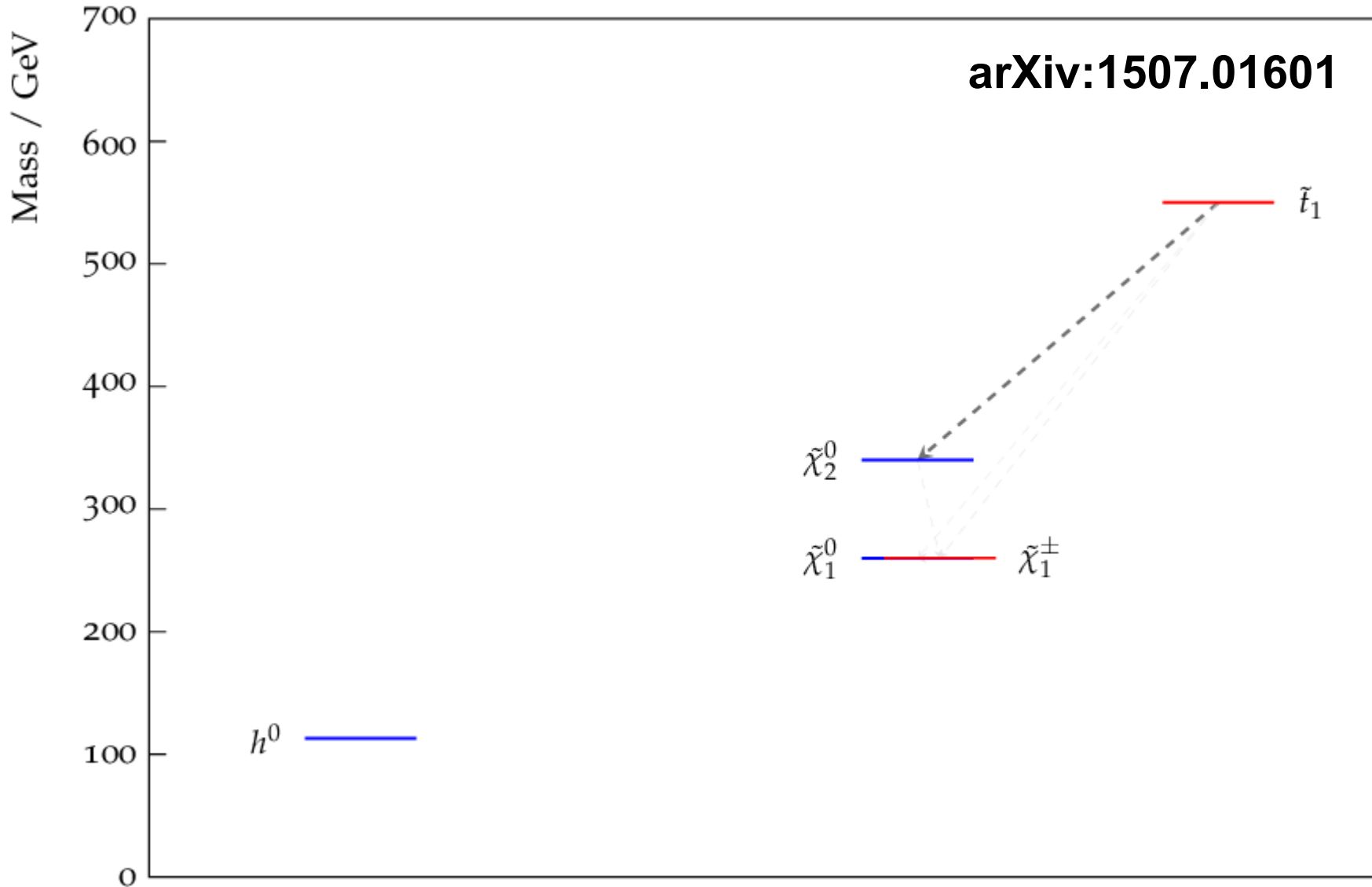


Stop with intermediate ewkinos

Ran model from P.Huang, A.Ismail, C.Wagner and I.Low through 8TeV and 13 TeV SUSY analyses



ATLAS 8 TeV Acceptance

- Most significant in same-sign-1b signal region
 - Expect ~ 3.5 events in 8 TeV analysis (cross section is 45fb)

