

| Uncertainty of channel | SR1LBin0 | SR1LBin1 | SR1LBin2 | SR1LBin3 | SR1LBin4 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
| Total background expectation | 168.17 | 170.86 | 54.01 | 19.72 | 15.28 |
| Total statistical ($\sqrt{N_{\text{exp}}}$) | ± 12.97 | ± 13.07 | ± 7.35 | ± 4.44 | ± 3.91 |
| Total background systematic | ± 14.52 [8.64%] | ± 13.49 [7.89%] | ± 6.29 [11.64%] | ± 2.83 [14.37%] | ± 2.87 [18.79%] |
| mu_tt_1L | ± 19.37 [11.5%] | ± 16.24 [9.5%] | ± 3.92 [7.3%] | ± 0.99 [5.0%] | ± 0.49 [3.2%] |
| alpha_MatrixElement-Top1L | ± 12.38 [7.4%] | ± 8.10 [4.7%] | ± 1.75 [3.2%] | ± 0.44 [2.3%] | ± 0.34 [2.2%] |
| alpha_JER_EffectiveNP_1 | ± 6.73 [4.0%] | ± 2.08 [1.2%] | ± 0.94 [1.7%] | ± 0.18 [0.92%] | ± 0.22 [1.5%] |
| alpha_JER_EffectiveNP_2 | ± 5.21 [3.1%] | ± 1.15 [0.67%] | ± 1.01 [1.9%] | ± 0.32 [1.6%] | ± 0.65 [4.2%] |
| alpha_FSR-Top1L | ± 4.33 [2.6%] | ± 3.97 [2.3%] | ± 0.26 [0.47%] | ± 0.66 [3.3%] | ± 0.15 [1.0%] |
| gamma_stat_SR1LBin0.cuts_bin_0 | ± 4.16 [2.5%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| alpha_PartonShower-Top1L | ± 4.11 [2.4%] | ± 6.82 [4.0%] | ± 3.21 [6.0%] | ± 0.99 [5.0%] | ± 0.67 [4.4%] |
| alpha_JER_DataVsMC | ± 4.04 [2.4%] | ± 0.93 [0.54%] | ± 1.06 [2.0%] | ± 0.31 [1.6%] | ± 0.43 [2.8%] |
| alpha_JER_EffectiveNP_7restTerm | ± 3.94 [2.3%] | ± 1.08 [0.63%] | ± 0.15 [0.27%] | ± 0.22 [1.1%] | ± 0.08 [0.51%] |
| alpha_PartonShower-SingleTop | ± 3.88 [2.3%] | ± 0.41 [0.24%] | ± 1.95 [3.6%] | ± 0.77 [3.9%] | ± 0.38 [2.5%] |
| alpha_JES_Group2 | ± 3.45 [2.1%] | ± 1.04 [0.61%] | ± 1.22 [2.3%] | ± 0.02 [0.11%] | ± 0.02 [0.11%] |
| alpha_muR_muF-ttV | ± 3.06 [1.8%] | ± 4.68 [2.7%] | ± 2.11 [3.9%] | ± 0.88 [4.5%] | ± 0.64 [4.2%] |
| alpha_JER_EffectiveNP_3 | ± 2.96 [1.8%] | ± 1.66 [0.97%] | ± 0.24 [0.45%] | ± 0.64 [3.2%] | ± 0.45 [2.9%] |
| alpha_JES_Group1 | ± 2.93 [1.7%] | ± 1.02 [0.60%] | ± 0.98 [1.8%] | ± 0.46 [2.3%] | ± 0.01 [0.05%] |
| alpha_JER_EffectiveNP_4 | ± 2.89 [1.7%] | ± 2.61 [1.5%] | ± 0.59 [1.1%] | ± 0.07 [0.37%] | ± 0.07 [0.48%] |
| alpha_JER_EffectiveNP_5 | ± 2.52 [1.5%] | ± 1.90 [1.1%] | ± 0.63 [1.2%] | ± 0.24 [1.2%] | ± 0.07 [0.48%] |
| alpha_JET_Flavor_Response | ± 2.34 [1.4%] | ± 0.78 [0.45%] | ± 0.21 [0.39%] | ± 0.18 [0.93%] | ± 0.07 [0.45%] |
| mu_W | ± 2.26 [1.3%] | ± 3.02 [1.8%] | ± 1.16 [2.1%] | ± 0.50 [2.5%] | ± 0.48 [3.1%] |
| alpha_FSR-SingleTop | ± 1.85 [1.1%] | ± 0.55 [0.32%] | ± 0.01 [0.01%] | ± 0.04 [0.18%] | ± 1.06 [6.9%] |
| alpha_ISR-SingleTop | ± 1.83 [1.1%] | ± 2.87 [1.7%] | ± 1.05 [1.9%] | ± 0.54 [2.8%] | ± 1.07 [7.0%] |
| alpha_MatrixElement-SingleTop | ± 1.56 [0.93%] | ± 2.42 [1.4%] | ± 0.12 [0.23%] | ± 0.25 [1.2%] | ± 0.35 [2.3%] |
| alpha_muR_muF-Diboson | ± 1.35 [0.80%] | ± 1.67 [0.98%] | ± 0.79 [1.5%] | ± 0.38 [1.9%] | ± 0.46 [3.0%] |
