

Uncertainty	Value	Formula	Affected Samples
Integrated luminosity	0.73%	rate only	Simulation
Pileup	< 1%	$\pm 4.6\%$	Simulation
e trigger	< 1%	$\pm \text{s.d.}(p_T, \eta)$	Simulation
$\mu$ trigger	< 1%	$\pm \text{s.d.}(p_T, \eta)$	Simulation
Level-1 trigger timing	1%	$\pm \text{s.d.}(p_T, \eta)$	Simulation
Lepton scale factors	< 1%	$\pm \text{s.d.}(p_T, \eta)$	Simulation
Jet energy scale	$\leq 2\%$	$\pm \text{s.d.}(p_T, \eta)$	Simulation
Jet energy res.	$\leq 1\%$	$\pm \text{s.d.}(\eta)$	Simulation
Pileup jet ident.	1%	$\pm \text{s.d.}(p_T, \eta)$	Simulation
b tag: b/c	$\leq 3\%$	$\pm \text{s.d.}(p_T)$	Simulation
b tag: light	$\leq 1\%$	$\pm \text{s.d.}(p_T)$	Simulation
Renormalization scale	4–11% (minor)	$\Delta(\mu_R \times 0.5, \mu_R \times 2)$	Simulation
Factorization scale	3–5% (minor)	$\Delta(\mu_F \times 0.5, \mu_F \times 2)$	Simulation
PDF (shape only)	1–6% (minor)	$\pm \text{RMS (Hessian)}$	Simulation
PARTICLENET: t tag	9% (signal)	$\pm \text{s.d.}(p_T)$	all
PARTICLENET: W tag	14% (signal)	$\pm \text{s.d.}(p_T)$	all
Training accuracy	1–25%	$\pm \%(\text{CR}_{\text{pred}} - \text{CR}_{\text{data}})$	ABCDnn
VR closure	1–3%	$\Delta(\text{corr.} \times 0, \text{corr.} \times 2)$	ABCDnn
ABCDnn smoothing	1–2%	$\pm \Delta(2\text{D} - 1\text{D})$	ABCDnn
ABCDnn normalization	2–8%	rate only	ABCDnn