

| Uncertainty source                    | Process (magnitude)   | Correlation  |
|---------------------------------------|---|--|
| Fact. & renorm. scales (QCD)          | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0.1 – 0.5%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (0.2 – 0.5%) | Correlated between processes;<br>and in $p_T$          |
| $p_T$ shape dependence (QCD)          | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0.4 – 0.1%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (0.1 – 0.2%) | Correlated between processes;<br>and in $p_T$          |
| Process dependence (QCD)              | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0.4 – 1.5%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (1.5 – 3.0%) | Correlated between processes;<br>and in $p_T$          |
| Effects of unknown Sudakov logs (EW)  | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0 – 0.5%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (0.1 – 1.5%)   | Correlated between processes;<br>and in $p_T$          |
| Missing NNLO effects (EW)             | $Z \rightarrow \nu\nu$ (0.2 – 3.0%)<br>$W \rightarrow \ell\nu$ (0.4 – 4.5%)<br>$\gamma$ +jets (0.1 – 1.0%)    | Uncorrelated between processes;<br>correlated in $p_T$ |
| Effects of NLL Sudakov approx. (EW)   | $Z \rightarrow \nu\nu$ (0.2 – 4.0%)<br>$W \rightarrow \ell\nu$ (0 – 1.0%)<br>$\gamma$ +jets (0.1 – 3.0%)      | Uncorrelated between processes;<br>correlated in $p_T$ |
| Unfactorized mixed QCD-EW corrections | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0.15 – 0.3%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (<0.1%)     | Correlated between processes;<br>and in $p_T$          |
| PDF                                   | $Z \rightarrow \nu\nu/W \rightarrow \ell\nu$ (0 – 0.3%)<br>$Z \rightarrow \nu\nu/\gamma$ +jets (0 – 0.6%)     | Correlated between processes;<br>and in $p_T$          |