| alpha_Interference-SingleTop | ± 1.07 [0.64%] | ± 2.71 [1.6%] | ± 2.15 [4.0%] | ± 1.44 [7.3%] | ± 1.26 [8.2%] |
| alpha_ISR-Top1L | ± 0.93 [0.55%] | ± 1.73 [1.0%] | ± 1.62 [3.0%] | ± 0.77 [3.9%] | ± 0.76 [5.0%] |
| alpha_JES_Group3 | ± 0.83 [0.49%] | ± 0.02 [0.01%] | ± 0.31 [0.58%] | ± 0.19 [0.99%] | ± 0.13 [0.83%] |
| alpha_muR_muF-Wjets | ± 0.75 [0.44%] | ± 1.63 [0.96%] | ± 0.76 [1.4%] | ± 0.08 [0.42%] | ± 0.53 [3.5%] |
| Lumi | ± 0.64 [0.38%] | ± 0.81 [0.47%] | ± 0.32 [0.59%] | ± 0.14 [0.71%] | ± 0.11 [0.75%] |
| alpha_qsf-Wjets | ± 0.25 [0.15%] | ± 0.17 [0.10%] | ± 0.04 [0.08%] | ± 0.04 [0.21%] | ± 0.05 [0.30%] |
| alpha_muR_muF-Zjets | ± 0.23 [0.14%] | ± 0.12 [0.07%] | ± 0.02 [0.03%] | ± 0.01 [0.04%] | ± 0.01 [0.05%] |
| alpha_JET_EtaInt_negEta | ± 0.17 [0.10%] | ± 0.02 [0.01%] | ± 0.01 [0.01%] | ± 0.00 [0.01%] | ± 0.01 [0.06%] |
| alpha_ckkw-Wjets | ± 0.09 [0.05%] | ± 0.36 [0.21%] | ± 0.05 [0.10%] | ± 0.11 [0.55%] | ± 0.12 [0.81%] |
| alpha_JET_EtaInt_highE | ± 0.03 [0.02%] | ± 0.03 [0.01%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| alpha_ckkw-Zjets | ± 0.02 [0.01%] | ± 0.01 [0.00%] | ± 0.01 [0.02%] | ± 0.00 [0.00%] | ± 0.00 [0.01%] |
| alpha_qsf-Zjets | ± 0.02 [0.01%] | ± 0.00 [0.00%] | ± 0.01 [0.02%] | ± 0.00 [0.01%] | ± 0.00 [0.01%] |
| alpha_JET_RelNonClos_AFII | ± 0.01 [0.01%] | ± 0.02 [0.01%] | ± 0.01 [0.01%] | ± 0.00 [0.00%] | ± 0.00 [0.01%] |
| alpha_JER_DataVsMC_AFII | ± 0.00 [0.00%] | ± 0.01 [0.01%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| alpha_JET_EtaInt_posEta | ± 0.00 [0.00%] | ± 0.03 [0.02%] | ± 0.02 [0.04%] | ± 0.00 [0.01%] | ± 0.00 [0.03%] |
| alpha_JER_EffectiveNP_6 | ± 0.00 [0.00%] | ± 2.38 [1.4%] | ± 0.23 [0.42%] | ± 0.21 [1.1%] | ± 0.08 [0.52%] |
| gamma_stat_SR1LBin3.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 1.10 [5.6%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_CRWm.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_VRW_VR1m.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_VRW_VR2m.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_VRW_VR2p.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_VRW_VR1p.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_SR1LBin4.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 1.20 [7.8%] |
| gamma_stat_tW1L_VRtt_VR2.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_SR1LBin1.cuts_bin_0 | ± 0.00 [0.00%] | ± 4.19 [2.5%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_CRWp.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_VRtt_VR1.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |
| gamma_stat_tW1L_CRtt.cuts_bin_0 | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] | ± 0.00 [0.00%] |

Table 1: Breakdown of the dominant systematic uncertainties on background estimates in the various signal regions. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.