

ATLAS Exotics Searches* - 95% CL Exclusion

Status: August 2016

ATLAS Preliminary

$\int \mathcal{L} dt = (3.2 - 20.3) \text{ fb}^{-1}$

$\sqrt{s} = 8, 13 \text{ TeV}$

Model	ℓ, γ	Jets [†]	E_T^{miss}	$\int \mathcal{L} dt [\text{fb}^{-1}]$	Limit	Reference		
Extra dimensions	ADD $G_{KK} + g/q$	$\geq 1 j$	Yes	3.2	M_D 6.58 TeV	$n = 2$	1604.07773	
	ADD non-resonant $\ell\ell$	$2 e, \mu$	-	20.3	M_S 4.7 TeV	$n = 3 \text{ HLZ}$	1407.2410	
	ADD QBH $\rightarrow \ell q$	$1 e, \mu$ 1 j	-	20.3	M_{th} 5.2 TeV	$n = 6$	1311.2006	
	ADD QBH	-	$2 j$	-	M_{th} 8.7 TeV	$n = 6$	ATLAS-CONF-2016-069	
	ADD BH high $\sum p_T$	$\geq 1 e, \mu$	$\geq 2 j$	-	M_{th} 8.2 TeV	$n = 6, M_D = 3 \text{ TeV, rot BH}$	1606.02265	
	ADD BH multijet	-	$\geq 3 j$	-	M_{th} 9.55 TeV	$n = 6, M_D = 3 \text{ TeV, rot BH}$	1512.02586	
	RS1 $G_{KK} \rightarrow \ell\ell$	$2 e, \mu$	-	-	$G_{KK} \text{ mass}$ 2.68 TeV	$k/\overline{M}_{Pl} = 0.1$	1405.4123	
	RS1 $G_{KK} \rightarrow \gamma\gamma$	2γ	-	-	$G_{KK} \text{ mass}$ 3.2 TeV	$k/\overline{M}_{Pl} = 0.1$	1606.03833	
	Bulk RS $G_{KK} \rightarrow WW \rightarrow qq\ell\nu$	$1 e, \mu$ 1 J	Yes	13.2	$G_{KK} \text{ mass}$ 1.24 TeV	$k/\overline{M}_{Pl} = 1.0$	ATLAS-CONF-2016-062	
	Bulk RS $G_{KK} \rightarrow HH \rightarrow bbbb$	-	$4 b$	-	$G_{KK} \text{ mass}$ 360-860 GeV	$k/\overline{M}_{Pl} = 1.0$	ATLAS-CONF-2016-049	
Bulk RS $g_{KK} \rightarrow tt$	$1 e, \mu$	$\geq 1 b, \geq 1J/2j$	Yes	20.3	$g_{KK} \text{ mass}$ 2.2 TeV	BR = 0.925	1505.07018	
2UED / RPP	$1 e, \mu$	$\geq 2 b, \geq 4 j$	Yes	3.2	$KK \text{ mass}$ 1.46 TeV	Tier (1,1), BR($A^{(1,1)} \rightarrow tt$) = 1	ATLAS-CONF-2016-013	
Gauge bosons	SSM $Z' \rightarrow \ell\ell$	$2 e, \mu$	-	13.3	$Z' \text{ mass}$ 4.05 TeV		ATLAS-CONF-2016-045	
	SSM $Z' \rightarrow \tau\tau$	2τ	-	19.5	$Z' \text{ mass}$ 2.02 TeV		1502.07177	
	Leptophobic $Z' \rightarrow bb$	-	$2 b$	-	$Z' \text{ mass}$ 1.5 TeV		1603.08791	
	SSM $W' \rightarrow \ell\nu$	$1 e, \mu$	-	Yes	13.3	$W' \text{ mass}$ 4.74 TeV		ATLAS-CONF-2016-061
	HVT $W' \rightarrow WZ \rightarrow qq\nu\nu$ model A	$0 e, \mu$	1 J	Yes	13.2	$W' \text{ mass}$ 2.4 TeV	$g_V = 1$	ATLAS-CONF-2016-082
	HVT $W' \rightarrow WZ \rightarrow qqqq$ model B	-	$2 J$	-	15.5	$W' \text{ mass}$ 3.0 TeV	$g_V = 3$	ATLAS-CONF-2016-055
	HVT $V' \rightarrow WH/ZH$ model B	multi-channel	-	-	3.2	$V' \text{ mass}$ 2.31 TeV		1607.05621
	LRSM $W'_R \rightarrow tb$	$1 e, \mu$	$2 b, 0-1 j$	Yes	20.3	$W'_R \text{ mass}$ 1.92 TeV		1410.4103
LRSM $W'_R \rightarrow tb$	$0 e, \mu$	$\geq 1 b, 1 J$	-	20.3	$W'_R \text{ mass}$ 1.76 TeV		1408.0886	
CI	CI $qqqq$	-	$2 j$	-	15.7	Λ 19.9 TeV $\eta_{LL} = -1$	ATLAS-CONF-2016-069	
	CI $\ell\ell qq$	$2 e, \mu$	-	-	3.2	Λ 25.2 TeV $\eta_{LL} = -1$	1607.03669	
	CI $uutt$	$2(SS)/\geq 3 e, \mu$	$\geq 1 b, \geq 1 j$	Yes	20.3	Λ 4.9 TeV	$ C_{RR} = 1$	1504.04605
DM	Axial-vector mediator (Dirac DM)	$0 e, \mu$	$\geq 1 j$	Yes	3.2	m_A 1.0 TeV	$g_q=0.25, g_\chi=1.0, m(\chi) < 250 \text{ GeV}$	1604.07773
	Axial-vector mediator (Dirac DM)	$0 e, \mu, 1 \gamma$	1 j	Yes	3.2	m_A 710 GeV	$g_q=0.25, g_\chi=1.0, m(\chi) < 150 \text{ GeV}$	1604.01306
