

ATLAS SUSY Searches* - 95% CL Lower Limits (Status: SUSY 2012)

$$\int \mathcal{L} dt = (1.00 - 5.8) \text{ fb}^{-1}$$

$$\sqrt{s} = 7, 8 \text{ TeV}$$

ATLAS
Preliminary

Inclusive searches	MSUGRA/CMSSM : 0 lep + j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-109]	1.50 TeV	$\tilde{q} = \tilde{g}$ mass
	MSUGRA/CMSSM : 1 lep + j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-104]	1.24 TeV	$\tilde{q} = \tilde{g}$ mass
	Pheno model : 0 lep + j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-109]	1.18 TeV	\tilde{g} mass ($m(\tilde{q}) < 2 \text{ TeV}$, light $\tilde{\chi}_1^0$)
	Pheno model : 0 lep + j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-109]	1.38 TeV	\tilde{q} mass ($m(\tilde{g}) < 2 \text{ TeV}$, light $\tilde{\chi}_1^0$)
	Gluino med. $\tilde{\chi}^\pm (\tilde{g} \rightarrow q\tilde{\chi}^\pm)$: 1 lep + j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-041]	900 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 200 \text{ GeV}$, $m(\tilde{\chi}_1^\pm) = \frac{1}{2}(m(\tilde{\chi}_1^0) + m(\tilde{g}))$)
3rd gen. squarks gluino mediated	GMSB : 2 lep (OS) + j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [Preliminary]	1.24 TeV	\tilde{g} mass ($\tan\beta < 15$)
	GMSB : 1-2 τ + 0-1 lep + j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-112]	1.20 TeV	\tilde{g} mass ($\tan\beta > 20$)
	GGM : $\gamma\gamma + E_{T,miss}$	$\sqrt{s}=4.8 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-072]	1.07 TeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) > 50 \text{ GeV}$)
	$\tilde{g} \rightarrow b\tilde{b}\tilde{\chi}_1^0$ (virtual b) : 0 lep + 1/2 b-j's + $E_{T,miss}$	$\sqrt{s}=2.1 \text{ fb}^{-1}, 7 \text{ TeV}$ [1203.6193]	900 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 300 \text{ GeV}$)
	$\tilde{g} \rightarrow b\tilde{b}\tilde{\chi}_1^0$ (virtual b) : 0 lep + 3 b-j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [1207.4686]	1.02 TeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 400 \text{ GeV}$)
	$\tilde{g} \rightarrow b\tilde{b}\tilde{\chi}_1^0$ (real b) : 0 lep + 3 b-j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [1207.4686]	1.00 TeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) = 60 \text{ GeV}$)
	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (virtual t) : 1 lep + 1/2 b-j's + $E_{T,miss}$	$\sqrt{s}=2.1 \text{ fb}^{-1}, 7 \text{ TeV}$ [1203.6193]	710 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 150 \text{ GeV}$)
	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (virtual t) : 2 lep (SS) + j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-105]	850 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 300 \text{ GeV}$)
	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (virtual t) : 3 lep + j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-108]	760 GeV	\tilde{g} mass (any $m(\tilde{\chi}_1^0) < m(\tilde{g})$)
	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (virtual t) : 0 lep + multi-j's + $E_{T,miss}$	$\sqrt{s}=5.8 \text{ fb}^{-1}, 8 \text{ TeV}$ [ATLAS-CONF-2012-103]	1.00 TeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 300 \text{ GeV}$)
3rd gen. squarks direct production	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (virtual t) : 0 lep + 3 b-j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [1207.4686]	940 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) < 50 \text{ GeV}$)
	$\tilde{g} \rightarrow t\tilde{t}\tilde{\chi}_1^0$ (real t) : 0 lep + 3 b-j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [1207.4686]	820 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^0) = 60 \text{ GeV}$)
	$b\tilde{b}, b_1 \rightarrow b\tilde{\chi}_1^0$: 0 lep + 2-b-jets + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-106]	480 GeV	b mass ($m(\tilde{\chi}_1^0) < 150 \text{ GeV}$)
	$b\tilde{b}, b_1 \rightarrow t\tilde{\chi}_1^+$: 3 lep + j's + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-108]	380 GeV	\tilde{g} mass ($m(\tilde{\chi}_1^\pm) = 2m(\tilde{\chi}_1^0)$)
	$\tilde{t}\tilde{t}$ (very light), $\tilde{t} \rightarrow b\tilde{\chi}_1^+$: 2 lep + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-059]	135 GeV	\tilde{t} mass ($m(\tilde{\chi}_1^0) = 45 \text{ GeV}$)
