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The ATLAS Collaboration

Abstract

A search is presented for the pair production of light scalar top quarks in $\sqrt{s} = 7$ TeV proton–proton collisions recorded with the ATLAS detector at the Large Hadron Collider. This analysis uses the full data sample collected during 2011 that corresponds to a total integrated luminosity of 4.7 fb$^{-1}$. Light scalar top quarks are searched for in events with two opposite-sign leptons ($e$, $\mu$), large missing transverse momentum and at least one jet in the final state. No excess over Standard Model expectations is found, and the results are interpreted under the assumption that the light scalar top decays to a $b$-quark in addition to an on-shell chargino whose decay occurs through a virtual $W$ boson. If the chargino mass is 106 GeV, light scalar top quark masses up to 130 GeV are excluded for neutralino masses below 70 GeV.
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1 Introduction

Weak-scale supersymmetry (SUSY) is an extension to the Standard Model (SM) that provides a solution to the instability of the scalar SM sector with respect to new high-scale physics. For each known boson or fermion, SUSY introduces a particle with identical quantum numbers except for a difference of half a unit of spin. In the framework of a generic $R$-parity conserving minimal supersymmetric extension of the SM (MSSM), SUSY particles are produced in pairs and the lightest supersymmetric particle (LSP) is stable. In a large variety of models, the LSP is the lightest neutralino, $\tilde{\chi}_1^0$, which is only weakly interacting. The scalar partners of right-handed and left-handed quarks, $\tilde{q}_R$ and $\tilde{q}_L$, mix to form two mass eigenstates, $\tilde{q}_1$ and $\tilde{q}_2$, with $\tilde{q}_1$ defined to be the lighter one. In the case of the supersymmetric partner of the top quark ($\tilde{t}$, stop), large mixing effects can lead to one stop mass eigenstate, $\tilde{t}_1$, that is significantly lighter than the other squarks. Depending on the SUSY particle mass spectrum, stop pair production and decay can result in final states topologically similar to $t\bar{t}$ events.

In this Letter, a search for direct stop pair production is presented in $\sqrt{s} = 7$ TeV proton–proton collisions with the ATLAS detector at the Large Hadron Collider, considering a SUSY particle mass hierarchy such that $m_t > m_{\tilde{t}_1} > (m_{\tilde{\chi}_1^+} + m_b)$ and the $\tilde{t}_1$ decays exclusively via $b + \tilde{\chi}_1^+$. The mass of all other supersymmetric particles are set to be above 2 TeV, and large stop gauge mixing results in $m_{\tilde{t}_2} > m_{\tilde{t}_1}$ so that only $\tilde{t}_1$ pair production is considered. The stop is predominantly right-handed, but this has little effect on the acceptance and efficiency for the final interpretation. The chargino ($\tilde{\chi}_1^\pm$) mass is set to 106 GeV (above the present exclusion limit of 103.5 GeV) and it is assumed to decay through a virtual $W$ boson ($\tilde{\chi}_1^\pm \rightarrow W^* \tilde{\chi}_1^0$). The choice of chargino mass is identical to that used in a previous study reported by the CDF experiment, thus allowing easy comparison of the CDF and ATLAS results. Stops within a mass range between 110 GeV and 160 GeV would be produced with relatively large cross-sections — between 245 pb and 41 pb. In this search, dilepton final states ($\ell = e, \mu$) are considered. Although these events could contribute to an anomaly in the measured $t\bar{t}$ cross-section, the relative contribution would be small due to the low transverse momenta of the visible decay products. Events are required to contain at least one energetic jet, large missing transverse momentum ($E_T^{\text{miss}}$) and low transverse momenta ($p_T$) leptons, to target the light stop final state.

By targeting very light top squarks, this analysis is complementary to other direct stop searches recently presented by the ATLAS experiment.

