| syst. source / bin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Jet energy scale | $\begin{array}{r} +1.9 \\ +0.9 \end{array}$ | $\begin{aligned} & +0.5 \\ & -2.4 \end{aligned}$ | $\begin{aligned} & +2.8 \\ & -2.9 \end{aligned}$ | $\begin{aligned} & -1.5 \\ & +3.3 \end{aligned}$ | $\begin{aligned} & -2.7 \\ & +2.4 \end{aligned}$ | $\begin{aligned} & +0.3 \\ & +0.2 \end{aligned}$ | $\begin{aligned} & -1.8 \\ & +0.8 \end{aligned}$ | $\begin{aligned} & -2.5 \\ & +2.3 \end{aligned}$ | $\begin{aligned} & +0.9 \\ & -0.5 \end{aligned}$ | $\begin{aligned} & -6.9 \\ & -3.1 \end{aligned}$ | $\begin{array}{r} +3.9 \\ -1.2 \end{array}$ | $\begin{aligned} & +1.2 \\ & { }_{-3.0} \end{aligned}$ |
| Jet energy resolution | $\begin{aligned} & +1.1 \\ & +2.1 \end{aligned}$ | $\begin{aligned} & -0.8 \\ & +0.4 \end{aligned}$ | $\begin{aligned} & -0.9 \\ & -2.6 \end{aligned}$ | $\begin{aligned} & -2.1 \\ & -1.7 \end{aligned}$ | $\begin{aligned} & +0.3 \\ & { }_{-0.1} \end{aligned}$ | $\begin{array}{r} +0.7 \\ -0.0 \end{array}$ | $\begin{array}{r} +5.5 \\ +4.0 \end{array}$ | $\begin{aligned} & -0.4 \\ & +0.3 \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.3}^{+} \end{aligned}$ | $\begin{aligned} & -3.6 \\ & -4.8 \end{aligned}$ | $\begin{aligned} & +0.5 \\ & +2.4 \end{aligned}$ | $\begin{aligned} & -1.0 \\ & -0.1 \end{aligned}$ |
| Kin. reconstruction | $\begin{gathered} +0.0 \\ -0.0 \end{gathered}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{gathered} +0.0 \\ -0.0 \end{gathered}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | ${ }_{-0.0}^{+0.0}$ | $\begin{aligned} & +0.0 \\ & -0.0 \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | ${ }_{-0.0}^{+0.0}$ | $\begin{aligned} & +0.0 \\ & { }_{-0.0}^{+0} \end{aligned}$ |
| Pileup | $\begin{aligned} & -0.2 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & -0.2 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & +1.1 \\ & -1.3 \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.0}^{+0} \end{aligned}$ | $\begin{aligned} & -0.4 \\ & +0.4 \end{aligned}$ | ${ }_{-0.3}^{+0.4}$ | $\begin{aligned} & -1.0 \\ & +1.3 \end{aligned}$ | $\begin{aligned} & -0.6 \\ & +0.5 \end{aligned}$ | $\begin{aligned} & +0.2 \\ & -0.1 \end{aligned}$ | $\begin{aligned} & -0.9 \\ & +0.8 \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.2}^{+} \end{aligned}$ | $\begin{aligned} & -0.0 \\ & -0.0 \end{aligned}$ |
| Trigger | +0.0 ${ }_{-0.0}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.1 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & +0.0 \\ & -0.0 \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.1}^{+0} \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.1}^{+0} \end{aligned}$ | $\begin{array}{r} -0.1 \\ +0.2 \end{array}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.3 \\ & +0.3 \end{aligned}$ | $\begin{aligned} & +0.0 \\ & +0.0 \end{aligned}$ | ${ }_{-0.1}^{+0.1}$ |
| Background Z/ $\gamma^{*}$ | $\begin{aligned} & -1.0 \\ & +1.0 \end{aligned}$ | $\begin{aligned} & -0.5 \\ & +0.5 \end{aligned}$ | $\begin{aligned} & -0.4 \\ & +0.5 \end{aligned}$ | $\begin{aligned} & -0.2 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & +0.3 \\ & { }_{-0.3}^{+0} \end{aligned}$ | $\begin{aligned} & +0.2 \\ & { }_{-0.2} \end{aligned}$ | $\begin{aligned} & +1.0 \\ & { }_{-0.7} \end{aligned}$ | $\begin{aligned} & +0.2 \\ & { }_{-0.2}^{+} \end{aligned}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.1}^{+0} \end{aligned}$ | $\begin{aligned} & +0.4 \\ & { }_{-0.3}^{+0} \end{aligned}$ | ${ }_{-0.2}^{+0.2}$ | ${ }_{-0.4}^{+0.4}$ |