	$\tilde{t}\tilde{t}$ (light), $\tilde{t} \rightarrow b\tilde{\chi}_1^+$: 1/2 lep + b-jet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-070]	120-173 GeV	\tilde{t} mass ($m(\tilde{\chi}_1^0) = 45 \text{ GeV}$)
	$\tilde{t}\tilde{t}$ (heavy), $\tilde{t} \rightarrow t\tilde{\chi}_1^0$: 0 lep + b-jet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [1208.1447]	380-465 GeV	\tilde{t} mass ($m(\tilde{\chi}_1^0) = 0$)
	$\tilde{t}\tilde{t}$ (heavy), $\tilde{t} \rightarrow t\tilde{\chi}_1^0$: 1 lep + b-jet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-073]	230-440 GeV	\tilde{t} mass ($m(\tilde{\chi}_1^0) = 0$)
	$\tilde{t}\tilde{t}$ (heavy), $\tilde{t} \rightarrow t\tilde{\chi}_1^0$: 2 lep + b-jet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-071]	298-305 GeV	\tilde{t} mass ($m(\tilde{\chi}_1^0) = 0$)
	$\tilde{t}\tilde{t}$ (GMSB) : $Z(\rightarrow ll) + b\text{-jet} + E_{T,miss}$	$\sqrt{s}=2.1 \text{ fb}^{-1}, 7 \text{ TeV}$ [1204.6736]	310 GeV	\tilde{t} mass ($115 < m(\tilde{\chi}_1^0) < 230 \text{ GeV}$)
EW direct	$\tilde{l}_L, \tilde{l} \rightarrow l\tilde{\chi}_1^0$: 2 lep + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-076]	93-180 GeV	\tilde{l} mass ($m(\tilde{\chi}_1^0) = 0$)
	$\tilde{\chi}_1^+ \tilde{\chi}_1^- \rightarrow l\nu(\bar{\nu}) \rightarrow l\nu\tilde{\chi}_1^0$: 2 lep + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-076]	120-330 GeV	$\tilde{\chi}_1^\pm$ mass ($m(\tilde{\chi}_1^0) = 0, m(\tilde{l}, \tilde{\nu}) = \frac{1}{2}(m(\tilde{\chi}_1^0) + m(\tilde{\chi}_1^\pm))$)
Long-lived particles	$\tilde{\chi}_1^\pm \tilde{\chi}_1^\mp \rightarrow 3(l\nu\nu + \nu + 2\tilde{\chi}_1^0)$: 3 lep + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [CONF-2012-077]	60-500 GeV	$\tilde{\chi}_1^\pm$ mass ($m(\tilde{\chi}_1^0) = m(\tilde{\chi}_2^0), m(\tilde{\chi}_1^\pm) = 0, m(\tilde{l}, \tilde{\nu})$ as above)
	AMSB (direct $\tilde{\chi}_1^\pm$ pair prod.) : long-lived $\tilde{\chi}_1^\pm$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-111]	210 GeV	$\tilde{\chi}_1^\pm$ mass ($1 < \tau(\tilde{\chi}_1^\pm) < 10 \text{ ns}$)
	Stable \tilde{g} R-hadrons : Full detector	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-075]	985 GeV	\tilde{g} mass
	Stable \tilde{t} R-hadrons : Full detector	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-075]	683 GeV	\tilde{t} mass
	Metastable \tilde{g} R-hadrons : Pixel det. only	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-075]	910 GeV	\tilde{g} mass ($\tau(\tilde{g}) > 10 \text{ ns}$)
RPV	GMSB : stable $\tilde{\tau}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-075]	310 GeV	$\tilde{\tau}$ mass ($5 < \tan\beta < 20$)
	RPV : high-mass $e\mu$	$\sqrt{s}=1.1 \text{ fb}^{-1}, 7 \text{ TeV}$ [1109.3089]	1.32 TeV	$\tilde{\nu}_\tau$ mass ($\lambda_{311}^2 = 0.10, \lambda_{312}^2 = 0.05$)
	Bilinear RPV : 1 lep + j's + $E_{T,miss}$	$\sqrt{s}=1.0 \text{ fb}^{-1}, 7 \text{ TeV}$ [1109.6606]	760 GeV	$\tilde{q} = \tilde{g}$ mass ($c\tau_{LSP} < 15 \text{ mm}$)
Other	BC1 RPV : 4 lep + $E_{T,miss}$	$\sqrt{s}=2.1 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-035]	1.77 TeV	\tilde{g} mass
	RPV $\tilde{\chi}_1^0 \rightarrow q\bar{q}\mu$: μ + heavy displaced vertex	$\sqrt{s}=4.4 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-113]	700 GeV	\tilde{q} mass ($3.0 \times 10^{-6} < \lambda_{211}^2 < 1.5 \times 10^{-5}, 1 \text{ mm} < c\tau < 1 \text{ m}, \tilde{g}$ decoupled)
	Hypercolour scalar gluons : 4 jets, $m_{H_1} \approx m_{H_2}$	$\sqrt{s}=4.6 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-110]	100-287 GeV	sgluon mass (incl. limit from 1110.2693)
	Spin dep. WIMP interaction : monojet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-084]	709 GeV	M^* scale ($m_\chi < 100 \text{ GeV}$, vector D5, Dirac χ)
	Spin indep. WIMP interaction : monojet + $E_{T,miss}$	$\sqrt{s}=4.7 \text{ fb}^{-1}, 7 \text{ TeV}$ [ATLAS-CONF-2012-084]	548 GeV	M^* scale ($m_\chi < 100 \text{ GeV}$, tensor D9, Dirac χ)

10⁻¹

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Mass scale [TeV]

*Only a selection of the available mass limits on new states or phenomena shown.
All limits quoted are observed minus 1 σ theoretical signal cross section uncertainty.