

| Selection   | Requirement                                   | Reject  |
|---|---|---|
| $N_\ell$  | =2  | WZ, VVV   |
| $p_T^\ell$  | >25/20 GeV for electrons<br>>20 GeV for muons | QCD   |
| Z boson mass requirement                                    | $ m_{\ell\ell} - m_Z  < 15$ (30) GeV          | WW, top quark                                       |
| Jet counting  | $\leq 1$ jet with $p_T^j > 30$ GeV            | Z/ $\gamma^* \rightarrow \ell\ell$ , top quark, VVV |
| $p_T^{\ell\ell}$  | >60 GeV                                       | Z/ $\gamma^* \rightarrow \ell\ell$                  |
| b tagging veto  | CSVv2 < 0.8484                                | Top quark, VVV                                      |
| $\tau$ lepton veto  | 0 $\tau_h$ cand. with $p_T^\tau > 18$ GeV     | WZ  |
| $p_T^{\text{miss}}$   | >100 GeV (130 GeV, training only)             | Z/ $\gamma^* \rightarrow \ell\ell$ , WW, top quark  |
| $\Delta\phi(\vec{p}_T^j, \vec{p}_T^{\text{miss}})$          | >0.5 rad                                      | Z/ $\gamma^* \rightarrow \ell\ell$ , WZ             |
| $\Delta\phi(\vec{p}_T^{\ell\ell}, \vec{p}_T^{\text{miss}})$ | >2.6 rad (omitted)                            | Z/ $\gamma^* \rightarrow \ell\ell$                  |
| $ p_T^{\text{miss}} - p_T^{\ell\ell}  / p_T^{\ell\ell}$     | <0.4 (omitted)                                | Z/ $\gamma^* \rightarrow \ell\ell$                  |
| $\Delta R_{\ell\ell}$                                       | <1.8 (omitted)                                | WW, top quark                                       |