

**Baseline selection**

|                                       |   |
|---------------------------------------|---|
| $E_{\text{T}}^{\text{miss}}$ cleaning | Filters related to beam and instrumental effects  |
| Lepton/photon vetoes                  | $p_{\text{T}} > 10, 10, 25 \text{ GeV}$ for isolated tracks, leptons, photons (respectively) and $ \eta  < 2.5$   |
| Jet $j_i$ acceptance                  | Consider each jet $j_i$ that satisfies $p_{\text{T}}^{j_i} > 40 \text{ GeV}$ and $ \eta^{j_i}  < 3$   |
| Jet $j_1$ acceptance                  | $p_{\text{T}}^{j_1} > 100 \text{ GeV}$ and $ \eta^{j_1}  < 2.5$   |
| Jet $j_2$ acceptance                  | $p_{\text{T}}^{j_2} < 40 \text{ GeV}$ (monojet),<br>$40 < p_{\text{T}}^{j_2} < 100 \text{ GeV}$ (asymmetric),<br>$p_{\text{T}}^{j_2} > 100 \text{ GeV}$ (symmetric) |
| Forward jet veto                      | Veto events containing jet satisfying $p_{\text{T}} > 40 \text{ GeV}$ and $ \eta  > 3$  |
| Jets below threshold                  | $H_{\text{T}}^{\text{miss}} / E_{\text{T}}^{\text{miss}} < 1.25$  |
| Energy sums                           | $H_{\text{T}} > 200 \text{ GeV}$ and $H_{\text{T}}^{\text{miss}} > 130 \text{ GeV}$   |

**Event categorisation**

|                      |   |
|----------------------|---|
| $n_{\text{jet}}$     | 1 (monojet); 2, 3, 4, $\geq 5$ (asymmetric); 2, 3, 4, $\geq 5$ (symmetric)                                  |
| $n_{\text{b}}$       | 0, 1, 2, $\geq 3$ ( $n_{\text{b}} \leq n_{\text{jet}}$ )  |
| $H_{\text{T}}$ (GeV) | 200, 250, 300, 350, 400, 500, 600, $> 800 \text{ GeV}$ (some bins are dropped/merged vs. $n_{\text{jet}}$ ) |

**Signal region (SR)**

|                        |   |
|------------------------|---|
|                        | Baseline selection +  |
| QCD multijet rejection | $\alpha_{\text{T}} > 0.65, 0.60, 0.55, 0.53, 0.52, 0.52, 0.52$ (mapped to $H_{\text{T}}$ bins in range 200–800 GeV) |
| QCD multijet rejection | $\Delta\phi_{\text{min}}^* > 0.5$   |

**Control samples (CS)**

|                   |  |
|-------------------|--|
|                   | Baseline selection +   |
| Multijet-enriched | SR + $H_{\text{T}}^{\text{miss}} / E_{\text{T}}^{\text{miss}} > 1.25$ (inverted)   |
| $\gamma$ + jets   | 1 $\gamma$ with $p_{\text{T}} > 200 \text{ GeV}$ , $ \eta  < 1.45$ , $\Delta R(\gamma, j_i) > 1.0$ , $H_{\text{T}} > 400 \text{ GeV}$ , same $\alpha_{\text{T}}$ req. as SR                    |
| $\mu$ + jets      | 1 $\mu$ with $p_{\text{T}} > 30 \text{ GeV}$ , $ \eta  < 2.1$ , $\Delta R(\mu, j_i) > 0.5$ , $30 < m_{\text{T}}(\vec{p}_{\text{T}}^{\mu}, \vec{p}_{\text{T}}^{\text{miss}}) < 125 \text{ GeV}$ |
| $\mu\mu$ + jets   | 2 $\mu$ with $p_{\text{T}} > 30 \text{ GeV}$ , $ \eta  < 2.1$ , $\Delta R(\mu_{1,2}, j_i) > 0.5$ , $ m_{\mu\mu} - m_{\text{Z}}  < 25 \text{ GeV}$  |