ArXiv:1404.2500

SR	Leptons	$N_{b\text{-jets}}$	Other variables	Additional requirement on m_{eff}
SR3b	SS or 3L	≥ 3	$N_{\text{jets}} \geq 5$	$m_{\text{eff}} > 350$ GeV
SR0b	SS	$= 0$	$N_{\text{jets}} \geq 3, E_{\text{T}}^{\text{miss}} > 150$ GeV, $m_{\text{T}} > 100$ GeV	$m_{\text{eff}} > 400$ GeV
SR1b	SS	≥ 1	$N_{\text{jets}} \geq 3, E_{\text{T}}^{\text{miss}} > 150$ GeV, $m_{\text{T}} > 100$ GeV, SR3b veto	$m_{\text{eff}} > 700$ GeV
SR3Llow	3L	-	$N_{\text{jets}} \geq 4, 50 < E_{\text{T}}^{\text{miss}} < 150$ GeV, Z boson veto, SR3b veto	$m_{\text{eff}} > 400$ GeV
SR3Lhigh	3L	-	$N_{\text{jets}} \geq 4, E_{\text{T}}^{\text{miss}} > 150$ GeV, SR3b veto	$m_{\text{eff}} > 400$ GeV

	SR3b	SR0b	SR1b	SR3Llow	SR3Lhigh
Observed events	1	14	10	6	2
Total expected background events	2.2 ± 0.8	6.5 ± 2.3	4.7 ± 2.1	4.3 ± 2.1	2.5 ± 0.9
$p(s = 0)$	0.50	0.03	0.07	0.29	0.50

1.5 event
expected
here

Signal channel	$\langle \sigma_{\text{vis}} \rangle_{\text{obs}}^{95}$ [fb]	S_{obs}^{95}	S_{exp}^{95}
SR3b	0.19	3.9	$4.4^{+1.7}_{-0.6}$
SR0b	0.80	16.3	$8.9^{+3.6}_{-2.0}$
SR1b	0.65	13.3	$8.0^{+3.3}_{-2.0}$
SR3Llow	0.42	8.6	$7.2^{+2.9}_{-1.3}$
SR3Lhigh	0.23	4.6	$5.0^{+1.6}_{-1.1}$

3.5 events not
within expected
sensitivity

- ~ 2 events expected in loose Stop 0/1-lepton searches, but background yields are even higher than in same-sign

ATLAS 13 TeV Acceptances

- Same region most promising in 13 TeV searches
 - Now expect ~2.5 events (cross section is 300 fb) **ArXiv:1602.09058**

Signal region	$N_{\text{lept}}^{\text{signal}}$	$N_{b\text{-jets}}^{20}$	N_{jets}^{50}	E_T^{miss} [GeV]	m_{eff} [GeV]
SR0b3j	≥ 3	=0	≥ 3	>200	>550
SR0b5j	>2	=0	>5	>125	>650
SR1b	≥ 2	≥ 1	≥ 4	>150	>550
SR3b	≥ 2	≥ 3	-	>125	>650

Asking for 3 leptons kills 85% of signal

	SR0b3j	SR0b5j	SR1b	SR3b
Observed events	3	3	7	1
Total background events	1.5 ± 0.4	0.88 ± 0.29	4.5 ± 1.0	0.80 ± 0.25
$p(s = 0)$	0.13	0.04	0.15	0.36

