

Event category	Tight leptons ( $\mu, e$ )	Additional selection criteria
WqWq	2 opposite-sign leading $p_T > 30$ GeV subleading $p_T > 20$ GeV	$\geq 2$ selected jets all jets anti-b-tagged leading $p_T > 200$ GeV subleading $p_T > 100$ GeV $ m_{\ell\ell} - m_Z  > 7.5$ GeV (same flavor) $E_T^{\text{miss}} > 60$ GeV
ZqHq	2 opposite-sign same-flavor leading $p_T > 30$ GeV subleading $p_T > 20$ GeV	$\geq 3$ selected jets $\geq 2$ anti-b-tagged jets leading $p_T > 200$ GeV subleading $p_T > 100$ GeV $\geq 1$ b-tagged jet $ m_{\ell\ell} - m_Z  < 7.5$ GeV $p_T(Z \rightarrow \ell\ell) > 150$ GeV
VqZq semi-leptonic	2 opposite-sign same-flavor leading $p_T > 30$ GeV subleading $p_T > 20$ GeV	$\geq 4$ selected jets $\geq 2$ anti-b-tagged jets leading $p_T > 200$ GeV subleading $p_T > 100$ GeV veto b-tagged jets $ m_{\ell\ell} - m_Z  < 7.5$ GeV $p_T(Z \rightarrow \ell\ell) > 150$ GeV
VqZq full-leptonic	3 or 4 leading $p_T > 30$ GeV others $p_T > 20$ GeV	$\geq 2$ selected jets all jets anti-b-tagged leading $p_T > 200$ GeV subleading $p_T > 100$ GeV $ m_{\ell\ell} - m_Z  < 7.5$ GeV $p_T(Z \rightarrow \ell\ell) > 150$ GeV $E_T^{\text{miss}} > 60$ GeV (3 leptons) $\Delta R(\ell, \ell) > 0.05$ (other flavor)