

Common selections				
M selection	2 "high-purity" tracks, opposite sign			
	$ \eta^{\text{trk}}  < 2.5, p_T^{\text{trk1}} > 20 \text{ GeV}, p_T^{\text{trk2}} > 5 \text{ GeV},  \eta^{\text{M}}  < 2.1$ $0.62 < m_{\pi\pi} < 0.92 \text{ GeV } (\rho^0) / 1.008 < m_{\text{KK}} < 1.032 \text{ GeV } (\phi) / 0.84 < m_{\text{K}\pi} < 0.94 \text{ GeV } (\text{K}^{*0})$			
Category	ggH	VBF high- $p_T^\gamma$	VBF low- $p_T^\gamma$	VH
Trigger	Photon + jet with $\tau$ -ID	high- $p_T$ photon + VBF-like jets	Photon + jet with $\tau$ -ID	Double or single lepton
$p_T^\gamma$ [GeV]	$> 38$	$> 75$	$> 38 \text{ and } < 75$	$> 40$
$ \eta^\gamma $	$< 2.5$	$< 1.4$	$< 2.1$	$< 2.5$
$\gamma$ -ID signal eff.	80%	90%	80/90%	90%
$p_T^{\text{M}}$ [GeV]	$> 38$	$> 30$	$> 38$	$> 38$
$I^{\text{trk}}(M)$	$> 0.9$	$> 0.9$	$> 0.9$	$> 0.8$
$I^{\text{neu}}(M)$	$> 0.8$	-	-	-
Event tagging	Meson candidate within a jet with $p_T^{\text{j}} > 40 \text{ GeV}$ , tracks with $\Delta R < 0.07$	2 jets with $p_T^{\text{j}} > 40 \text{ GeV}$ $m_{\text{jj}} > 400 \text{ GeV}$ $ \Delta\eta_{\text{jj}}  > 3$	2 jets with $p_T^{\text{j}} > 30/20 \text{ GeV}$ $m_{\text{jj}} > 300 \text{ GeV}$ $ \Delta\eta_{\text{jj}}  > 3$	1 selected and isolated $e/\mu$ or 2 selected $e/\mu$ compatible with Z mass
BDT categories				
cat0	BDT $> 0.55$	BDT $> 0.7$	BDT $> 0.7$	-
cat1	$-0.4 < \text{BDT} < 0.55$	$-0.6 < \text{BDT} < 0.7$	$-0.6 < \text{BDT} < 0.7$	-