atlas_1308_2631 CutFlow

ATLAS
atlas_1308_2631
ATLAS-SUSY-13-05
2 b-jet, 0 lepton, 3rd generation squark search
Energy: 8 TeV
Luminosity: 20.1 fb^{-1}

Process	$\tilde{b} \to b\tilde{\chi}_1^0$		$\tilde{t} \to b\tilde{\chi}_1^\pm$, $\tilde{\chi}_1^\pm \to W^*\tilde{\chi}_1^0$	
Point	$m(\tilde{b}) = 500$ GeV		$m(\tilde{t}) = 500$ GeV	
	$m(\tilde{\chi}_1^0) = 1$ GeV		$m(\tilde{\chi}_1^\pm) = 120$, $m(\tilde{\chi}_1^0) = 100$ GeV	
Source	ATLAS	CheckMATE	ATLAS	CheckMATE
Generated events	15000	75790	80000	50000
Initial Events	1738	1717	1738	1717
$E_T^{miss} > 80$ GeV	1606 ± 4	1598 ± 2	1632 ± 2	1556 ± 2
Trigger*	1548 ± 4	1598 ± 2	1515 ± 2	1556 ± 2
All cleaning*	1537 ± 5	1581 ± 2	1503 ± 3	1541 ± 2
Lepton veto*	1505 ± 5	1558 ± 3	1061 ± 3	1108 ± 3
$E_T^{miss} > 150$ GeV	1323 ± 6	1318 ± 2	859 ± 1	863 ± 3
Jet selection	119 ± 4	111 ± 1	39 ± 3	29 ± 1
$m_{bb} > 200$ GeV	96 ± 3	79 ± 1	32 ± 2	24 ± 1
$M_{CT} > 150$ GeV	82 ± 3	69 ± 1	26.8 ± 2	20 ± 1
$M_{CT} > 200$ GeV	67 ± 3	57 ± 1	20.2 ± 1.1	15 ± 0.6
$M_{CT} > 250$ GeV	51 ± 2	43 ± 1	13.2 ± 1.1	9.1 ± 0.5
$M_{CT} > 300$ GeV	35 ± 2	29 ± 1	7.7 ± 0.8	5.2 ± 0.4

Table 1: Cutflow validation for atlas_1308_2631, testing 3rd generation production. Shown are the number of events after each selection cut, normalised to 20.1 fb^{-1}. Final error is from Monte Carlo statistics for both ATLAS and CheckMATE. **A trigger is not applied in CheckMATEsince the signal regions are 100% efficient. Consequently, the cutflow can only be reliably followed after the $E_T^{miss} > 150$ GeV cut*

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Point	$m(\tilde{b}) = 350$ GeV		$m(\tilde{t}) = 500$ GeV	
	$m(\tilde{\chi}_1^0) = 320$ GeV		$m(\tilde{\chi}_1^\pm) = 420$, $m(\tilde{\chi}_1^0) = 400$ GeV	
Source	ATLAS	CheckMATE	ATLAS	CheckMATE
Generated events	50000	79856	80000	50000
Initial Events	16241	15997	1738	1717
$E_T^{miss} > 80$ GeV	6221 ± 35	5544 ± 27	1329 ± 5	1093 ± 3
Trigger*	4487 ± 32	5544 ± 27	899 ± 6	1093 ± 3
All cleaning*	4453 ± 32	5489 ± 27	890 ± 6	1082 ± 3
Lepton veto*	4069 ± 31	5147 ± 26	669 ± 6	834 ± 3
$E_T^{miss} > 250$ GeV	757 ± 15	772 ± 12	93 ± 3	102 ± 2
Jet selection	7.9 ± 1.6	6.3 ± 1.1	6.2 ± 0.7	5.6 ± 0.4
$H_{T,3} < 50$ GeV	5.2 ± 1.3	5.5 ± 1.0	3 ± 0.5	3.6 ± 0.3

Table 2: Cutflow validation for atlas_1308_2631, testing 3rd generation production. Shown are the number of events after each selection cut, normalised to 20.1 fb^{-1}. Final error is from Monte Carlo statistics for both ATLAS and CheckMATE. **A trigger is not applied in CheckMATEsince the signal regions are 100% efficient. Consequently, the cutflow can only be reliably followed after the $E_T^{miss} > 150$ GeV cut*