

Process	$2\ell ss + 0\tau_h$	$1\ell + 1\tau_h$	$0\ell + 2\tau_h$
$t\bar{t}H$	222.1 ± 51.1	183.1 ± 40.8	24.4 ± 6.0
tH	119.3 ± 85.4	64.6 ± 45.6	16.1 ± 11.7
$t\bar{t}Z + t\bar{t}\gamma^*$	321.6 ± 24.8	203.0 ± 23.6	27.1 ± 3.8
$t\bar{t}W + t\bar{t}WW$	1153.2 ± 64.2	254.5 ± 34.3	3.8 ± 0.5
WZ	296.2 ± 31.0	198.1 ± 37.3	42.5 ± 8.7
ZZ	31.2 ± 3.3	98.5 ± 12.8	34.2 ± 4.8
DY	—	4477.2 ± 465.0	1433.0 ± 217.5
$t\bar{t}+\text{jets}$	—	40951.2 ± 1904.0	860.5 ± 98.1
Non-prompt leptons	1217.3 ± 90.7	25336.7 ± 1885.4	3788.0 ± 221.7
Flips	121.1 ± 19.4	—	—
Rare backgrounds	222.0 ± 47.8	1928.1 ± 424.0	60.3 ± 13.9
Conversion	42.3 ± 11.9	—	—
$ggH + qqH + VH + t\bar{t}VH$	35.3 ± 4.0	38.5 ± 3.6	26.7 ± 3.6
Total expected background	3517.4 ± 85.1	73550.4 ± 611.6	6292.3 ± 135.9
Data	3738	73736	6310

Process	$3\ell + 0\tau_h$	$2\ell ss + 1\tau_h$	$2\ell os + 1\tau_h$	$1\ell + 2\tau_h$
$t\bar{t}H$	60.9 ± 14.7	28.9 ± 6.4	19.1 ± 4.3	19.3 ± 4.2
tH	20.1 ± 14.2	12.7 ± 9.0	4.8 ± 3.4	2.6 ± 1.9
$t\bar{t}Z + t\bar{t}\gamma^*$	145.5 ± 10.9	29.6 ± 3.3	25.5 ± 2.9	20.3 ± 2.1
$t\bar{t}W + t\bar{t}WW$	171.1 ± 9.5	47.4 ± 6.5	17.4 ± 2.4	2.6 ± 0.4
WZ	89.7 ± 9.7	19.4 ± 2.9	8.4 ± 1.6	11.8 ± 2.2
ZZ	16.2 ± 1.6	1.6 ± 0.3	1.9 ± 0.3	1.8 ± 0.3
Non-prompt leptons	140.3 ± 11.3	52.0 ± 9.6	518.9 ± 28.0	250.1 ± 15.9
Rare backgrounds	41.0 ± 8.9	13.3 ± 3.1	5.9 ± 1.3	5.6 ± 1.3
Conversion	5.6 ± 1.6	—	0.5 ± 0.2	—
$ggH + qqH + VH + t\bar{t}VH$	3.4 ± 0.3	1.8 ± 0.3	0.8 ± 0.1	—
Total expected background	627.3 ± 19.6	178.7 ± 12.6	583.6 ± 27.4	295.0 ± 15.9
Data	744	201	603	307

Process	$4\ell + 0\tau_h$	$3\ell + 1\tau_h$	$2\ell + 2\tau_h$
$t\bar{t}H$	2.0 ± 0.5	4.0 ± 0.9	2.2 ± 0.5
tH	0.2 ± 0.2	0.8 ± 0.6	0.3 ± 0.2
$t\bar{t}Z + t\bar{t}\gamma^*$	5.9 ± 0.4	6.6 ± 0.7	2.5 ± 0.3
$t\bar{t}W + t\bar{t}WW$	0.2 ± 0.0	1.1 ± 0.2	—
ZZ	0.6 ± 0.2	0.3 ± 0.1	0.2 ± 0.0
Non-prompt leptons	—	1.5 ± 0.9	3.4 ± 0.9
Rare backgrounds	0.6 ± 0.1	1.0 ± 0.3	0.3 ± 0.1
Conversion	—	—	—
Total expected background	7.4 ± 0.5	11.5 ± 1.3	6.8 ± 1.0
Data	12	18	3