jets modTopness $\geq$ 6.4 MET > 650
$t\bar{t}$ , $\geq$ 2 leptons	43.15 $\pm$ 2.16	4.76 $\pm$ 0.69	0.61 $\pm$ 0.26	—	0.06 $\pm$ 0.06
$t\bar{t}$ , 1 lepton	0.41 $\pm$ 0.34	0.07 $\pm$ 0.07	0.06 $\pm$ 0.06	—	—
single $t$	3.71 $\pm$ 1.87	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	5.91 $\pm$ 5.91	—	—	—
W+Jets $\rightarrow \ell\nu$	229.35 $\pm$ 13.38	63.59 $\pm$ 6.33	19.79 $\pm$ 3.12	5.71 $\pm$ 1.31	3.72 $\pm$ 0.74
diBoson	56.71 $\pm$ 3.47	18.92 $\pm$ 1.84	5.98 $\pm$ 0.87	3.16 $\pm$ 0.76	2.48 $\pm$ 0.71
$t\bar{t}$ + W	0.32 $\pm$ 0.13	0.06 $\pm$ 0.05	0.02 $\pm$ 0.02	—	0.02 $\pm$ 0.02
$t\bar{t}$ + Z	1.14 $\pm$ 0.03	0.31 $\pm$ 0.02	0.08 $\pm$ 0.01	0.04 $\pm$ 0.01	0.03 $\pm$ 0.00
All Background	334.79 $\pm$ 17.13	93.61 $\pm$ 8.88	26.55 $\pm$ 3.25	8.91 $\pm$ 1.51	6.32 $\pm$ 1.03
Data, single $e/\mu$ , MET	371.00 $\pm$ 19.26	131.00 $\pm$ 11.45	37.00 $\pm$ 6.08	14.00 $\pm$ 3.74	42.00 $\pm$ 6.48
Data/MC	1.11 $\pm$ 0.08	1.40 $\pm$ 0.18	1.39 $\pm$ 0.29	1.57 $\pm$ 0.50	6.65 $\pm$ 1.49
1 lepton, from W	240.12 $\pm$ 13.57	66.98 $\pm$ 6.44	20.35 $\pm$ 3.15	6.66 $\pm$ 1.44	4.34 $\pm$ 0.85
1 lepton, from $t$	0.41 $\pm$ 0.34	0.07 $\pm$ 0.07	0.06 $\pm$ 0.06	—	—
$\geq$ 2 leptons	60.41 $\pm$ 10.19	14.23 $\pm$ 5.98	1.66 $\pm$ 0.41	0.40 $\pm$ 0.20	0.49 $\pm$ 0.43
Z $\rightarrow \nu\nu$	33.85 $\pm$ 2.28	12.33 $\pm$ 1.23	4.48 $\pm$ 0.68	1.86 $\pm$ 0.41	1.49 $\pm$ 0.39

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	3jets MT2W $\geq$ 200 250 < MET < 350	3jets MT2W $\geq$ 200 350 < MET < 450	3jets MT2W $\geq$ 200 450 < MET < 550	3jets MT2W $\geq$ 200 550 < MET < 650	3jets MT2W $\geq$ 200 MET > 650
$t\bar{t}$ , $\geq 2$ leptons	$26.99 \pm 1.90$	$5.65 \pm 0.73$	$0.63 \pm 0.21$	$0.37 \pm 0.16$	$0.06 \pm 0.06$
$t\bar{t}$ , 1 lepton	$0.65 \pm 0.36$	—	—	$0.07 \pm 0.07$	$0.20 \pm 0.20$
single $t$	$1.08 \pm 1.08$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$89.66 \pm 7.24$	$35.39 \pm 4.15$	$11.02 \pm 1.98$	$3.63 \pm 0.99$	$5.00 \pm 1.21$
diBoson	$27.69 \pm 2.16$	$14.36 \pm 1.81$	$2.75 \pm 0.80$	$1.77 \pm 0.49$	$1.91 \pm 0.50$
$t\bar{t} + W$	$0.49 \pm 0.17$	$0.03 \pm 0.07$	$0.04 \pm 0.05$	—	—
$t\bar{t} + Z$	$1.59 \pm 0.04$	$0.52 \pm 0.02$	$0.16 \pm 0.01$	$0.05 \pm 0.01$	$0.04 \pm 0.01$
All Background	$148.16 \pm 7.88$	$55.95 \pm 4.59$	$14.61 \pm 2.14$	$5.89 \pm 1.12$	$7.22 \pm 1.33$
Data, single $e/\mu$ , MET	$164.00 \pm 12.81$	$48.00 \pm 6.93$	$17.00 \pm 4.12$	$11.00 \pm 3.32$	$14.00 \pm 3.74$
Data/MC	$1.11 \pm 0.10$	$0.86 \pm 0.14$	$1.16 \pm 0.33$	$1.87 \pm 0.67$	$1.94 \pm 0.63$
1 lepton, from $W$	$93.41 \pm 7.34$	$40.07 \pm 4.41$	$11.72 \pm 2.05$	$4.06 \pm 1.05$	$5.46 \pm 1.27$
1 lepton, from $t$	$0.66 \pm 0.36$	$0.00 \pm 0.00$	$0.00 \pm 0.00$	$0.07 \pm 0.07$	$0.20 \pm 0.20$
$\geq 2$ leptons	$35.97 \pm 2.42$	$8.12 \pm 0.91$	$1.08 \pm 0.30$	$0.55 \pm 0.20$	$0.34 \pm 0.15$
$Z \rightarrow \nu\nu$	$18.13 \pm 1.51$	$7.77 \pm 0.89$	$1.81 \pm 0.55$	$1.21 \pm 0.30$	$1.23 \pm 0.30$

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	$\geq 4\text{jets}$ MT2W < 200 250 < MET < 350	$\geq 4\text{jets}$ MT2W < 200 350 < MET < 450	$\geq 4\text{jets}$ MT2W < 200 450 < MET < 550	$\geq 4\text{jets}$ MT2W < 200 550 < MET < 650	$\geq 4\text{jets}$ MT2W < 200 MET > 650
$t\bar{t}$ , $\geq 2$ leptons	68.98 $\pm$ 3.10	11.51 $\pm$ 1.33	2.19 $\pm$ 0.46	0.86 $\pm$ 0.28	0.29 $\pm$ 0.17
$t\bar{t}$ , 1 lepton	3.14 $\pm$ 1.11	0.09 $\pm$ 0.09	0.09 $\pm$ 0.09	—	0.12 $\pm$ 0.12
single $t$	1.24 $\pm$ 1.24	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	30.59 $\pm$ 4.05	9.96 $\pm$ 2.14	0.64 $\pm$ 0.16	0.52 $\pm$ 0.15	0.26 $\pm$ 0.11
diBoson	10.96 $\pm$ 1.39	2.49 $\pm$ 0.78	1.11 $\pm$ 0.30	0.18 $\pm$ 0.16	0.21 $\pm$ 0.10
$t\bar{t}$ + W	0.22 $\pm$ 0.23	0.13 $\pm$ 0.09	0.04 $\pm$ 0.04	—	0.05 $\pm$ 0.03
$t\bar{t}$ + Z	1.95 $\pm$ 0.05	0.40 $\pm$ 0.02	0.07 $\pm$ 0.01	0.01 $\pm$ 0.00	0.00 $\pm$ 0.00
All Background	117.08 $\pm$ 5.55	24.58 $\pm$ 2.64	4.14 $\pm$ 0.58	1.58 $\pm$ 0.35	0.92 $\pm$ 0.26
Data, single $e/\mu$ , MET	87.00 $\pm$ 9.33	20.00 $\pm$ 4.47	7.00 $\pm$ 2.65	3.00 $\pm$ 1.73	5.00 $\pm$ 2.24
Data/MC	0.74 $\pm$ 0.09	0.81 $\pm$ 0.20	1.69 $\pm$ 0.68	1.90 $\pm$ 1.18	5.41 $\pm$ 2.85
1 lepton, from W	32.67 $\pm$ 4.14	10.62 $\pm$ 2.20	0.65 $\pm$ 0.16	0.53 $\pm$ 0.15	0.26 $\pm$ 0.11
1 lepton, from $t$	3.15 $\pm$ 1.11	0.09 $\pm$ 0.09	0.09 $\pm$ 0.09	—	0.14 $\pm$ 0.12
$\geq 2$ leptons	73.52 $\pm$ 3.40	12.75 $\pm$ 1.38	2.70 $\pm$ 0.51	0.86 $\pm$ 0.28	0.31 $\pm$ 0.17
Z $\rightarrow \nu\nu$	7.73 $\pm$ 0.89	1.12 $\pm$ 0.45	0.70 $\pm$ 0.22	0.18 $\pm$ 0.16	0.21 $\pm$ 0.10

CR0b, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb						
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$ $250 < MET < 350$	$\geq 4\text{jets}$ MT2W $\geq 200$ $350 < MET < 450$	$\geq 4\text{jets}$ MT2W $\geq 200$ $450 < MET < 550$	$\geq 4\text{jets}$ MT2W $\geq 200$ $550 < MET < 650$	$\geq 4\text{jets}$ MT2W $\geq 200$ $650 < MET < 800$	$\geq 4\text{jets}$ MT2W $\geq 200$ $MET > 800$
$t\bar{t}$ , $\geq 2$ leptons	$29.06 \pm 2.07$	$6.54 \pm 0.86$	$1.32 \pm 0.34$	$0.62 \pm 0.25$	$0.20 \pm 0.12$	—
$t\bar{t}$ , 1 lepton	$1.64 \pm 0.55$	$0.28 \pm 0.28$	—	—	—	$0.06 \pm 0.06$
single $t$	$2.22 \pm 1.58$	—	—	$1.24 \pm 1.24$	—	—
DY+Jets $\rightarrow \ell\ell$	$14.23 \pm 10.06$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$53.82 \pm 5.05$	$20.56 \pm 2.73$	$8.54 \pm 1.53$	$4.06 \pm 0.88$	$2.38 \pm 0.63$	$1.79 \pm 0.79$
diBoson	$15.49 \pm 1.99$	$5.96 \pm 0.94$	$3.32 \pm 0.70$	$1.71 \pm 0.53$	$0.47 \pm 0.21$	$1.04 \pm 0.39$
$t\bar{t} + W$	$0.75 \pm 0.27$	$0.66 \pm 0.18$	$0.00 \pm 0.08$	$0.01 \pm 0.07$	—	$0.01 \pm 0.02$
$t\bar{t} + Z$	$1.51 \pm 0.04$	$0.71 \pm 0.03$	$0.27 \pm 0.02$	$0.08 \pm 0.01$	$0.03 \pm 0.00$	$0.01 \pm 0.00$
All Background	$118.73 \pm 11.74$	$34.72 \pm 3.03$	$13.45 \pm 1.72$	$7.72 \pm 1.63$	$3.08 \pm 0.68$	$2.91 \pm 0.88$
Data, single $e/\mu$ , MET	$86.00 \pm 9.27$	$32.00 \pm 5.66$	$6.00 \pm 2.45$	$6.00 \pm 2.45$	$3.00 \pm 1.73$	$4.00 \pm 2.00$
Data/MC	$0.72 \pm 0.11$	$0.92 \pm 0.18$	$0.45 \pm 0.19$	$0.78 \pm 0.36$	$0.98 \pm 0.60$	$1.37 \pm 0.80$
1 lepton, from $W$	$60.36 \pm 5.42$	$21.33 \pm 2.78$	$9.22 \pm 1.60$	$4.53 \pm 0.97$	$2.39 \pm 0.63$	$2.17 \pm 0.85$
1 lepton, from $t$	$1.68 \pm 0.55$	$0.29 \pm 0.28$	—	—	—	$0.06 \pm 0.06$
$\geq 2$ leptons	$49.14 \pm 10.35$	$8.77 \pm 0.97$	$1.78 \pm 0.41$	$2.42 \pm 1.29$	$0.26 \pm 0.14$	$0.29 \pm 0.14$
$Z \rightarrow \nu\nu$	$7.55 \pm 0.98$	$4.33 \pm 0.67$	$2.45 \pm 0.48$	$0.77 \pm 0.26$	$0.42 \pm 0.20$	$0.39 \pm 0.16$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $MET > 550$
$t\bar{t}, \geq 2$ leptons	$50.60 \pm 2.35$	$7.77 \pm 0.87$	$0.94 \pm 0.30$	$0.30 \pm 0.14$
$t\bar{t}, 1$ lepton	$0.49 \pm 0.35$	$0.07 \pm 0.07$	$0.06 \pm 0.06$	$0.20 \pm 0.20$
single $t$	$3.71 \pm 1.87$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	$5.91 \pm 5.91$	—	—
W+Jets $\rightarrow \ell\nu$	$231.59 \pm 13.15$	$78.99 \pm 6.98$	$24.76 \pm 3.39$	$14.52 \pm 1.94$
diBoson	$60.81 \pm 3.54$	$24.32 \pm 2.05$	$7.20 \pm 0.96$	$8.04 \pm 1.16$
$t\bar{t} + W$	$0.54 \pm 0.15$	$0.03 \pm 0.06$	$0.09 \pm 0.05$	$0.02 \pm 0.02$
$t\bar{t} + Z$	$1.98 \pm 0.05$	$0.67 \pm 0.02$	$0.20 \pm 0.01$	$0.15 \pm 0.01$
All Background	$349.73 \pm 16.99$	$117.76 \pm 9.41$	$33.25 \pm 3.54$	$23.23 \pm 2.27$
Data, single $e/\mu$ , MET	$382.00 \pm 19.54$	$146.00 \pm 12.08$	$44.00 \pm 6.63$	$69.00 \pm 8.31$
Data/MC	$1.09 \pm 0.08$	$1.24 \pm 0.14$	$1.32 \pm 0.24$	$2.97 \pm 0.46$
1 lepton, from $W$	$242.86 \pm 13.34$	$83.20 \pm 7.10$	$25.51 \pm 3.42$	$16.48 \pm 2.11$
1 lepton, from $t$	$0.49 \pm 0.35$	$0.07 \pm 0.07$	$0.06 \pm 0.06$	$0.20 \pm 0.20$
$\geq 2$ leptons	$68.50 \pm 10.24$	$18.11 \pm 6.02$	$2.16 \pm 0.45$	$1.42 \pm 0.51$
$Z \rightarrow \nu\nu$	$37.88 \pm 2.38$	$16.38 \pm 1.39$	$5.53 \pm 0.78$	$5.13 \pm 0.64$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$< 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 350$	$< 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $350 < MET < 450$	$< 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $450 < MET < 550$	$< 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	—	—	—	—
$t\bar{t}$ , 1 lepton	—	—	—	—
single $t$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	—	—	—	—
diBoson	—	—	—	—
$t\bar{t} + W$	—	—	—	—
$t\bar{t} + Z$	—	—	—	—
All Background	—	—	—	—
Data, single $e/\mu$ , MET	—	—	—	—
Data/MC	—	—	—	—
1 lepton, from $W$	—	—	—	—
1 lepton, from $t$	—	—	—	—
$\geq 2$ leptons	—	—	—	—
$Z \rightarrow \nu\nu$	—	—	—	—



CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0	$\geq 4\text{jets}$ modTopness < 0.0	$\geq 4\text{jets}$ modTopness < 0.0	$\geq 4\text{jets}$ modTopness < 0.0	$\geq 4\text{jets}$ modTopness < 0.0
	$M_{lb} < 175$	$M_{lb} < 175$	$M_{lb} < 175$	$M_{lb} < 175$	$M_{lb} < 175$
	$250 < MET < 350$	$350 < MET < 450$	$450 < MET < 550$	$550 < MET < 650$	$MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	80.97 $\pm$ 3.36	14.37 $\pm$ 1.44	2.74 $\pm$ 0.51	1.03 $\pm$ 0.30	0.37 $\pm$ 0.19
$t\bar{t}$ , 1 lepton	4.49 $\pm$ 1.23	0.09 $\pm$ 0.09	0.09 $\pm$ 0.09	—	0.18 $\pm$ 0.13
single $t$	1.03 $\pm$ 1.03	—	—	1.24 $\pm$ 1.24	—
DY+Jets $\rightarrow \ell\ell$	7.22 $\pm$ 7.22	—	—	—	—
W+Jets $\rightarrow \ell\nu$	57.14 $\pm$ 4.90	19.53 $\pm$ 2.69	4.43 $\pm$ 0.88	2.57 $\pm$ 0.58	1.48 $\pm$ 0.38
diBoson	18.54 $\pm$ 2.07	4.66 $\pm$ 0.94	2.96 $\pm$ 0.66	0.56 $\pm$ 0.28	0.65 $\pm$ 0.22
$t\bar{t} + W$	0.52 $\pm$ 0.29	0.45 $\pm$ 0.15	0.05 $\pm$ 0.05	—	0.05 $\pm$ 0.05
$t\bar{t} + Z$	2.28 $\pm$ 0.05	0.51 $\pm$ 0.02	0.11 $\pm$ 0.01	0.03 $\pm$ 0.00	0.01 $\pm$ 0.00
All Background	172.18 $\pm$ 9.71	39.61 $\pm$ 3.20	10.38 $\pm$ 1.22	5.43 $\pm$ 1.43	2.74 $\pm$ 0.50
Data, single $e/\mu$ , MET	128.00 $\pm$ 11.31	38.00 $\pm$ 6.16	8.00 $\pm$ 2.83	5.00 $\pm$ 2.24	7.00 $\pm$ 2.65
Data/MC	0.74 $\pm$ 0.08	0.96 $\pm$ 0.17	0.77 $\pm$ 0.29	0.92 $\pm$ 0.48	2.55 $\pm$ 1.07
1 lepton, from $W$	62.97 $\pm$ 5.14	20.42 $\pm$ 2.74	5.05 $\pm$ 1.00	2.58 $\pm$ 0.58	1.50 $\pm$ 0.38
1 lepton, from $t$	4.54 $\pm$ 1.23	0.09 $\pm$ 0.09	0.09 $\pm$ 0.09	—	0.20 $\pm$ 0.14
$\geq 2$ leptons	94.77 $\pm$ 8.08	16.41 $\pm$ 1.51	3.50 $\pm$ 0.57	2.59 $\pm$ 1.29	0.61 $\pm$ 0.23
$Z \rightarrow \nu\nu$	9.90 $\pm$ 1.09	2.69 $\pm$ 0.65	1.75 $\pm$ 0.39	0.26 $\pm$ 0.21	0.44 $\pm$ 0.18

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ $\text{modTopness} < 0.0$ $M_{lb} \geq 175$ $250 < MET < 350$	$\geq 4\text{jets}$ $\text{modTopness} < 0.0$ $M_{lb} \geq 175$ $350 < MET < 450$	$\geq 4\text{jets}$ $\text{modTopness} < 0.0$ $M_{lb} \geq 175$ $450 < MET < 550$	$\geq 4\text{jets}$ $\text{modTopness} < 0.0$ $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	—	—	—	—
$t\bar{t}$ , 1 lepton	—	—	—	—
single $t$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	—	—	—	—
diBoson	—	—	—	—
$t\bar{t} + W$	—	—	—	—
$t\bar{t} + Z$	—	—	—	—
All Background	—	—	—	—
Data, single $e/\mu$ , MET	—	—	—	—
Data/MC	—	—	—	—
1 lepton, from $W$	—	—	—	—
1 lepton, from $t$	—	—	—	—
$\geq 2$ leptons	—	—	—	—
$Z \rightarrow \nu\nu$	—	—	—	—

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1					
Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$8.77 \pm 1.18$	$1.15 \pm 0.35$	$0.20 \pm 0.12$	—	—
$t\bar{t}$ , 1 lepton	$0.11 \pm 0.11$	—	—	—	—
single $t$	$1.24 \pm 1.24$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$7.90 \pm 2.23$	$2.93 \pm 1.02$	$1.19 \pm 0.55$	—	—
diBoson	$3.70 \pm 0.88$	$0.82 \pm 0.29$	$0.43 \pm 0.18$	—	—
$t\bar{t} + W$	$0.07 \pm 0.11$	$0.06 \pm 0.06$	$0.02 \pm 0.02$	—	—
$t\bar{t} + Z$	$0.49 \pm 0.03$	$0.12 \pm 0.01$	$0.03 \pm 0.01$	—	—
All Background	$22.27 \pm 2.95$	$5.08 \pm 1.11$	$1.87 \pm 0.59$	—	—
Data, single $e/\mu$ , MET	$21.00 \pm 4.58$	$4.00 \pm 2.00$	—	—	—
Data/MC	$0.94 \pm 0.24$	$0.79 \pm 0.43$	—	—	—
1 lepton, from $W$	$8.51 \pm 2.30$	$2.93 \pm 1.02$	$1.23 \pm 0.55$	—	—
1 lepton, from $t$	$0.11 \pm 0.11$	$0.00 \pm 0.00$	—	—	—
$\geq 2$ leptons	$10.90 \pm 1.75$	$1.56 \pm 0.41$	$0.28 \pm 0.14$	—	—
$Z \rightarrow \nu\nu$	$2.75 \pm 0.56$	$0.59 \pm 0.20$	$0.35 \pm 0.16$	—	—

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $450 < MET < 600$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} < 175$ $MET > 600$
$t\bar{t}$ , $\geq 2$ leptons	$8.30 \pm 1.09$	$2.54 \pm 0.55$	$0.88 \pm 0.28$	$0.25 \pm 0.15$
$t\bar{t}$ , 1 lepton	$0.19 \pm 0.13$	$0.28 \pm 0.28$	—	—
single $t$	$1.19 \pm 1.19$	—	—	—
DY+Jets $\rightarrow \ell\ell$	$7.01 \pm 7.01$	—	—	—
W+Jets $\rightarrow \ell\nu$	$19.37 \pm 3.60$	$8.06 \pm 1.93$	$5.18 \pm 1.32$	$3.33 \pm 0.95$
diBoson	$4.22 \pm 0.91$	$2.99 \pm 0.73$	$1.81 \pm 0.42$	$1.62 \pm 0.57$
$t\bar{t} + W$	$0.29 \pm 0.16$	$0.29 \pm 0.13$	—	$0.01 \pm 0.03$
$t\bar{t} + Z$	$0.69 \pm 0.03$	$0.48 \pm 0.02$	$0.24 \pm 0.02$	$0.06 \pm 0.01$
All Background	$41.26 \pm 8.09$	$14.64 \pm 2.16$	$8.12 \pm 1.41$	$5.27 \pm 1.12$
Data, single $e/\mu$ , MET	$24.00 \pm 4.90$	$10.00 \pm 3.16$	$9.00 \pm 3.00$	$5.00 \pm 2.24$
Data/MC	$0.58 \pm 0.16$	$0.68 \pm 0.24$	$1.11 \pm 0.42$	$0.95 \pm 0.47$
1 lepton, from $W$	$21.52 \pm 3.84$	$8.62 \pm 2.00$	$5.29 \pm 1.32$	$4.09 \pm 1.08$
1 lepton, from $t$	$0.19 \pm 0.13$	$0.28 \pm 0.28$	—	—
$\geq 2$ leptons	$16.94 \pm 7.10$	$3.57 \pm 0.63$	$1.34 \pm 0.36$	$0.33 \pm 0.17$
$Z \rightarrow \nu\nu$	$2.62 \pm 0.50$	$2.18 \pm 0.42$	$1.49 \pm 0.36$	$0.85 \pm 0.23$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1			
Sample	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $400 < MET < 650$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} \geq 175$ $MET > 650$
$t\bar{t}, \geq 2$ leptons	—	—	—
$t\bar{t}, 1$ lepton	—	—	—
single $t$	—	—	—
DY+Jets $\rightarrow \ell\bar{\ell}$	—	—	—
W+Jets $\rightarrow \ell\nu$	—	—	—
diBoson	—	—	—
$t\bar{t} + W$	—	—	—
$t\bar{t} + Z$	—	—	—
All Background	—	—	—
Data, single $e/\mu$ , MET	—	—	—
Data/MC	—	—	—
1 lepton, from $W$	—	—	—
1 lepton, from $t$	—	—	—
$\geq 2$ leptons	—	—	—
$Z \rightarrow \nu\nu$	—	—	—

