

## 0.1 SR L: $\tilde{t}_1(400) \rightarrow b\tilde{\chi}_1^+(390) \rightarrow W^+\tilde{\chi}_1^0(195)$ (ATLAS\_2014\_I1286444 (1403.4853))

- Process:  $pp \rightarrow \tilde{t}_1\tilde{t}_1^* : \tilde{t}_1 \rightarrow b\tilde{\chi}_1^+ \rightarrow W^+\tilde{\chi}_1^0$ .
- Mass:  $m_{\tilde{t}_1} = 400$  GeV,  $m_{\tilde{\chi}_1^\pm} = 390$  GeV,  $m_{\tilde{\chi}_1^0} = 195$  GeV.
- The number of events:  $2 \cdot 10^4$ .
- Event Generator: Herwig++ 2.5.2.

| # | cut name                              | $\epsilon_{\text{Exp}}$ | $\epsilon_{\text{Atom}}$ | $\frac{\text{Atom}}{\text{Exp}}$ | $\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$ | #/? | $R_{\text{Exp}}$ | $R_{\text{Atom}}$ | $\frac{\text{Atom}}{\text{Exp}}$ | $\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$ |
|---|---------------------------------------|-------------------------|--------------------------|----------------------------------|---|-----|------------------|-------------------|----------------------------------|---|
| 0 | $p_T(\ell_1) > 25$ : SF               | 100.0                   | 100.0                    |                                  |   |     |                  |                   |                                  |   |
| 1 | Z veto: SF                            | $75.72 \pm 0.66$        | $76.52 \pm 1.37$         | 1.01                             | 0.52  | 0   | $0.76 \pm 0.01$  | $0.77 \pm 0.01$   | 1.01                             | 0.52  |
| 2 | $\Delta\phi_j > 1.0$ : SF             | $56.4 \pm 0.57$         | $62.86 \pm 1.26$         | 1.11                             | 4.68  | 1   | $0.74 \pm 0.01$  | $0.82 \pm 0.02$   | 1.1                              | 4.24  |
| 3 | $\Delta\phi_b < 1.5$ : SF             | $43.12 \pm 0.49$        | $48.01 \pm 1.12$         | 1.11                             | 4.01  | 2   | $0.76 \pm 0.01$  | $0.76 \pm 0.02$   | 1.0                              | -0.04   |
| 4 | $m_{T2} > 90$ : SF                    | $12.19 \pm 0.26$        | $13.09 \pm 0.6$          | 1.07                             | 1.37  | 3   | $0.28 \pm 0.01$  | $0.27 \pm 0.01$   | 0.96                             | -0.72   |
| 5 | $m_{T2} > 120$ : SF                   | $6.51 \pm 0.19$         | $6.76 \pm 0.44$          | 1.04                             | 0.52  | 4   | $0.53 \pm 0.02$  | $0.52 \pm 0.03$   | 0.97                             | -0.49   |
| 6 | $m_{T2} > 100, p_T(j) > 100, 50$ : SF | $0.67 \pm 0.06$         | $0.62 \pm 0.13$          | 0.94                             | -0.29   | 5   | $0.1 \pm 0.01$   | $0.09 \pm 0.02$   | 0.9                              | -0.46   |
| 7 | $m_{T2} > 110, p_T(j) > 20, 20$ : SF  | $2.64 \pm 0.12$         | $2.13 \pm 0.25$          | 0.81                             | -1.87   | 6   | $3.96 \pm 0.18$  | $3.41 \pm 0.39$   | 0.86                             | -1.28   |

Table 1: The cut-flow table for the same flavour channel.

| # | cut name                              | $\epsilon_{\text{Exp}}$ | $\epsilon_{\text{Atom}}$ | $\frac{\text{Atom}}{\text{Exp}}$ | $\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$ | #/? | $R_{\text{Exp}}$ | $R_{\text{Atom}}$ | $\frac{\text{Atom}}{\text{Exp}}$ | $\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$ |
|---|---------------------------------------|-------------------------|--------------------------|----------------------------------|---|-----|------------------|-------------------|----------------------------------|---|
| 0 | $p_T(\ell_1) > 25$ : SF               | 100.0                   | 100.0                    |                                  |   |     |                  |                   |                                  |   |
| 1 | $\Delta\phi_j > 1.0$ : SF             | $76.33 \pm 0.66$        | $82.58 \pm 1.42$         | 1.08                             | 4.0   | 0   | $0.76 \pm 0.01$  | $0.83 \pm 0.01$   | 1.08                             | 4.0   |
| 2 | $\Delta\phi_b < 1.5$ : SF             | $57.5 \pm 0.57$         | $63.11 \pm 1.26$         | 1.1                              | 4.04  | 1   | $0.75 \pm 0.01$  | $0.76 \pm 0.02$   | 1.01                             | 0.64  |
| 3 | $m_{T2} > 90$ : SF                    | $15.97 \pm 0.3$         | $17.45 \pm 0.69$         | 1.09                             | 1.96  | 2   | $0.28 \pm 0.01$  | $0.28 \pm 0.01$   | 1.0                              | -0.1  |
| 4 | $m_{T2} > 120$ : SF                   | $7.93 \pm 0.21$         | $8.71 \pm 0.49$          | 1.1                              | 1.45  | 3   | $0.5 \pm 0.01$   | $0.5 \pm 0.03$    | 1.0                              | 0.08  |
| 5 | $m_{T2} > 100, p_T(j) > 100, 50$ : SF | $1.12 \pm 0.08$         | $0.65 \pm 0.14$          | 0.59                             | -2.93   | 4   | $0.14 \pm 0.01$  | $0.08 \pm 0.02$   | 0.53                             | -3.53   |
| 6 | $m_{T2} > 110, p_T(j) > 20, 20$ : SF  | $3.71 \pm 0.15$         | $2.88 \pm 0.29$          | 0.78                             | -2.6  | 5   | $3.32 \pm 0.13$  | $4.39 \pm 0.44$   | 1.32                             | 2.36  |

Table 2: The cut-flow table for the different flavour channel.