2 The ATLAS detector

The ATLAS detector is a multi-purpose particle physics detector with a forward-backward symmetric cylindrical geometry and nearly 4$\pi$ coverage in solid angle. It contains four superconducting magnet systems, which comprise a solenoid surrounding the inner tracking detector (ID), and the barrel and two end-cap toroids equipping a muon spectrometer. The ID consists of a silicon pixel detector.
tector, a silicon microstrip detector (SCT), and a transition radiation tracker (TRT). In the pseudorapidity region $|\eta| < 3.2$, high-granularity liquid-argon (LAr) electromagnetic (EM) sampling calorimeters are used. An iron/scintillator tile calorimeter provides coverage for hadron detection over $|\eta| < 1.7$. The end-cap and forward regions, spanning $1.5 < |\eta| < 4.9$, are instrumented with LAr calorimeters for both EM and hadronic measurements. The muon spectrometer surrounds the calorimeters and consists of a system of precision tracking chambers ($|\eta| < 2.7$), and detectors for triggering ($|\eta| < 2.4$).

### 3 Simulated event samples

Monte Carlo (MC) simulated event samples are used to develop and validate the analysis procedure and to evaluate the SM backgrounds in the signal region. Production of top quark pairs is simulated with MCONLO 4.01 [20], using a top quark mass of 172.5 GeV. Samples of $W(\to \ell \nu)$ and $Z/\gamma^*(\to \ell\ell)$, produced with accompanying jets (of both light and heavy flavour), are obtained with ALPGEN 2.14 [21]. Diboson ($WW$, $WZ$, $ZZ$) production is simulated with HERWIG 6.520 [22] and single top production with MCONLO 4.01. Fragmentation and hadronisation for the ALPGEN 2.14 and MCONLO 4.01 samples are performed with HERWIG 6.520, using JIMMY 4.31 [23] for the underlying event. Expected diboson yields are normalised with the full width of the envelope, following the PDF4LHC recommendations [39]. All MC samples are produced using a combination of single and double lepton triggers. The single electron triggers vary with the data-taking period, and the tightest of these has an efficiency of $\sim$97% for electrons with $p_T > 25$ GeV. The single muon trigger used for all data-taking periods reaches an efficiency plateau of $\sim$75% ($\sim$90%) in the barrel (end-caps) for muons with $p_T > 20$ GeV. All efficiencies are quoted with respect to reconstructed leptons, passing the baseline lepton definitions. The double lepton triggers reach similar plateau efficiencies, but at lower $p_T$ thresholds (greater than 17 GeV for electrons passing the dielectron trigger, and greater than 12 GeV for muons passing the dimuon trigger; for the electron-muon trigger the thresholds are 15 and 10 GeV for electrons and muons respectively). If a lepton has an offline $p_T$ above the single lepton trigger plateau threshold in a given event, the relevant single lepton trigger is used. Double lepton triggers are used for events with no such lepton. An exception to this rule is applied in the $\mu\mu$ channel. In this case when one lepton has $p_T > 20$ GeV and the second $p_T > 12$ GeV, a logical OR of both triggers is used to recover efficiency.

Jet candidates are reconstructed using the anti-$k_T$ jet clustering algorithm [42] with a radius parameter of 0.4. The inputs to this algorithm are three-dimensional energy clusters seeded by calorimeter cells with energy significantly above the noise resulting from the electronics and additional proton–proton interactions (calorimeter clusters). The jet candidate energies are corrected for the effects of calorimeter non-compensation, inhomogeneities and energy loss in material in front of the calorimeter, by using $p_T$- and $\eta$-dependent calibration factors based on MC simulations and validated with extensive test-beam and collision-data studies [43]. Furthermore, the reconstructed jet is modified such that the jet direction points to the primary vertex, defined as the vertex with the highest summed track $p_T^2$. Only jet candidates with corrected transverse momenta $p_T > 20$ GeV and $|\eta| < 4.5$ are subsequently retained. Jets likely to have arisen from detector noise or cosmic rays are rejected [43]. Electron candidates are required to have $p_T > 10$ GeV, $|\eta| < 2.47$, and pass the “medium” shower shape and track selection criteria of Ref. [43]. Muon candidates are reconstructed using either a full muon spectrometer track matched to an ID track, or a muon spectrometer segment matched to an extrapolated ID track [45]. They must be reconstructed with sufficient hits in the pixel, SCT and TRT detectors. They are required to have $p_T > 10$ GeV and $|\eta| < 2.4$.

