

Cut	700 GeV, 1000 cm, region 2017		
	ϵ_i^{CMS}	$\epsilon_i^{\text{sim}}, \text{MLM}$	$\epsilon_i^{\text{sim}}, \text{MLM, no pileup}$
total	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$
trigger	$2.0^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
passes p_T^{miss} filters	$2.0^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
$p_T^{\text{miss}} > 120 \text{ GeV}$	$1.9^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
≥ 1 jet with $p_T > 110 \text{ GeV}$ and $ \eta < 2.4$	$1.4^{+0.02}_{-0.02} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$
$=0$ pairs of jets with $\Delta\phi_{\text{jet, jet}} > 2.5$	$1.2^{+0.02}_{-0.02} \times 10^{-1}$	$9.3^{+0.08}_{-0.08} \times 10^{-2}$	$9.2^{+0.08}_{-0.08} \times 10^{-2}$
$ \Delta\phi(\text{leading jet}, p_T^{\text{miss}}) > 0.5$	$1.2^{+0.02}_{-0.02} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $ \eta < 2.1$	$1.2^{+0.02}_{-0.02} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $p_T > 55 \text{ GeV}$	$1.1^{+0.02}_{-0.02} \times 10^{-1}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track passing fiducial selections	$7.9^{+0.12}_{-0.12} \times 10^{-2}$	$6.9^{+0.07}_{-0.07} \times 10^{-2}$	$6.8^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with ≥ 4 pixel hits	$5.9^{+0.10}_{-0.10} \times 10^{-2}$	$5.5^{+0.07}_{-0.07} \times 10^{-2}$	$5.4^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with no missing inner hits	$5.9^{+0.10}_{-0.10} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with no missing middle hits	$5.4^{+0.10}_{-0.10} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with relative track isolation $< 5\%$	$4.6^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_{xy} < 0.02 \text{ cm}$	$4.6^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_z < 0.5 \text{ cm}$	$4.6^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, jet}) > 0.5$	$4.5^{+0.10}_{-0.10} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, electron}) > 0.15$	$4.0^{+0.09}_{-0.09} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, muon}) > 0.15$	$1.7^{+0.06}_{-0.06} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track}, \tau_h) > 0.15$	$1.7^{+0.06}_{-0.06} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $E_{\text{calo}} < 10 \text{ GeV}$	$1.6^{+0.06}_{-0.06} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with ≥ 3 missing outer hits	$5.4^{+0.33}_{-0.33} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$
≥ 1 track with 4 layers	$8.1^{+1.38}_{-1.38} \times 10^{-4}$	$5.9^{+0.71}_{-0.71} \times 10^{-4}$	$6.3^{+0.73}_{-0.73} \times 10^{-4}$
≥ 1 track with 5 layers	$6.6^{+1.21}_{-1.21} \times 10^{-4}$	$6.9^{+0.77}_{-0.77} \times 10^{-4}$	$6.8^{+0.76}_{-0.76} \times 10^{-4}$
≥ 1 track with ≥ 6 layers	$4.0^{+0.29}_{-0.29} \times 10^{-3}$	$3.0^{+0.16}_{-0.16} \times 10^{-3}$	$3.0^{+0.16}_{-0.16} \times 10^{-3}$

Table 1: Cutflow comparison for 700 GeV, 1000 cm, region 2017

Cut	700 GeV, 1000 cm, region 2018A		
	ϵ_i^{CMS}	$\epsilon_i^{\text{sim}}, \text{MLM}$	$\epsilon_i^{\text{sim}}, \text{MLM, no pileup}$
total	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$
trigger	$1.6^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
passes p_T^{miss} filters	$1.6^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
$p_T^{\text{miss}} > 120 \text{ GeV}$	$1.5^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
≥ 1 jet with $p_T > 110 \text{ GeV}$ and $ \eta < 2.4$	$1.4^{+0.02}_{-0.02} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$
$=0$ pairs of jets with $\Delta\phi_{\text{jet, jet}} > 2.5$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$9.3^{+0.08}_{-0.08} \times 10^{-2}$	$9.2^{+0.08}_{-0.08} \times 10^{-2}$
$ \Delta\phi(\text{leading jet}, p_T^{\text{miss}}) > 0.5$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $ \eta < 2.1$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $p_T > 55 \text{ GeV}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track passing fiducial selections	$7.5^{+0.14}_{-0.14} \times 10^{-2}$	$6.9^{+0.07}_{-0.07} \times 10^{-2}$	$6.8^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with ≥ 4 pixel hits	$5.3^{+0.10}_{-0.10} \times 10^{-2}$	$5.5^{+0.07}_{-0.07} \times 10^{-2}$	$5.4^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with no missing inner hits	$5.2^{+0.10}_{-0.10} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with no missing middle hits	$4.6^{+0.10}_{-0.10} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with relative track isolation $< 5\%$	$3.8^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_{xy} < 0.02 \text{ cm}$	$3.8^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_z < 0.5 \text{ cm}$	$3.8^{+0.10}_{-0.10} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, jet}) > 0.5$	$3.8^{+0.10}_{-0.10} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, electron}) > 0.15$	$3.3^{+0.08}_{-0.08} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, muon}) > 0.15$	$1.4^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track}, \tau_h) > 0.15$	$1.4^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $E_{\text{calo}} < 10 \text{ GeV}$	$1.3^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with ≥ 3 missing outer hits	$4.6^{+0.31}_{-0.31} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$
≥ 1 track with 4 layers	$7.1^{+1.36}_{-1.36} \times 10^{-4}$	$5.8^{+0.70}_{-0.70} \times 10^{-4}$	$6.2^{+0.73}_{-0.73} \times 10^{-4}$
≥ 1 track with 5 layers	$4.8^{+1.02}_{-1.02} \times 10^{-4}$	$6.6^{+0.75}_{-0.75} \times 10^{-4}$	$6.7^{+0.76}_{-0.76} \times 10^{-4}$
≥ 1 track with ≥ 6 layers	$3.4^{+0.27}_{-0.27} \times 10^{-3}$	$3.1^{+0.16}_{-0.16} \times 10^{-3}$	$3.1^{+0.16}_{-0.16} \times 10^{-3}$

