| Process                     | $	au_{ m lep}	au_{ m lep}$                  | $	au_{ m lep}	au_{ m had}$                               | $	au_{ m had}	au_{ m had}$  |
|-----------------------------|---|--|---|
| $Z \to \ell\ell$ -enriched  | $80 < m_{\tau\tau}^{\rm vis} < 100 \ GeV$   |  |   |
|                             | (same-flavour)                              |  |   |
| Top control region          | Invert $b$ -jet veto                        | Invert b-jet veto and $m_{\rm T} > 40~GeV$               |   |
| Rest category               |   |  | Pass preselection,  |
|                             |   |  | Fail VBF and Boosted selections   |
| $Z \to \tau \tau$ -enriched | $m_{\tau\tau}^{\mathrm{HPTO}} < 100 \; GeV$ | $m_{\rm T} < 40~GeV$ and $m_{	au	au}^{ m MMC} < 110~GeV$ |   |
| Fake-enriched               | Same sign $\tau$ decay products             | Same sign $\tau$ decay products                          |   |
| W-enriched                  |   | $m_{\rm T} > 70~GeV$                                     |   |
| Mass sideband               |   |  | $m_{\tau\tau}^{\rm MMC} < 110~GeV~{ m or}~m_{\tau\tau}^{\rm MMC} > 150~GeV$ |