Following object reconstruction, overlaps between candidate jets and leptons are resolved. Any jet candidate ly-

### 4 Data and event selection

The analysis uses the full 2011 proton-proton collision data sample. After applying the beam, detector and data-quality requirements, the data sample corresponds to a total integrated luminosity of 4.7 fb$^{-1}$. Events were triggered using a combination of single and double lepton triggers. The single electron triggers vary with the data-taking period, and the tightest of these has an efficiency of $\sim$97% for electrons with $p_T > 25$ GeV. The single muon trigger used for all data-taking periods reaches an efficiency plateau of $\sim$75% ($\sim$90%) in the barrel (end-caps) for muons with $p_T > 20$ GeV. All efficiencies are quoted with respect to reconstructed leptons, passing the baseline lepton definitions. The double lepton triggers reach similar plateau efficiencies, but at lower $p_T$ thresholds (greater than 17 GeV for electrons passing the dielectron trigger, and greater than 12 GeV for muons passing the dimuon trigger; for the electron-muon trigger the thresholds are 15 and 10 GeV for electrons and muons respectively). If a lepton has an offline $p_T$ above the single lepton trigger plateau threshold in a given event, the relevant single lepton trigger is used. Double lepton triggers are used for events with no such lepton. An exception to this rule is applied in the $\mu\mu$ channel. In this case when one lepton has $p_T > 20$ GeV and the second $p_T > 12$ GeV, a logical OR of both triggers is used to recover efficiency.

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Following object reconstruction, overlaps between candidate jets and leptons are resolved. Any jet candidate ly-
ing within a distance $\Delta R = \sqrt{(\Delta \eta)^2 + (\Delta \phi)^2} = 0.2$ of an electron is discarded. Subsequently, any electron or muon candidate remaining within a distance $\Delta R = 0.4$ of any surviving jet candidate is discarded.

The measurement of the missing transverse momentum $p_T^{miss}$, and its magnitude $E_T^{miss}$, is based on the transverse momenta of all electrons, muons and jets as described above, and of all calorimeter clusters with $|\eta| < 4.5$ not associated to such objects.

Following overlap removal, electrons are further required to have $p_T > 17$ GeV and to pass the “tight” quality criteria, which places additional requirements on the ratio of calorimetric energy to track momentum, and the fraction of high-threshold hits in the TRT. Electrons are also required to be isolated: the $p_T$ sum of tracks above 1 GeV within a cone of size $\Delta R = 0.2$ around each electron candidate (excluding the electron candidates themselves) is required to be less than 10% of the electron $p_T$. Muons must have $p_T > 12$ GeV and must be isolated: the $p_T$ sum of tracks within a cone of size $\Delta R = 0.2$ around the muon candidate is required to be less than 1.8 GeV. Jets are subject to the further requirements $p_T > 25$ GeV, $|\eta| < 2.5$ and a “jet vertex fraction” higher than 0.75.

The top background measurement described below uses a $b$-tagging algorithm, which exploits the topological structure of weak $b$- and $c$-hadron decays inside a candidate jet to identify jets containing a $b$-hadron decay. The nominal $b$-tagging efficiency, computed from $tt$ MC events, is on average 60%, with a misidentification (mis-tag) rate for light-quark/gluon jets of less than 1%. To correct small differences in the $b$-tagging efficiency observed in the simulation with respect to the data, a scale factor is applied to all simulated samples.

During part of the data-taking period, a localised electronics failure in the electromagnetic calorimeter created a dead region ($\Delta \eta \times \Delta \phi \approx 1.4 \times 0.2$). For jets in this region, a correction to their energy is made using the energy deposits in the neighbouring cells, and is propagated to $E_T^{miss}$. If the energy correction exceeds 10 GeV or 10% of the $E_T^{miss}$, the event is discarded. Events with reconstructed electrons in the calorimeter dead region are also rejected.

