

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 central jets, all anti-tagged leading $p_T > 200$ GeV subleading $p_T > 100$ GeV $ m_{\ell\ell} - m_Z  > 7.5$ GeV (same flavor) $p_T^{\text{miss}} > 60$ GeV
		$\geq 3$ selected central jets, $\geq 2$ anti-tagged 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
ZqHq	2 opposite-sign same-flavor leading $p_T > 30$ GeV subleading $p_T > 20$ GeV	$\geq 4$ selected central jets, $\geq 2$ anti-tagged leading $p_T > 200$ GeV subleading $p_T > 100$ GeV veto events with b-tagged jets $ m_{\ell\ell} - m_Z  < 7.5$ GeV $p_T(Z \rightarrow \ell\ell) > 150$ GeV
VqZq semileptonic	2 opposite-sign same-flavor leading $p_T > 30$ GeV subleading $p_T > 20$ GeV	$\geq 2$ selected central jets, all anti-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
VqZq leptonic	3 or 4 leading $p_T > 30$ Ge others $p_T > 20$ GeV	$\geq 2$ selected central jets, all anti-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 $p_T^{\text{miss}} > 60$ GeV (3 leptons) $\Delta R(\ell, \ell) > 0.05$ (other flavor)