

Validation of ATLAS_CONF_2016_050

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We have validated our codes according to Figure 15 in Page 27 in the conference note ATLAS_CONF_2016_050 because of no cutflow information given by the ATLAS group. Our simulation agrees with the corresponding ATLAS analysis within 20% uncertainty.

For the signal region **SR1**, we choose the point $(m_{\tilde{t}_1}, m_{\tilde{\chi}_1^0}) = (650\text{GeV}, 250\text{GeV})$ at the observed limit line in the left plot in Figure 15. Our result is 26.4 and the 95% CL upper limit S_{obs}^{95} is 26, so we get the relative error is $(26.4-26)/26 = 1.5\%$. We generated 50000 events and the acceptance ratio is 1.9%.

For the signal region **tN_high** (without using the variable $E_{T,\perp}^{miss}$), we choose the point $(m_{\tilde{t}_1}, m_{\tilde{\chi}_1^0}) = (820\text{GeV}, 1\text{GeV})$ at the observed limit line in the left plot in Figure 15. Our result is 6.25 and the 95% CL upper limit S_{obs}^{95} is 7.2, so we get the relative error is $(6.25-7.2)/7.2 = -13\%$. We generated 50000 events and the acceptance ratio is 2.1%.

For the signal region **bC2x_diag**, we choose the point $(m_{\tilde{t}_1}, m_{\tilde{\chi}_1^0}) = (650\text{GeV}, 350\text{GeV})$ at the expected limit line in the left plot in Figure 15. Our result is 12.4 and the 95% CL upper limit S_{exp}^{95} is 12.4, so we get the relative error is $(12.4-12.4)/12.4 = 0\%$. We generated 50000 events and the acceptance ratio is 0.91%.

For the signal region **bC2x_med**, we choose the point $(m_{\tilde{t}_1}, m_{\tilde{\chi}_1^0}) = (650\text{GeV}, 200\text{GeV})$ at the observed limit line in the right plot in Figure 15. Our result is 10.8 and the 95% CL upper limit S_{obs}^{95} is 9.9, so we get the relative error is $(10.8-9.9)/9.9 = 9\%$. We generated 50000 events and the acceptance ratio is 2.6%.

For the signal region **bCbv**, we choose the point $(m_{\tilde{t}_1}, m_{\tilde{\chi}_1^0}) = (600\text{GeV}, 296\text{GeV})$ at the expected limit line in the right plot in Figure 15. Our result is 5.8 and the 95% CL upper limit S_{exp}^{95} is 7.3, so we get the relative error is $(5.8-7.3)/7.3 = -20\%$. We generated 50000 events and the acceptance ratio is 0.88%.

Note: We do not include the signal regions DM_low and DM_high in our codes because we focus on the stop search.