Events are subject to the following requirements. The primary vertex in the event must have at least five associated tracks and each event must contain exactly two selected leptons (electrons or muons) of opposite sign. Both of these leptons must additionally satisfy the full list of signal lepton requirements, and the dilepton invariant mass, $m_{\ell\ell}$, must be greater than 20 GeV across all flavour combinations. In addition, events in the signal region must have at least one jet with $p_T > 25$ GeV, $E_T^{miss} > 20$ GeV, missing transverse momentum signifi-

\[ (N_{tt})_{SR} = \left[ (N_{data})_{CR} - (N_{non-tt,MC})_{CR} \right] \frac{(N_{tt,MC})_{SR}}{(N_{tt,MC})_{CR}} \]  \( (1) \)

The CR is designed to give an event sample dominated by top events, whilst minimising signal contamination. It is further chosen to be kinematically similar to the signal region to minimise systematic uncertainties due to extrapolation. Selection requirements for the top control region are summarised in Table I. In this analysis, models with small stop–chargino mass difference are considered, and hence soft $b$-jets are expected in the signal events which are not efficiently tagged. By requiring a $b$-jet in the top control region a high-purity sample of top events is obtained. The signal contamination in the considered models is typically of the order of a few per cent, rising to 30% for models with $m_{\tilde{g}} = 1$ GeV and high $m_{\tilde{t}_1}$. The percentage of SM, non-$tt$ events in the CR is less than 5% across all channels. The resulting $tt$ background contributions are consistent with the expected MC yields in all channels within the uncertainties. Signal contamination is taken into account when setting the exclusion limit in the next section by including, for each signal model,
Table 1. Signal region, top control region and Z control region requirements in each flavour channel. The Z veto rejects events with $m_{ll} > 81$ GeV and $m_{ll} < 101$ GeV.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>ee channel</th>
<th>$\mu\mu$ channel</th>
<th>$e\mu$ channel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lepton $p_T$</td>
<td>&gt; 17 GeV</td>
<td>&gt; 12 GeV</td>
<td>&gt; 17(12) GeV for $e(\mu)$</td>
</tr>
<tr>
<td>leading lepton $p_T$</td>
<td>&lt; 30 GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$m_{ll}$</td>
<td>&gt; 20 GeV and $Z$ veto</td>
<td>&gt; 20 GeV</td>
<td></td>
</tr>
<tr>
<td>jet $p_T$</td>
<td></td>
<td>$\geq 1$ jet, $p_T &gt; 25$ GeV</td>
<td></td>
</tr>
<tr>
<td>$E_{T}^{miss}$</td>
<td>&gt; 20 GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{T}^{miss, sig}$</td>
<td>&gt; 7.5 GeV^{1/2}</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Top Control Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lepton $p_T$</td>
<td>&gt; 17 GeV</td>
<td>&gt; 12 GeV</td>
<td>&gt; 17(12) GeV for $e(\mu)$</td>
</tr>
<tr>
<td>leading lepton $p_T$</td>
<td>&gt; 30 GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$m_{ll}$</td>
<td>&gt; 20 GeV and $Z$ veto</td>
<td>&gt; 20 GeV</td>
<td></td>
</tr>
<tr>
<td>jet $p_T$</td>
<td>$\geq 2$ (b)jets, $p_T &gt; 25$ GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b$-jet $p_T$</td>
<td>$\geq 1$ b jet, $p_T &gt; 25$ GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{T}^{miss}$</td>
<td>&gt; 20 GeV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{T}^{miss, sig}$</td>
<td>&gt; 7.5 GeV^{1/2}</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Z Control Region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lepton $p_T$</td>
<td>&gt; 17 GeV</td>
<td>&gt; 12 GeV</td>
<td>n/a</td>
</tr>
<tr>
<td>leading lepton $p_T$</td>
<td>&lt; 30 GeV</td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td>$m_{ll}$</td>
<td>&gt; 81 GeV and &lt; 101 GeV</td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td>jet $p_T$</td>
<td>$\geq 1$ jet, $p_T &gt; 25$ GeV</td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td>$E_{T}^{miss}$</td>
<td>&gt; 20 GeV</td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td>$E_{T}^{miss, sig}$</td>
<td>&gt; 4.0 GeV^{1/2}</td>
<td></td>
<td>n/a</td>
</tr>
</tbody>
</table>