| Background other | ${ }_{-0.6}^{+0.6}$ | ${ }_{-0.3}^{+0.3}$ | $\begin{aligned} & +0.1 \\ & { }_{-0.1}^{+0} \end{aligned}$ | $\begin{aligned} & -0.8 \\ & +0.7 \end{aligned}$ | $\begin{aligned} & -0.1 \\ & +0.1 \end{aligned}$ | ${ }_{-0.0}^{+0.0}$ | $\begin{aligned} & -0.5 \\ & +0.4 \end{aligned}$ | $\begin{aligned} & -0.4 \\ & +0.4 \end{aligned}$ | +0.0 -0.0 | $\begin{aligned} & -1.0 \\ & +0.9 \end{aligned}$ | $\begin{aligned} & +0.2 \\ & { }_{-0.1} \end{aligned}$ | +0.1 -0.1 |
| b tagging | $\begin{aligned} & +0.9 \\ & { }_{-0.9} \end{aligned}$ | $\begin{aligned} & +1.7 \\ & -0.7 \end{aligned}$ | $\begin{aligned} & +0.4 \\ & { }_{-0.7}^{+} \end{aligned}$ | $\begin{aligned} & +0.3 \\ & { }_{-0.7} \end{aligned}$ | ${ }_{-0.6}^{+1.6}$ | $\begin{aligned} & +0.3 \\ & -0.4 \end{aligned}$ | $\begin{aligned} & +0.4 \\ & { }_{-2.6}^{+0} \end{aligned}$ | $\begin{aligned} & +0.8 \\ & -0.4 \end{aligned}$ | $\begin{aligned} & +0.5 \\ & -0.4 \end{aligned}$ | $\begin{aligned} & +0.5 \\ & { }_{-1.5}^{+} \end{aligned}$ | +1.4 -0.8 | +0.3 -0.4 |
| Int. luminosity | ${ }_{-0.2}^{+0.2}$ | -0.3 +0.3 | $\begin{aligned} & +0.1 \\ & { }_{-0.1} \end{aligned}$ | $\begin{aligned} & -0.0 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.1 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & +0.3 \\ & { }_{-0.3}^{+0} \end{aligned}$ | ${ }_{-0.1}^{+0.1}$ | -0.4 +0.4 | -0.1 +0.1 | -0.1 +0.1 | ${ }_{-0.2}^{+0.2}$ | ${ }_{-0.2}^{+0.2}$ |
| $m_{\text {t }}$ | -0.5 -0.9 | $\begin{aligned} & -1.8 \\ & +1.7 \end{aligned}$ | $\begin{aligned} & -5.0 \\ & +4.6 \end{aligned}$ | $\begin{aligned} & +0.5 \\ & +0.9 \end{aligned}$ | $\begin{aligned} & +0.4 \\ & +0.0 \end{aligned}$ | $\begin{aligned} & -0.1 \\ & +0.1 \end{aligned}$ | $\begin{aligned} & +0.3 \\ & +1.4 \end{aligned}$ | -0.2 -0.8 | $\begin{aligned} & +2.0 \\ & -1.9 \end{aligned}$ | $\begin{aligned} & +1.9 \\ & -1.3 \end{aligned}$ | +2.3 -1.8 | +3.1 -3.2 |
| $\mu_{\mathrm{f}}, \mu_{\mathrm{r}}$ | +9.2 +7.7 | $\begin{aligned} & -3.3 \\ & -2.4 \end{aligned}$ | $\begin{aligned} & -11.5 \\ & +21.0 \end{aligned}$ | $\begin{aligned} & +9.6 \\ & -7.6 \end{aligned}$ | $\begin{aligned} & +2.5 \\ & -4.4 \end{aligned}$ | $\begin{aligned} & -1.7 \\ & +3.7 \end{aligned}$ | $\begin{array}{r} -0.7 \\ +4.8 \end{array}$ | +6.9 -9.2 | -5.4 +3.8 | ${ }_{-10.5}^{+1.5}$ | +4.0 -2.6 | -2.0 +2.2 |
| Matching threshold | $\begin{aligned} & +1.8 \\ & { }_{-1.0}^{+1} \end{aligned}$ | $\begin{aligned} & -0.8 \\ & +2.4 \end{aligned}$ | $\begin{aligned} & -1.7 \\ & +2.3 \end{aligned}$ | $\begin{aligned} & +1.2 \\ & +0.4 \end{aligned}$ | $\begin{aligned} & -1.2 \\ & -2.2 \end{aligned}$ | $\begin{aligned} & +1.1 \\ & +1.1 \end{aligned}$ | $\begin{aligned} & +4.3 \\ & +9.1 \end{aligned}$ | -2.0 -6.5 | $\begin{aligned} & +0.5 \\ & +2.5 \end{aligned}$ | $\begin{aligned} & -4.5 \\ & -5.5 \end{aligned}$ | +4.5 -2.8 | ${ }_{-0.8}^{-1.5}$ |
| PDFs | ${ }_{-0.2}^{+0.2}$ | $\begin{aligned} & +2.1 \\ & -2.2 \end{aligned}$ | $\begin{aligned} & +1.1 \\ & { }_{-1.2} \end{aligned}$ | $\begin{aligned} & +0.3 \\ & -0.3 \end{aligned}$ | $\begin{aligned} & +0.4 \\ & { }_{-0.4}^{+} \end{aligned}$ | $\begin{gathered} +0.1 \\ { }_{-0.1}^{+0} \end{gathered}$ | $\begin{aligned} & +0.5 \\ & { }_{-0.4}^{+0} \end{aligned}$ | ${ }_{-0.2}^{+0.2}$ | ${ }_{-0.1}^{+0.1}$ | ${ }_{-0.3}^{+0.4}$ | ${ }_{-0.2}^{+0.3}$ | ${ }_{-0.1}^{+0.1}$ |
| Hadronization | $+1.0$ | -3.6 | $+2.5$ | +3.4 | $-2.7$ | $+2.7$ | +14.1 | $-7.4$ | +3.0 | -14.7 | +1.2 | -0.5 |
| Hard scattering | +0.8 | -1.1 | +1.8 | -5.1 | $-2.7$ | $+0.3$ | -6.6 | +1.3 | +3.7 | $-7.6$ | +6.9 | +0.2 |