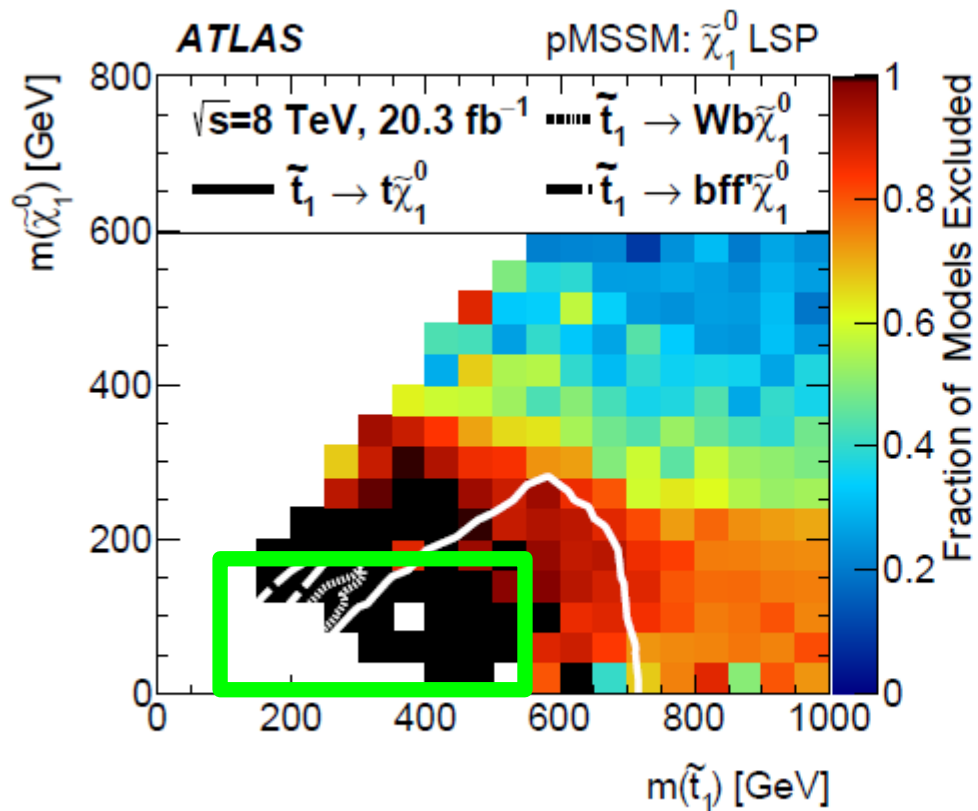
2.5 events not within expected sensitivity

	SR0b3j	SR0b5j	SR1b	SR3b
$N_{\text{BSM}}^{\text{obs}} (N_{\text{BSM}}^{\text{exp}})$	5.9 ($4.1_{-0.8}^{+1.6}$)	6.4 ($3.6_{-1.1}^{+1.2}$)	8.8 ($6.0_{-1.6}^{+2.6}$)	3.8 ($3.7_{-0.5}^{+1.1}$)
$\sigma_{\text{vis}}^{\text{obs}}$ [fb]	1.8	2.0	2.8	1.2

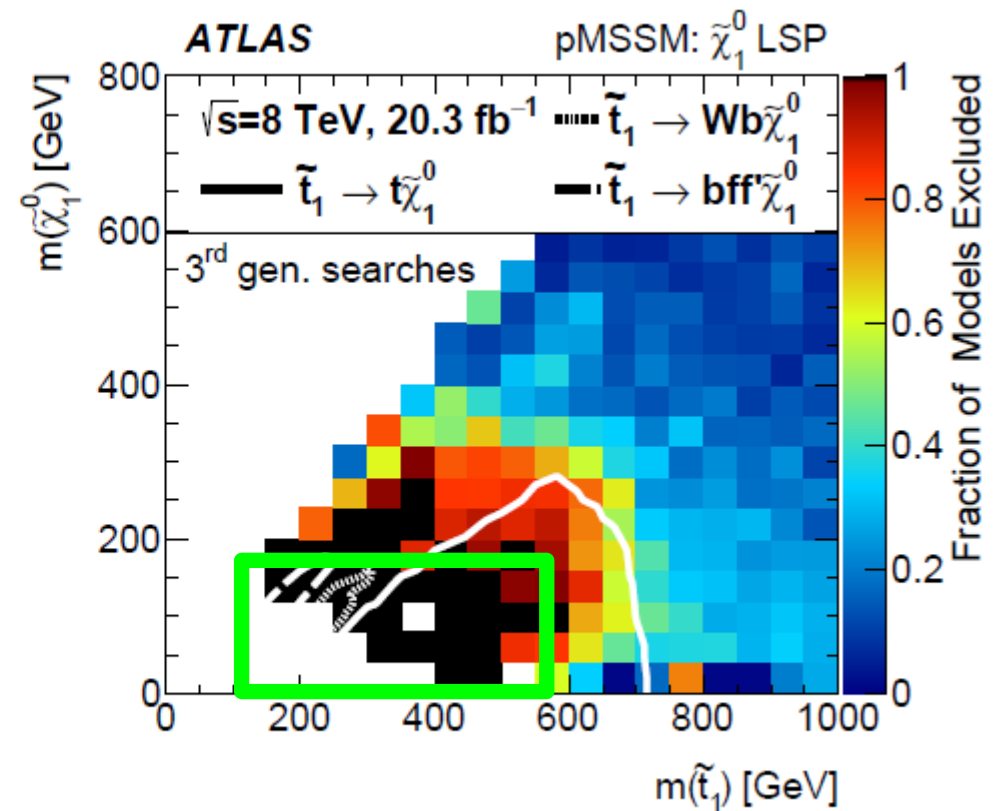
- ~5 events in 7-10 jet search, but much larger bkgd