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$44.18 \pm 2.21$	$5.52 \pm 0.71$	$0.67 \pm 0.27$	$0.20 \pm 0.12$
$t\bar{t}$ , 1 lepton	$0.49 \pm 0.35$	—	—	$0.20 \pm 0.20$
single $t$	$3.71 \pm 1.87$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	$5.91 \pm 5.91$	—	—
W+Jets $\rightarrow \ell\nu$	$194.51 \pm 12.42$	$57.06 \pm 6.21$	$14.32 \pm 2.81$	$5.86 \pm 1.36$
diBoson	$52.40 \pm 3.31$	$14.53 \pm 1.67$	$2.81 \pm 0.59$	$3.77 \pm 0.85$
$t\bar{t} + W$	$0.47 \pm 0.14$	$0.03 \pm 0.04$	$0.04 \pm 0.04$	$0.02 \pm 0.02$
$t\bar{t} + Z$	$1.74 \pm 0.04$	$0.48 \pm 0.02$	$0.13 \pm 0.01$	$0.08 \pm 0.01$
All Background	$297.51 \pm 16.36$	$83.53 \pm 8.76$	$17.96 \pm 2.88$	$10.14 \pm 1.62$
Data, single $e/\mu$ , MET	$327.00 \pm 18.08$	$98.00 \pm 9.90$	$24.00 \pm 4.90$	$40.00 \pm 6.32$
Data/MC	$1.10 \pm 0.09$	$1.17 \pm 0.17$	$1.34 \pm 0.35$	$3.94 \pm 0.89$
1 lepton, from $W$	$204.98 \pm 12.61$	$60.13 \pm 6.32$	$14.53 \pm 2.81$	$6.96 \pm 1.49$
1 lepton, from $t$	$0.49 \pm 0.35$	—	$0.00 \pm 0.00$	$0.20 \pm 0.20$
$\geq 2$ leptons	$60.18 \pm 10.19$	$13.97 \pm 5.98$	$1.21 \pm 0.35$	$0.80 \pm 0.45$
$Z \rightarrow \nu\nu$	$31.85 \pm 2.15$	$9.43 \pm 1.09$	$2.22 \pm 0.54$	$2.18 \pm 0.40$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$6.42 \pm 0.82$	$2.25 \pm 0.51$	$0.27 \pm 0.14$	$0.10 \pm 0.07$
$t\bar{t}$ , 1 lepton	—	$0.07 \pm 0.07$	$0.06 \pm 0.06$	—
single $t$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$37.08 \pm 4.34$	$21.93 \pm 3.17$	$10.44 \pm 1.90$	$8.65 \pm 1.38$
diBoson	$8.41 \pm 1.26$	$9.79 \pm 1.20$	$4.39 \pm 0.76$	$4.27 \pm 0.78$
$t\bar{t} + W$	$0.07 \pm 0.05$	—	$0.05 \pm 0.04$	—
$t\bar{t} + Z$	$0.24 \pm 0.02$	$0.19 \pm 0.01$	$0.07 \pm 0.01$	$0.06 \pm 0.01$
All Background	$52.22 \pm 4.59$	$34.23 \pm 3.43$	$15.29 \pm 2.05$	$13.09 \pm 1.59$
Data, single $e/\mu$ , MET	$55.00 \pm 7.42$	$48.00 \pm 6.93$	$20.00 \pm 4.47$	$29.00 \pm 5.39$
Data/MC	$1.05 \pm 0.17$	$1.40 \pm 0.25$	$1.31 \pm 0.34$	$2.22 \pm 0.49$
1 lepton, from $W$	$37.88 \pm 4.37$	$23.07 \pm 3.25$	$10.97 \pm 1.95$	$9.52 \pm 1.49$
1 lepton, from $t$	—	$0.07 \pm 0.07$	$0.06 \pm 0.06$	—
$\geq 2$ leptons	$8.32 \pm 0.95$	$4.14 \pm 0.70$	$0.95 \pm 0.28$	$0.62 \pm 0.23$
$Z \rightarrow \nu\nu$	$6.02 \pm 1.00$	$6.95 \pm 0.87$	$3.31 \pm 0.57$	$2.95 \pm 0.50$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $550 < MET < 650$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $MET > 650$
$t\bar{t}, \geq 2$ leptons	$71.14 \pm 3.14$	$11.63 \pm 1.34$	$2.00 \pm 0.44$	$0.67 \pm 0.24$	$0.29 \pm 0.17$
$t\bar{t}, 1$ lepton	$3.73 \pm 1.19$	—	$0.09 \pm 0.09$	—	$0.12 \pm 0.12$
single $t$	$1.03 \pm 1.03$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$44.78 \pm 4.54$	$15.94 \pm 2.59$	$2.68 \pm 0.62$	$1.58 \pm 0.53$	$0.90 \pm 0.34$
diBoson	$16.37 \pm 2.00$	$3.45 \pm 0.86$	$2.50 \pm 0.63$	$0.48 \pm 0.24$	$0.48 \pm 0.17$
$t\bar{t} + W$	$0.34 \pm 0.24$	$0.20 \pm 0.11$	$0.08 \pm 0.05$	—	$0.05 \pm 0.05$
$t\bar{t} + Z$	$2.00 \pm 0.05$	$0.40 \pm 0.02$	$0.07 \pm 0.01$	$0.02 \pm 0.00$	$0.01 \pm 0.00$
All Background	$139.39 \pm 6.08$	$31.62 \pm 3.04$	$7.41 \pm 0.99$	$2.75 \pm 0.63$	$1.84 \pm 0.44$
Data, single $e/\mu$ , MET	$91.00 \pm 9.54$	$28.00 \pm 5.29$	$7.00 \pm 2.65$	$3.00 \pm 1.73$	$5.00 \pm 2.24$
Data/MC	$0.65 \pm 0.07$	$0.89 \pm 0.19$	$0.94 \pm 0.38$	$1.09 \pm 0.68$	$2.72 \pm 1.38$
1 lepton, from $W$	$50.24 \pm 4.80$	$16.65 \pm 2.64$	$3.26 \pm 0.78$	$1.58 \pm 0.53$	$0.91 \pm 0.34$
1 lepton, from $t$	$3.78 \pm 1.19$	$0.00 \pm 0.00$	$0.09 \pm 0.09$	—	$0.14 \pm 0.12$
$\geq 2$ leptons	$76.79 \pm 3.40$	$12.96 \pm 1.38$	$2.74 \pm 0.50$	$0.88 \pm 0.29$	$0.45 \pm 0.20$
$Z \rightarrow \nu\nu$	$8.58 \pm 1.01$	$2.01 \pm 0.58$	$1.33 \pm 0.34$	$0.29 \pm 0.19$	$0.34 \pm 0.14$



CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$9.82 \pm 1.20$	$2.74 \pm 0.54$	$0.74 \pm 0.27$	$0.45 \pm 0.20$
$t\bar{t}$ , 1 lepton	$0.76 \pm 0.29$	$0.09 \pm 0.09$	—	$0.06 \pm 0.06$
single $t$	—	—	—	$1.24 \pm 1.24$
DY+Jets $\rightarrow \ell\ell$	$7.22 \pm 7.22$	—	—	—
W+Jets $\rightarrow \ell\nu$	$12.36 \pm 1.84$	$3.60 \pm 0.74$	$1.76 \pm 0.63$	$1.57 \pm 0.29$
diBoson	$2.17 \pm 0.54$	$1.21 \pm 0.39$	$0.46 \pm 0.20$	$0.26 \pm 0.19$
$t\bar{t} + W$	$0.17 \pm 0.16$	$0.25 \pm 0.10$	—	$0.00 \pm 0.03$
$t\bar{t} + Z$	$0.29 \pm 0.02$	$0.11 \pm 0.01$	$0.04 \pm 0.01$	$0.01 \pm 0.00$
All Background	$32.80 \pm 7.57$	$7.99 \pm 1.00$	$2.99 \pm 0.71$	$3.59 \pm 1.31$
Data, single $e/\mu$ , MET	$37.00 \pm 6.08$	$10.00 \pm 3.16$	$1.00 \pm 1.00$	$4.00 \pm 2.00$
Data/MC	$1.13 \pm 0.32$	$1.25 \pm 0.43$	$0.33 \pm 0.34$	$1.11 \pm 0.69$
1 lepton, from $W$	$12.72 \pm 1.84$	$3.77 \pm 0.74$	$1.79 \pm 0.63$	$1.61 \pm 0.29$
1 lepton, from $t$	$0.76 \pm 0.29$	$0.09 \pm 0.09$	—	$0.06 \pm 0.06$
$\geq 2$ leptons	$17.98 \pm 7.33$	$3.45 \pm 0.60$	$0.78 \pm 0.27$	$1.87 \pm 1.26$
$Z \rightarrow \nu\nu$	$1.32 \pm 0.41$	$0.68 \pm 0.31$	$0.42 \pm 0.19$	$0.06 \pm 0.15$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$7.47 \pm 1.05$	$0.69 \pm 0.27$	$0.15 \pm 0.11$	$1.30 \pm 0.54$	$0.50 \pm 0.24$
$t\bar{t}$ , 1 lepton	—	—	—	$0.11 \pm 0.11$	—
single $t$	$1.24 \pm 1.24$	—	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$7.32 \pm 2.22$	$2.03 \pm 0.84$	$0.37 \pm 0.15$	$0.58 \pm 0.18$	$1.72 \pm 0.77$
diBoson	$3.40 \pm 0.86$	$0.62 \pm 0.26$	$0.37 \pm 0.15$	$0.31 \pm 0.19$	$0.24 \pm 0.15$
$t\bar{t} + W$	$0.11 \pm 0.10$	$0.06 \pm 0.06$	$0.02 \pm 0.02$	—	—
$t\bar{t} + Z$	$0.45 \pm 0.02$	$0.10 \pm 0.01$	$0.02 \pm 0.00$	$0.04 \pm 0.01$	$0.04 \pm 0.01$
All Background	$20.01 \pm 2.88$	$3.49 \pm 0.92$	$0.92 \pm 0.24$	$2.33 \pm 0.61$	$2.51 \pm 0.82$
Data, single $e/\mu$ , MET	$16.00 \pm 4.00$	$2.00 \pm 1.41$	—	$5.00 \pm 2.24$	$2.00 \pm 1.41$
Data/MC	$0.80 \pm 0.23$	$0.57 \pm 0.43$	—	$2.14 \pm 1.11$	$0.80 \pm 0.62$
1 lepton, from $W$	$7.95 \pm 2.30$	$2.03 \pm 0.84$	$0.37 \pm 0.15$	$0.58 \pm 0.19$	$1.75 \pm 0.77$
1 lepton, from $t$	$0.00 \pm 0.00$	—	—	$0.11 \pm 0.11$	$0.00 \pm 0.00$
$\geq 2$ leptons	$9.65 \pm 1.66$	$1.10 \pm 0.34$	$0.24 \pm 0.13$	$1.30 \pm 0.54$	$0.50 \pm 0.24$
$Z \rightarrow \nu\nu$	$2.40 \pm 0.53$	$0.37 \pm 0.17$	$0.32 \pm 0.13$	$0.35 \pm 0.19$	$0.25 \pm 0.15$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt < 200$ $450 < MET < 600$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt < 200$ $MET > 600$
$t\bar{t}$ , $\geq 2$ leptons	$8.16 \pm 1.06$	$1.32 \pm 0.41$	$0.61 \pm 0.24$	—
$t\bar{t}$ , 1 lepton	$0.19 \pm 0.13$	$0.28 \pm 0.28$	—	—
single $t$	$1.19 \pm 1.19$	—	—	—
DY+Jets $\rightarrow \ell\ell$	$7.01 \pm 7.01$	—	—	—
W+Jets $\rightarrow \ell\nu$	$20.18 \pm 3.74$	$3.53 \pm 1.14$	$2.53 \pm 0.87$	$2.48 \pm 0.93$
diBoson	$4.84 \pm 1.04$	$1.45 \pm 0.41$	$0.95 \pm 0.29$	$0.61 \pm 0.37$
$t\bar{t} + W$	$0.32 \pm 0.18$	—	—	—
$t\bar{t} + Z$	$0.88 \pm 0.03$	$0.26 \pm 0.02$	$0.12 \pm 0.01$	$0.02 \pm 0.00$
All Background	$42.76 \pm 8.17$	$6.85 \pm 1.32$	$4.21 \pm 0.94$	$3.10 \pm 1.00$
Data, single $e/\mu$ , MET	$20.00 \pm 4.47$	$4.00 \pm 2.00$	$5.00 \pm 2.24$	$4.00 \pm 2.00$
Data/MC	$0.47 \pm 0.14$	$0.58 \pm 0.31$	$1.19 \pm 0.59$	$1.29 \pm 0.77$
1 lepton, from $W$	$22.72 \pm 4.01$	$3.53 \pm 1.15$	$2.65 \pm 0.87$	$2.82 \pm 0.99$
1 lepton, from $t$	$0.19 \pm 0.13$	$0.28 \pm 0.28$	—	—
$\geq 2$ leptons	$16.54 \pm 7.10$	$1.91 \pm 0.49$	$0.83 \pm 0.28$	—
$Z \rightarrow \nu\nu$	$3.31 \pm 0.53$	$1.12 \pm 0.32$	$0.73 \pm 0.25$	$0.29 \pm 0.18$

