

Systematic Uncertainty	Value	Type
t $\bar{t}$ Cross Section	30%	Rate
t $\bar{t}$ $Q^2$	+24%/-24%	Rate + Shape
PDF	+0.9%/-0.9%	Rate + Shape
t-tag Scale Factor 2016	$\pm 5\sigma$	Rate + Shape
t-tag Scale Factor 2017	$\pm 5\sigma$	Rate + Shape
t-tag Scale Factor 2018	$\pm 5\sigma$	Rate + Shape
Jet Energy Scale 2016	+5.1%/-4.8%	Rate + Shape
Jet Energy Scale 2017	+4.8%/-4.4%	Rate + Shape
Jet Energy Scale 2018	+5.5%/-4.4%	Rate + Shape
Jet Energy Resolution 2016	+0.4%/-0.5%	Rate + Shape
Jet Energy Resolution 2017	+0.7%/-0.8%	Rate + Shape
Jet Energy Resolution 2018	+0.6%/-0.6%	Rate + Shape
Pileup	+0.1%/-0.1%	Rate + Shape
L1 Prefiring	+1.0%/-1.0%	Rate + Shape
Luminosity 2016 (Uncorrelated)	1.0%	Rate
Luminosity 2017 (Uncorrelated)	2.0%	Rate
Luminosity 2018 (Uncorrelated)	1.5%	Rate
Luminosity 2017 (Correlated 2017, 2018)	0.6%	Rate
Luminosity 2018 (Correlated 2017, 2018)	0.2%	Rate
Luminosity 2016 (Correlated 2016, 2017, 2018)	0.6%	Rate
Luminosity 2017 (Correlated 2016, 2017, 2018)	0.9%	Rate
Luminosity 2018 (Correlated 2016, 2017, 2018)	2.0%	Rate