

Common selection	$p_T^{\ell 1, \ell 2} > 25 \text{ GeV}, \eta^{\ell 1, \ell 2} < 2.5$ for electron channel $p_T^{\ell 1, \ell 2} > 20 \text{ GeV}, \eta^{\ell 1, \ell 2} < 2.4$ for muon channel $p_T^\gamma > 20 \text{ GeV}, \eta^\gamma < 1.444$ or $1.566 < \eta^\gamma < 2.500$ $p_T^{j1, j2} > 30 \text{ GeV}, \eta^{j1, j2} < 4.7$ $70 < m_{\ell\ell} < 110 \text{ GeV}, m_{Z\gamma} > 100 \text{ GeV}$ $\Delta R_{jj}, \Delta R_{j\gamma}, \Delta R_{j\ell} > 0.5, \Delta R_{\ell\gamma} > 0.7$
Control region	$150 < m_{jj} < 400 \text{ GeV},$ Common selection
EW signal region	$m_{jj} > 500 \text{ GeV}, \Delta\eta_{jj} > 2.5,$ $\eta^* < 2.4, \Delta\phi_{Z\gamma, jj} > 1.9,$ Common selection
Fiducial region	$m_{jj} > 500 \text{ GeV}, \Delta\eta_{jj} > 2.5,$
aQGC search region	Common selection, without requirement on $m_{Z\gamma}$ $m_{jj} > 500 \text{ GeV}, \Delta\eta_{jj} > 2.5,$ $p_T^\gamma > 100 \text{ GeV},$ Common selection, without requirement on $m_{Z\gamma}$