CR0b, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $400 < MET < 650$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	$1.33 \pm 0.43$	$0.49 \pm 0.23$	$0.07 \pm 0.07$
$t\bar{t}$ , 1 lepton	—	—	—
single $t$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow t\nu$	$4.94 \pm 1.40$	$2.03 \pm 0.66$	$0.27 \pm 0.07$
diBoson	$1.09 \pm 0.38$	$1.38 \pm 0.48$	$0.33 \pm 0.12$
$t\bar{t} + W$	$0.13 \pm 0.08$	$0.16 \pm 0.10$	$0.01 \pm 0.03$
$t\bar{t} + Z$	$0.09 \pm 0.01$	$0.10 \pm 0.01$	$0.01 \pm 0.00$
All Background	$7.58 \pm 1.51$	$4.16 \pm 0.85$	$0.68 \pm 0.16$
Data, single $e/\mu$ , MET	$8.00 \pm 2.83$	$6.00 \pm 2.45$	$1.00 \pm 1.00$
Data/MC	$1.06 \pm 0.43$	$1.44 \pm 0.66$	$1.47 \pm 1.50$
1 lepton, from $W$	$5.06 \pm 1.40$	$2.46 \pm 0.77$	$0.28 \pm 0.07$
1 lepton, from $t$	—	—	—
$\geq 2$ leptons	$2.12 \pm 0.53$	$0.68 \pm 0.25$	$0.15 \pm 0.10$
$Z \rightarrow \nu\nu$	$0.40 \pm 0.23$	$1.03 \pm 0.26$	$0.26 \pm 0.10$

CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP			
Sample	2jets modTopness $\geq 6.4$ 250 < MET < 350	2jets modTopness $\geq 6.4$ 350 < MET < 450	2jets modTopness $\geq 6.4$ MET > 450
$t\bar{t}$ , $\geq 2$ leptons	226.43 $\pm$ 3.78	33.16 $\pm$ 1.39	7.18 $\pm$ 0.70
$t\bar{t}$ , 1 lepton	2.50 $\pm$ 0.65	0.59 $\pm$ 0.24	—
single $t$	14.08 $\pm$ 2.97	3.82 $\pm$ 1.46	1.24 $\pm$ 0.72
DY+Jets $\rightarrow \ell\ell$	20.45 $\pm$ 19.00	7.31 $\pm$ 7.31	—
W+Jets $\rightarrow \ell\nu$	5.40 $\pm$ 1.39	0.73 $\pm$ 0.16	0.41 $\pm$ 0.14
diBoson	4.26 $\pm$ 0.70	1.63 $\pm$ 0.37	1.35 $\pm$ 0.43
$t\bar{t}$ + W	1.24 $\pm$ 0.23	0.19 $\pm$ 0.11	0.09 $\pm$ 0.08
$t\bar{t}$ + Z	1.59 $\pm$ 0.03	0.36 $\pm$ 0.01	0.13 $\pm$ 0.01
All Background	275.94 $\pm$ 19.67	47.79 $\pm$ 7.60	10.41 $\pm$ 1.11
Data, single $e/\mu$ , MET	265.00 $\pm$ 16.28	54.00 $\pm$ 7.35	13.00 $\pm$ 3.61
Data/MC	0.96 $\pm$ 0.09	1.13 $\pm$ 0.24	1.25 $\pm$ 0.37
1 lepton, from W	5.43 $\pm$ 1.40	0.81 $\pm$ 0.16	0.43 $\pm$ 0.14
1 lepton, from $t$	2.60 $\pm$ 0.66	0.59 $\pm$ 0.24	—
$\geq 2$ leptons	266.17 $\pm$ 19.61	45.95 $\pm$ 7.59	9.78 $\pm$ 1.10
Z $\rightarrow \nu\nu$	1.75 $\pm$ 0.04	0.45 $\pm$ 0.02	0.20 $\pm$ 0.02

CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP

Sample	3jets MT2W $\geq$ 200 250 < MET < 350	3jets MT2W $\geq$ 200 350 < MET < 450	3jets MT2W $\geq$ 200 450 < MET < 550	3jets MT2W $\geq$ 200 MET > 550
$t\bar{t}$ , $\geq 2$ leptons	131.55 $\pm$ 3.15	30.00 $\pm$ 1.43	6.28 $\pm$ 0.61	2.31 $\pm$ 0.34
$t\bar{t}$ , 1 lepton	8.96 $\pm$ 1.42	1.23 $\pm$ 0.41	0.33 $\pm$ 0.14	0.23 $\pm$ 0.15
single $t$	12.42 $\pm$ 2.92	5.48 $\pm$ 1.89	0.48 $\pm$ 0.48	1.38 $\pm$ 0.80
DY+Jets $\rightarrow \ell\ell$	5.36 $\pm$ 5.36	—	4.07 $\pm$ 4.07	—
W+Jets $\rightarrow \ell\nu$	3.27 $\pm$ 0.57	1.01 $\pm$ 0.19	0.47 $\pm$ 0.15	0.46 $\pm$ 0.29
diBoson	4.16 $\pm$ 0.74	1.77 $\pm$ 0.43	0.96 $\pm$ 0.39	0.70 $\pm$ 0.33
$t\bar{t} + W$	1.79 $\pm$ 0.31	0.48 $\pm$ 0.17	0.10 $\pm$ 0.07	0.10 $\pm$ 0.04
$t\bar{t} + Z$	1.92 $\pm$ 0.04	0.54 $\pm$ 0.02	0.14 $\pm$ 0.01	0.04 $\pm$ 0.00
All Background	169.43 $\pm$ 7.08	40.51 $\pm$ 2.46	12.83 $\pm$ 4.17	5.23 $\pm$ 0.98
Data, single $e/\mu$ , MET	135.00 $\pm$ 11.62	48.00 $\pm$ 6.93	18.00 $\pm$ 4.24	6.00 $\pm$ 2.45
Data/MC	0.80 $\pm$ 0.08	1.18 $\pm$ 0.19	1.40 $\pm$ 0.56	1.15 $\pm$ 0.52
1 lepton, from $W$	3.39 $\pm$ 0.57	2.02 $\pm$ 0.99	0.48 $\pm$ 0.15	0.46 $\pm$ 0.29
1 lepton, from $t$	8.99 $\pm$ 1.42	1.24 $\pm$ 0.41	0.33 $\pm$ 0.14	0.23 $\pm$ 0.15
$\geq 2$ leptons	155.55 $\pm$ 6.91	36.70 $\pm$ 2.21	11.89 $\pm$ 4.17	4.45 $\pm$ 0.93
$Z \rightarrow \nu\nu$	1.50 $\pm$ 0.03	0.55 $\pm$ 0.06	0.12 $\pm$ 0.01	0.08 $\pm$ 0.04

CR21, Nominal Systematic, Yield Table for h yields SR ICHEP

Sample	$\geq 4\text{jets}$ MT2W < 200 250 < MET < 350	$\geq 4\text{jets}$ MT2W < 200 350 < MET < 450	$\geq 4\text{jets}$ MT2W < 200 MET > 450
$t\bar{t}$ , $\geq 2$ leptons	$560.75 \pm 6.37$	$101.75 \pm 2.59$	$29.05 \pm 1.26$
$t\bar{t}$ , 1 lepton	$15.23 \pm 1.69$	$4.00 \pm 0.90$	$1.61 \pm 0.44$
single $t$	$7.18 \pm 2.12$	$0.55 \pm 0.55$	$0.41 \pm 0.41$
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	$1.74 \pm 0.55$	$0.48 \pm 0.18$	$0.12 \pm 0.07$
diBoson	$1.66 \pm 0.37$	$0.35 \pm 0.15$	$0.09 \pm 0.05$
$t\bar{t} + W$	$4.96 \pm 0.52$	$1.34 \pm 0.25$	$0.60 \pm 0.14$
$t\bar{t} + Z$	$3.27 \pm 0.05$	$0.60 \pm 0.02$	$0.13 \pm 0.01$
All Background	$594.79 \pm 6.97$	$109.09 \pm 2.82$	$32.01 \pm 1.40$
Data, single $e/\mu$ , MET	$399.00 \pm 19.97$	$91.00 \pm 9.54$	$22.00 \pm 4.69$
Data/MC	$0.67 \pm 0.03$	$0.83 \pm 0.09$	$0.69 \pm 0.15$
1 lepton, from $W$	$2.48 \pm 0.83$	$0.48 \pm 0.18$	$0.12 \pm 0.07$
1 lepton, from $t$	$15.32 \pm 1.69$	$4.06 \pm 0.90$	$1.61 \pm 0.44$
$\geq 2$ leptons	$574.65 \pm 6.71$	$104.09 \pm 2.67$	$30.17 \pm 1.33$
$Z \rightarrow \nu\nu$	$2.34 \pm 0.04$	$0.45 \pm 0.02$	$0.11 \pm 0.01$

CR21, Nominal Systematic, Yield Table for h yields SR ICHEP					
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$	$\geq 4\text{jets}$ MT2W $\geq 200$	$\geq 4\text{jets}$ MT2W $\geq 200$	$\geq 4\text{jets}$ MT2W $\geq 200$	$\geq 4\text{jets}$ MT2W $\geq 200$
	250 < MET < 350	350 < MET < 450	450 < MET < 550	550 < MET < 650	MET > 650
$t\bar{t}$ , $\geq 2$ leptons	142.18 $\pm$ 3.75	39.40 $\pm$ 1.73	13.53 $\pm$ 1.16	3.47 $\pm$ 0.52	1.81 $\pm$ 0.33
$t\bar{t}$ , 1 lepton	15.71 $\pm$ 1.71	5.11 $\pm$ 0.98	1.99 $\pm$ 0.46	0.75 $\pm$ 0.37	0.18 $\pm$ 0.13
single $t$	9.08 $\pm$ 2.40	3.69 $\pm$ 1.54	—	2.55 $\pm$ 1.16	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	3.53 $\pm$ 0.79	2.04 $\pm$ 0.76	0.36 $\pm$ 0.12	0.53 $\pm$ 0.32	0.38 $\pm$ 0.25
diBoson	2.02 $\pm$ 0.38	1.79 $\pm$ 0.52	0.45 $\pm$ 0.16	0.30 $\pm$ 0.14	0.53 $\pm$ 0.27
$t\bar{t}$ + W	3.68 $\pm$ 0.53	1.72 $\pm$ 0.29	0.28 $\pm$ 0.19	0.17 $\pm$ 0.10	0.12 $\pm$ 0.09
$t\bar{t}$ + Z	2.26 $\pm$ 0.04	0.59 $\pm$ 0.02	0.16 $\pm$ 0.01	0.06 $\pm$ 0.01	0.02 $\pm$ 0.00
All Background	178.46 $\pm$ 10.59	54.33 $\pm$ 5.35	16.78 $\pm$ 1.28	7.82 $\pm$ 1.37	3.04 $\pm$ 0.52
Data, single $e/\mu$ , MET	132.00 $\pm$ 11.49	37.00 $\pm$ 6.08	14.00 $\pm$ 3.74	3.00 $\pm$ 1.73	3.00 $\pm$ 1.73
Data/MC	0.74 $\pm$ 0.08	0.68 $\pm$ 0.13	0.83 $\pm$ 0.23	0.38 $\pm$ 0.23	0.99 $\pm$ 0.59
1 lepton, from W	3.69 $\pm$ 0.79	2.10 $\pm$ 0.76	0.41 $\pm$ 0.12	0.97 $\pm$ 0.51	0.38 $\pm$ 0.25
1 lepton, from $t$	15.76 $\pm$ 1.72	5.13 $\pm$ 0.98	2.03 $\pm$ 0.46	0.75 $\pm$ 0.37	0.18 $\pm$ 0.13
$\geq 2$ leptons	157.85 $\pm$ 10.42	46.76 $\pm$ 5.20	14.19 $\pm$ 1.19	6.06 $\pm$ 1.22	2.42 $\pm$ 0.44
Z $\rightarrow \nu\nu$	1.17 $\pm$ 0.06	0.34 $\pm$ 0.02	0.15 $\pm$ 0.05	0.04 $\pm$ 0.01	0.06 $\pm$ 0.04



CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	2jets modTopness $\geq$ 6.4 250 < MET < 350	2jets modTopness $\geq$ 6.4 350 < MET < 450	2jets modTopness $\geq$ 6.4 450 < MET < 550	2jets modTopness $\geq$ 6.4 550 < MET < 650	2jets modTopness $\geq$ 6.4 MET > 650
$t\bar{t}$ , $\geq$ 2 leptons	226.43 $\pm$ 3.78	33.16 $\pm$ 1.39	5.09 $\pm$ 0.51	0.99 $\pm$ 0.22	1.10 $\pm$ 0.43
$t\bar{t}$ , 1 lepton	2.50 $\pm$ 0.65	0.59 $\pm$ 0.24	—	—	—
single $t$	14.08 $\pm$ 2.97	3.82 $\pm$ 1.46	1.24 $\pm$ 0.72	—	—
DY+Jets $\rightarrow \ell\ell$	20.45 $\pm$ 19.00	7.31 $\pm$ 7.31	—	—	—
W+Jets $\rightarrow \ell\nu$	5.40 $\pm$ 1.39	0.73 $\pm$ 0.16	0.33 $\pm$ 0.12	0.07 $\pm$ 0.07	0.02 $\pm$ 0.01
diBoson	4.26 $\pm$ 0.70	1.63 $\pm$ 0.37	0.48 $\pm$ 0.19	0.47 $\pm$ 0.34	0.40 $\pm$ 0.19
$t\bar{t}$ + W	1.24 $\pm$ 0.23	0.19 $\pm$ 0.11	0.02 $\pm$ 0.05	0.05 $\pm$ 0.03	0.05 $\pm$ 0.05
$t\bar{t}$ + Z	1.59 $\pm$ 0.03	0.36 $\pm$ 0.01	0.09 $\pm$ 0.01	0.03 $\pm$ 0.00	0.02 $\pm$ 0.00
All Background	275.94 $\pm$ 19.67	47.79 $\pm$ 7.60	7.24 $\pm$ 0.91	1.61 $\pm$ 0.41	1.59 $\pm$ 0.47
Data, single $e/\mu$ , MET	265.00 $\pm$ 16.28	54.00 $\pm$ 7.35	9.00 $\pm$ 3.00	3.00 $\pm$ 1.73	1.00 $\pm$ 1.00
Data/MC	0.96 $\pm$ 0.09	1.13 $\pm$ 0.24	1.24 $\pm$ 0.44	1.87 $\pm$ 1.18	0.63 $\pm$ 0.66
1 lepton, from W	5.43 $\pm$ 1.40	0.81 $\pm$ 0.16	0.35 $\pm$ 0.12	0.07 $\pm$ 0.07	0.02 $\pm$ 0.01
1 lepton, from $t$	2.60 $\pm$ 0.66	0.59 $\pm$ 0.24	—	—	—
$\geq$ 2 leptons	266.17 $\pm$ 19.61	45.95 $\pm$ 7.59	6.77 $\pm$ 0.90	1.49 $\pm$ 0.41	1.54 $\pm$ 0.47
Z $\rightarrow \nu\nu$	1.75 $\pm$ 0.04	0.45 $\pm$ 0.02	0.12 $\pm$ 0.01	0.05 $\pm$ 0.01	0.03 $\pm$ 0.01

CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200	3jets MT2W $\geq$ 200
	250 < MET < 350	350 < MET < 450	450 < MET < 550	550 < MET < 650	MET > 650
t $\bar{t}$ , $\geq$ 2 leptons	131.55 $\pm$ 3.15	30.00 $\pm$ 1.43	6.28 $\pm$ 0.61	1.70 $\pm$ 0.31	0.61 $\pm$ 0.15
t $\bar{t}$ , 1 lepton	8.96 $\pm$ 1.42	1.23 $\pm$ 0.41	0.33 $\pm$ 0.14	0.23 $\pm$ 0.15	—
single t	12.42 $\pm$ 2.92	5.48 $\pm$ 1.89	0.48 $\pm$ 0.48	0.88 $\pm$ 0.63	0.50 $\pm$ 0.50
DY+Jets $\rightarrow \ell\ell$	5.36 $\pm$ 5.36	—	4.07 $\pm$ 4.07	—	—
W+Jets $\rightarrow \ell\nu$	3.27 $\pm$ 0.57	1.01 $\pm$ 0.19	0.47 $\pm$ 0.15	0.15 $\pm$ 0.08	0.31 $\pm$ 0.27
diBoson	4.16 $\pm$ 0.74	1.77 $\pm$ 0.43	0.96 $\pm$ 0.39	0.21 $\pm$ 0.10	0.50 $\pm$ 0.31
t $\bar{t}$ + W	1.79 $\pm$ 0.31	0.48 $\pm$ 0.17	0.10 $\pm$ 0.07	0.06 $\pm$ 0.03	0.04 $\pm$ 0.03
t $\bar{t}$ + Z	1.92 $\pm$ 0.04	0.54 $\pm$ 0.02	0.14 $\pm$ 0.01	0.02 $\pm$ 0.00	0.02 $\pm$ 0.00
All Background	169.43 $\pm$ 7.08	40.51 $\pm$ 2.46	12.83 $\pm$ 4.17	3.26 $\pm$ 0.73	1.98 $\pm$ 0.66
Data, single e/ $\mu$ , MET	135.00 $\pm$ 11.62	48.00 $\pm$ 6.93	18.00 $\pm$ 4.24	4.00 $\pm$ 2.00	2.00 $\pm$ 1.41
Data/MC	0.80 $\pm$ 0.08	1.18 $\pm$ 0.19	1.40 $\pm$ 0.56	1.23 $\pm$ 0.67	1.01 $\pm$ 0.79
1 lepton, from W	3.39 $\pm$ 0.57	2.02 $\pm$ 0.99	0.48 $\pm$ 0.15	0.15 $\pm$ 0.08	0.31 $\pm$ 0.27
1 lepton, from t	8.99 $\pm$ 1.42	1.24 $\pm$ 0.41	0.33 $\pm$ 0.14	0.23 $\pm$ 0.15	—
$\geq$ 2 leptons	155.55 $\pm$ 6.91	36.70 $\pm$ 2.21	11.89 $\pm$ 4.17	2.84 $\pm$ 0.70	1.61 $\pm$ 0.60
Z $\rightarrow \nu\nu$	1.50 $\pm$ 0.03	0.55 $\pm$ 0.06	0.12 $\pm$ 0.01	0.03 $\pm$ 0.00	0.06 $\pm$ 0.04

CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb					
Sample	$\geq 4\text{jets}$ MT2W < 200 250 < MET < 350	$\geq 4\text{jets}$ MT2W < 200 350 < MET < 450	$\geq 4\text{jets}$ MT2W < 200 450 < MET < 550	$\geq 4\text{jets}$ MT2W < 200 550 < MET < 650	$\geq 4\text{jets}$ MT2W < 200 MET > 650
$t\bar{t}$ , $\geq 2$ leptons	560.75 $\pm$ 6.37	101.75 $\pm$ 2.59	21.07 $\pm$ 1.07	5.95 $\pm$ 0.57	2.03 $\pm$ 0.34
$t\bar{t}$ , 1 lepton	15.23 $\pm$ 1.69	4.00 $\pm$ 0.90	1.06 $\pm$ 0.39	0.44 $\pm$ 0.19	0.10 $\pm$ 0.07
single $t$	7.18 $\pm$ 2.12	0.55 $\pm$ 0.55	0.41 $\pm$ 0.41	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	1.74 $\pm$ 0.55	0.48 $\pm$ 0.18	0.04 $\pm$ 0.02	—	0.08 $\pm$ 0.07
diBoson	1.66 $\pm$ 0.37	0.35 $\pm$ 0.15	0.02 $\pm$ 0.01	0.04 $\pm$ 0.03	0.04 $\pm$ 0.04
$t\bar{t}$ + W	4.96 $\pm$ 0.52	1.34 $\pm$ 0.25	0.39 $\pm$ 0.10	0.22 $\pm$ 0.09	0.01 $\pm$ 0.03
$t\bar{t}$ + Z	3.27 $\pm$ 0.05	0.60 $\pm$ 0.02	0.09 $\pm$ 0.01	0.02 $\pm$ 0.00	0.01 $\pm$ 0.00
All Background	594.79 $\pm$ 6.97	109.09 $\pm$ 2.82	23.09 $\pm$ 1.21	6.67 $\pm$ 0.61	2.27 $\pm$ 0.36
Data, single $e/\mu$ , MET	399.00 $\pm$ 19.97	91.00 $\pm$ 9.54	17.00 $\pm$ 4.12	5.00 $\pm$ 2.24	—
Data/MC	0.67 $\pm$ 0.03	0.83 $\pm$ 0.09	0.74 $\pm$ 0.18	0.75 $\pm$ 0.34	—
1 lepton, from W	2.48 $\pm$ 0.83	0.48 $\pm$ 0.18	0.04 $\pm$ 0.02	—	0.08 $\pm$ 0.07
1 lepton, from $t$	15.32 $\pm$ 1.69	4.06 $\pm$ 0.90	1.07 $\pm$ 0.39	0.44 $\pm$ 0.19	0.10 $\pm$ 0.07
$\geq 2$ leptons	574.65 $\pm$ 6.71	104.09 $\pm$ 2.67	21.91 $\pm$ 1.15	6.21 $\pm$ 0.57	2.07 $\pm$ 0.35
Z $\rightarrow \nu\nu$	2.34 $\pm$ 0.04	0.45 $\pm$ 0.02	0.07 $\pm$ 0.01	0.02 $\pm$ 0.00	0.02 $\pm$ 0.00