Table 2: Cutflow comparison for 700 GeV, 1000 cm, region 2018A

Cut	700 GeV, 1000 cm, region 2018B		
	ϵ_i^{CMS}	$\epsilon_i^{\text{sim}}, \text{MLM}$	$\epsilon_i^{\text{sim}}, \text{MLM, no pileup}$
total	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$	$1.0^{+0.00}_{-0.00}$
trigger	$1.6^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
passes p_T^{miss} filters	$1.6^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
$p_T^{\text{miss}} > 120 \text{ GeV}$	$1.5^{+0.02}_{-0.02} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$	$1.7^{+0.01}_{-0.01} \times 10^{-1}$
≥ 1 jet with $p_T > 110 \text{ GeV}$ and $ \eta < 2.4$	$1.3^{+0.02}_{-0.02} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$
$=0$ pairs of jets with $\Delta\phi_{\text{jet, jet}} > 2.5$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$9.3^{+0.08}_{-0.08} \times 10^{-2}$	$9.2^{+0.08}_{-0.08} \times 10^{-2}$
$ \Delta\phi(\text{leading jet}, p_T^{\text{miss}}) > 0.5$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $ \eta < 2.1$	$1.2^{+0.01}_{-0.01} \times 10^{-1}$	$8.8^{+0.08}_{-0.08} \times 10^{-2}$	$8.7^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track with $p_T > 55 \text{ GeV}$	$1.0^{+0.01}_{-0.01} \times 10^{-1}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$	$8.2^{+0.08}_{-0.08} \times 10^{-2}$
≥ 1 track passing fiducial selections	$7.5^{+0.13}_{-0.13} \times 10^{-2}$	$6.9^{+0.07}_{-0.07} \times 10^{-2}$	$6.8^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with ≥ 4 pixel hits	$5.3^{+0.11}_{-0.11} \times 10^{-2}$	$5.5^{+0.07}_{-0.07} \times 10^{-2}$	$5.4^{+0.07}_{-0.07} \times 10^{-2}$
≥ 1 track with no missing inner hits	$5.2^{+0.11}_{-0.11} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with no missing middle hits	$4.6^{+0.09}_{-0.09} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$	$3.8^{+0.06}_{-0.06} \times 10^{-2}$
≥ 1 track with relative track isolation $< 5\%$	$3.9^{+0.09}_{-0.09} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_{xy} < 0.02 \text{ cm}$	$3.9^{+0.09}_{-0.09} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $ d_z < 0.5 \text{ cm}$	$3.9^{+0.09}_{-0.09} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, jet}) > 0.5$	$3.8^{+0.09}_{-0.09} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, electron}) > 0.15$	$3.3^{+0.07}_{-0.07} \times 10^{-2}$	$2.8^{+0.05}_{-0.05} \times 10^{-2}$	$2.9^{+0.05}_{-0.05} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track, muon}) > 0.15$	$1.4^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $\Delta R(\text{track}, \tau_h) > 0.15$	$1.4^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with $E_{\text{calo}} < 10 \text{ GeV}$	$1.4^{+0.05}_{-0.05} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$	$1.9^{+0.04}_{-0.04} \times 10^{-2}$
≥ 1 track with ≥ 3 missing outer hits	$4.6^{+0.30}_{-0.30} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$	$4.4^{+0.19}_{-0.19} \times 10^{-3}$
$\phi(p_T^{\text{miss}}) < -1.6$ or $\phi(p_T^{\text{miss}}) > -0.6$	$3.8^{+0.28}_{-0.28} \times 10^{-3}$	$3.6^{+0.18}_{-0.18} \times 10^{-3}$	$3.6^{+0.18}_{-0.18} \times 10^{-3}$
≥ 1 track with 4 layers	$6.5^{+1.11}_{-1.11} \times 10^{-4}$	$5.2^{+0.67}_{-0.67} \times 10^{-4}$	$5.6^{+0.69}_{-0.69} \times 10^{-4}$
≥ 1 track with 5 layers	$4.3^{+0.93}_{-0.93} \times 10^{-4}$	$5.6^{+0.69}_{-0.69} \times 10^{-4}$	$5.6^{+0.69}_{-0.69} \times 10^{-4}$
≥ 1 track with ≥ 6 layers	$2.8^{+0.24}_{-0.24} \times 10^{-3}$	$2.5^{+0.15}_{-0.15} \times 10^{-3}$	$2.4^{+0.14}_{-0.14} \times 10^{-3}$

Table 3: Cutflow comparison for 700 GeV, 1000 cm, region 2018B