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The primary source of uncertainty on the $Z/\gamma^*+\text{jets}$ background estimate in the combined flavour channel is the jet energy resolution uncertainty, with smaller contributions coming from the statistical and jet energy scale uncertainties. The systematic uncertainties on the $Z/\gamma^*+\text{jets}$ background are investigated by varying the PDF and renormalisation scales. An uncertainty on the luminosity of 3.9\% [50,51] is included in the systematic uncertainty calculation for backgrounds taken directly from the MC simulation. The dominant uncertainties on these backgrounds are the jet energy scale and statistical uncertainties. The systematic uncertainty on the multijet yield is obtained by varying the range in which the template fit is performed, and using the maximum variation of the final yield to assign the uncertainty.

The observed data yield is in good agreement with the SM prediction in the combined flavour channel given in Table 2.

### Table 2.
The expected and observed numbers of events in the signal region for each flavour channel. In the combined flavour column (“all”), the statistical uncertainty (first uncertainty quoted, includes the MC and data statistical errors) on the various background sources. Observed and expected upper limits at 95% confidence level on the visible cross-section $\sigma_{\text{vis}} = \sigma \times A \times \epsilon$ are also shown.

<table>
<thead>
<tr>
<th>Channel</th>
<th>$ee$</th>
<th>$e\mu$</th>
<th>$\mu\mu$</th>
<th>all</th>
</tr>
</thead>
<tbody>
<tr>
<td>$tt$</td>
<td>$44 \pm 4^{+5}_{-5}$</td>
<td>$139 \pm 7^{+22}_{-22}$</td>
<td>$111 \pm 8^{+10}_{-10}$</td>
<td>$293 \pm 12^{+34}_{-34}$</td>
</tr>
<tr>
<td>$Z/\gamma^*+\text{jets}$</td>
<td>$5 \pm 1^{+2}_{-1}$</td>
<td>$23 \pm 2^{+8}_{-8}$</td>
<td>$48 \pm 16^{+27}_{-27}$</td>
<td>$76 \pm 16^{+27}_{-27}$</td>
</tr>
<tr>
<td>Single top</td>
<td>$3 \pm 0.5^{+1}_{-1}$</td>
<td>$12 \pm 1^{+2}_{-2}$</td>
<td>$12 \pm 1^{+2}_{-2}$</td>
<td>$28 \pm 2^{+5}_{-5}$</td>
</tr>
<tr>
<td>$W+\text{jets}$</td>
<td>$3 \pm 3^{+3}_{-3}$</td>
<td>$5 \pm 2^{+1}_{-1}$</td>
<td>$6 \pm 2^{+1}_{-1}$</td>
<td>$13 \pm 3^{+3}_{-3}$</td>
</tr>
<tr>
<td>Diboson</td>
<td>$4 \pm 0.4^{+0.5}_{-0.5}$</td>
<td>$9 \pm 0.7^{+2}_{-2}$</td>
<td>$10 \pm 0.7^{+1}_{-1}$</td>
<td>$22 \pm 1^{+1}_{-1}$</td>
</tr>
<tr>
<td>Multijet</td>
<td>$2.9^{+3.2}_{-2.9}^{+2.2}$</td>
<td>$2.0 \pm 1.4^{+0.3}_{-0.3}$</td>
<td>$3.0 \pm 2.8^{+0.3}_{-0.3}$</td>
<td>$8.0 \pm 3.7^{+2.3}_{-2.3}$</td>
</tr>
</tbody>
</table>

| Total                     | $61 \pm 6^{+6}_{-6}$ | $189 \pm 8^{+21}_{-21}$ | $190 \pm 19^{+31}_{-31}$ | $440 \pm 21^{+43}_{-43}$ |

| Data                      | 48             | 188            | 195             | 431            |

| $\sigma_{\text{vis}}$ (exp. limit) [fb] | 4.9          | 11.1          | 16.2          | 22.0          |
| $\sigma_{\text{vis}}$ (obs. limit) [fb] | 3.3          | 10.9          | 16.9          | 21.0          |

| $(m_{t\tilde{t}},m_{\chi^0_1})$= (112, 55) GeV | $44.1 \pm 4.8$ | $137 \pm 8$ | $140 \pm 8$ | $322 \pm 13$ |
| $(m_{t\tilde{t}},m_{\chi^0_1})$= (160, 55) GeV | $8.8 \pm 1.5$ | $31.4 \pm 2.7$ | $36.5 \pm 2.9$ | $76.6 \pm 4.3$ |