CR2l, Nominal Systematic, Yield Table for h yields SR ICHEP ext30fb						
Sample	$\geq 4\text{jets}$ MT2W $\geq 200$ $250 < MET < 350$	$\geq 4\text{jets}$ MT2W $\geq 200$ $350 < MET < 450$	$\geq 4\text{jets}$ MT2W $\geq 200$ $450 < MET < 550$	$\geq 4\text{jets}$ MT2W $\geq 200$ $550 < MET < 650$	$\geq 4\text{jets}$ MT2W $\geq 200$ $650 < MET < 800$	$\geq 4\text{jets}$ MT2W $\geq 200$ $MET > 800$
$t\bar{t}$ , $\geq 2$ leptons	$142.18 \pm 3.75$	$39.40 \pm 1.73$	$13.53 \pm 1.16$	$3.47 \pm 0.52$	$1.49 \pm 0.31$	$0.32 \pm 0.13$
$t\bar{t}$ , 1 lepton	$15.71 \pm 1.71$	$5.11 \pm 0.98$	$1.99 \pm 0.46$	$0.75 \pm 0.37$	$0.18 \pm 0.13$	—
single $t$	$9.08 \pm 2.40$	$3.69 \pm 1.54$	—	$2.55 \pm 1.16$	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$3.53 \pm 0.79$	$2.04 \pm 0.76$	$0.36 \pm 0.12$	$0.53 \pm 0.32$	$0.36 \pm 0.25$	$0.02 \pm 0.01$
diBoson	$2.02 \pm 0.38$	$1.79 \pm 0.52$	$0.45 \pm 0.16$	$0.30 \pm 0.14$	$0.50 \pm 0.27$	$0.03 \pm 0.02$
$t\bar{t} + W$	$3.68 \pm 0.53$	$1.72 \pm 0.29$	$0.28 \pm 0.19$	$0.17 \pm 0.10$	$0.09 \pm 0.07$	$0.05 \pm 0.06$
$t\bar{t} + Z$	$2.26 \pm 0.04$	$0.59 \pm 0.02$	$0.16 \pm 0.01$	$0.06 \pm 0.01$	$0.02 \pm 0.00$	$0.00 \pm 0.00$
All Background	$178.46 \pm 10.59$	$54.33 \pm 5.35$	$16.78 \pm 1.28$	$7.82 \pm 1.37$	$2.63 \pm 0.50$	$0.43 \pm 0.14$
Data, single $e/\mu$ , MET	$132.00 \pm 11.49$	$37.00 \pm 6.08$	$14.00 \pm 3.74$	$3.00 \pm 1.73$	$3.00 \pm 1.73$	—
Data/MC	$0.74 \pm 0.08$	$0.68 \pm 0.13$	$0.83 \pm 0.23$	$0.38 \pm 0.23$	$1.14 \pm 0.69$	—
1 lepton, from $W$	$3.69 \pm 0.79$	$2.10 \pm 0.76$	$0.41 \pm 0.12$	$0.97 \pm 0.51$	$0.36 \pm 0.25$	$0.02 \pm 0.01$
1 lepton, from $t$	$15.76 \pm 1.72$	$5.13 \pm 0.98$	$2.03 \pm 0.46$	$0.75 \pm 0.37$	$0.18 \pm 0.13$	—
$\geq 2$ leptons	$157.85 \pm 10.42$	$46.76 \pm 5.20$	$14.19 \pm 1.19$	$6.06 \pm 1.22$	$2.04 \pm 0.41$	$0.40 \pm 0.14$
$Z \rightarrow \nu\nu$	$1.17 \pm 0.06$	$0.34 \pm 0.02$	$0.15 \pm 0.05$	$0.04 \pm 0.01$	$0.06 \pm 0.04$	$0.01 \pm 0.00$

CR2l. Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $M_{lb} < 175$ $MET > 550$
$t\bar{t}, \geq 2$ leptons	$264.07 \pm 4.09$	$48.83 \pm 1.66$	$8.59 \pm 0.65$	$2.80 \pm 0.35$
$t\bar{t}, 1$ lepton	$6.77 \pm 1.18$	$1.26 \pm 0.37$	$0.26 \pm 0.12$	$0.23 \pm 0.15$
single $t$	$13.25 \pm 2.93$	$6.40 \pm 2.00$	$0.87 \pm 0.61$	$0.88 \pm 0.63$
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$4.26 \pm 1.33$	$0.59 \pm 0.16$	$0.14 \pm 0.05$	$0.05 \pm 0.04$
diBoson	$3.05 \pm 0.63$	$0.90 \pm 0.27$	$0.35 \pm 0.16$	$0.08 \pm 0.04$
$t\bar{t} + W$	$1.67 \pm 0.28$	$0.26 \pm 0.14$	$0.10 \pm 0.06$	$0.11 \pm 0.07$
$t\bar{t} + Z$	$1.93 \pm 0.04$	$0.54 \pm 0.02$	$0.13 \pm 0.01$	$0.05 \pm 0.00$
All Background	$294.99 \pm 10.59$	$58.77 \pm 2.65$	$10.43 \pm 0.92$	$4.21 \pm 0.74$
Data, single $e/\mu$ , MET	$286.00 \pm 16.91$	$69.00 \pm 8.31$	$16.00 \pm 4.00$	$4.00 \pm 2.00$
Data/MC	$0.97 \pm 0.07$	$1.17 \pm 0.15$	$1.53 \pm 0.41$	$0.95 \pm 0.50$
1 lepton, from $W$	$4.27 \pm 1.33$	$1.64 \pm 0.99$	$0.16 \pm 0.06$	$0.05 \pm 0.04$
1 lepton, from $t$	$6.89 \pm 1.18$	$1.26 \pm 0.37$	$0.26 \pm 0.12$	$0.23 \pm 0.15$
$\geq 2$ leptons	$281.87 \pm 10.44$	$55.25 \pm 2.43$	$9.88 \pm 0.91$	$3.83 \pm 0.72$
$Z \rightarrow \nu\nu$	$1.95 \pm 0.04$	$0.62 \pm 0.06$	$0.13 \pm 0.01$	$0.09 \pm 0.04$

CR2l. Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}, \geq 2$ leptons	$9.67 \pm 0.99$	$2.93 \pm 0.53$	$0.66 \pm 0.25$	$0.94 \pm 0.42$
$t\bar{t}, 1$ lepton	$1.81 \pm 0.74$	$0.45 \pm 0.28$	$0.07 \pm 0.07$	—
single $t$	$6.70 \pm 2.18$	$0.47 \pm 0.47$	$0.86 \pm 0.61$	—
DY+Jets $\rightarrow \ell\ell$	$27.83 \pm 17.51$	$7.31 \pm 7.31$	$4.07 \pm 4.07$	—
W+Jets $\rightarrow \ell\nu$	$2.50 \pm 0.61$	$0.77 \pm 0.15$	$0.53 \pm 0.17$	$0.39 \pm 0.28$
diBoson	$2.25 \pm 0.42$	$1.15 \pm 0.28$	$0.88 \pm 0.37$	$1.32 \pm 0.50$
$t\bar{t} + W$	$0.48 \pm 0.14$	$0.20 \pm 0.11$	—	$0.03 \pm 0.02$
$t\bar{t} + Z$	$0.50 \pm 0.02$	$0.17 \pm 0.01$	$0.05 \pm 0.01$	$0.02 \pm 0.00$
All Background	$51.75 \pm 17.70$	$13.45 \pm 7.36$	$7.13 \pm 4.15$	$2.71 \pm 0.71$
Data, single $e/\mu$ , MET	$24.00 \pm 4.90$	$11.00 \pm 3.32$	$2.00 \pm 1.41$	$1.00 \pm 1.00$
Data/MC	$0.46 \pm 0.18$	$0.82 \pm 0.51$	$0.28 \pm 0.26$	$0.37 \pm 0.38$
1 lepton, from W	$2.55 \pm 0.61$	$0.80 \pm 0.15$	$0.55 \pm 0.17$	$0.39 \pm 0.28$
1 lepton, from $t$	$1.81 \pm 0.74$	$0.45 \pm 0.29$	$0.07 \pm 0.07$	—
$\geq 2$ leptons	$46.89 \pm 17.67$	$11.98 \pm 7.35$	$6.43 \pm 4.14$	$2.26 \pm 0.65$
$Z \rightarrow \nu\nu$	$0.50 \pm 0.02$	$0.22 \pm 0.02$	$0.08 \pm 0.01$	$0.06 \pm 0.01$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $550 < MET < 650$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} < 175$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	485.00 $\pm$ 5.89	88.92 $\pm$ 2.41	19.90 $\pm$ 1.07	5.36 $\pm$ 0.53	2.08 $\pm$ 0.34
$t\bar{t}$ , 1 lepton	14.48 $\pm$ 1.71	3.31 $\pm$ 0.82	1.06 $\pm$ 0.39	0.40 $\pm$ 0.19	0.16 $\pm$ 0.12
single $t$	7.35 $\pm$ 2.08	—	—	0.49 $\pm$ 0.49	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	1.56 $\pm$ 0.54	0.43 $\pm$ 0.17	0.06 $\pm$ 0.03	0.07 $\pm$ 0.07	0.08 $\pm$ 0.07
diBoson	1.69 $\pm$ 0.39	0.33 $\pm$ 0.15	0.01 $\pm$ 0.01	0.04 $\pm$ 0.03	0.04 $\pm$ 0.04
$t\bar{t} + W$	4.64 $\pm$ 0.48	1.04 $\pm$ 0.23	0.38 $\pm$ 0.11	0.19 $\pm$ 0.08	0.02 $\pm$ 0.03
$t\bar{t} + Z$	2.82 $\pm$ 0.04	0.50 $\pm$ 0.02	0.08 $\pm$ 0.01	0.03 $\pm$ 0.00	0.01 $\pm$ 0.00
All Background	517.52 $\pm$ 6.53	94.53 $\pm$ 2.57	21.50 $\pm$ 1.14	6.57 $\pm$ 0.75	2.39 $\pm$ 0.37
Data, single $e/\mu$ , MET	352.00 $\pm$ 18.76	85.00 $\pm$ 9.22	16.00 $\pm$ 4.00	3.00 $\pm$ 1.73	—
Data/MC	0.68 $\pm$ 0.04	0.90 $\pm$ 0.10	0.74 $\pm$ 0.19	0.46 $\pm$ 0.27	—
1 lepton, from W	2.24 $\pm$ 0.82	0.43 $\pm$ 0.17	0.06 $\pm$ 0.03	0.07 $\pm$ 0.07	0.08 $\pm$ 0.07
1 lepton, from $t$	14.57 $\pm$ 1.71	3.36 $\pm$ 0.83	1.07 $\pm$ 0.39	0.40 $\pm$ 0.19	0.16 $\pm$ 0.12
$\geq 2$ leptons	498.72 $\pm$ 6.25	90.37 $\pm$ 2.42	20.32 $\pm$ 1.07	6.08 $\pm$ 0.73	2.14 $\pm$ 0.34
$Z \rightarrow \nu\nu$	1.99 $\pm$ 0.04	0.37 $\pm$ 0.02	0.06 $\pm$ 0.01	0.02 $\pm$ 0.00	0.01 $\pm$ 0.00

CR2l. Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $M_{lb} \geq 175$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$110.86 \pm 3.41$	$24.91 \pm 1.40$	$6.61 \pm 0.77$	$2.56 \pm 0.44$
$t\bar{t}$ , 1 lepton	$4.85 \pm 0.86$	$0.92 \pm 0.39$	$0.08 \pm 0.05$	$0.17 \pm 0.10$
single $t$	$5.17 \pm 1.86$	$0.71 \pm 0.71$	$0.41 \pm 0.41$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$1.23 \pm 0.24$	$1.31 \pm 0.73$	$0.11 \pm 0.08$	$0.36 \pm 0.25$
diBoson	$1.26 \pm 0.28$	$1.18 \pm 0.45$	$0.18 \pm 0.07$	$0.34 \pm 0.24$
$t\bar{t} + W$	$1.81 \pm 0.38$	$0.89 \pm 0.20$	$0.19 \pm 0.12$	$0.01 \pm 0.09$
$t\bar{t} + Z$	$1.46 \pm 0.03$	$0.34 \pm 0.02$	$0.07 \pm 0.01$	$0.04 \pm 0.00$
All Background	$126.64 \pm 4.02$	$30.25 \pm 4.98$	$7.64 \pm 0.89$	$3.47 \pm 0.58$
Data, single $e/\mu$ , MET	$75.00 \pm 8.66$	$15.00 \pm 3.87$	$5.00 \pm 2.24$	$4.00 \pm 2.00$
Data/MC	$0.59 \pm 0.07$	$0.50 \pm 0.15$	$0.65 \pm 0.30$	$1.15 \pm 0.61$
1 lepton, from $W$	$1.29 \pm 0.24$	$1.32 \pm 0.73$	$0.11 \pm 0.08$	$0.41 \pm 0.25$
1 lepton, from $t$	$4.88 \pm 0.86$	$0.93 \pm 0.39$	$0.08 \pm 0.05$	$0.17 \pm 0.10$
$\geq 2$ leptons	$119.86 \pm 3.92$	$27.85 \pm 4.91$	$7.42 \pm 0.88$	$2.88 \pm 0.51$
$Z \rightarrow \nu\nu$	$0.60 \pm 0.06$	$0.16 \pm 0.01$	$0.04 \pm 0.01$	$0.02 \pm 0.00$



CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} < 175$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $M_{lb} \geq 175$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$44.15 \pm 1.75$	$5.53 \pm 0.59$	$1.70 \pm 0.50$	$4.21 \pm 0.64$	$0.51 \pm 0.19$
$t\bar{t}$ , 1 lepton	$2.27 \pm 0.52$	$0.51 \pm 0.25$	$0.09 \pm 0.06$	$0.54 \pm 0.36$	$0.07 \pm 0.07$
single $t$	—	$0.55 \pm 0.55$	—	$0.76 \pm 0.76$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.38 \pm 0.15$	$0.10 \pm 0.08$	$0.01 \pm 0.01$	$0.38 \pm 0.15$	$0.04 \pm 0.04$
diBoson	$0.15 \pm 0.06$	$0.01 \pm 0.01$	$0.13 \pm 0.12$	$0.07 \pm 0.04$	$0.06 \pm 0.04$
$t\bar{t} + W$	$0.56 \pm 0.20$	$0.27 \pm 0.11$	$0.05 \pm 0.03$	$0.08 \pm 0.08$	$0.03 \pm 0.03$
$t\bar{t} + Z$	$0.35 \pm 0.02$	$0.06 \pm 0.01$	$0.01 \pm 0.00$	$0.13 \pm 0.01$	$0.01 \pm 0.00$
All Background	$47.86 \pm 1.85$	$7.02 \pm 0.86$	$1.99 \pm 0.52$	$6.17 \pm 1.07$	$0.72 \pm 0.21$
Data, single $e/\mu$ , MET	$37.00 \pm 6.08$	$3.00 \pm 1.73$	$2.00 \pm 1.41$	$3.00 \pm 1.73$	$1.00 \pm 1.00$
Data/MC	$0.77 \pm 0.13$	$0.43 \pm 0.25$	$1.01 \pm 0.76$	$0.49 \pm 0.29$	$1.39 \pm 1.45$
1 lepton, from $W$	$0.46 \pm 0.16$	$0.10 \pm 0.08$	$0.01 \pm 0.01$	$0.38 \pm 0.15$	$0.04 \pm 0.04$
1 lepton, from $t$	$2.27 \pm 0.54$	$0.53 \pm 0.25$	$0.09 \pm 0.06$	$0.54 \pm 0.36$	$0.07 \pm 0.07$
$\geq 2$ leptons	$44.86 \pm 1.76$	$6.35 \pm 0.81$	$1.87 \pm 0.52$	$5.18 \pm 1.00$	$0.61 \pm 0.19$
$Z \rightarrow \nu\nu$	$0.27 \pm 0.01$	$0.04 \pm 0.01$	$0.01 \pm 0.00$	$0.05 \pm 0.01$	$0.01 \pm 0.00$

CR2l. Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1

Sample	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} < 175$ $250 < MET < 350$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} < 175$ $350 < MET < 450$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} < 175$ $450 < MET < 600$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $M_{lb} < 175$ $MET > 600$
$t\bar{t}$ , $\geq 2$ leptons	$55.56 \pm 2.11$	$18.90 \pm 1.11$	$7.23 \pm 0.71$	$1.41 \pm 0.37$
$t\bar{t}$ , 1 lepton	$8.29 \pm 1.30$	$3.28 \pm 0.81$	$1.68 \pm 0.45$	$0.09 \pm 0.06$
single $t$	$2.10 \pm 1.05$	$2.23 \pm 1.14$	$0.89 \pm 0.63$	$0.52 \pm 0.52$
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.69 \pm 0.25$	$0.18 \pm 0.09$	$0.10 \pm 0.07$	$0.00 \pm 0.00$
diBoson	$0.16 \pm 0.07$	$0.22 \pm 0.14$	$0.16 \pm 0.09$	$0.21 \pm 0.12$
$t\bar{t} + W$	$1.09 \pm 0.30$	$0.74 \pm 0.16$	$0.05 \pm 0.11$	$0.21 \pm 0.08$
$t\bar{t} + Z$	$0.63 \pm 0.02$	$0.21 \pm 0.01$	$0.07 \pm 0.01$	$0.01 \pm 0.00$
All Background	$68.53 \pm 2.72$	$25.76 \pm 1.80$	$10.18 \pm 1.06$	$2.45 \pm 0.66$
Data, single $e/\mu$ , MET	$58.00 \pm 7.62$	$23.00 \pm 4.80$	$5.00 \pm 2.24$	$3.00 \pm 1.73$
Data/MC	$0.85 \pm 0.12$	$0.89 \pm 0.20$	$0.49 \pm 0.23$	$1.22 \pm 0.78$
1 lepton, from $W$	$0.73 \pm 0.25$	$0.23 \pm 0.09$	$0.50 \pm 0.40$	$0.00 \pm 0.00$
1 lepton, from $t$	$8.31 \pm 1.30$	$3.29 \pm 0.81$	$1.71 \pm 0.45$	$0.09 \pm 0.06$
$\geq 2$ leptons	$58.99 \pm 2.38$	$22.07 \pm 1.61$	$7.91 \pm 0.88$	$2.31 \pm 0.66$
$Z \rightarrow \nu\nu$	$0.51 \pm 0.02$	$0.17 \pm 0.01$	$0.07 \pm 0.01$	$0.05 \pm 0.04$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb mlb v1			
Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} \geq 175$ $250 < MET < 400$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} \geq 175$ $400 < MET < 650$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $M_{lb} \geq 175$ $MET > 650$
$t\bar{t}, \geq 2$ leptons	$5.15 \pm 0.75$	$1.35 \pm 0.48$	$0.06 \pm 0.04$
$t\bar{t}, 1$ lepton	$1.22 \pm 0.41$	$1.12 \pm 0.48$	—
single $t$	$0.87 \pm 0.87$	$1.40 \pm 0.99$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow \ell\nu$	$1.34 \pm 0.69$	$0.74 \pm 0.34$	$0.02 \pm 0.01$
diBoson	$0.75 \pm 0.29$	$0.14 \pm 0.07$	$0.10 \pm 0.10$
$t\bar{t} + W$	$0.60 \pm 0.22$	$0.12 \pm 0.11$	—
$t\bar{t} + Z$	$0.20 \pm 0.01$	$0.06 \pm 0.01$	$0.00 \pm 0.00$
All Background	$10.12 \pm 9.51$	$4.93 \pm 1.25$	$0.18 \pm 0.11$
Data, single $e/\mu$ , MET	$6.00 \pm 2.45$	$4.00 \pm 2.00$	$1.00 \pm 1.00$
Data/MC	$0.59 \pm 0.61$	$0.81 \pm 0.46$	$5.50 \pm 6.43$
1 lepton, from $W$	$1.38 \pm 0.69$	$0.78 \pm 0.34$	$0.02 \pm 0.01$
1 lepton, from $t$	$1.22 \pm 0.41$	$1.12 \pm 0.48$	—
$\geq 2$ leptons	$7.41 \pm 9.48$	$2.94 \pm 1.11$	$0.16 \pm 0.11$
$Z \rightarrow \nu\nu$	$0.11 \pm 0.01$	$0.09 \pm 0.05$	$0.01 \pm 0.00$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt < 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$244.33 \pm 3.94$	$38.06 \pm 1.47$	$6.05 \pm 0.56$	$2.07 \pm 0.30$
$t\bar{t}$ , 1 lepton	$7.21 \pm 1.27$	$1.36 \pm 0.41$	$0.26 \pm 0.12$	$0.19 \pm 0.15$
single $t$	$15.55 \pm 3.25$	$5.79 \pm 1.90$	$1.35 \pm 0.78$	$0.88 \pm 0.63$
DY+Jets $\rightarrow \ell\ell$	$5.55 \pm 11.86$	$7.31 \pm 7.31$	$4.07 \pm 4.07$	—
W+Jets $\rightarrow \ell\nu$	$3.94 \pm 1.04$	$0.70 \pm 0.17$	$0.35 \pm 0.14$	$0.06 \pm 0.04$
diBoson	$3.89 \pm 0.58$	$1.58 \pm 0.35$	$0.49 \pm 0.17$	$0.26 \pm 0.13$
$t\bar{t} + W$	$1.97 \pm 0.30$	$0.24 \pm 0.14$	$0.06 \pm 0.07$	$0.11 \pm 0.05$
$t\bar{t} + Z$	$2.15 \pm 0.04$	$0.55 \pm 0.02$	$0.13 \pm 0.01$	$0.05 \pm 0.00$
All Background	$284.59 \pm 13.03$	$55.58 \pm 7.72$	$12.75 \pm 4.19$	$3.63 \pm 0.73$
Data, single $e/\mu$ , MET	$274.00 \pm 16.55$	$63.00 \pm 7.94$	$14.00 \pm 3.74$	$3.00 \pm 1.73$
Data/MC	$0.96 \pm 0.07$	$1.13 \pm 0.21$	$1.10 \pm 0.47$	$0.83 \pm 0.51$
1 lepton, from $W$	$4.02 \pm 1.05$	$1.77 \pm 0.99$	$0.38 \pm 0.14$	$0.06 \pm 0.04$
1 lepton, from $t$	$7.22 \pm 1.27$	$1.36 \pm 0.41$	$0.26 \pm 0.12$	$0.19 \pm 0.15$
$\geq 2$ leptons	$271.17 \pm 12.93$	$51.81 \pm 7.64$	$11.97 \pm 4.19$	$3.27 \pm 0.71$
$Z \rightarrow \nu\nu$	$2.19 \pm 0.04$	$0.65 \pm 0.06$	$0.14 \pm 0.01$	$0.10 \pm 0.04$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 350$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $350 < MET < 450$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $450 < MET < 550$	< 4jets modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$29.42 \pm 1.45$	$13.70 \pm 0.95$	$3.20 \pm 0.42$	$1.66 \pm 0.45$
$t\bar{t}$ , 1 lepton	$1.37 \pm 0.56$	$0.35 \pm 0.21$	$0.07 \pm 0.07$	$0.04 \pm 0.04$
single $t$	$4.40 \pm 1.65$	$1.08 \pm 0.77$	$0.38 \pm 0.38$	—
DY+Jets $\rightarrow \ell\ell$	$20.26 \pm 15.78$	—	—	—
W+Jets $\rightarrow \ell\nu$	$2.81 \pm 1.02$	$0.66 \pm 0.15$	$0.32 \pm 0.11$	$0.38 \pm 0.28$
diBoson	$1.42 \pm 0.49$	$0.48 \pm 0.17$	$0.74 \pm 0.37$	$1.14 \pm 0.48$
$t\bar{t} + W$	$0.17 \pm 0.11$	$0.22 \pm 0.11$	$0.04 \pm 0.04$	$0.04 \pm 0.05$
$t\bar{t} + Z$	$0.28 \pm 0.01$	$0.15 \pm 0.01$	$0.05 \pm 0.01$	$0.03 \pm 0.00$
All Background	$60.14 \pm 15.99$	$16.63 \pm 1.26$	$4.80 \pm 0.69$	$3.30 \pm 0.72$
Data, single $e/\mu$ , MET	$36.00 \pm 6.00$	$17.00 \pm 4.12$	$4.00 \pm 2.00$	$2.00 \pm 1.41$
Data/MC	$0.60 \pm 0.19$	$1.02 \pm 0.26$	$0.83 \pm 0.43$	$0.61 \pm 0.45$
1 lepton, from $W$	$2.81 \pm 1.02$	$0.67 \pm 0.15$	$0.32 \pm 0.11$	$0.38 \pm 0.28$
1 lepton, from $t$	$1.49 \pm 0.57$	$0.35 \pm 0.21$	$0.07 \pm 0.07$	$0.04 \pm 0.04$
$\geq 2$ leptons	$55.57 \pm 15.94$	$15.43 \pm 1.23$	$4.34 \pm 0.67$	$2.82 \pm 0.66$
$Z \rightarrow \nu\nu$	$0.27 \pm 0.02$	$0.19 \pm 0.01$	$0.07 \pm 0.01$	$0.06 \pm 0.01$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $550 < MET < 650$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt < 200$ $MET > 650$
$t\bar{t}, \geq 2$ leptons	$540.28 \pm 6.34$	$100.07 \pm 2.59$	$22.14 \pm 1.18$	$5.99 \pm 0.57$	$2.56 \pm 0.37$
$t\bar{t}, 1$ lepton	$17.06 \pm 1.81$	$3.80 \pm 0.90$	$1.03 \pm 0.38$	$0.30 \pm 0.18$	$0.21 \pm 0.13$
single $t$	$10.83 \pm 2.61$	$0.71 \pm 0.71$	$0.41 \pm 0.41$	$0.49 \pm 0.49$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$2.09 \pm 0.56$	$1.59 \pm 0.75$	$0.12 \pm 0.08$	$0.07 \pm 0.07$	$0.19 \pm 0.10$
diBoson	$2.41 \pm 0.44$	$0.75 \pm 0.28$	$0.06 \pm 0.03$	$0.05 \pm 0.04$	$0.04 \pm 0.04$
$t\bar{t} + W$	$5.44 \pm 0.57$	$1.58 \pm 0.28$	$0.46 \pm 0.13$	$0.23 \pm 0.10$	$0.00 \pm 0.06$
$t\bar{t} + Z$	$3.84 \pm 0.05$	$0.73 \pm 0.02$	$0.13 \pm 0.01$	$0.04 \pm 0.00$	$0.02 \pm 0.00$
All Background	$581.95 \pm 7.15$	$109.23 \pm 2.95$	$24.34 \pm 1.31$	$7.17 \pm 0.78$	$3.02 \pm 0.41$
Data, single $e/\mu$ , MET	$394.00 \pm 19.85$	$92.00 \pm 9.59$	$19.00 \pm 4.36$	$5.00 \pm 2.24$	$1.00 \pm 1.00$
Data/MC	$0.68 \pm 0.04$	$0.84 \pm 0.09$	$0.78 \pm 0.18$	$0.70 \pm 0.32$	$0.33 \pm 0.33$
1 lepton, from $W$	$2.79 \pm 0.84$	$1.61 \pm 0.75$	$0.12 \pm 0.08$	$0.07 \pm 0.07$	$0.19 \pm 0.10$
1 lepton, from $t$	$17.19 \pm 1.81$	$3.83 \pm 0.90$	$1.03 \pm 0.38$	$0.30 \pm 0.18$	$0.21 \pm 0.13$
$\geq 2$ leptons	$559.63 \pm 6.86$	$103.35 \pm 2.71$	$23.10 \pm 1.25$	$6.78 \pm 0.76$	$2.61 \pm 0.38$
$Z \rightarrow \nu\nu$	$2.34 \pm 0.04$	$0.45 \pm 0.02$	$0.09 \pm 0.01$	$0.02 \pm 0.00$	$0.01 \pm 0.00$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $250 < MET < 350$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $350 < MET < 450$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $450 < MET < 550$	$\geq 4\text{jets}$ modTopness < 0.0 $leadBJetPt \geq 200$ $MET > 550$
$t\bar{t}$ , $\geq 2$ leptons	$55.58 \pm 2.50$	$13.76 \pm 1.03$	$4.38 \pm 0.58$	$1.45 \pm 0.36$
$t\bar{t}$ , 1 lepton	$2.27 \pm 0.61$	$0.43 \pm 0.18$	$0.11 \pm 0.08$	$0.21 \pm 0.11$
single $t$	$1.69 \pm 0.98$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.70 \pm 0.18$	$0.15 \pm 0.07$	$0.04 \pm 0.03$	$0.25 \pm 0.24$
diBoson	$0.53 \pm 0.21$	$0.76 \pm 0.38$	$0.13 \pm 0.06$	$0.33 \pm 0.24$
$t\bar{t} + W$	$1.02 \pm 0.24$	$0.34 \pm 0.12$	$0.13 \pm 0.10$	$0.01 \pm 0.04$
$t\bar{t} + Z$	$0.43 \pm 0.02$	$0.11 \pm 0.01$	$0.03 \pm 0.01$	$0.02 \pm 0.00$
All Background	$62.22 \pm 2.78$	$15.56 \pm 4.76$	$4.81 \pm 0.60$	$2.27 \pm 0.51$
Data, single $e/\mu$ , MET	$33.00 \pm 5.74$	$8.00 \pm 2.83$	$2.00 \pm 1.41$	$1.00 \pm 1.00$
Data/MC	$0.53 \pm 0.10$	$0.51 \pm 0.24$	$0.42 \pm 0.30$	$0.44 \pm 0.45$
1 lepton, from $W$	$0.74 \pm 0.18$	$0.15 \pm 0.07$	$0.04 \pm 0.03$	$0.30 \pm 0.24$
1 lepton, from $t$	$2.28 \pm 0.61$	$0.45 \pm 0.18$	$0.12 \pm 0.08$	$0.22 \pm 0.11$
$\geq 2$ leptons	$58.95 \pm 2.70$	$14.88 \pm 4.76$	$4.64 \pm 0.60$	$1.74 \pm 0.44$
$Z \rightarrow \nu\nu$	$0.25 \pm 0.06$	$0.08 \pm 0.01$	$0.01 \pm 0.00$	$0.01 \pm 0.00$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1					
Sample	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $250 < MET < 350$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $350 < MET < 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt < 200$ $MET > 450$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ 0.0 <modTopness< 7.5 $leadBJetPt \geq 200$ $MET > 400$
$t\bar{t}$ , $\geq 2$ leptons	$43.30 \pm 1.75$	$5.68 \pm 0.60$	$1.48 \pm 0.35$	$4.49 \pm 0.60$	$1.15 \pm 0.46$
$t\bar{t}$ , 1 lepton	$2.35 \pm 0.53$	$0.48 \pm 0.24$	$0.16 \pm 0.09$	$0.40 \pm 0.34$	$0.09 \pm 0.09$
single $t$	$0.76 \pm 0.78$	$0.55 \pm 0.55$	—	—	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$0.49 \pm 0.17$	$0.16 \pm 0.12$	$0.01 \pm 0.01$	$0.15 \pm 0.07$	$0.12 \pm 0.09$
diBoson	$0.18 \pm 0.06$	$0.05 \pm 0.03$	$0.13 \pm 0.12$	$0.01 \pm 0.01$	$0.05 \pm 0.04$
$t\bar{t} + W$	$0.53 \pm 0.20$	$0.25 \pm 0.11$	$0.02 \pm 0.03$	$0.07 \pm 0.07$	$0.11 \pm 0.05$
$t\bar{t} + Z$	$0.42 \pm 0.02$	$0.07 \pm 0.01$	$0.01 \pm 0.00$	$0.03 \pm 0.00$	$0.01 \pm 0.00$
All Background	$48.03 \pm 2.01$	$7.23 \pm 0.87$	$1.81 \pm 0.38$	$5.15 \pm 0.70$	$1.53 \pm 0.48$
Data, single $e/\mu$ , MET	$38.00 \pm 6.16$	$3.00 \pm 1.73$	$2.00 \pm 1.41$	$2.00 \pm 1.41$	$1.00 \pm 1.00$
Data/MC	$0.79 \pm 0.13$	$0.42 \pm 0.24$	$1.11 \pm 0.82$	$0.39 \pm 0.28$	$0.65 \pm 0.68$
1 lepton, from $W$	$0.56 \pm 0.17$	$0.16 \pm 0.12$	$0.01 \pm 0.01$	$0.15 \pm 0.07$	$0.12 \pm 0.09$
1 lepton, from $t$	$2.36 \pm 0.55$	$0.50 \pm 0.24$	$0.16 \pm 0.09$	$0.40 \pm 0.34$	$0.09 \pm 0.09$
$\geq 2$ leptons	$44.81 \pm 1.92$	$6.52 \pm 0.82$	$1.63 \pm 0.37$	$4.58 \pm 0.60$	$1.32 \pm 0.46$
$Z \rightarrow \nu\nu$	$0.30 \pm 0.02$	$0.05 \pm 0.01$	$0.01 \pm 0.00$	$0.02 \pm 0.00$	$0.01 \pm 0.00$



CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $250 < \text{MET} < 350$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $350 < \text{MET} < 450$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $450 < \text{MET} < 600$	$\geq 4\text{jets}$ $\text{modTopness} \geq 7.5$ $\text{leadBJetPt} < 200$ $\text{MET} > 600$
$t\bar{t}$ , $\geq 2$ leptons	$62.25 \pm 2.19$	$8.20 \pm 0.72$	$2.80 \pm 0.49$	$0.55 \pm 0.15$
$t\bar{t}$ , 1 lepton	$10.75 \pm 1.50$	$2.07 \pm 0.55$	$1.27 \pm 0.43$	—
single $t$	$4.17 \pm 1.62$	$1.03 \pm 0.73$	$0.92 \pm 0.65$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—	—
W+Jets $\rightarrow \ell\nu$	$1.14 \pm 0.28$	$0.31 \pm 0.13$	$0.11 \pm 0.11$	$0.00 \pm 0.00$
diBoson	$0.83 \pm 0.29$	$0.15 \pm 0.07$	$0.21 \pm 0.13$	$0.20 \pm 0.12$
$t\bar{t} + W$	$1.71 \pm 0.33$	$0.22 \pm 0.12$	—	$0.11 \pm 0.05$
$t\bar{t} + Z$	$0.83 \pm 0.02$	$0.13 \pm 0.01$	$0.05 \pm 0.01$	$0.01 \pm 0.00$
All Background	$81.70 \pm 9.92$	$12.11 \pm 1.18$	$5.35 \pm 0.94$	$0.86 \pm 0.20$
Data, single $e/\mu$ , MET	$68.00 \pm 8.25$	$9.00 \pm 3.00$	$3.00 \pm 1.73$	$1.00 \pm 1.00$
Data/MC	$0.83 \pm 0.14$	$0.74 \pm 0.26$	$0.56 \pm 0.34$	$1.16 \pm 1.19$
1 lepton, from $W$	$1.25 \pm 0.29$	$0.34 \pm 0.14$	$0.50 \pm 0.41$	$0.00 \pm 0.00$
1 lepton, from $t$	$10.77 \pm 1.50$	$2.09 \pm 0.55$	$1.27 \pm 0.43$	—
$\geq 2$ leptons	$69.04 \pm 9.80$	$9.53 \pm 1.04$	$3.54 \pm 0.73$	$0.82 \pm 0.19$
$Z \rightarrow \nu\nu$	$0.63 \pm 0.02$	$0.14 \pm 0.05$	$0.04 \pm 0.01$	$0.05 \pm 0.04$

CR2l, Nominal Systematic, Yield Table for h yields SR dev ext30fb bJetPt v1

Sample	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $250 < MET < 400$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $400 < MET < 650$	$\geq 4\text{jets}$ modTopness $\geq 7.5$ $leadBJetPt \geq 200$ $MET > 650$
$t\bar{t}$ , $\geq 2$ leptons	$10.36 \pm 0.99$	$5.34 \pm 0.75$	$0.17 \pm 0.09$
$t\bar{t}$ , 1 lepton	$0.91 \pm 0.38$	$0.68 \pm 0.28$	—
single $t$	—	$1.90 \pm 1.11$	—
DY+Jets $\rightarrow \ell\ell$	—	—	—
W+Jets $\rightarrow t\nu$	$0.97 \pm 0.68$	$0.53 \pm 0.31$	$0.02 \pm 0.01$
diBoson	$0.27 \pm 0.16$	$0.06 \pm 0.04$	$0.01 \pm 0.00$
$t\bar{t} + W$	$0.41 \pm 0.22$	$0.30 \pm 0.12$	$0.04 \pm 0.04$
$t\bar{t} + Z$	$0.12 \pm 0.01$	$0.05 \pm 0.01$	$0.00 \pm 0.00$
All Background	$13.03 \pm 1.29$	$8.85 \pm 1.41$	$0.23 \pm 0.10$
Data, single $e/\mu$ , MET	$13.00 \pm 3.61$	$5.00 \pm 2.24$	$1.00 \pm 1.00$
Data/MC	$1.00 \pm 0.29$	$0.57 \pm 0.27$	$4.31 \pm 4.72$
1 lepton, from $W$	$0.97 \pm 0.68$	$0.55 \pm 0.31$	$0.02 \pm 0.01$
1 lepton, from $t$	$0.91 \pm 0.38$	$0.69 \pm 0.28$	—
$\geq 2$ leptons	$11.06 \pm 1.03$	$7.56 \pm 1.34$	$0.21 \pm 0.10$
$Z \rightarrow \nu\nu$	$0.09 \pm 0.01$	$0.04 \pm 0.01$	$0.01 \pm 0.00$