	$ZZ\chi\chi$ EFT (Dirac DM)	$0 e, \mu$	$1 J, \leq 1 j$	Yes	3.2	M_χ 550 GeV	$m(\chi) < 150 \text{ GeV}$	ATLAS-CONF-2015-080
LQ	Scalar LQ 1 st gen	$2 e$	$\geq 2 j$	-	3.2	LQ mass 1.1 TeV	$\beta = 1$	1605.06035
	Scalar LQ 2 nd gen	2μ	$\geq 2 j$	-	3.2	LQ mass 1.05 TeV	$\beta = 1$	1605.06035
	Scalar LQ 3 rd gen	$1 e, \mu$	$\geq 1 b, \geq 3 j$	Yes	20.3	LQ mass 640 GeV	$\beta = 0$	1508.04735
Heavy quarks	VLQ $TT \rightarrow Ht + X$	$1 e, \mu$	$\geq 2 b, \geq 3 j$	Yes	20.3	T mass 855 GeV	T in (T,B) doublet	1505.04306
	VLQ $YY \rightarrow Wb + X$	$1 e, \mu$	$\geq 1 b, \geq 3 j$	Yes	20.3	Y mass 770 GeV	Y in (B,Y) doublet	1505.04306
	VLQ $BB \rightarrow Hb + X$	$1 e, \mu$	$\geq 2 b, \geq 3 j$	Yes	20.3	B mass 735 GeV	isospin singlet	1505.04306
	VLQ $BB \rightarrow Zb + X$	$2/\geq 3 e, \mu$	$\geq 2/\geq 1 b$	-	20.3	B mass 755 GeV	B in (B,Y) doublet	1409.5500
	VLQ $QQ \rightarrow WqWq$	$1 e, \mu$	$\geq 4 j$	Yes	20.3	Q mass 690 GeV		1509.04261
	VLQ $T_{5/3} T_{5/3} \rightarrow WtWt$	$2(SS)/\geq 3 e, \mu$	$\geq 1 b, \geq 1 j$	Yes	3.2	$T_{5/3} \text{ mass}$ 990 GeV		ATLAS-CONF-2016-032
Excited fermions	Excited quark $q^* \rightarrow q\gamma$	1γ	1 j	-	3.2	$q^* \text{ mass}$ 4.4 TeV	only u^* and d^* , $\Lambda = m(q^*)$	1512.05910
	Excited quark $q^* \rightarrow qg$	-	$2 j$	-	15.7	$q^* \text{ mass}$ 5.6 TeV	only u^* and d^* , $\Lambda = m(q^*)$	ATLAS-CONF-2016-069
	Excited quark $b^* \rightarrow bg$	-	$1 b, 1 j$	-	8.8	$b^* \text{ mass}$ 2.3 TeV		ATLAS-CONF-2016-060
	Excited quark $b^* \rightarrow Wt$	$1 \text{ or } 2 e, \mu$	$1 b, 2-0 j$	Yes	20.3	$b^* \text{ mass}$ 1.5 TeV	$f_g = f_L = f_R = 1$	1510.02664
	Excited lepton ℓ^*	$3 e, \mu$	-	-	20.3	$\ell^* \text{ mass}$ 3.0 TeV	$\Lambda = 3.0 \text{ TeV}$	1411.2921
	Excited lepton ν^*	$3 e, \mu, \tau$	-	-	20.3	$\nu^* \text{ mass}$ 1.6 TeV	$\Lambda = 1.6 \text{ TeV}$	1411.2921
Other	LSTC $a_T \rightarrow W\gamma$	$1 e, \mu, 1 \gamma$	-	Yes	20.3	$a_T \text{ mass}$ 960 GeV		1407.8150
	LRSM Majorana ν	$2 e, \mu$	$2 j$	-	20.3	$N^0 \text{ mass}$ 2.0 TeV		1506.06020
	Higgs triplet $H^{\pm\pm} \rightarrow ee$	$2 e (SS)$	-	-	13.9	$H^{\pm\pm} \text{ mass}$ 570 GeV	$m(W_R) = 2.4 \text{ TeV, no mixing}$	ATLAS-CONF-2016-051
	Higgs triplet $H^{\pm\pm} \rightarrow \ell\tau$	$3 e, \mu, \tau$	-	-	20.3	$H^{\pm\pm} \text{ mass}$ 400 GeV	DY production, BR($H_L^{\pm\pm} \rightarrow ee$)=1	1411.2921
	Monotop (non-res prod)	$1 e, \mu$	1 b	Yes	20.3	spin-1 invisible particle mass 657 GeV	DY production, BR($H_L^{\pm\pm} \rightarrow \ell\tau$)=1	1410.5404
	Multi-charged particles	-	-	-	20.3	multi-charged particle mass 785 GeV	$a_{\text{non-res}} = 0.2$	1504.04188
	Magnetic monopoles	-	-	-	7.0	monopole mass 1.34 TeV	DY production, $ g = 1g_D, \text{ spin } 1/2$	1509.08059

$\sqrt{s} = 8 \text{ TeV}$ $\sqrt{s} = 13 \text{ TeV}$

10⁻¹ 1 10 Mass scale [TeV]

*Only a selection of the available mass limits on new states or phenomena is shown. Lower bounds are specified only when explicitly not excluded.

†Small-radius (large-radius) jets are denoted by the letter j (J).