Non-excluded Stop in pMSSM

- Looked for lightest non-excluded stop in ATLAS pMSSM scan with light LSP (<160 GeV)

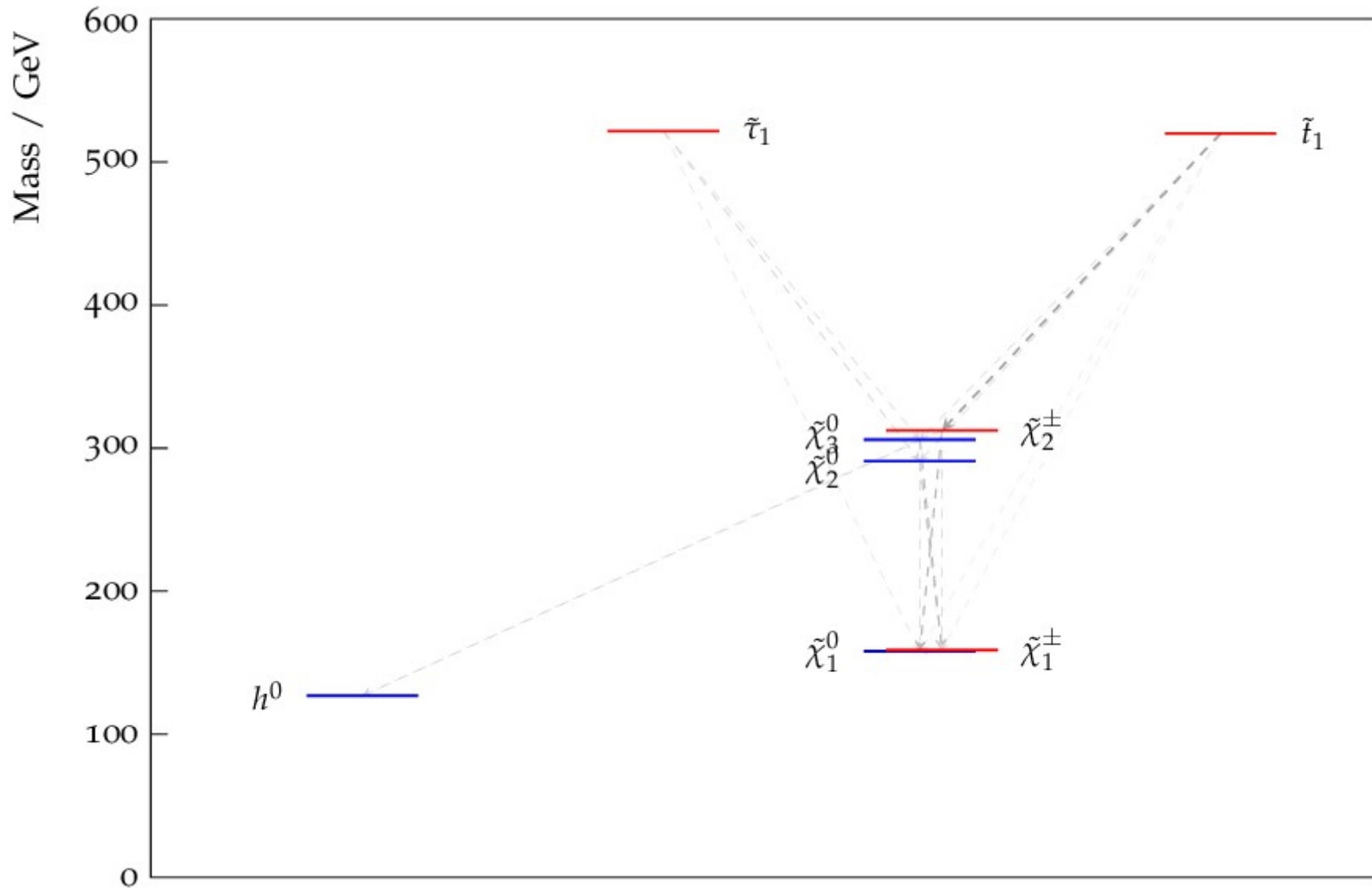


(a) All pMSSM points, all searches



(b) All pMSSM points, 3rd gen. searches

Lightest non-excluded model



- This might be excluded by inclusive 2-6 and 7-10 jet+MET searches at 13 TeV