$$L(\{N_{\varpi}^{\mathrm{SS,obs}}\}|\{\xi(\eta,p_{\mathrm{T}})\}) = \prod_{\varpi} \mathcal{P}\left(N_{\varpi}^{\mathrm{SS,obs}}|w_{\mathrm{flip}}(\xi(\eta_1,p_{\mathrm{T},1}),\xi(\eta_2,p_{\mathrm{T},2})) \times N_{\varpi}^{\mathrm{OS+SS,obs}}\right) \tag{1}$$

$$\begin{pmatrix} n_{\mathrm{T}} \\ n_{\mathrm{L}} \end{pmatrix} = \begin{pmatrix} \varepsilon_r & \varepsilon_f \\ 1-\varepsilon_r & 1-\varepsilon_f \end{pmatrix} \begin{pmatrix} n_{\mathrm{R}} \\ n_{\mathrm{F}} \end{pmatrix} \tag{2}$$

$$\varepsilon_f = \frac{n_{\mathrm{signal}}^{\mathrm{data}} - n_{\mathrm{signal}}^{\mathrm{MC}}}{n_{\mathrm{baseline}}^{\mathrm{data}} - n_{\mathrm{baseline}}^{\mathrm{MC}}}$$

$$\varepsilon_r = \frac{n_{\mathrm{signal}}^{\mathrm{data}}}{n_{\mathrm{baseline}}^{\mathrm{data}} - n_{\mathrm{baseline}}^{\mathrm{BKG}}}$$

$10 < p_{\mathrm{T}} < 12$	$12 < p_{\mathrm{T}} < 14$	$14 < p_{\mathrm{T}} < 17$	$17 < p_{\mathrm{T}} < 20$
$0.10 \pm 0.01 \pm 0.00$	$0.10 \pm 0.01 \pm 0.01$	$0.12 \pm 0.01 \pm 0.01$	$0.08 \pm 0.02 \pm 0.00$
$20 < p_{\mathrm{T}} < 25$	$25 < p_{\mathrm{T}} < 30$	$30 < p_{\mathrm{T}} < 40$	$40 > p_{\mathrm{T}}$
$0.07 \pm 0.02 \pm 0.01$	$0.11 \pm 0.03 \pm 0.01$	$0.20 \pm 0.07 \pm 0.03$	$0.25 \pm 0.10 \pm 0.05$

Table 1: Electron fake rate measured in data and the associated statistical uncertainty. The systematic uncertainty originating from the subtraction of "backgrounds" with only prompt leptons is also displayed.

$10 < p_{\mathrm{T}} < 12$ GeV		$12 < p_{\mathrm{T}} < 14$	
$\lvert\eta\rvert < 2.3$	$\lvert\eta\rvert > 2.3$	$\lvert\eta\rvert < 2.3$	$\lvert\eta\rvert > 2.3$
$0.14 \pm 0.01 \pm 0.00$	$0.22 \pm 0.05 \pm 0.00$	$0.11 \pm 0.01 \pm 0.00$	$0.24 \pm 0.06 \pm 0.00$
$14 < p_{\mathrm{T}} < 17$		$17 < p_{\mathrm{T}} < 20$ GeV	
$\lvert\eta\rvert < 2.3$	$\lvert\eta\rvert > 2.3$	$\lvert\eta\rvert < 2.3$	$\lvert\eta\rvert > 2.3$
$0.12 \pm 0.01 \pm 0.00$	$0.09 \pm 0.05 \pm 0.00$	$0.09 \pm 0.01 \pm 0.00$	$0.21 \pm 0.07 \pm 0.00$
$20 < p_{\mathrm{T}} < 30$	$30 < p_{\mathrm{T}} < 40$	$40 < p_{\mathrm{T}} < 60$	$p_{\mathrm{T}} > 60$
$0.07 \pm 0.02 \pm 0.00$	$0.12 \pm 0.05 \pm 0.01$	$0.16 \pm 0.09 \pm 0.04$	$0.49 \pm 0.10 \pm 0.07$

Table 2: Muon fake rate measured in data and the associated statistical uncertainty. The systematic uncertainty originating from the subtraction of "backgrounds" with only prompt leptons is also displayed.

Region	Matrix method	Template method	Retained estimate
Rpc2L0bH	$0.83 \pm 0.56 \pm 0.74$	$1.00 \pm 0.96 \pm 0.81$	$0.87 \pm 0.48 \pm 0.76$
Rpc2L0bS	$1.51 \pm 0.60 \pm 0.66$	$1.68 \pm 1.02 \pm 1.26$	$1.55 \pm 0.52 \pm 0.81$
Rpc2L1bH	$3.54 \pm 1.62 \pm 3.12$	$2.07 \pm 0.63 \pm 1.56$	$2.26 \pm 0.59 \pm 1.76$
Rpc2L1bS	$2.65 \pm 1.21 \pm 1.89$	$2.33 \pm 1.17 \pm 2.10$	$2.48 \pm 0.84 \pm 2.00$
Rpc2L2bH	$-0.11 \pm 0.11 \pm 0.18$	< 0.5	$0.15 \pm 0.15 \pm 0.00$
Rpc2L2bS	$1.31 \pm 1.07 \pm 1.65$	$0.41 \pm 0.33 \pm 0.45$	$0.49 \pm 0.32 \pm 0.55$
Rpc2Lsoft1b	$4.75 \pm 1.42 \pm 2.64$	$2.48 \pm 1.32 \pm 1.86$	$3.53 \pm 0.97 \pm 2.22$
Rpc2Lsoft2b	$1.91 \pm 1.18 \pm 1.63$	$1.66 \pm 0.66 \pm 1.28$	$1.72 \pm 0.58 \pm 1.36$
Rpc3L0bH	$-0.01 \pm 0.11 \pm 0.10$	< 0.5	$0.15 \pm 0.15 \pm 0.00$
Rpc3L0bS	$2.31 \pm 1.50 \pm 2.63$	$0.21 \pm 0.15 \pm 0.16$	$0.23 \pm 0.15 \pm 0.18$
Rpc3L1bH	$0.57 \pm 0.43 \pm 0.50$	$0.42 \pm 0.29 \pm 0.32$	$0.47 \pm 0.24 \pm 0.38$
Rpc3L1bS	$4.94 \pm 1.83 \pm 2.96$	$3.55 \pm 1.80 \pm 2.76$	$4.23 \pm 1.28 \pm 2.86$
Rpc3LSS1b	$-0.18 \pm 1.24 \pm 2.85$	$0.90 \pm 0.14 \pm 0.69$	$0.89 \pm 0.14 \pm 0.72$

Table 3: Expected yields for background processes with fake leptons, in the signal regions shown for 36 fb^{-1}. Estimates from the matrix method and the MC template method are shown along with the retained estimates. Uncertainties include all statistical and systematic sources for the nominal estimate.