7 Results and interpretation

Table 2 shows the data observations in the signal regions in each flavour channel, and in the combined flavour channel, along with the evaluated background contributions. Good agreement is observed across all channels, and the absence of evidence for light scalar top production allows a limit to be set on the visible cross-section for non-SM physics, $\sigma_{\text{vis}} = \sigma \times A \times \epsilon$, for which this analysis has an efficiency $\epsilon$ and acceptance $A$. The limits are calculated using the modified frequentist CLs prescription [52] by comparing the number of observed events in data with the SM and SM-plus-signal expectations.

All systematic uncertainties and their correlations are taken into account via nuisance parameters using a profile likelihood technique [53]. In Fig. 1 the leading lepton $p_T$ distributions in the $ee$ and $\mu\mu$ channels are illustrated along with the $E_{\text{T}}^{\text{miss}}$ and $E_{\text{T}}^{\text{miss, sig}}$ distributions of the data and simulated events in the signal region (with the background normalisations set to their nominal values).

The observed data yield is in good agreement with the SM prediction in the combined flavour channel given in Table 2.
The results in the combined channel are used to place exclusions at 95% confidence level in the $m_{\tilde{t}_1} - m_{\tilde{\chi}_0^0}$ mass plane, using the CLs method. The resulting 95% confidence level expected (dashed) and observed (solid) limits are shown in Figure 2. Neutralino masses down to 1 GeV are considered, since there is no LEP limit on the neutralino mass in the MSSM for the case that the lightest neutralino is predominantly bino in nature. A bino-dominated lightest neutralino is favoured by the recent LHC Higgs search results.

The observed limits represent a significant extension of the CDF limit for a chargino mass of 106 GeV to smaller chargino minus neutralino mass difference (the ATLAS limit extends up to a neutralino mass of 70 GeV for a stop mass of 130 GeV, whilst the CDF limit extends up to a neutralino mass of 46 GeV).

The limit on the stop mass for neutralino masses of 45 GeV (135 GeV) is comparable to the equivalent CDF limit. Increasing the chargino mass by 15 GeV leads to a comparable CDF limit (130 GeV) for a stop mass of 130 GeV, whilst the CDF limit extends up to a neutralino mass of 70 GeV.

**Fig. 1.** The leading electron and muon $p_T$ distributions in the same flavour (a) $ee$ and (b) $\mu\mu$ channels, before the requirement on the leading lepton $p_T$ (which is marked by the dashed vertical line), and (c) the $E_T^{miss}$ distribution and (d) $E_T^{miss, sig}$ distribution after all signal region requirements. The data and evaluated background components are shown. The hashed band indicates the total experimental uncertainty on the expectation. The dashed lines give the expectations for signal models with stop masses of 112 GeV and 160 GeV, and a neutralino mass of 55 GeV. The last histogram bins in (a) and (b) include the integrals of all events with $p_T > 300$ GeV. The final bin in (d) includes all events with an $E_T^{miss}$ of at least 15 GeV/2. The bottom panels show the ratio of the data to the expected background (points) and the systematic uncertainty on the background (hashed area).
A search for light top squarks has been performed in the dilepton final state. SM backgrounds have been evaluated using a combination of data-driven techniques and MC simulation. Good agreement is observed between data and the SM prediction in all three flavour channels. The results of the simulation. Good agreement is observed between data and using a combination of data-driven techniques and MC backgrounds have been evaluated in all three flavour channels. SM backgrounds have been evaluated in all three flavour channels. A lower limit at 95% confidence level is set on the stop mass in a model with $m_{\tilde{t}_{1}}-m_{\tilde{\chi}_{1}^{0}}$=106 GeV, indicated by the horizontal dotted line.

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9 Acknowledgements

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References


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