

Category	VBF-tagged	VH-tagged	Untagged
Selection	$\mathcal{D}_{2\text{jet}}^{\text{VBF}}$ or $\mathcal{D}_{2\text{jet}}^{\text{VBF,BSM}} > 0.5$	$\mathcal{D}_{2\text{jet}}^{\text{WH}}$ or $\mathcal{D}_{2\text{jet}}^{\text{WH,BSM}}$ , or $\mathcal{D}_{2\text{jet}}^{\text{ZH}}$ or $\mathcal{D}_{2\text{jet}}^{\text{ZH,BSM}} > 0.5$	Rest of events
SM obs.	$m_{4l}, \mathcal{D}_{\text{bkg}}^{\text{VBF+dec}}$	$m_{4l}, \mathcal{D}_{\text{bkg}}^{\text{VH+dec}}$	$m_{4l}, \mathcal{D}_{\text{bkg}}^{\text{kin}}$
$a_3$ obs.	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0-}^{\text{VBF+dec}}, \mathcal{D}_{\text{CP}}^{\text{VBF}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0-}^{\text{VH+dec}}, \mathcal{D}_{\text{CP}}^{\text{VH}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0-}^{\text{dec}}, \mathcal{D}_{\text{CP}}^{\text{dec}}$
$a_2$ obs.	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0h+}^{\text{VBF+dec}}, \mathcal{D}_{\text{int}}^{\text{VBF}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0h+}^{\text{VH+dec}}, \mathcal{D}_{\text{int}}^{\text{VH}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{0h+}^{\text{dec}}, \mathcal{D}_{\text{int}}^{\text{dec}}$
$\Lambda_1$ obs.	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{\text{VBF+dec}}, \mathcal{D}_{0h+}^{\text{VBF+dec}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{\text{VH+dec}}, \mathcal{D}_{0h+}^{\text{VH+dec}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{\text{dec}}, \mathcal{D}_{0h+}^{\text{dec}}$
$\Lambda_1^{Z\gamma}$ obs.	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{Z\gamma, \text{VBF+dec}}, \mathcal{D}_{0h+}^{\text{VBF+dec}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{Z\gamma, \text{VH+dec}}, \mathcal{D}_{0h+}^{\text{VH+dec}}$	$\mathcal{D}_{\text{bkg}}, \mathcal{D}_{\Lambda_1}^{Z\gamma, \text{dec}}, \mathcal{D}_{0h+}^{\text{dec}}$